Engineering & Science University Magnet School

500 Boston Post Road
West Haven, Connecticut

SDE Project #093-0357 MAG/N

PROJECT MANUAL
VOLUME II of II
DIVISIONS 1 - 34

CD DOCUMENTS
PHASE 1 OF 3
May 1, 2013

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SUMMARY OF WORK

PART 1 - GENERAL

1.01 CONTRACT

A. The Construction Manager (CM) will award Multiple Trade Contracts for the Project to complete the Work as indicated and specified.

B. The Trade Contractor agrees to accept the site as it exists and to remove any encumbrances that interfere with the proper fulfillment of the Work without change in the Contract Sum.

C. The Trade Contractor shall cooperate with other Trade Contractors for any other separate contracts that the CM may award.
   1. In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:
      a. The Trade Contract Agreement.
      b. Addenda, with those of later date having precedence over those of earlier date.
      c. The Supplementary Conditions.
      d. The General Conditions of the Contract for Construction.
      e. Drawings and Specifications.
   2. In the case of an inconsistency between Drawings and Specifications, or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.
   3. In the case of inconsistencies between Drawings where quality and quantity are not in conflict, the Scope of work indicated by the larger-scaled drawing shall take precedence over conflicting information shown in a smaller scaled drawing.

1.02 PROJECT OBJECTIVES

A. The CM shall complete the construction in the shortest period of time and shall plan the work, obtain materials, and execute the construction in the most expeditious manner possible in accordance with the requirements listed below.

B. The CM shall protect the building and occupants from damages cause by weather and construction activity during the progress of the work. Safety shall be of paramount importance. The CM shall erect temporary barricades to facilitate construction safety without hindering access of the students and staff. Temporary exterior barricades required to be installed around the construction site, illustrated on the site layout drawing, shall be a minimum of eight (8) ft high and may be constructed of either chain link fencing or plywood. Openings shall be restricted to those indicated and the minimum required by the contractor to access the work; all gates, doors and other accessible points shall be kept closed when not in use.

C. The CM will be responsible to post warning signs indicating safety requirements, such as existing exit doors that are not to be used or are to be used for emergency access only.

D. The CM shall maintain systems in working order, maintain appropriate means of egress, and maintain the construction site in an orderly manner. Housekeeping procedures shall be maintained on a daily basis to minimize the intrusion of dust and construction debris into the school environment.

E. All construction workers on the site must wear visible identification on their person at all times; maintain an alcohol, drug and smoke free environment, refrain from fraternizing with students or staff and refrain from objectionable or obnoxious language or behavior. Violators will be discharged from the project site.

1.03 SCHEDULE CONSTRAINTS

A. The Construction Schedule is critical to the project. All work is required to be Substantially Complete, with a Certificate of Occupancy obtained, and ready for occupancy by the Owner, on or before the date agreed upon in the CM/Owner Agreement.

B. Premium costs required by the Trade Contractors to perform the work that is required to comply with the completion dates on the construction schedule are to be included in the Trade Contractor's base bid. Additional Trade Contractor costs related to the use of overtime or additional personnel necessary to complete with work within the stated completion time will not be considered after award of Contract.

1.04 WORK SCHEDULE

A. Perform Work in accordance with a predetermined Work Schedule agreed upon by the Owner, Construction Manager and Trade Contractor.

B. The Trade Contractor shall coordinate work with the Construction Manager and other Trade Contractors at the site.

C. Location of trailers, storage areas, parking areas, and staging areas shall be coordinated with the Owner and the Construction Manager.

D. If the Trade Contractor fails to expedite and pursue any part of the Work, the CM may terminate the Work or may carry out the Work as described by the General Conditions.

E. Immediately upon the receipt of a contract for construction, the Trade Contractors shall organize the Work, prepare a detailed construction schedule, provide required submittals in accordance with the Shop Drawing, Product Data, and Sample Schedule so that all materials subject to approval may be ordered, and shall expedite long-lead items. If requested by the Owner or CM, the Trade Contractor shall provide proof of orders and delivery dates.

F. The Trade Contractor shall maintain on-site, and submit with the monthly update, a copy of the schedule, graphically depicting actual vs. scheduled start and finish dates for all activities.

G. If it appears that the Work cannot be completed by the scheduled dates, the Trade Contractor shall increase the work force or increase the hours of work, including evenings and weekends if necessary, at no additional cost to the Owner.

H. If the CM fails to staff the job adequately to meet the completion date, the Owner reserves the right to assume possession of the material and to complete the installation with the Owner's forces or other Contractors or to require the CM to work additional shifts, as necessary.

I. If the Work is complete, but the area is not cleaned and debris or equipment is not removed, the Owner shall have the right to have the area prepared for occupancy with his own or other forces and deduct the costs from the contract amount.

J. The final Construction Schedule will be subject to the approval of the Owner, the Architect, and the Construction Manager.

K. The Trade Contractor shall secure and pay for all required trade permits, fees licenses and shall schedule all progress inspections necessary for proper execution and completion of work. Building Permit will be obtained by the Owner.

1.05 PRE-CONSTRUCTION CONFERENCE

A. Prior to commencing any work on the Project, a Pre-Construction Conference shall be scheduled at the site by the Construction Manager. The following parties shall be represented: Owner, Architect, Trade Contractors, major Trade Subcontractors, and Construction Manager.

B. Subsequent to the Pre-Construction Conference, the Construction Manager will schedule and conduct progress meetings for the course of the project, with all parties represented at the Pre-Construction Conference.

1.06 CODES AND STANDARDS APPLICABLE

A. All construction will be governed by:
   1. State of Connecticut Basic Building Code, latest edition.
   2. Connecticut Fire Safety Code, latest edition.
   3. All other applicable laws and regulations, including local Building, Fire or Health Codes.

1.07 PREPARATION OF SITE

A. Site drawings indicate existing grade elevations, final grade elevations, and locations of work on the property.

B. Trade Contractor agrees to accept site as indicated and to remove encumbrances that interfere with proper fulfillment of his work without change in Contract Sum.

C. Contractor shall do all work as noted inside or outside of Contract Limit Lines.

1.08 LINE AND LEVELS

A. Drawings indicate location of the Work.

B. Trade Contractor shall lay out Work prior to construction and will be held responsible for its accuracy. Layout approval by Owner and Construction Manager is required prior to construction.

C. CM shall establish a "Datum" or "Bench Mark" at convenient locations, which will remain throughout Work, for convenience and constant reference for use of subcontractors.

1.09 TIME FOR COMPLETION

A. It shall be understood and mutually agreed that the time for Substantial Completion is an essential condition of the Trade Contract.

B. Trade Contractor agrees that Work shall be prosecuted diligently and uninterruptedly at such rate as will insure Substantial Completion of Work and issuance of Certificates of Occupancy on or before the dates stated in the Trade Contract.

C. It is expressly understood and agreed by the Trade Contractor, CM and Owner that the time for Substantial Completion and issuance of Certificates of Occupancy are reasonable, taking into consideration average climatic range, Owner's restrictions, and other conditions prevailing.

D. Trade Contractors shall schedule the Work accordingly.

1.10 EXAMINATION OF SURFACES TO BE COVERED

A. Prior to application of materials included in the various Sections, the installer, the manufacturer's representative, and the Trade Contractor shall together examine the building and surfaces upon which materials are to be supplied.

B. The installer and the manufacturer's representative shall accept all surfaces and conditions affecting proper installation of their materials. The installer shall not proceed with the work until all conditions and surfaces are satisfactory to him.

C. The Trade Contractor shall do all work necessary to correct unsatisfactory conditions and surfaces not specifically included as work of the subcontractor.

D. The Trade Subcontractor shall furnish to the Trade Contractor for submission to the Architect two (2) copies of his statement, countersigned by the manufacturer or his appointed representative, that the entire installation has been made by correct techniques over properly prepared surfaces and under proper job conditions.

1.11 WORK BY OWNER

A. The Owner may furnish labor and materials under separate contracts for certain items of work to be selected.

B. The Trade Contractor shall coordinate their work with that of the separate contractors as provided in Article 6 of the AIA General Conditions.

1.12 FIRE SAFETY REQUIREMENTS

A. The Contractor shall conform to the following mandatory requirements during the course of the work:
   1. All debris shall be cleaned out of the building at the end of each working day.
   2. All combustible materials shall be stored outside the building.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
   1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.03 DESCRIPTION

A. General: To enable the Owner to compare total costs where alternate materials and methods might be used or to adjust construction areas to meet the budget, the following alternates have been established. Provide prices for each of the alternates listed in accordance with the contract documents.

B. Related Work Specified in Other Sections: Materials and methods to be used in the Base Bid and in the Alternates have been described in each Section of the project manual referred to by the Alternate Number.

1.04 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
   1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

1.05 ACCEPTANCE

A. The price of the Alternate may be accepted or rejected by the Owner at the time the contract is awarded. Order of alternate list does not constitute a priority of award.

1.06 QUALITY ASSURANCE

A. Standards: See individual Sections for required standards modified to conform to alternate conditions.

B. Qualifications: See individual Sections for required Installer qualifications.

1.07 SUBMITTALS

A. See individual Sections for required submittals modified to conform to alternate conditions.

1.08 PRODUCT HANDLING

A. Specific Sections of the specifications specify the material handling requirements included in both the base bid and the alternate. Perform work in accordance with the requirements of the applicable Section.

PART 2 - PRODUCTS

2.01 Not Used

PART 3 - EXECUTION

3.01 INSTALLATION

A. Alternates that have been accepted shall be installed in accordance with the applicable specification Section. The intent of the Alternate is to allow for cost adjustments only for a particular item or system and not to permit any lower standards or workmanship.

3.02 SCHEDULE OF ALTERNATES

A. Alternate No. 1 - Garden Beds and Storage Benches:
   1. Base Bid Work: Garden beds and storage benches as indicated on L1.1 and detailed on L4.6 and in Specifications 32 13 13, 32 13 73, 32 32 23, and 32 91 15.
   2. Deduct Alternate Work: eliminate the raised garden beds, concrete block retaining walls, storage benches and concrete walkways, and replace with lawn panel and plant beds as indicated on drawing L5.0 and Specifications 32 91 15 and 32 92 00.
   3. Credit: Provide a credit for deleting concrete walks, 4 storage benches, concrete block retaining walls except for the one to the north of the HC ramp, three yard drains and pipe.

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electronic document submittal service.

B. Preconstruction meeting.

C. Site mobilization meeting.

D. Progress meetings.

E. Construction progress schedule.

F. Progress photographs.

G. Coordination drawings.

H. Submittals for review, information, and project closeout.

I. Number of copies of submittals.

J. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

1.03 PROJECT COORDINATION

A. Project Coordinator: Construction Manager.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for interpretation.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.

9. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL

A. All documents transmitted for purposes of administration of the contract are to be transmitted in electronic (PDF) format.
   1. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, and any other document any participant wishes to make part of the project record.
   2. Paper document transmittals will not be reviewed.
   3. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

3.02 PRECONSTRUCTION MEETING

A. Construction Manager will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract and Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.

D. Construction Manager shall record minutes and distribute copies within three days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Construction Manager will schedule a meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Special Consultants.
   5. Contractor's Superintendent.
   6. Major Subcontractors.
   7. Commissioning Agent, if any.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements and occupancy prior to completion.
   3. Construction facilities and controls provided by Owner.

4. Temporary utilities provided by Owner.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.
11. Requirements for start-up of equipment.
12. Inspection and acceptance of equipment put into service during construction period.

D. Construction Manager shall record minutes and distribute copies within three days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. DESCRIPTION
1. General: To enable the orderly review during progress of the Work, and to provide for a systematic discussion of problems, the Construction Manager (CM) will conduct project meetings throughout the construction period in accordance with the Contract Documents.
2. Scope of Meetings includes but is not limited to:
   a. Pre-Construction Meeting.
   b. Job Progress Meetings.
   c. Field Observations.
   d. Other Meetings.
3. Other Meetings not included in this Scope:
   a. Special meetings between Architect, Owner, Construction Manager, Trade Contractors or manufacturer representatives.
   b. Pre-bid scope review meetings.

B. QUALITY ASSURANCE
1. Each Trade Contractor and his applicable subcontractors and manufacturer representatives must be represented at meetings by a principal or authorized representative of their organization capable of making binding financial decisions.

C. SUBMITTALS
1. Notice of Meeting: CM shall send written meeting notices and agenda to all parties whose attendance is required. (Notice may be included in previous Minutes of Meeting, if appropriate).
2. Minutes of Meeting: The CM shall take, transcribe and distribute minutes of job meetings, clearly indicating the action taken and/or the follow-up required of each party. Minutes shall include outstanding items from previous meetings and their stage of resolution. Minutes shall be of consistent size and format for record keeping purposes.

D. PRE-CONSTRUCTION MEETING
1. Meeting will be held at a location near the job site with adequate light and ventilation as provided by the CM.
2. Attendees: Major Trade Contractors shall be represented. Attendees shall include appropriate Trade Contractors, major material suppliers, Owner and Architect's representatives and others as needed.
3. Agenda: Organizational arrangement of each Trade Contractor's forces and personnel, and those of subcontractors, Materials Suppliers, and Architect.
   a. Channels and procedures for communications.
   b. Construction schedule, including sequence of critical work, deliveries and priorities.
   c. Contract Documents, including distribution of required copies of original Documents and revisions.
   d. Processing of Shop Drawings and other data submitted to the Architect through the

CM for review.

e. Processing of field decisions and Change Orders.
f. Rules and regulations governing performance of the Work.
g. Procedures for safety and first aid, security quality control, use of premises, housekeeping, field decisions, proposal requests, change orders, application for payment and other related matters.

E. JOB PROGRESS MEETINGS
1. Hold meetings on a regular basis at a location near the job site with adequate light and ventilation as selected by the CM.
2. Attendees: Major Trade Contractors are required to be represented, unless excused by the Construction Manager. Manufacturers, materials' suppliers, and others may be invited to attend those project meetings in which their aspects of the Work are involved.
3. Agenda:
   a. Review safety concerns and / or events at the Project.
   b. Review, revise as necessary, and approved minutes of previous meeting.
   c. Review progress of the Work since last meeting, including status of submittals for approval.
   d. Identify problems that impede planned progress.
   e. Develop corrective measures and procedures to regain planned construction schedule.
   f. Complete other current business.

F. FIELD OBSERVATIONS
1. Formal Observation Trips: Shall be made of the job progress for the Owner, Architect, Engineers, Local, State or Federal officials, etc., as the occasion warrants, as scheduled through the CM.
2. Requests For Observation: If requested, the Trade Contractor shall be prepared to show and explain his job progress throughout the building to the observation parties.
3. Field Notes: Observation trips shall have appropriate comments transcribed and distributed to the observation party members, Owner, Engineers and Trade Contractors by the CM.
4. Punch List & Final Inspection: The CM shall conduct a punch list inspection and final inspection of completed work.

G. OTHER MEETINGS
1. The Owner or CM shall call meetings to resolve construction problems. Trade Contractors must work through the CM for resolving questions and differences.

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date established in Notice to Proceed, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.06 PROGRESS PHOTOGRAPHS

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Architect.

D. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Completion of site clearing.
   2. Excavations in progress.
   3. Foundations in progress and upon completion.
   4. Structural framing in progress and upon completion.
   5. Enclosure of building, upon completion.

E. Take photographs as evidence of compliance with Construction Indoor Air Quality Management Plan as outlined in Section 01 50 00 Temporary Facilities and Controls.

F. Views:
   1. Provide aerial photographs from two views at each specified time, until structure is enclosed.
   2. Provide non-aerial photographs from four cardinal views at each specified time, until Date of Substantial Completion.
   3. Consult with Architect for instructions on views required.
   4. Provide factual presentation.
   5. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

G. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email with project record photo CD.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
   4. Photo CD(s): Provide 1 copy including all photos cumulative to date and PDF file(s), with files organized in separate folders by submittal date.
   5. Hard Copy: Printed hardcopy (grayscale) of PDF file.

3.07 COORDINATION DRAWINGS

A. COMPOSITE TRADE CONSTRUCTION COORDINATION
   1. Within 30 days of award of Contract, the Construction Manager shall prepare ¼" = 1'-0" scale composite construction Drawings of the floor plans, reflected ceiling plans, and cross-sections (if applicable), revealing each trade.
   2. The Construction Manager shall provide reproducible transparencies indicating all proposed utility installations Mechanical, Electrical, Plumbing and Fire Protection relative to the contract reflected ceiling plans and structural framing plans.

B. COORDINATION DRAWINGS
   1. Coordination Drawings shall include but not be limited to the following:
      a. Ceiling systems, finish ceiling heights, and structural components.
      b. Registers, grilles, diffusers, ductwork, and valve dampers.
      c. Lighting fixtures, speakers, distribution conduit, electrical panels, and Fire Alarm devices.
      d. Waste and vent piping, water piping and rain water leaders.
      e. Sprinkler heads and piping

C. SUBMITTAL
   1. Prior to submittal to Architect's office, areas of potential conflict shall be brought to the attention of the Construction Manager who shall convene a coordination meeting of all parties involved, for the purpose of resolving utility conflicts. The Construction Manager

shall supervise and direct corrective measures and have all trades sign acceptance of the Drawings. Submit blue line prints and electronic files of each Drawing to the Architect for the record, and only after conflicts have been accommodated.

2. If the coordination meeting fails to resolve coordination conflicts, the Construction Manager shall indicate the nature of such conflicts in a detailed RFI (Request for Information Form), propose the most economical solution and submit to Architect for review.

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - CLOSEOUT SUBMITTALS.

3.09 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. VOC content reports.
   3. Certificates.
   4. Test reports.
   5. Inspection reports.
   6. Manufacturer's instructions.
   7. Manufacturer's field reports.
   8. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

B. Submit for Owner's benefit during and after project completion.

3.11 NUMBER OF COPIES OF SUBMITTALS

A. Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.12 SUBMITTAL PROCEDURES

A. Transmit each submittal with approved form.

B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project, and coordinate submission of related items.

F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

G. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

H. Provide space for Contractor and Architect review stamps.

I. When revised for resubmission, identify all changes made since previous submission.

J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01 35 29.13

HEALTH AND SAFETY

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor's work shall include, but not be limited to, the following:

A. Provide all necessary labor, materials, equipment and services and perform all operations specified in these technical specifications.

B. Prepare and implement a health and safety plan and field monitoring program applicable to on-site contractor personnel.

C. Provide and install barricade fencing, lighting, warning signs, and other safety measures as necessary to secure the work areas.

D. Obtain all Federal, State, and local permits required for work covered by this specification.

1.02 RELATED SECTIONS AND DOCUMENTS

A. References
   1. Phase II Environmental Site Investigation Report by Langan Engineering & Environmental Services, Inc. dated 8 May 2013.
   2. Delineation of Lead in Soils and Additional Soil Sampling Letter Report by Langan Engineering & Environmental Services, Inc., dated 13 June 2013 (Revised 17 July 2013).
   3. Geotechnical Engineering Study, prepared by Langan Engineering & Environmental Services, dated 15 February 2012 and revised 8 November 2013.
   4. Material Management Plan by Langan Engineering & Environmental Services, Inc. dated 14 June 2013 (Revised 8 November 2013).

B. Sections containing requirements related to this Section include, but are not limited to:
   1. EN 1.01 – Environmental Conditions Plan
   2. Earthwork - Section 31 00 00
   3. Soil Erosion and Sediment Control
   4. Handling & Disposal of Contaminated Materials - Section 06 61 13

C. Regulatory Requirements and Reference Standards

   All work and materials under this section shall conform to the latest revision of the following standard specifications, where not otherwise required by the Bid Documents:
   1. All applicable US Department of Labor Occupational Safety and Health (OSHA) construction requirements
   2. CTDEEP Remediation Standard Regulations (RSRs)

1.03 SUBMITTALS

A. Unless otherwise noted, all submittals shall be provided not less than two weeks prior to mobilization as indicated herein to the Engineer. Order of materials, fabrication, and/or mobilization prior to review shall be at the Contractor's own risk.

B. The Contractor shall submit satisfactory proof of his qualifications for performing the work specified herein. Documentation verifying that the Contractor personnel have received the appropriate Hazardous Waste Operator's Training shall be submitted to the Engineer.

C. The contractor shall provide a Health and Safety Plan (HASP) in accordance with OSHA regulations for hazardous site workers (29 CFR 1910.120 and 29 CFR 1926) and shall provide a safe working environment in accordance with all applicable Federal, State and local

requirements. This plan will be submitted for review at least two weeks prior to mobilization of equipment or materials to the site.

D. An Air Monitoring Plan and dust suppression plan for the work zone perimeter shall be submitted to the Engineer for review at least two weeks prior to mobilization of equipment or materials to the site.

1.04 QUALITY ASSURANCE

A. Codes and Standards:
   1. Perform work specified herein and shown on the Bid drawings in compliance with the Contract, codes, and standards listed in this section and with the requirements of all Federal, State, and local authorities having jurisdiction.

PART 2 PRODUCTS

Not Applicable

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. The Contractor shall attend a Pre-Construction Meeting with the Engineer to understand potential hazards at the site and required health and safety measures. At the meeting, the Contractor's proposed health and safety measures shall be discussed. Requirements discussed at this meeting shall be incorporated into the Specification for this work. This meeting shall occur before Contractor mobilizes to the site.

3.02 HEALTH AND SAFETY MEASURES

A. The Contractor shall be solely responsible for the health and safety of his own personnel and performing his work in accordance with all Federal, State, and local regulations.

B. The Contractor shall designate a Site Health and Safety Coordinator who shall be responsible for ensuring that the designated procedures are implemented in the field.

C. The level of protection and the procedures specified in the HASP shall represent the minimum health and safety requirements to be observed by site personnel engaged in the Contactor's construction related activities. The HASP shall detail equipment and methods to be utilized to protect on-site workers and the public from physical injury and adverse health effects due to construction-related activities.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. References and standards.

B. Quality assurance submittals.

C. Mock-ups.

D. Control of installation.

E. Tolerances.

F. Testing and inspection services.

G. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

1.03 REFERENCES

A. DEFINITIONS
1. General: Basic Contract definitions are included in the Conditions of the Contract.
2. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
3. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
4. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
5. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
6. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
7. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
8. "Provide": Furnish and install, complete and ready for the intended use.
9. Specifier Note: Usually retain the following paragraph or revise to suit specific project.
10. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

B. INDUSTRY STANDARDS
1. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect

as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

2. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
3. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   a. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
4. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

C. REFERENCE STANDARDS
1. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008.
2. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2012.
3. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2011.
4. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2009.

1.04 SUBMITTALS

A. Testing Agency Qualifications:
1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
1. Include:
   a. Date issued.
   b. Project title and number.
   c. Name of inspector.
   d. Date and time of sampling or inspection.
   e. Identification of product and specifications section.
   f. Location in the Project.
   g. Type of test/inspection.
   h. Date of test/inspection.
   i. Results of test/inspection.
   j. Conformance with Contract Documents.
   k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the

manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.05 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 TESTING AND INSPECTION AGENCIES

A. Owner will employ services of an independent testing agency to perform certain specified testing and inspection.

B. Owner will employ and pay for services of an independent testing agency to perform other specified testing and inspection.

C. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

D. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be

used that require testing, along with proposed mix designs.

2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION

A. General: During the construction period various types of services are necessary to record or support the construction process, which are not an integral part of the final construction. Provide temporary facilities and controls in accordance with the Contract Documents.

B. Scope of Work includes but is not limited to:
1. Layout and measurements.
2. Field offices.
3. Staging areas.
4. Project signs.
5. Rubbish removal.
6. Safety, protection and security.
7. Temporary toilets.
8. Temporary scaffolding, ladders, stairs, hoists, etc.
9. Site fence.
10. Temporary closures.
11. Labor disputes.
12. Items furnished by Owner and installed by the Contractor.
13. Ceremonies.
14. Energy conservation.
15. Temporary light and power.
16. Temporary heat.
17. Temporary plumbing and fire protection.
18. Asbestos discovery.
19. Tree protection.

C. RELATED REQUIREMENTS
1. Related Documents: General Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications shall apply to this Section.
2. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

1.02 QUALITY ASSURANCE

A. Codes: Comply with applicable Building Code and standards.

B. Standards: Comply with the State and Local Board of Health, Environmental Protection Agency, Fire Department and other applicable standards.

1.03 SUBMITTALS

A. Refer to Section 01 30 00 or certain individual items of this section.

1.04 PRODUCT HANDLING

A. Maintain temporary facilities and controls in proper safe condition throughout progress of the Work.

PART 2 - PRODUCTS

2.01 LAYOUT & MEASUREMENTS

A. Borings, Sub-Surface Data:

1. Use of Data Furnished: Boring and survey data made available to the Contractor is for information only, and the Contractor shall use his own judgment as to the actual conditions. He is warned that reliance on the information presented is at his own risk, and neither the Owner nor the Architect and his consultants will be liable for errors relating to such data.
2. Additional Data Required By Contractor: The Contractor may make borings or drive test pits he requires to verify the conditions at the site at his own expense. The location and size of such exploratory holes will be subject to approval by the Architect.

B. Protection of Survey: Land monuments, bench marks, survey points and other such references shall be protected from damage unless and until their removal is authorized. If they are disturbed, they shall be replaced in their proper positions.

C. Layout of Work: Furnish necessary stakes, grade and batter boards, lines and appurtenances and necessary facilities for establishing benchmarks and grades and making measurements. Each Contractor shall locate locations, lines, and grades of structures, pipelines, valves and other appurtenances.

D. Measurements: Take measurements of the work and be responsible for it.
1. Discrepancies: Thoroughly examine the drawings and specifications, carefully checking the figured dimensions, before commencing work, and report to the Architect if any discrepancy, error, or defect appears.
2. Dimensions: If figured dimensions are lacking on the drawings, the Architect will supply them.

E. Location of Apparatus: The locations of apparatus, equipment, fixtures, piping outlets, etc., shown or specified but not specifically dimensioned shall be considered as only approximate. The actual location shall be as directed and as required to suit the conditions at the time of installation. Before installation, the Contractor shall consult the Architect and ascertain the actual location required. He shall consult with other Contractors and examine their drawings so as to avoid conflicts with other work and apparatus.

F. Owner's Certification of Lines & Levels & Final Survey: Furnish certification and survey from a Licensed Professional Land Surveyor that structural work is located in accordance with the contract drawings and at the elevations indicated. The survey will also meet requirements of the Local Building Department. The Surveyor for the final survey shall:
1. Selection: The Surveyor selected for the purpose shall be subject to the Owner's approval. It is intended that the Surveyor's certification shall represent an independent and disinterested verification of such layout.
2. Work: The Surveyor shall promptly verify and certify to the lines and levels of the work at any time it may be deemed necessary by the Owner. Deviations from drawings shall be certified to the Owner within forty-eight (48) hours of discovery of same.
3. Deviations: Final certifications shall be submitted upon completion of the work, or upon completion of any subdivision of the work and before final payment is made. Exceptions or deviations from the Contract Drawings shall be noted on the final certificate, and there shall be included maps, plans, notes, pertinent documents and data necessary, in the opinion of the Architect, to constitute a full and complete final report.
4. As-Built Building Survey: The final survey shall show the exact locations to building line dimensions and elevations. In parentheses, immediately below dimensions that differ from the Contract Drawings, the survey shall indicate dimensions shown on the Contract drawings. This as-built survey shall be completed and furnished to the Architect immediately upon the completion of the structural work.
5. As-Built Site Survey: The final survey should also indicate a final topographical survey of areas constructed under this Contract. Elevations of final grades differing from contract drawings shall be shown by revised 2-foot contours and spot elevations as needed. Indicate location of permanent control points within the Contract limits, with respective coordinates and elevations at points, certified by the Engineer or Surveyor.
6. Cost: The cost of survey certifications shall be at the Owner's expense.

2.02 FIELD OFFICES

A. Location: Coordinate temporary field offices in a space permitted by the local Police Department or such other location as may be designated by the Construction Manager.

B. Equipment: The field office shall be equipped to handle the work, and shall contain racks for proper filing and handling of contract drawings, shop drawings and samples.

C. Removal: At the conclusion of construction work under this contract remove the field office.

2.03 STAGING AREAS

A. Scope: Access and staging areas for purposes of this Contract shall be confined to areas as directed by the Construction Manager.

B. Scheduling: Subject to the conditions as noted on drawings and specified in this article, the Trade Contractor shall plan and be responsible for the methods of use of the access and staging areas in accordance with his construction schedules and needs.

C. Protection of Existing Work:
   1. In the use of the access and staging areas, protect operations under the Contract including construction utilities and installations of whatever sort except such as are designated to be removed.
   2. Provide for adequate timber bridging and planking or other suitable means as required for legal egress, and for the safeguarding of existing paving, walks and curbs, structures and utilities from damage due to his construction vehicle traffic. Safeguard existing work from damage due to other construction operations under this Contract and permit safety without interference or delay in the carrying out of construction operations. Repair or replace existing work within the designated access and staging areas which is needed to remain in place and which is damaged by operations under this Contract.

D. Limits for Each Trade Contractor's Staging Areas: Do not encumber the premises nor overload the structures beyond their allowable design live load with his apparatus, storage of materials and the operation of his workmen, and shall be confined within the limits designated by the Construction Manager.

E. Storage of Material: Provide temporary storage sheds and other storage facilities on the job site for the storage of materials that may be subject to weather damage when interior or covered space is not available.

2.04 PROJECT SIGNS

A. Project Sign Standards: Furnish one (1) Project Sign erected, finished, designed and sized to Architect's standard at a location to be designated by the Architect or Construction Manager. Sign shall list project name, Owner, Architect, major Consultants and other pertinent data. The sign shall conform to area zoning requirements and to the project sign sketch.

B. Location: Erect the sign in a location as directed by the Construction Manager.

C. Maintain the sign for the duration of the Work of the Project to provide the following:
   1. Good appearance.
   2. Good structural condition (level, plumb).

D. Appearance: Erect sign plumb and true; set vertical supports firmly in the ground, of sufficient depth to resist both vertical and lateral forces anticipated. Brace as required for conditions. Bottom of sign 6' - 0” above ground.

E. Other Signs: Maintain the premises free from advertising placards and inscriptions and other announcements, lettering or insignia and remove, immediately, signs or posters which may be placed by others on a structure or parts of the property, released by the Owner for construction purposes.

F. Protection of Sign: Protect the sign from damage during the construction work under contract and maintain same in proper condition and in proper position for the duration of the Contract.

G. Removal of Sign: At the conclusion of the work under the Contract, the project sign shall be removed, as directed by the Owner.

2.05 RUBBISH REMOVAL

A. Clean-up debris, rubbish and old materials resulting from the Work on a daily basis.

B. Cleaning Responsibility: Remove from the work area of buildings and site debris, resulting from the work daily or as often as necessary if it interferes with the work under any contract or presents a fire hazard. No rubbish or debris shall be dropped from a height of more than 6 feet, or thrown out of windows or openings without a chute. An adequate number of cleaning personnel shall be provided during working hours, who shall keep areas within and adjacent to the building free from dust and loose dirt by sweeping and wet mopping.

C. Rubbish Disposal:
   1. Furnish containers at central collection locations as designated by the Construction Manager on the site to receive construction debris. Cost of containers, removal and disposal charges shall be paid by the Contractor. Containers shall be removed as often as necessary to minimize interference with work in progress.
   2. Clean the site around the building and maintain it clean and free from food and beverage containers, waste and other debris. Provide and rigidly enforce the use of waste receptacles by construction personnel. Burning of refuse is not permitted.

D. Salvage Materials: Construction salvage materials, not including items elsewhere to be returned to the Owner, shall become the property of the Contractor and shall be taken from the premises. Storage of materials and equipment on the site, other than for this project, will not be permitted.

E. Existing Debris: Rubbish and debris found existing on the site at the start of the work shall be removed from the premises.

F. Coordination of the Final Clean-Up: Refer to Section 01 70 00.

2.06 SAFETY, PROTECTION AND SECURITY

A. Provide safety and protection in accordance with Section 01 35 29.13.

B. Protection: Protection shall be maintained for the duration of the Project and shall include:
   1. Water Protection in Excavations: Arrange to protect the excavation, trenches, site and the building from damage from rainwater, springwater, groundwater, backing up of drains or sewers and other water and shall provide pumps and equipment and enclosures to provide this protection.
   2. Temporary Drainage: Construct and maintain necessary drainage and do pumping necessary to keep the excavation free from water and in such a manner as to avoid endangering or damaging surrounding property and construction.
   3. Temporary Sheet Piling, Shoring, Bracing and Underpinning: Coordinate temporary sheet piling, shoring, underpinning and bracing to be provided to maintain excavation banks in a safe and stable condition or where needed for the protection of adjoining structures. Sheet piling, shoring and bracing shall consist of sound timbers or rolled structural shapes. Sheet piling shall be securely braced so as to prevent cave-ins, slips, or washouts. Piling, shoring and bracing not incorporated into the finished structure shall safely support the property to be protected and shall be installed so as to interfere as little as possible with construction operations. Settlement in the shoring supports shall be immediately adjusted. The Contractor's professional engineer shall design piling, shoring, bracing and underpinning design work not incorporated into the finished structure. Temporary protection shall be removed when no longer required.

4. Guard Lights: Provide and maintain guard lights at barricades, railings, and obstructions in the streets or on the sidewalks, and at trenches or pits adjacent to public walks or streets as directed and as required by law.
5. Weather Protection: Arrange to provide protection against rain, wind, storms, frost, heat and other weather conditions, so as to maintain work, materials, apparatus and fixtures free from injury or damage. At the end of each day's work items likely to be damaged shall be covered. Remove snow and ice for the proper protection and/or execution of the construction work.
6. Protection of Finished Work: Provide protection for the finished work. Finished floors shall be protected from traffic by method approved by the finish manufacturer. Finished construction and materials shall be protected from rain, snow and windstorm damage throughout the building period.
7. Fire Protection: Maintain fire-fighting equipment for the duration of construction in accordance with the requirements of the Fire Department and the Insurance Underwriters and subject to approval of the Owner's insurance agents. Provide fire extinguishers as required by the local Fire Department and the Building Code. Coordinate with existing fire fighting equipment in existing buildings.
8. Volatile Liquids: Bulk storage of volatile liquids shall be outside the building at location. Only as much volatile liquid shall be allowed within the building at any given time as is needed for that day's operation.
9. Vermin and Rodent Control: Prevent the infestation and multiplication of vermin and rodents, and, if necessary, employ an exterminator to rid the premises of them if there is evidence that they exist.
10. Dust Protection: Prevent the nuisance of dust to the surrounding areas, and provide water sprinkling materials and equipment as required for such dust prevention for the work.
11. Structural Alterations: Do not permit endangering work by excavation or otherwise and shall not cut or alter the work without the consent of the Structural Engineer. Written instruction shall be obtained from the Structural Engineer's representatives before cutting beams or other structural members, arches, lintels, etc.
12. Protection of Adjacent Property:
    a. Scope: Take necessary precautions to protect public and private property on or adjacent to the job site, including utilities, street signs, light standards, hydrants, pavements and walks, planting and natural features, against damage or injury including settlement or collapse.
    b. Building Damage: Should damage result to structures or property, the Contractor shall correct or repair it without undue delay and to the complete satisfaction of the Owner. No "Waiver of Responsibility" for incomplete, inadequate or defective adjoining work will be accepted unless otherwise stated by the Construction Manager.
    c. Excavation Damage: Maintain the existing and adjoining structures safety. Concrete or rock excavation in the proximity of the adjoining structures shall be done by line drilling. Existing footings and foundation work exposed shall be underpinned as directed by Site Engineer. Prevent damage to pipes, conduits, wires, cables or structures above or below ground.
    d. Site Damage: Repair and restoration of existing roads, pavements, walks, curbs, manholes, hydrants, light standards, street signs, catch basins, railings and plantings, and other construction or surfaces required due to the work under this contract shall be included in the work under the Contract even if not specifically called for in the various sections of the Specifications. Repair and restoration work shall match existing work. Costs incurred in repair work, including permits, bonds and supervision by public authorities, shall be borne by the Contractor causing the damage.
13. Welding & Cutting:
    a. Handling of Welding Materials: The handling and storage of welding materials, acetylene and oxygen tanks, burners, and other equipment required for the execution of welding and cutting work at the job shall be subject to the approval of the Building

Department.

b. Welding Standards: Work shall be performed in accordance with the standard specifications of the American Welding Society.

c. Fire Protection: Welders shall take precautions required to prevent fires as a result of his operations. When welding tools or torches are in used, the Contractor shall have available, in the immediate vicinity of the work, a fire extinguisher of the CO2 type. The fire extinguisher shall be provided and maintained by the Installer. Fuel for cutting and heating torches shall be gas only, and shall be contained in Underwriters Laboratory listed containers. Storage of gas shall be in locations approved by the Fire Department. Provide fireproofed tarpaulins where applicable at welding and cutting operations.

d. Power: The Owner will not provide power for electric welders.

14. Tree Protection: Trees identified on the plans or by the Owner to remain must be protected during the construction period. Maintain a snow fence at the tree drip line. Avoid driving vehicles or storing materials within the fence area and excavating in the root area unless accepted by the Owner.

C. Security: During the period of the Construction Contract, the Owner's security force shall maintain the necessary security of the construction site and areas after normal working hours. Each Contractor shall secure his tools, materials and assemblies. Claims shall not be made against the Owner or Architect for equipment or tool losses or damage to installed assemblies.

2.07 TEMPORARY TOILETS

A. Chemical Toilets: Provide and maintain temporary enclosed and weatherproof chemical toilets located on the site or within buildings where directed. The chemical toilets shall be used for construction personnel until Standard Flush Toilets can be installed in temporary plumbing. Use of undesignated toilets by construction personnel within occupied areas of the building is not permitted.

B. Use of Existing Toilets: Designated toilets are available for each Contractor's use. Use of toilets elsewhere in the building by the construction personnel is prohibited.

C. Cleaning of Toilets: Toilets shall be maintained in a clean and sanitary condition and shall conform to the requirements of the local Department of Health and Labor requirements.

2.08 TEMPORARY SCAFFOLDING, LADDERS, STAIRS, HOISTS, ETC.

A. Scope: Coordinate the installation and maintenance and safety of temporary stairs, ladders, ramps, scaffolds, runways, sidewalk bridges, fences, derricks, hoists, chutes, and other such operational facilities as may be needed for the proper execution of the work. Apparatus, equipment and construction shall meet the requirements of the Labor Law and other State and local Building Department Requirements.

B. Scaffolding: Coordinate the location, erection, maintenance and removal of scaffolding and other temporary facilities as required for the proper installation of the work.

C. Hoists and/or Crane: (for General Use) Coordinate and maintain the use of conventional construction hoists of sufficient size and capacity to raise materials and equipment and give access to construction levels. Coordinate the use of other cranes used on the site by individual Contractors.

2.09 SITE FENCE

A. Location: A site fence shall be installed at the construction site perimeter and adjacent staging areas. New construction work, including trailer and staging shall be contained within the site fence.

B. Type: Provide either of the following types:

1. Plywood: 8'-0" high fence with gates and required bracing painted in a color selected by

the Architect. Maintain fence free of advertising.
2. Woven Wire Mesh: 8'-0" high with gates and required bracing.
3. Maintain fence and gates during entire construction period in a neat and orderly way free of graffiti or unauthorized signs.

2.10 TEMPORARY CLOSURES

A. Take special precautions against damage to materials and work installed in cold or freezing weather, by providing adequate special heat and/or covering to prevent damage by the elements. The ground surfaces under footings and under pipelines, and concrete and masonry, shall be protected against frost or freezing..

B. Temporary Partitions: (adjacent to occupied areas) After relocation of occupancy from spaces requiring access, provide temporary partitions to isolate occupied areas from work areas. Temporary partitions shall be of gypsum board on suitable studs and shall not interfere with the emergency exit requirements of occupied areas.
1. Exterior partitions shall be suitably weather protected insulated and otherwise sealed off to prevent dirt and weather infiltration.
2. Interior partitions shall be suitably sealed to limit noise and dirt infiltration. Exposed temporary partition surfaces shall be painted.

2.11 LABOR DISPUTES

A. Notifications: Immediately notify the Owner of actual or impending labor disputes that may affect or is affecting the schedule of the Work. Take appropriate measures to eliminate or minimize the effect of such labor dispute on the schedule, including but not limited to, such measures as: promptly seeking appropriate injunctive relief; filing appropriate charges with the National Labor Relations Board under the applicable provisions of the Labor Management Relations Act of 1947, as amended; filing appropriate damage actions; taking such measures as establishing a reserved gate, where appropriate; seek other sources or supply or service; and other measures that may be appropriately utilized to limit or eliminate the effect of the labor dispute.

B. Damage - Time Extension: To the extent the Contractor fails to promptly initiate measures that are appropriate, no extension of time for completion shall be allowed. In addition, any delay impact on any Contractor's schedule or on the schedule for the Project, which is a direct result of such failure, shall be considered as a Contractor caused delay under applicable provisions of the Contract. The rights and remedies provided in this paragraph are in addition to other rights or remedies provided by law or under this Contract. The Contractor shall include this clause in every Contract, together with a requirement that Sub-Subcontractors include a substantially similar clause in each lower tier subcontract.

2.12 ITEMS FURNISHED BY OWNER AND INSTALLED BY THE CONTRACTOR

A. Scheduled Items: Items shown on the drawings to be furnished by the Owner and installed by the Contractor shall be furnished to the Project site by the Owner unless otherwise indicated.

B. Time: Within thirty (30) calendar days after receipt of notice to proceed, the Contractor shall submit to the Owner a schedule in quadruplicate giving desired dates for delivery of items to be furnished by the Owner. The schedule shall be subject to written approval of the Owner. Approved dates of delivery shall be confirmed thirty (30) days prior to delivery by the Contractor. The Contractor shall accept delivery on the established dates or be responsible for demurrage resulting from his failure to take delivery of the shipment on the established dates. Promptly upon delivery, the Contractor jointly with the Owner shall inspect the materials or equipment for possible shortage or damage in transit. If shortage or damage is found, follow the instruction on the Bill of Lading for reporting to the carrier and submit a report for proper storage and protection of items delivered, including incidental expenses.

C. Receipt, Assembly & Connection: The Contractor shall receive the items, sign receipts,

provide additional transportation if needed, uncrate, assemble, locate in place and install or connect ready for operation or use. Assembly shall include such projecting parts and loose fittings as are usually shipped detached. For details of construction and installation of each item, drawings and standard details shall be referred to. Installation or connection shall be in accordance with specifications, including fitting to adjacent work and additional labor and materials needed.

2.13 CEREMONIES

A. Subject to mutually satisfactory arrangements between the parties to the Contract, the Owner may enter the premises during the construction period to conduct ceremonies, such as laying the cornerstone or dedication ceremonies, and to occupy temporarily such portions of the premises as may be necessary for such ceremonies.

2.14 ENERGY CONSERVATION

A. Energy Conservation Officer: Designate one of the staff as "Energy Conservation Officer". The duties of such designee shall include the development and implementation of a program for minimizing the use of energy on the site.

B. Program: Post in a conspicuous location so that personnel employed on the Project may be made aware of the need to conserve energy.

2.15 TEMPORARY LIGHT & POWER

A. Scope: Provide labor, materials, tools, appliances, and equipment and perform operations necessary for the complete execution of a separate system of temporary electric light and power throughout the project suitable for supplying electrical energy for illumination and for power tools and equipment. Such system shall be installed and maintained in place as needed and removed promptly as its necessity ceases to exist. Maintaining shall and include energizing and de-energizing the electrical systems each working day, and turning on and off of lights daily.

B. Lighting Standards: The minimum temporary lighting to be provided, and maintained in each room and changed as needed when interior walls are being erected as directed by OSHA standards. Temporary lighting must be maintained for twenty-four (24) hours a day, and seven (7) days a week at stairs and corridors below ground. In other spaces, temporary lighting and power shall be energized approximately thirty (30) minutes before the starting time and after the quitting time of the latest stopping unless otherwise directed by code.

C. Wiring Standards: Temporary wiring and equipment shall conform to the requirements of the National Electrical Code, regulations of the Building Code and the National Board of Fire Underwriters. Three phase temporary power circuits shall be installed as required to operate construction equipment of the various trades and to install and test equipment such as pump and elevators. Install and maintain temporary or permanent service for the permanently installed building equipment such as sump pumps, fans, heating equipment etc., so that such equipment may be operated for drainage or for temporary heat.

D. Energy Costs: The Owner shall pay the Electric Utility bills, as they become due, for electric energy used for temporary lighting and power to perform work in the new and existing buildings.

E. Other Costs: Costs in connection with providing and maintaining the temporary electrical power system.

2.16 TEMPORARY HEAT

A. Foundation, Concrete and Masonry Protection: During the winter from November through April, Contractor shall provide winter weather protection for the foundation concrete, and masonry work. The heating may be accomplished by use of portable heaters. See Sections 03300 and 04810 for specific cold weather temperature requirements.

B. Scope of Enclosed Building Protection: Prior to the time new building or portion is enclosed, winter weather protection as required to accomplish the following:
   1. To protect the finish work.
   2. To provide sufficient heat so that trades can accomplish the work in accordance with the Contract.

C. Cost: The Owner shall pay for temporary heat fuel charges from the central power plant in connection with the work under this contract. The Contractor shall pay the cost of fuel for portable heaters.

D. Heat from Existing Heating Plant: The use of heat from the existing heating plant shall be available for heating the new and existing building areas using permanently installed facilities as coordinated with the Construction Manager.

E. Damage Due to Lack of or Improperly Operated Temporary Heat: Maintain heat to prevent damage due to frost and freezing during the period when temporary heat is needed. Prevent damage due to defective equipment or the use of equipment, including but not limited to damage such a stains, smudges, soot or fire, and repair damage in a manner satisfactory to the Owner and Architect, or other Contractors.

F. Use of New HVAC System: Upon beneficial occupancy or acceptance of areas of new construction work, the Owner shall operate the system subject to satisfactory completion.

2.17 TREE PROTECTION

A. Identification: Before starting work and during the course of the work, trees to be saved as shown by tags or indicated on the drawings to remain shall be protected.

B. Scope: Trees to be preserved within the contract limit line and trees adjacent to the contract limit line shall be protected against damage during construction operations by fencing or armoring. The tree protection shall be placed before excavation or grading is begun and shall be maintained in repair for the duration of the construction work unless otherwise directed. No material shall be stored nor shall construction operations be carried on within 25 feet of trees designated to be saved. The Architect shall determine the extent of fencing and armoring at the time he designates trees to remain.
   1. Protection With Wrap: Individual trees near heavy construction traffic shall be wrapped with burlap and 2" x 4" planks wired vertically as armor around trunks, spaced no more than two (2) inches apart to a height of five (5) ft above ground. No nails, screws or bolts shall be attached to trees during this or any other procedure unless specifically called for.
   2. Protection With Fence: Other trees in groups near construction traffic shall be protected by snow fencing at the drip line.
      a. Trees having low hanging branches liable to damage shall be fenced around the outer perimeter of the spread of their branches. Fences shall be standard 48-inch high snow fence mounted on standard steel posts set not more than six (6) ft apart.
      b. Trees Near Contract Limit Line: Fencing similar to above shall be installed along the contract limit lines to protect the trees outside these limits. The Subcontractor's employees shall be prohibited from using or passing through protected tree areas.
   3. Root Protection: Care should be taken that the trees to remain shall not have their roots damaged by construction operations. Excavation within drip line of trees shall be done only where shown on drawings or where directed by Construction Manager.
      a. Do not strip topsoil from areas inside the drip line of trees to remain. Protect the tree roots that may be exposed when the soil is stripped around the tree by sloping from the old grade gently to the adjacent subgrade.
      b. Where trenching for utilities is required or directed within drip line, tunnel under or around roots by hand digging. Do not cut main lateral roots or tap roots; cut smaller roots with sharp pruning instruments; do not break or chop.
      c. Topsoil shall be added where cuts expose or affect root systems of trees, and such

disturbed areas shall be watered and protected from machinery and other hazards.

PART 3 - EXECUTION

3.01 MAINTENANCE & REMOVAL

A. Maintain temporary facilities and controls as long as needed for the safe and proper completion of the Work.

B. Remove temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Construction Manager.

END OF SECTION

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Sections:

1. Section 31 10 00 "Site Clearing" for removing existing trees and shrubs.

1.03 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape at 6 inches above the ground for trees up to, and including, 4-inch size; and 12 inches above the ground for trees larger than 4-inch size.

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings .

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified arborist and tree service firm.

B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.06 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA.

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

C. Preinstallation Conference: Conduct conference at Project site .

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

a. Construction schedule. Verify availability of materials, personnel, and equipment needed to make progress and avoid delays.
b. Enforcing requirements for protection zones.
c. Identification of trees to be protected during construction.

1.07 PROJECT CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements. Previously used materials may be used when approved by Landscape Architect.

1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch opening, 0.148-inch- diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch- OD line posts, and 2-7/8-inch- OD corner and pull posts ; with 0.177-inch- diameter top tension wire and 0.177-inch- diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
a. Height: 4 feet.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. For the record, prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.02 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Tie a 1-inch blue-vinyl tape around Insert requirement each tree trunk at 54 inches above the ground.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.03 TREE AND PLANT-PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected area except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
2. Posts: Provide appropriate means of post support acceptable to Landscape Architect.

B. Maintain protection zones free of weeds and trash.

C. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Landscape Architect.

D. Maintain protection-zone fencing in good condition as acceptable to Landscape Architect and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.04 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 31 20 00 "Earth Moving."

B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.05 ROOT PRUNING

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Cut Ends: Do not paint cut root ends .
3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible according to requirements in Section 31 20 00 "Earth Moving."

B. Root Pruning at Edge of Protection Zone: Prune roots 6 inches outside of the protection zone, by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Protection Zone: Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

3.06 REGRADING

A. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

B. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

3.07 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.08 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed root cutting and tree and shrub repairs.
2. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
3. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
4. Perform repairs within 24 hours.
5. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size and species as those being replaced for each tree that measures 6 inches or smaller in caliper size.

2. Plant and maintain new trees as specified in Section 32 93 00 "Plants."

3.09 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 01 57 50

CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.01 CONDITIONS AND REQUIREMENTS

A. The General Conditions, Supplementary Conditions, and Division 1 - General Requirements apply.

1.02 SECTION INCLUDES

A. Administrative and procedural requirements for the following:
   1. Salvaging non-hazardous demolition and construction waste.
   2. Recycling non-hazardous demolition and construction waste.
   3. Disposing of non-hazardous demolition and construction waste.

1.03 RELATED SECTIONS

1.04 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.05 PERFORMANCE GOALS

A. Salvage/Recycle Goals: Owner's goal is to salvage and recycle as much non-hazardous demolition and construction waste as possible including the following materials:
   1. Demolition Waste:
      a. Asphaltic concrete paving.
      b. Concrete.
      c. Concrete reinforcing steel.
      d. Brick.
      e. Concrete masonry units.
      f. Wood studs.
      g. Wood joists.
      h. Plywood and oriented strand board.
      i. Wood paneling.
      j. Wood trim.
      k. Structural and miscellaneous steel.
      l. Rough hardware.
      m. Roofing.
      n. Insulation.
      o. Doors and frames.

p. Door hardware.
q. Windows.
r. Glazing.
s. Metal studs.
t. Gypsum board.
u. Acoustical tile and panels.
v. Carpet.
w. Carpet pad.
x. Demountable partitions.
y. Equipment.
z. Cabinets.
aa. Plumbing fixtures.
ab. Piping.
ac. Supports and hangers.
ad. Valves.
ae. Sprinklers.
af. Mechanical equipment.
ag. Refrigerants.
ah. Electrical conduit.
ai. Copper wiring.
aj. Lighting fixtures.
ak. Lamps.
al. Ballasts.
am. Electrical devices.
an. Switchgear and panelboards.
ao. Transformers.
ap. Construction Waste:
    1) Site-clearing waste.
    2) Masonry and CMU.
    3) Lumber.
    4) Wood sheet materials.
    5) Wood trim.
    6) Metals.
    7) Roofing.
    8) Insulation.
    9) Carpet and pad.
    10) Gypsum board.
    11) Piping.
    12) Electrical conduit.
    13) Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
        (a) Paper.
        (b) Cardboard.
        (c) Boxes.
        (d) Plastic sheet and film.
        (e) Polystyrene packaging.
        (f) Wood crates.
        (g) Plastic pails.

1.06 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Waste Management Plan: Submit three (3) copies of plan within seven (7) days of date

established for commencement of the Work.

C. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three (3) copies of report. Include the following information:
   1. Material category.
   2. Generation point of waste.
   3. Total quantity of waste in tons.
   4. Quantity of waste salvaged, both estimated and actual in tons.
   5. Quantity of waste recycled, both estimated and actual in tons.
   6. Total quantity of waste recovered (salvaged plus recycled) in tons.
   7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

D. Waste Reduction Calculations: Before request for Substantial Completion, submit three (3) copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

E. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

F. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

G. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

H. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

I. Qualification Data: For [Waste Management Coordinator] [and] [refrigerant recovery technician].

J. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.07 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Waste Management Conference: Conduct conference at project site. Review methods and procedures related to waste management including, but not limited to, the following:
   1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
   2. Review requirements for documenting quantities of each type of waste and its disposition.
   3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
   4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
   5. Review waste management requirements for each trade.

1.08 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction work plan, and

cost/revenue analysis. Include separate sections in plan for demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
   1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
   2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
   3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
   4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
   5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
   6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
   1. Total quantity of waste.
   2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
   3. Total cost of disposal (with no waste management).
   4. Revenue from salvaged materials.
   5. Revenue from recycled materials.
   6. Savings in hauling and tipping fees by donating materials.
   7. Savings in hauling and tipping fees that are avoided.
   8. Handling and transportation costs. Include cost of collection containers for each type of waste.
   9. Net additional cost or net savings from waste management plan.

1.09 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

PART 2 - PRODUCTS

2.01 Not Used

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
   1. Distribute waste management plan to everyone concerned within [three (3)] [_____] days of submittal return.
   2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
   2. Comply with requirements for controlling dust and dirt, environmental protection, and noise control.

3.02 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until installation.
   4. Protect items from damage during transport and storage.
   5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

3.03 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
   1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
      a. Inspect containers and bins for contamination and remove contaminated materials if found.
      b. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
      c. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
      d. Store components off the ground and protect from the weather.
      e. Remove recyclable waste off Owner's property and transport to recycling receiver or

processor.

3.04 RECYCLING CONSTRUCTION WASTE

A. Packaging:
   1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
   2. Polystyrene Packaging: Separate and bag materials.
   3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
   4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees [on-site] [at landfill facility].

C. Wood Materials:
   1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
   2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.
   1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.05 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
   1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Re-use of existing products.

B. Transportation, handling, storage and protection.

C. Product option requirements.

D. Substitution limitations and procedures.

E. Procedures for Owner-supplied products.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

1.03 REFERENCE STANDARDS

A. 16 CFR 260 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; current edition.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

E. CT HPB Submittals and Reports: as specified below and within individual sections.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

D. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Do not use products having any of the following characteristics:
   1. Made using or containing CFC's, HCFC's or Halons.
   2. Made of wood from newly cut old growth timber.

C. Where all other criteria are met, Contractor shall give preference to products that:
   1. Are extracted, harvested, and/or manufactured closer to the location of the project.
   2. Have longer documented life span under normal use.
   3. Result in less construction waste.
   4. Are made of vegetable materials that are rapidly renewable.

D. Regionally-Sourced Products:
   1. Overall Project Requirement: Provide materials amounting to a minimum of 20 percent of the total value of all materials (excluding plumbing, HVAC, electrical, elevators, and other equipment) that have been extracted, harvested, or recovered, as well as manufactured, within a radius of 500 miles from the project site.

E. Products with Rapidly Renewable Material Content:
   1. Definition: Materials made from plants that are typically harvested within 10 years or less after planting.
   2. Overall Project Requirement: Provide materials amounting to a minimum of 2.5 percent of the total value of all materials and products used on the project.

F. Products with Recycled Content:
   1. Overall Project Requirement: Provide products with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial recycled content constitutes at least 20 percent of the total value of all products installed, except mechanical and electrical components.

G. Sustainably Harvested Wood:
   1. Definition: Wood-based materials include but are not limited to structural framing, dimension lumber, flooring, wood doors, finishes, and furnishings that are permanently installed in the project. Wood and wood-based products not permanently installed in the project are not included in the definition.
   2. Overall Project Requirement: Provide a minimum of 50 percent of all wood-based materials made of sustainably harvested wood.
   3. Specific Wood-Based Fabrications: Fabricate of sustainably harvested wood when so specified elsewhere.
   4. Certification: Provide wood certified or labeled by an organization accredited by one of the following:
      a. The Forest Stewardship Council, The Principles for Natural Forest Management; for Canada visit http://www.fsccanada.org, for the USA visit http://www.fscus.org.

H. Urea-Formaldehyde Prohibition:

1. Overall Project Requirement: Provide composite wood and agrifiber products having no added urea-formaldehyde resins.
   a. Require each installer to certify compliance and submit product data showing product content.
2. Specific Product Categories: Comply with limitations specified elsewhere.

I. Adhesives and Joint Sealants:
1. Definition: This provision applies to gunnable, trowelable, and liquid-applied adhesives, sealants, and sealant primers used anywhere on the interior of the building inside the weather barrier, including duct sealers.
2. Provide only products having lower volatile organic compound (VOC) content than required by California Department of Health Services (CDHS) Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers, including 2004 Addenda.
   a. Require each installer to certify compliance and submit product data showing product content.
3. Specific Product Categories: Comply with limitations specified elsewhere.

J. Aerosol Adhesives:
1. Provide only products having lower volatile organic compound (VOC) content than required by California Department of Health Services (CDHS) Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers, including 2004 Addenda.
   a. Require each installer to certify compliance and submit product data showing product content.
2. Specific Product Categories: Comply with limitations specified elsewhere.

K. Provide interchangeable components of the same manufacture for components being replaced.

L. Motors: Refer to Section 22 05 13, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.

M. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.

N. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.

D. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:
   1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
   5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
   1. Review Owner reviewed shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to

installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

G. Prevent contact with material that may cause corrosion, discoloration, or staining.

H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Surveying for laying out the work.

D. Cleaning and protection.

E. Demonstration and instruction of Owner personnel.

F. Closeout procedures, except payment procedures.

G. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2009.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

A. For survey work, employ a land surveyor registered in Connecticut and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Connecticut.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in Connecticut.

1.06 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

C. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

J. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
   2. Do not hold materials more than seven (7) days during normal weather or three (3) days if the temperature is expected to rise above 80 degrees F.

B. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

C. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

F. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
   1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
   1. Excessive static or dynamic loading.
   2. Excessive internal or external pressures.
   3. Excessively high or low temperatures.
   4. Thermal shock.
   5. Excessively high or low humidity.
   6. Pollution and air contamination.
   7. Water or ice.
   8. Chemicals and solvents.
   9. Light.
   10. Radiation.
   11. Puncture.
   12. Abrasion.
   13. Heavy traffic.
   14. Soiling, staining, and corrosion.
   15. Bacteria.
   16. Rodent and insect infestation.
   17. Combustion.
   18. Electrical current.
   19. High-speed operation.
   20. Improper lubrication.
   21. Unusual wear or other misuse.
   22. Contact between incompatible materials.
   23. Destructive testing.
   24. Misalignment.
   25. Excessive weathering.
   26. Unprotected storage.
   27. Improper shipping or handling.
   28. Theft or vandalism.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.08 DEMONSTRATION AND INSTRUCTION

A. See Section 01 79 00 - Demonstration and Training.

B. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

C. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

D. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.09 STARTING AND ADJUSTING

A. STARTING SYSTEMS
1. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
2. Coordinate schedule for start-up of various equipment and systems.
3. Notify and Architect/Engineer and Owner seven (7) days prior to start-up of each item.
4. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions that may cause damage.
5. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
6. Verify wiring and support components for equipment are complete and tested.
7. Execute start-up under supervision of responsible manufacturer's representative and Contractor's personnel in accordance with manufacturer's instructions.
8. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
9. Submit a written report that equipment or system has been properly installed and is functioning correctly.

B. TESTING, ADJUSTING AND BALANCING
1. Owner will appoint, employ, and pay for services of an independent firm to perform testing, adjusting and balancing.
2. The independent firm will perform services specified in Division 15 and 16 sections.
3. Independent firm will submit reports to the Architect/Engineer, Owner and Contractor indicating observations and results of tests and indicate compliance or non-compliance with specified requirements and with the requirements of the Contract Documents.
4. Adjust operation components for proper operation without binding. Adjust equipment for proper operation.
5. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
6. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements.

3.10 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean

each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire project or for a portion of project:
    a. Clean project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas and courtyards of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from project site.
    e. Remove snow and ice to provide safe access to building.
    f. Clean all exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    h. Sweep concrete floors broom clean in unoccupied spaces.
    i. Empty all trash cans and pencil sharpeners.
    j. Clean all cabinetry inside and out.
    k. High and low dust all spaces.
    l. High dust lobby ceiling edges, vents and light fixtures.
    m. Spot clean and vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
    n. Floor Cleaning Procedures:
        1) VCT Flooring in Classrooms Offices and Cafeterias: Auto scrub and strip floors then apply one (1)) coat of sealer. Apply two (2) coats of specified floor finish. Repeat finish application and burnish process two times, for a total of six (6) coats of floor finish.
        2) VCT Flooring in Corridors: Auto scrub and strip floors then apply one (1) coat of sealer. Apply two (2) coats of specified floor finish. Repeat finish application and burnish process three times, for a total of eight (8) coats of floor finish.
        3) Toilet Rooms and Locker Rooms:
            (a) Dust mop and wet mop ceramic tile flooring.
            (b) Auto scrub and strip VCT flooring. Apply one (1) coat of sealer. Apply two (2) coats of specified floor finish. Repeat finish application and burnish process two times, for a total of six (6) coats of floor finish.
        4) Stairwells: Remove marks from stairwells. Dry mop then wet mop stair treads. Finish with floor finish material as directed by the Plant Operations Manager (POM).
        5) Stage/Platform Areas: Dry mop then wet mop. Finish with floor finish material as directed by the Plant Operations Manager (POM).
        6) Gymnasium: Dry mop then wet mop. Finish with floor finish material as directed by the Plant Operations Manager (POM).
    o. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
    p. Remove labels that are not permanent.
    q. Remove grease, paint spots, dirt, dust, stains, labels, fingerprints and other foreign matter from interior and exterior surfaces; vacuum and dust behind grilles, louvers and screens; wash floor surfaces not otherwise finished; clean metal doors and frames; clean metal work; clean equipment; clean hardware; clean and polish glass on both sides; clean and polish mirrors.

r. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
   1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
s. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
t. Replace parts subject to unusual operating conditions.
u. Replace cracked and broken glass.
v. Clean and sanitize plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
w. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
x. Clean ducts, blowers, and coils if units were operated without filters during construction.
y. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
z. Clean kitchen, food preparation, serving area and rooms associated with kitchen or food preparation support, including walls, floors, ceilings, food service equipment, etc… with sanitizing cleaners.
aa. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

E. Provide protection of floors throughout building during Mover's activities. Protection shall be removed after the Mover's activities have been completed.

3.11 CLOSEOUT PROCEDURES

A. SUBSTANTIAL COMPLETION
   1. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
      a. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
      b. Advise Owner of pending insurance changeover requirements.
      c. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
      d. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
      e. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
      f. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
      g. Complete startup testing of systems.
      h. Submit test/adjust/balance records.
      i. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.

j. Advise Owner of changeover in heat and other utilities.
k. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
l. Complete final cleaning requirements, including touchup painting.
m. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

2. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect that must be completed or corrected before certificate will be issued.
   a. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   b. Results of completed inspection will form the basis of requirements for Final Completion.

B. FINAL COMPLETION
1. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   a. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   b. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   c. Submit pest-control final inspection report and warranty.
   d. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. [Submit demonstration and training videotapes.]
   e. Comply with all requirements of the New Haven School Construction Program - Building Turnover Process Procedure
   f. Submit completed Extra Materials Checklist accepted and signed off by the School Construction Program Project Manager and Board of Education Plant & Operations Manager.
2. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   a. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

C. LIST OF INCOMPLETE ITEMS (PUNCH LIST)
1. Preparation: Submit digital file and three (3) copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   a. Organize list of spaces in sequential order, [starting with exterior areas first] [and] [proceeding from lowest floor to highest floor].
   b. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   c. Include the following information at the top of each page:
      1) Project name.
      2) Date.
      3) Name of Architect and Construction Manager.

4) Name of Contractor.
5) Page number.

D. WARRANTIES
1. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
2. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
3. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   a. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
   b. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   c. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," project name, and name of Contractor.
   d. Provide two copies of this binder to the Owner.
4. Provide additional copies of each warranty to include in operation and maintenance manuals.

E. EXTRA MATERIALS
1. Submit completed Extra Materials Checklist accepted and signed off by the School Construction Program Project Manager and Board of Education Plant & Operations Manager. A copy of the Extra Materials Checklist for this project is appended to the end of this section.

3.12 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.

4. Change Orders and other modifications to the Contract.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction including:
1. Field changes of dimension and detail.
2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Provide control diagrams by controls manufacturer as installed.

J. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

K. Include test and balancing reports.

L. Additional Requirements: As specified in individual product specification sections.

3.05 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Plumbing equipment.
   4. Electrical systems and equipment.
   5. Conveying systems.
   6. Items specified in individual product Sections.

C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
   1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
   2. Finishes, including flooring, wall finishes, ceiling finishes.
   3. Fixtures and fittings.
   4. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

B. Draft Training Plans: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Commissioning Authority for review and inclusion in overall training plan.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such a slides, hand-outs, etc.

h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
1. Include applicable portion of O&M manuals.
2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:
1. Identification of each training session, date, time, and duration.
2. Sign-in sheet showing names and job titles of attendees.
3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
4. Include Commissioning Authority's formal acceptance of training session.

E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
1. Format: DVD Disc.
2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.

C. Demonstration may be combined with Owner personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.
2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.

B. Conduct training on-site unless otherwise indicated.

C. Owner will provide classroom and seating at no cost to Contractor.

D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.

E. Provide training in minimum two hour segments.

F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.

G. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1. The location of the O&M manuals and procedures for use and preservation; backup copies.
   2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3. Typical uses of the O&M manuals.

I. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
   3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
   4. Provide hands-on training on all operational modes possible and preventive maintenance.
   5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
   6. Discuss common troubleshooting problems and solutions.
   7. Discuss any peculiarities of equipment installation or operation.
   8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
   9. Review recommended tools and spare parts inventory suggestions of manufacturers.
   10. Review spare parts and tools required to be furnished by Contractor.
   11. Review spare parts suppliers and sources and procurement procedures.

J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

B. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.

D. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

E. Section 02 65 00 - Underground Storage Tank Removal.

F. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2009.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.

C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.
   1. Hire the services of a surveyor licensed in the state of CT to accurately record actual lateral locations, elevations, size and type, of capped and active utilities, and subsurface construction that is uncovered during the demolition process and is scheduled to remain
   2. Document capped utilities with photographs in digital format
   3. Final record demolition documents (drawings and electronic files in AutoCAD format, letest edition) shall be submitted to the Owner's representative no later than 10 days after substantial completion of the demolition scope of work.

PART 3 EXECUTION

2.01 SCOPE

A. Remove and legally dispose of all buildings, components, structures, materials, equipment and miscellaneous items as indicated designated in the drawings.

B. Remove other items indicated, for salvage, relocation, and recycling.

C. Expeditiously fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion. Protect and barricade such areas in accordance with OSHA standards.

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits. It is noted that the City of West Haven will require a separate demolition permit for each building or parcel.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   6. Do not close or obstruct roadways or sidewalks without permit.
   7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.

D. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

E. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

2.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

2.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 02 61 13

HANDLING AND DISPOSAL OF CONTAMINATED MATERIALS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section provides requirements for the storage, on-site handling, transport, and disposal of excavated materials, including fill and native soils. The site soil has been characterized, and the selected Contractor shall make every effort to secure off-site soil disposal facility options with the existing soil data.

B. The Contractor shall furnish all labor, materials, equipment, and incidentals required to conduct the work of this Section, including testing, segregating, stockpiling, loading, transporting, handling, and disposal of all excavated material, in accordance with the Contract Documents and all applicable Federal, State, and local regulations. The work of this Section shall also include obtaining approvals from permitted soil disposal or recycling facilities; obtaining and paying for permits, not obtained by the Owner; and paying all fees required to perform the work. Further details are provided herein.

C. Contractor's bid shall include unit costs for loading, transportation and off-site disposal of the following types of waste:
   1. Non-hazardous contaminated soil and water
   2. Non-hazardous polluted soil
   3. Non-hazardous contaminated debris including: concrete debris, asphalt debris, and miscellaneous debris.

D. For the purpose of this Section, "non-hazardous contaminated materials" are materials including, but not limited to soil, sediment, groundwater, and debris that contain chemical concentrations exceeding the applicable Connecticut Department of Energy and Environmental Protection (DEEP) Remediation Standard Regulations (RSRs).

E. For the purpose of this Section, "non-hazardous polluted soil" is soil affected by a release of a non-naturally occurring substance at a concentration above the analytical detection limit but below the applicable RSRs.

F. All soils and groundwater are deemed contaminated or polluted unless sample results indicate otherwise.

G. For the purpose of this Section, "environmentally unsuitable for reuse" means materials including, but not limited to: characteristic hazardous waste; contaminated material, and material having objectionable odors including petroleum or synthetic odors.

H. All work shall be performed in accordance with the Contract Documents for the project and applicable Federal, State, and local regulations.

I. The Contractor will be responsible for the health and safety of his workers and his Subcontractors in accordance with Occupational Safety and Health Administration (OSHA) regulations, including Title 29 CFR Part 1910.120 and specification Section 01 35 29.13.

J. The Contractor shall accept the site "as-is" and shall be deemed to have inspected the site and reviewed all drawings, reports, and documents applicable to this work prior to submitting a bid.

K. The Contractor's work may include contact with, and handling of, contaminated materials.

L. Additional undiscovered environmental conditions may potentially exist at the site including, but not limited to: underground piping; underground storage tanks (USTs); areas of contamination; and previously unidentified soil and groundwater contamination.

1.02 RELATED SECTIONS AND DOCUMENTS

A. References
   1. Phase II Environmental Site Investigation Report by Langan Engineering & Environmental Services, Inc. dated 8 May 2013.
   2. Delineation of Lead in Soils and Additional Soil Sampling Letter Report by Langan Engineering & Environmental Services, Inc., dated 13 June 2013 (Revised 17 July 2013).
   3. Geotechnical Engineering Study, prepared by Langan Engineering & Environmental Services, dated 15 February 2012 and revised 8 November 2013.
   4. Material Management Plan by Langan Engineering & Environmental Services, Inc. dated 14 June 2013 (Revised 8 November 2013).

B. Sections containing requirements related to this Section include, but are not limited to:
   1. EN 1.01 – Environmental Conditions Plan
   2. Health & Safety – Section 01 35 29.13
   3. Earthwork - Section 31 00 00
   4. Soil Erosion and Sediment Control

C. All work and materials under this section shall conform to the latest revision of the following standards, where not otherwise required by the Contract Documents:
   1. CTDEEP Remediation Standard Regulations (RSRs), C.G.S. Section 22a-133k-1 through 22a-133k-3.
   2. 40 CFR, Part 260, Hazardous Waste Management System: General
   3. 40 CFR, Part 261, Identification and Listing of Hazardous Waste

D. Regulatory Requirements and Reference Standards
   1. The Contractor shall comply with all the laws, ordinances, codes, rules, and regulations of the Federal, State, and local authorities having jurisdiction over any of the work specified herein. The Contractor shall meet all federal Environmental Protection Agency (EPA) and State Department of Transportation (DOT) regulations for shipping of regulated substances to off-site disposal facilities, meet all regulatory requirements imposed by the Treatment, Storage, and Disposal Facility (TSDF), and all applicable Erosion and Sediment Control requirements. Regulations pertaining to the transport and disposal of regulated substances/materials include, but are not limited to the following:
   2. DOT 49 CFR 172 through 179
   3. DOT 49 CFR 387 (46 FR 30974)
   4. DOT DOT-E 8876
   5. EPA 40 CFR 136 (41 FR 52779)
   6. EPA 40 CFR 262 and 761
   7. Resource Conservation and Recovery Act (RCRA)
   8. USEPA Regulation 40 CFR Part 280, Underground Storage Tanks: Technical Requirements Final Rule and Office of Emergency and Remedial Response, Standard Safety Guides, PB92-983414.
   9. Underground Storage Tank Regulations, Regulations of Connecticut State Agencies, Sections 22a-449(d)-1, and Sections 22a-449(d) 101-113
   10. Connecticut Public Health Code, On-site Sewage Disposal Regulations, and Technical Standards for Subsurface Sewage Disposal Systems
   11. 29 CFR 1910 – Federal Occupational Safety and Health Administration (OSHA) standards.
   12. NIOSH Occupational Safety and Health Guidance manual for Hazardous Waste Site Activities.
   13. 29 CFR 1926 – Federal Construction Standards.
   14. Resource Conservation and Recovery Act, 40 CFR Parts 260-265, Safe Entry and Cleaning of Petroleum Storage Tanks.
   15. National Fire Prevention Association, Volume 30, “Flammable and Combustible Liquids Code.”

16. National Fire Prevention Association, Volume 327, “Cleaning or Safeguarding Small Tanks and Containers without Entry.”
17. US Department of Transportation (US DOT) 49 CFR Section 172.500 et seq.
18. American Petroleum Institute, API-2015A, “A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning.”
19. American Petroleum Institute, API-2217A, “Guidelines for Work in Inert Confined Spaces in the Petroleum Industry.”
20. American Petroleum Institute, API-2015, “Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks.”
21. American Petroleum Institute, API-2016, “Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks.”
22. American Petroleum Institute, API-1604, “Closure of Underground Petroleum Storage Tanks.”
23. American National Standard Institute, ANSI 22882, “Standard Practice for Respiratory Protection.”
24. American Society of Testing Materials, ASTM D 5088 (1990), Decontamination of Field Equipment Used at Non-radioactive Waste Sites.
25. National Institute for Occupational Safety and Health, NIOSH, “Working in Confined Space.”
26. Any transporter of contaminated/hazardous soils materials shall be licensed in the state in which handling and transportation shall take place in accordance with all applicable regulations.
27. Contractor shall comply with Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29 CFR Part 1910.120 “Hazardous Waste Operations and Emergency Response.”
28. Where reference is made to one of the above standards, the revision in effect at the time of the bid opening shall apply.
29. American Society for Testing and Materials (ASTM) latest edition.
30. D422 Method for Particle Size Analysis of Soils
31. D1557 Test for Moisture-Density Relations of Soils Using 10-lb (4.5 Kg) Hammer and 18-inch (457 mm) Drop (Modified Proctor)
32. D2216 Laboratory Determination of Content of Soil
33. D2487 Classification of Soils for Engineering Purposes
34. D2922 Tests for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth)
35. D3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
36. D4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils
37. American Association of State Highway and Transportation Officials (AASHTO) latest edition
38. T88 Mechanical Analysis of Soils

1.03 DEFINITIONS

A. CTDEEP Remediation Standard Regulations (RSRs): Detailed guidance and standards that may be used at any site to determine whether or not remediation of contamination is necessary to protect human health and the environment.

B. Clean Soil: Soils on site that have no detectable concentrations of non-naturally occurring compounds.

C. Clean Fill: Approved fill brought onto the site that has been tested and found to have no exceedances of any CTDEEP RSR Criteria. This material must be free of solid waste and organic matter (i.e. wood, glass, etc.), and shall also comply with the requirements for suitable backfill soils. See Section 31 00 00, Earthwork.

D. Polluted Soils: Soils that have concentrations of non-naturally occurring compounds detected above laboratory reporting limits, but below the CTDEEP RSR criteria. Polluted soils can be reused on-site with the preparation of a Materials Management Plan and approval from the Engineer.

E. Contaminated Soils: Soils containing concentrations of compounds that exceed CTDEEP RSR criteria. Contaminated soils can NOT be reused on-site and must be disposed of at an off-site disposal facility.

F. Contaminated Water: Groundwater containing concentrations of compounds that exceed CTDEEP RSR criteria. Contaminated water can be discharged on-site with treatment and a Remediation Wastewater Discharge Permit.

G. Contaminated Debris: Debris containing concentrations of compounds that exceed CTDEEP RSR criteria. Contaminated debris can NOT be reused on-site and must be disposed of at an off-site disposal facility.

H. Hazardous Materials: Includes all soil/fill material that exceeds regulatory limits for hazardous substances as defined in 40 CFR, Part 261.20 Subpart C – Characteristics of Hazardous Waste. This material can NOT be reused on-site and must be disposed of at an off-site disposal facility.

I. Unknown Environmental Conditions: An environmental condition not previously identified by Langan, or provided in the Contract Documents.

1.04 PROJECT CONDITIONS

A. The ESUMS site is approximately 4.6-acre in size, and is bordered by Boston Post Road to the north, commercial property and the University of New Haven (UNH) to the east, residential property to the south, and Rockview Street to the west in West Haven, Connecticut.

B. The site is bordered by existing structures, athletic fields, wetland areas, and roadways. The site is occupied by multiple residential and commercial structures.

C. The general subsurface conditions encountered at the site consists of a surficial layer of asphalt pavement or topsoil where encountered, underlain by miscellaneous fill material where encountered, a thin layer of silt where encountered, glacial till, followed by weathered rock and greenstone bedrock. The thin layer of silt was encountered generally north and south of the proposed building footprint. Bedrock was encountered between 1 and 24 feet below existing site grades and generally slopes downward from north to south and from west to east. Groundwater was encountered between 2 to 7.5 feet below the existing site grades at the boring locations and was observed to stabilize between 3.2 and 9.5 feet below existing site grades. See the Geotechnical Engineering Report referenced herein for additional subsurface information.

D. The Environmental Site Investigation performed by Langan, identified the following:
   1. A release to the soil was identified at the abandoned ASTs at 516 Boston Post Road and SVOC, ETPH, and lead impacts were identified at this location (HA-3).
   2. Elevated concentrations of lead exceeding applicable RSR criteria were detected in surficial soil samples collected in the vicinity of the residential structures where exterior LBP was identified (506 Boston Post Road, and 14, 34, and 38 Rockview Street) at concentrations exceeding applicable RSR criteria. Lead was detected in one of these samples (HA-2 at 506 Boston Post Road) at a concentration of 17,100 mg/kg which is above the industrial/commercial direct exposure criteria, as well as above the CTDEEP Significant Hazard Reporting threshold. This detection was discovered on 3 April 2013, and in accordance with CGS Section 22a-6u, the area was fenced pending remediation and the detection was reported to the CTDEEP within 90-days.
   3. Copper was detected in monitoring well ELB-12(OW) at a concentration of 89 ug/L, exceeding the SWPC of 48 ug/L.

4. VOC compounds Bromodichloromethane and Chloroform were detected in monitoring well ELB-5(OW) below the applicable RSR criteria.

E. The Contractor, by careful examination, shall inform himself as to the nature and location of the work; the nature of the subsurface conditions; the locations of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; the conditions of adjacent structures and utilities and all other matters which can in any way affect the work.

F. The Contractor shall be held to have visited the site and to have familiarized himself with the existing conditions of adjoining utilities and structures.

G. The Contractor shall make his own deductions of the subsurface conditions which may affect the methods or cost of construction of the work hereunder, and he agrees that he will make no claims for damages or compensations, except as are provided under the agreement, should he find conditions during the progress of the work different from those as calculated and/or anticipated by him. Additional borings and other exploratory operations may be performed by Contractor, at the Contractor's option and following approval from the Owner. No change in the Bid Sum will be authorized for such additional exploration undertaken by the Contractor.

H. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of the site. The Contractor shall conform to all Connecticut State and Federal regulations concerning the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.

1.05 SUBMITTALS

A. The Contractor shall submit to the Engineer, copies of all material to establish compliance with this Section no later than 14 calendar days prior to construction. Order of materials and/or mobilization prior to review shall be at the Contractor's own risk.

B. The Contractor shall submit satisfactory proof of his qualifications for performing the work specified herein. The Contractor performing the work of this Section shall prove that the firm and the personnel they intend to use for this project have at least 5 years of experience successfully completing contracts involving handling of contaminated materials on a scale as that specified for this project.

C. Professional Personnel
   1. Submit names of any OSHA 40 hour HAZWOPER-certified personnel that will be assigned to this project, as well as copies of their certifications.

D. Health and Safety
   1. The Contractor shall submit to the Engineer a site specific Health and Safety Plan 14 calendar days prior to construction (See Health and Safety – 01 35 29.13)

E. All proposed disposal facilities must be approved by the Engineer prior to transporting soil. For each proposed disposal facility, the Contractor shall submit the following:
   1. Name, address, and location of the facility, including owner's name, address, telephone, and fax number and the contact person at the facility.
   2. The EPA Disposal Facility Identification Number and expiration date, if applicable.
   3. Copies of valid, existing, operating permits for the facility from the applicable regulatory agencies.
   4. Copies of currently valid permits from all applicable regulatory agencies to specifically accept the material. Such permits shall indicate that they are presently in effect. Permits shall state the maximum capacity of the facility to accept the materials.
   5. A signed commitment letter from the facility owner granting permission to bring material to the facility throughout the life of the Contract. Commitment letters must be supplied on the

facility's letterhead, and include the site as the originating site, the specific analytical data provided to and reviewed by the facility, a statement that the facility is in compliance with its permit, any restrictions on delivery schedules or other conditions that may cause rejection of transported materials, and the accepted daily quantities of soil that may be disposed.

6. A listing of the number and types of analytical tests required for initial determinations of the material for each disposal facility. Also to be included are the testing requirements and frequency for testing of the material once the initial characterization has been made.

F. If on-site stockpiling of excavated soils is conducted:
   1. Provide a Stockpiling Plan.
   2. Provide a Location Plan identifying the proposed stockpile location.
   3. Cut sheets and details shall be provided for the stockpile areas construction materials and equipment, including base and cover materials and plastic liner, etc.

G. If backfill is brought on-site:
   1. Submit sources of proposed imported fill material to the Owner and the Engineer prior to transporting to the site.
   2. Submit certification that the fill material is environmentally clean.

H. Submit a copy of each manifest/weight tickets for each truck/container in accordance with Part 3 – Execution of this Section.

1.06 QUALITY ASSURANCE

A. Codes and Standards:
   1. Perform work specified herein as indicated in the Contract Documents and in accordance with all Federal, State and local authorities having jurisdiction.

B. Engineering Observations:
   1. The Engineer will observe the movement and handling of all contaminated and polluted materials. The Contractor shall notify the Engineer a minimum of 72 hours prior to start of work involving handling of contaminated materials.
   2. The Contractor shall cooperate with the Engineer to facilitate the progress of the work.
   3. The Engineer will inform the Contractor of any part of the work of this Section not incompliance with these specifications.

C. The Contractor shall have at its disposal access at any and all times to an adequate quantity of OSHA certified workers, who are experienced in dealing with contaminated and hazardous materials, to complete the necessary material management within the project schedule.

1.07 PROTECTION OF ADJACENT STRUCTURES AND PROPERTY

A. It is the Contractor's responsibility to ensure that contaminated materials will not be spilled, placed, or otherwise discharged into areas other than those specified in the Contract Documents. Any unauthorized placement, spill, or discharge of contaminated material by the Contractor shall be completely removed by the Contractor at his own expense.

B. Any unauthorized placement, spill, or discharge of contaminated material by the Contractor shall be reported immediately to the Engineer.

C. All costs associated with repairing any damage shall be the Contractor's sole responsibility, and such repairs shall be made to the satisfaction of the Owner.

1.08 COLLECTION OF ENVIRONMENTAL SAMPLES

A. The Contractor shall assist the Engineer to collect any environmental samples required during the course of the work. The Contractor shall provide safe and secure access to the work area for the purpose of collecting environmental samples.

B. The Contractor is responsible for collection of waste characterization soil samples required for approval at an off-site disposal facility.

1.09 HEALTH AND SAFETY MEASURES

A. The Contractor shall be solely responsible for the health and safety of his own personnel and performing his work in accordance with all Federal, State, and local regulations and the requirements of Section 01 35 29.13 - Health and Safety of these specifications.

PART 2 PRODUCTS

2.01 STOCKPILE AREAS

A. If stockpile areas are required:
   1. Minimum 8-mil thick impermeable polyethylene sheeting or equivalent. Contaminated soil covers are not permitted.
   2. Weights and/or stakes for anchoring sheeting.

2.02 FILL MATERIALS

A. Fill imported to the site, if required, must be deemed suitable for backfill as per the Geotechnical Engineer, meet the project Specifications for backfill material, and meet all applicable CTDEEP RSR Criteria.

2.03 DUST AND ODOR CONTROL MATERIALS

A. Materials required for dust and odor control may include:
   1. Minimum 8-mil thick impermeable polyethylene sheeting or equivalent to cover excavations and stockpiles to control dust and odors.
   2. Water for sprinkling and wetting to control dust.
   3. Dust suppression wetting agents to control dust (water soluble, non-toxic, non-reactive, non-volatile, and non-foaming).
   4. Foam to control odor, using chemical masking and/or encapsulation.

2.04 EQUIPMENT

A. Contractor shall use watertight waste containers and/or watertight dump and tank trucks conforming to applicable United States Department of Transportation (USDOT) regulations, Connecticut Department of Transportation (CTDOT) regulations, and of all other States in which waste materials from the site will be transported.

B. Contractor shall be responsible for labeling hazardous and non-hazardous material containers with labels conforming to Federal, State and local regulations.

C. Areas used for Contractor storage of equipment and materials (e.g., fuels) shall be lined with 8-mil plastic and observed regularly for any leakage of chemicals or fuels to the ground. Contractor shall rectify any such leakage immediately upon discovery.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Contractor shall attend a Pre-Construction Meeting with the Owner and the Engineer to understand: procedures and requirements for handling contaminated materials that may be encountered at the site and known environmental conditions and potential undiscovered

environmental conditions that may be encountered at the site. At the meeting, the Contractor's proposed methods and scheduling shall be discussed.

B. Contractor shall be responsible for locating appropriate disposal facilities for all wastes generated during the entire course of the Contract. Selected disposal facilities shall be legally authorized to accept the types of wastes delivered by Contractor.

C. Contractor shall be responsible for coordinating the safe legal transportation and off-site disposal of all waste material generated during the entire course of the Contract. Transportation and disposal of waste materials shall be in accordance with all applicable Federal, State and local codes and regulations.

D. Contractor shall ensure that off-site tracking of wastes is minimized. If, in the opinion of the Owner or the Engineer, the paved surfaces of the site and/or adjacent streets are affected by the transportation of materials from the loading area, Contractor shall supply mechanized road cleaning equipment to clean the paved surfaces at no additional cost. The wash water and accumulated waste materials will be disposed of in accordance with these specifications at no additional cost to the Owner.

3.02 PREPARATION

A. The Contractor shall obtain all necessary Federal, State and local permits and approvals required to work in the areas of known contamination, and implement all necessary health and safety requirements identified in these specifications.

3.03 UNKNOWN ENVIRONMENTAL CONDITIONS

A. The Contractor shall immediately notify the Engineer of any unknown environmental condition identified during the work.

B. The Contractor shall immediately stop work in the area of the environmental condition and secure the area to prevent exposure of workers or the public to any associated hazardous conditions. Appropriate health and safety procedures shall be implemented as required in the Contractor's Health and Safety Plan.

C. If the environmental condition presents an imminent risk of a spill or discharge to the environment, the Contractor shall implement measures to reduce or eliminate the risk provided that such measures can be implemented in accordance with the Contractor's Health and Safety Plan.

D. The Contractor shall provide the Owner with a cost estimate and scope of work to address any unknown environmental conditions identified during the work.

E. The Contractor shall not address any unknown environmental conditions without written authorization from the Owner or Engineer. Any work performed to address an unknown environmental condition prior to receiving written authorization will be at the Contractor's sole risk.

3.04 HANDLING OF CONTAMINATED SOIL

A. Contaminated soil to be disposed of off-site shall be loaded, transported, and disposed of without tracking or spilling. Any suspected soil spilled, tracked, or otherwise deposited in areas not approved by the Owner or Engineer shall be removed by the Contractor at his own expense.

B. The Contractor shall keep accurate, detailed records of the amount of soil handled, and the locations where the soil is placed.

C. The Contractor shall implement dust suppression measures necessary to minimize the generation of dust while handling known or suspected contaminated soil. The Engineer will conduct air monitoring during excavation of contaminated materials and will notify the

Contractor if dust is detected above action levels and additional dust suppression measures are necessary.

D. The Contractor shall complete any necessary manifests/weight tickets required for transport of the contaminated soil. Copies of any weight tickets and/or manifests for the contaminated soil shall be provided to the Owner or Engineer within 48 hours of transporting the soil.

3.05 HANDLING OF CONTAMINATED GROUNDWATER

A. If removal of contaminated groundwater is required to complete the work, the Contractor shall provide the Owner or Engineer with proposed treatment and/or disposal methods, as well as a cost estimate for treating and/or disposing of the contaminated water. The treatment system will consist of, at a minimum, frac tanks and bag filters.

B. The Contractor shall not treat and/or dispose of any contaminated groundwater without written authorization from the Owner or Engineer. Any treatment and/or disposal of contaminated groundwater prior to receiving written authorization will be at the Contractor's sole risk.

C. If contaminated groundwater is encountered, the Engineer will obtain the appropriate Groundwater Remediation Wastewater Discharge Permit.

D. Any penalties resulting from the improper discharge and/or disposal of the contaminated groundwater will be the sole responsibility of the Contractor.

3.06 HANDLING OF CONTAMINATED DEBRIS

A. All debris removed from contaminated areas of the site which is not suitable for use as backfill as determined by the Engineer shall be stockpiled on an impervious surface or on 8 mil thick plastic sheeting. The debris stockpile shall be covered with 8 mil thick plastic sheeting securely weighted to prevent movement by the wind. The Contractor will be responsible for classifying these materials prior to off-site disposal.

3.07 TRUCK AND EQUIPMENT DECONTAMINATION

A. All trucks and equipment shall be provided to the work site free of contamination. The Engineer may prohibit from the site any equipment that in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of the Contractor's equipment prior to arrival at the site shall be at the expense of the Contractor. The Contractor is prohibited from decontaminating equipment on the site that is not thoroughly decontaminated prior to arrival.

B. All transport vehicles shall be inspected, prior to leaving the site, by the Contractor to ensure that no material adheres to the wheels, undercarriage, tailgates, covers, or other areas of transport vehicles. Decontamination of equipment shall prevent off-site tracking of soil or tracking soil from contaminated areas of the site to clean areas. All vehicles shall be cleaned as necessary prior to leaving the site.

C. The Contractor shall ensure that the transport trucks are protected from contamination by properly covering and lining them with compatible materials or decontaminating them prior to any use other than hauling contaminated materials.

D. The Contractor is responsible for preventing the tracking of soil, dirt, etc., onto public streets.

E. Decontamination shall be considered complete when all visible oil, grease, soil, sediment and groundwater have been removed from the surface of the item being decontaminated.

F. All wheels, tracks, and exterior surfaces of equipment used to perform the specified work shall be decontaminated prior to leaving the site, as necessary, to prevent off-site tracking of potentially contaminated soil.
   1. Contaminated equipment shall not be driven or towed along public roadways.

2. If, in the Engineer's opinion, the site or adjacent roadways are affected by inadequately decontaminated equipment, the Contractor shall remove the soil in question at no additional cost.

G. Decontamination rinse waters shall be collected and disposed lawfully off-site in accordance with applicable Federal, State, and local regulations, or to the sewer in accordance with an approved CTDEEP/water pollution authority sewer discharge permit.

H. The Contractor shall furnish labor, materials, tools, and equipment for decontamination of all equipment and supplies that are used to handle contaminated materials.

I. The Contractor shall inspect the site entrances and exits daily for evidence of off-site sediment tracking. The existing conditions of the adjacent City streets shall be maintained. If necessary, Contractor shall clean adjacent streets within 50 feet (ft.) of the site entrance/exit.

3.08 CONTAMINATED WATER CONTROL

A. For general dewatering activities, the Contractor shall comply with the Dewatering specification, and the requirements of the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities.

B. The Owner's Engineer will evaluate the discharge and, if at any time impacts are noted, will obtain a Groundwater Remediation Wastewater Discharge Permit (to the Sanitary Sewer), which the Contractor must comply with.

A. Contaminated fluids may consist of decontamination rinse waters generated at the truck and equipment wash area, rainwater that has encountered exposed contaminated materials, or entrained groundwater/stormwater that has ponded in open excavation areas.

B. The Contractor shall dispose of contaminated water in such manner as will not cause injury to the public health, nor to public or private property, nor to the work completed or in progress, nor to the surface of the streets, nor cause any interference with the use of the same by the public.

3.09 DUST AND ODOR CONTROL

A. The Contractor shall maintain all stockpiles, haul roads, access roads, and equipment storage areas either covered or free from visible dust which would cause a hazard or nuisance, at all times including after working hours, on weekends, and holidays.

B. Uncovered stockpiles should be kept moist as a measure to control dust generation.

C. The Contractor shall carry out dust and particulate control measures, as necessary, such as water misting to prevent the generation of dust and particulate matter during project activities. Chemical means for dust and particulate control should not be used without the written approval of the Owner.

D. Dust and debris shall be confined within the work area boundaries. Contractor shall continuously monitor the exterior of the work area for visible emissions of water, dust, or debris.

E. Methods that may be applied to control dust emissions both on and off-site may include, but are not limited to:
   1. Installing gravel pads at vehicle egress points.
   2. Application of wetting agents to soil, stockpiles, excavation faces, buckets, and equipment during excavation or roadways.
   3. Covering of excavations after completion of construction activities.
   4. Direct loading excavated material to hauling vehicles and minimization of material stockpiling on-site.
   5. Covering haul trucks and containers with tarps.

3.10 SAMPLING AND TESTING

A. General
   1. The Contractor shall provide the Engineer safe access to any areas required to be field screened and/or sampled around the working excavation equipment and support vehicles. No delay claims will be accepted associated with the time required for the Engineer to field screen or sample.
   2. For sample analyses completed by the Contractor, hard copies of the test results shall be provided to the Engineer upon receipt by the Contractor.

B. Lab testing conducted for general sampling (i.e. end point, side wall, etc.) must be performed by a Connecticut certified Environmental Laboratory. Waste characterization sampling analysis must be conducted by a laboratory certified by the state that the material will be disposed.

3.11 TRANSPORTATION AND DISPOSAL

A. The Contractor shall construct stabilized construction entrances and exits prior to beginning work.

B. The Contractor shall transport and deliver material only to previously approved material disposal facilities.

C. The Contractor shall be responsible for appropriate measurement of unit quantity of contaminated material removed from the site. The Contractor shall coordinate vehicle inspection and recording of quantities leaving the site with the Engineer. These quantities shall be compared to recorded quantities received at the disposal facilities. The Contractor shall immediately resolve any discrepancies that occur and determine the probable cause for the discrepancy.

D. The Contractor shall be solely responsible for any and all actions necessary to remedy situations involving material spilled in transit.

E. To the extent possible and in conformance with all applicable regulations, all vehicles shall be routed away from environmentally sensitive areas such as residential areas, parks, schools, historic sites, wetlands, etc. For long distance hauling, all vehicles shall remain on primary highways.

F. The Contractor shall make every effort not to queue trucks outside of the property.

G. A sufficient number of containers and container handling equipment shall be procured by the Contractor such that the material can be managed in accordance with the terms and conditions of this section. The Contractor shall also have access to back-up vehicles and equipment to ensure that there is no downtime in connection with operations.

H. The disposal containers shall be ISO type, dump trailers, or approved equal, constructed of sufficient metal, have watertight bodies and sealed tailgates equipped with positive locking devices, and provisions for control of free liquids. No liquid shall leak from any part of the loaded container or trailer. The Contractor shall furnish and install a metal or tarpaulin cover on each container immediately after the container is full. The cover shall be secured in an approved manner and shall remain in place until the container has reached the disposal facility.

I. All trucks and containers shall be washed clean before leaving the disposal facility and shall be maintained in clean, sanitary condition by the Contractor at all times.

J. The Contractor shall be responsible for transportation safety of their employees and subcontractor. The Contractor shall inspect each vehicle to ensure that all doors, covers, etc. are secure and that no material can spill or otherwise be released or leak. Each vehicle shall bear, at a minimum, the name and phone number of the Contractor plainly visible on both cab doors. Each vehicle shall be uniquely numbered in lettering at least 4 inches high and shall be placarded in accordance with appropriate Federal, State, local, and DOT requirements (or other

applicable transportation requirements). Likewise, each trailer or container shall be so labeled on both sides and the tailgate if possible.

K. The contractor is responsible to ensure that the highway weight restrictions are not exceeded on project-related trucks.

L. The Contractor shall provide and maintain a truck manifest and security system.

M. The Contractor shall submit a copy of the completed manifest and weight tickets for each container to document the proper transportation of disposed material to an approved permitted facility by permitted vehicles. No payments shall be made until copies have been furnished.
   1. Each manifest shall include the following information:
      a. Waste stream source and surface location description
      b. Truck license plate number
      c. Trailer license plate number
      d. Container number
      e. Contractor's name, address, contact person, and phone number
      f. Transporter's name, address, contact person, and phone number
      g. Printed name and signature of the Contractor and date that the load was completed
      h. Printed name and signature of the disposal facility representative and date that the load was received at the facility.
   2. Each facility scale ticket shall include the following information:
      a. Facility name, address, and telephone number
      b. Material source and surface location description
      c. Scale ticket number
      d. Associated manifest number (if applicable)
      e. Truck license plate number
      f. Trailer license plate number
      g. Container number
      h. Transporter's name
         i) Gross, net, and tare weight of the load

3.12 BACKFILLING, COMPACTING, AND GRADING

A. Backfilling, compaction, grading, and restoration activities shall be conducted in accordance with the Earthwork Specifications prepared for the site (see Section 31 00 00 – Earthwork).

3.13 MAINTENANCE AND PROTECTION

A. Implement appropriate procedures and security measures to ensure the protection of site personnel, equipment, and the public from contaminated materials.

3.14 REPORTING

A. The Contractor shall provide any and all documents required by the Owner or the Engineer to complete a final site report as and when requested by the Owner at no additional cost to the Owner. Such Contractor-supplied documents shall include, but not be limited to, bills of lading, complete and fully signed manifests, certified weight tickets, analytical results, and certificates of destruction.

END OF SECTION

SECTION 02 65 00

UNDERGROUND STORAGE TANK REMOVAL

PART 1 GENERAL

1.01 GENERAL

A. The Contractor shall furnish all labor and materials, equipment and incidentals required for the proper decontamination, removal, and closure of all underground storage tanks (USTs), and removal of any petroleum-contaminated soil (if encountered).

B. One 550-gallon inactive fuel oil UST is located to the north of the commercial building located at the 488 Boston Post Road property. One inactive UST of unknown capacity is located directly to the south of the commercial building located at the 496 Boston Post Road property.

C. An on-site septic tank is located to the northwest of the commercial building located at the 488 Boston Post Road property.

D. Low levels of ETPH were detected at concentrations below CTDEEP RSR criteria in the soil in the vicinity of the inactive UST located at 488 Boston Post Road during a site investigation performed by GZA GeoEnvironmental, Inc. in December 2011.

E. All UST removal activities shall be observed by the Engineer on behalf of the Owner. The Engineer shall inspect USTs, and screen any residual tank sludge or fluids and adjacent soils and advise the Contractor. The contractor shall then handle the UST removals as specified herein.

1.02 SCOPE OF WORK

A. General
   1. Contractor shall attend a Pre-Construction Meeting with the Owner's Representative, Owner, and Engineer. At the meeting, Contractor's proposed plan, methods, and scheduling shall be discussed. This meeting shall occur before Contractor mobilizes to the site.
   2. The Contractor shall develop a Health and Safety Plan (HASP) in accordance with Section 01 35 29.13 – Health and Safety, which shall detail the equipment and methods to be utilized to protect on-site workers, the Owner's representative(s), and public from physical injury and adverse health effects due to removal, cutting, cleaning and disposing USTs and any residual tank sludge or fluids.
   3. The Contractor shall provide the Engineer with all information required for the Engineer to complete all necessary Connecticut Department of Energy and Environmental Protection (CTDEEP) tank change-in-status registration forms if necessary.
   4. The Contractor shall obtain all necessary permits, provide proper notification to all City and State agencies and utility companies, furnish all labor, materials, equipment and incidentals required for the proper decontamination, decommissioning, and removal of the USTs and associated electrical, structural, process piping and product equipment including, but not limited to, concrete, anchor straps, manways, pumps, remote fill lines, supply and return lines, vent lines, remote fill ports, etc. The Contractor also shall be responsible for providing the Engineer with UST closure documentation (i.e. manifests, bills of lading, certificate of closure, sample results) in accordance with existing CTDEEP guidance and regulatory policy.

B. UST REMOVAL
   1. The work in this Section shall include decommissioning, removal, cleaning, cutting and dismantling, and disposal of the USTs, ancillary equipment, tank fluids and/or sludge, tank cleaning rinse waters, equipment decontamination water, and the completion of all permits and closure reporting requirements.
   2. The Contractor shall be certified to perform UST removal work by the local fire department.

Copies of certifications shall be provided to the Owner and Engineer.

3. Any product in the tank piping shall be evacuated by flushing pipe contents back into the tank. Any product remaining in the tank shall be measured, reported to the Engineer, and then pumped out for proper off-site disposal. The Contractor shall characterize, remove and dispose of any residual product, water and sludge, as required and properly decommission and remove USTs.
4. Following removal of residual product from the tanks, the Contractor shall purge the tank of all flammable vapors.
5. Any asbestos present on the UST piping inside the vault shall be removed prior to UST and piping removal in accordance with applicable Federal, State and Local regulations.
6. The USTs and all associated supply piping, return piping, remote fill piping, vent piping, vent riser and appurtenances shall be removed, thoroughly cleaned and properly disposed in accordance with all applicable federal, state and local requirements.
7. The Contractor shall be responsible for removing UST vaults, if encountered. The Contractor shall break up, remove, and dispose of potential concrete bottom pads, encasements and underlying contaminated material.
8. The Contractor shall be responsible for the excavation, segregation, stockpiling, characterization, testing, transportation and disposal of all excavated contaminated materials (soil, debris, concrete, etc.), and pumping, testing and disposal of free phase product and groundwater removed from the excavation (if applicable). Refer to Section 02 61 13 - Handling & Disposal of Contaminated Materials for handling these materials.
9. The Contractor shall be responsible for the required testing for disposal classification of any contaminated materials including, but not limited to, oil, sludge, water or water containing oil or separate phase product, soil, rock, concrete or concrete products, brick, and other ancillary tank system related materials such as piping, conduit, wiring, tank fill facilities, and monitoring devices, to be removed from the site.
10. The Contractor shall assist the Engineer in the collection of post-excavation endpoint soil samples from the excavation bottom and sidewalls of the excavation.
11. If free petroleum product is encountered in the excavation following the tank removals, it shall be pumped to a vacuum truck for disposal.
12. The Contractor shall be responsible for continuously monitoring the work area for the presence of flammable, toxic or oxygen deficient atmosphere.
13. The Contractor shall be responsible for any necessary shoring/sheeting required to stabilize the sidewalls of the excavation and other structures, utilities, etc. adjacent to the work area. This shall be done accordance with applicable federal, state and local regulations and standards. The Contractor shall take appropriate action to make the work area safe.
14. At the direction of the Owner, the Contractor shall place and compact backfill in the excavation to return the site to pre-remediation elevations. Refer to Section 31 00 00 – Earthwork and Section 2.01 for the placement and compaction of backfill. The Contractor shall allow time and work space for the visual field confirmation and is responsible for density testing of fill placement. Refer to Section 2.01 below for backfill material requirements.
15. The Contractor shall prepare all necessary plans, obtain all necessary permits, and provide all necessary plans, notifications and submittals to the Engineer that may require submission to the CTDEEP.
16. No work shall be performed under this Contract without the direct, on-site supervision of the Engineer.
17. All work shall be performed in accordance with the Contract Documents and applicable Federal, State, and Local regulations.

1.03 RELATED SECTIONS AND DOCUMENTS

A. References
   1. Phase II Environmental Site Investigation Report, prepared by Langan, dated 8 May 2013
   2. Geotechnical Engineering Study, prepared by Langan Engineering & Environmental Services, dated 15 February 2012 and revised 8 November 2013.
   3. Material Management Plan by Langan Engineering & Environmental Services, Inc. dated 14 June 2013 (Revised 8 November 2013).

B. Sections containing requirements related to this Section include, but are not limited to:
   1. EN 1.01 – Environmental Conditions Plan
   2. Health & Safety – Section 01 35 29.13
   3. Handling & Disposal of Contaminated Materials - Section 02 61 13
   4. Earthwork - Section 31 00 00
   5. Soil Erosion and Sediment Control

C. Regulatory Requirements and Reference Standards
   1. The Contractor shall comply with all the laws, ordinances, codes, rules and regulations of the federal, state and local authorities having jurisdiction over any of the work specified herein. The Contractor shall meet Resource Conservation and Recovery Act (RCRA), CTDEEP, United States Environmental Protection Agency (USEPA), and State Department of Transportation regulations for shipping of regulated substances to off-site disposal facilities, and meet all regulatory requirements imposed by the Treatment, Storage and Disposal Facility. Regulations pertaining to the transport and disposal of regulated substances/materials include, but are not limited to the following:
      - USEPA Regulation 40 CFR Part 280, Underground Storage Tanks: Technical Requirements Final Rule and Office of Emergency and Remedial Response, Standard Safety Guides, PB92-983414.
      - Underground Storage Tank Regulations, Regulations of Connecticut State Agencies, Sections 22a-449(d)-1, and Sections 22a-449(d) 101-113
      - Connecticut Public Health Code, On-site Sewage Disposal Regulations, and Technical Standards for Subsurface Sewage Disposal Systems
      - 29 CFR 1910 – Federal Occupational Safety and Health Administration (OSHA) standards.
      - NIOSH Occupational Safety and Health Guidance manual for Hazardous Waste Site Activities.
      - 29 CFR 1926 – Federal Construction Standards.
      - Resource Conservation and Recovery Act, 40 CFR Parts 260-265, Safe Entry and Cleaning of Petroleum Storage Tanks.
      - National Fire Prevention Association, Volume 30, “Flammable and Combustible Liquids Code.”
      - National Fire Prevention Association, Volume 327, “Cleaning or Safeguarding Small Tanks and Containers without Entry.”
      - US Department of Transportation (US DOT) 49 CFR Section 172.500 et seq.
      - American Petroleum Institute, API-2015A, “A Guide for Controlling the Lead Hazard Associated with Tank Entry and Cleaning.”
      - American Petroleum Institute, API-2217A, “Guidelines for Work in Inert Confined Spaces in the Petroleum Industry.”
      - American Petroleum Institute, API-2015, “Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks.”
      - American Petroleum Institute, API-2016, “Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks.”
      - American Petroleum Institute, API-1604, “Closure of Underground Petroleum Storage Tanks.”

- American National Standard Institute, ANSI 22882, “Standard Practice for Respiratory Protection.”
- American Society of Testing Materials, ASTM D 5088 (1990), Decontamination of Field Equipment Used at Non-radioactive Waste Sites.
- National Institute for Occupational Safety and Health, NIOSH, “Working in Confined Space.”

2. Any transporter of contaminated/hazardous soils materials shall be licensed in the state in which handling and transportation shall take place in accordance with all applicable regulations.
3. Contractor shall comply with Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29 CFR Part 1910.120 “Hazardous Waste Operations and Emergency Response.”
4. American Society for Testing and Materials (ASTM) latest edition.
   - D422 Method for Particle Size Analysis of Soils
   - D1557 Test for Moisture-Density Relations of Soils Using 10-lb (4.5 Kg) Hammer and 18-inch (457 mm) Drop (Modified Proctor)
   - D2216 Laboratory Determination of Content of Soil
   - D2487 Classification of Soils for Engineering Purposes
   - D2922 Tests for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth)
   - D3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
   - D4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils
5. American Association of State Highway and Transportation Officials (AASHTO) latest edition
   - T88 Mechanical Analysis of Soils

1.04 QUALIFICATIONS

A. The Contractor shall be approved by the Owner, and shall be or have access to a tank contractor licensed by the local fire department. The Contractor shall be any person or persons, corporation, or proprietorship deemed competent and experienced to perform work involving the closures of USTs, hauling, disposal, transportation, or abatement of hazardous and non-hazardous materials. For the purposes of this contract, the Contractor shall possess the following:
   1. Access to facilities to handle, dispose, and/or abate hazardous or non-hazardous material.
   2. Access to certification of training for tank closure, spill responses, confined space entry, as well as trained personnel.
   3. Labor and materials to immediately execute work under this contract.
   4. Experience directly related to work under this contract.
   5. An adequate understanding of all the regulations and requirements governing this contract.
   6. Any item pertinent to work described in this contract.

B. The Contractor shall provide the Owner with evidence of the successful completion of at least five similar projects in scope and execution and/or a minimum of five years of experience of the same. Verification shall include letters of recommendation, references, owners/clients for whom the work was performed, dates, project durations, project cost, experience of personnel, licenses, etc.

C. When it is necessary for the Contractor to utilize the services of a Subcontractor to perform work, the Contractor shall be responsible for the Subcontractor. The Subcontractor shall meet the requirements of this Section and be submitted for approval by the Owner. Verification shall include letters of recommendation, references, owners/clients for whom the work was performed, dates, project durations, project cost, experience of personnel, licenses, certifications, etc.

1.05 SITE DESCRIPTION

A. The ESUMS site is located at 488, 496, 506 and 516 Boston Post Road; 4, 9, 14, 22, and 23 Daytona Street; 14, 20-22, 24, 34, 38 & 46 Rockview Street; and 3, 6, 7, 13 & 20 Waban Street in the City of West Haven, New Haven County, Connecticut. The site consists of 20 tax lots covering approximately 4.8- acres and 2 “paper” streets owned by the City of West Haven: Daytona Street and Waban Street. The site is bordered by Boston Post Road to the north, commercial property and the University of New Haven (UNH) to the east, residential property to the south, and Rockview Street to the west in West Haven, Connecticut.

B. Additional project information and site background is provided in the Contract Documents referenced in section 1.05.

1.06 PROJECT CONDITIONS

A. The site is bordered by existing structures, athletic fields, wetland areas, and roadways. The site is occupied by multiple residential and commercial structures.

B. The general subsurface conditions encountered at the site consists of a surficial layer of asphalt pavement or topsoil where encountered, underlain by miscellaneous fill material where encountered, a thin layer of silt where encountered, glacial till, followed by weathered rock and greenstone bedrock. The thin layer of silt was encountered generally north and south of the proposed building footprint. Bedrock was encountered between 1 and 24 feet below existing site grades and generally slopes downward from north to south and from west to east. Groundwater was encountered between 2 to 7.5 feet below the existing site grades at the boring locations and was observed to stabilize between 3.2 and 9.5 feet below existing site grades. See the Geotechnical Engineering Report referenced herein for additional subsurface information.

C. The Contractor, by careful examination, shall inform himself as to the nature and location of the work; the conformation of the ground, the nature of the surface and subsurface conditions; the locations of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; and all other matters which can in any way effect the work.

D. The Contractor shall be held to have visited the site and to have familiarized himself with the existing conditions of the site, adjoining properties, utilities and buildings.

E. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of the site of the work. The Contractor shall conform to all federal, state, and local regulations in regard to the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.

F. The Contractor shall locate existing underground utilities in and beyond the areas of work, and will provide adequate means of support and protection during the work.
   1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

G. The Contractor shall examine drawings to determine sequence of operations, and relation to work of other trades. Start of work shall signify acceptance of field conditions and shall acknowledge coordination with other trades.

1.07 SUBMITTALS

The Contractor shall provide the required submittals during the specific phases of the project as described below.

A. Pre-Construction Submittals – The Contractor shall submit to the Owner the following for review prior to receiving notice to proceed with the work.
   1. Confirmation of the Contractor's qualifications, licenses, permits, and items listed in Articles 1.03(A) and 1.03(B) of this Section.
   2. Confirmation of any Subcontractor's qualifications, licenses, permits, and items listed in Articles 1.03(A) and 1.03(C) of this Section.
   3. A detailed project schedule showing sequence of tank removals.
   4. All required insurance certificates and bonds, and proof that all required permits have been obtained.
   5. The name and address of the licensed tank disposal facility that shall accept the tanks and piping.
   6. A copy of certification for underground or aboveground storage tank removal per local fire department certification criteria.
   7. All pertinent information relating to the transport of materials. The information submitted shall include, but not be limited to:
      - Name and address of all transporters
      - All local, state and federal permits required for the transport of excavated materials resulting from the performance of the work. The licenses and permits that may apply include, but are not limited to: hazardous waste transporter permits (if applicable), vehicle and hauling permits
      - USEPA and/or state identification number and license expirations date (as required).
      - Proof of permit, license or authorization to transport waste in all affected states.
   8. Obtain and submit all local, state, and federal permits required for the disposal of all excavated materials resulting from the work performed. The applicable material disposal submittals are described in Specification 02091.
   9. The Contractor shall submit a site-specific HASP to the Owner at least fourteen (14) days prior to the Contractor's mobilization to the site. All requirements set forth in Section 01 35 29.13 – Health & Safety.

B. On-going Submittals – The Contractor shall submit the following to the Owner promptly after completion of each task:
   1. All manifests, bills of lading, weight tickets and analytical data for all tanks, piping, sludge or other material exported from the site associated with UST removal.

C. Once underground tank removal activities are completed, the following shall be submitted promptly after the tank is removed:
   1. Certification from the disposal facility that the tank has been properly disposed of (if applicable).
   2. All documentation required for the preparation of a written Closure Report by the Engineer, including but not limited to:
      a. Certification from disposal facility that all excavated materials, including scrap steel, demolition debris, waste oil, tank cleaning supplies, etc., have been properly disposed of or recycled.
      b. Copies of completed and disposal facility signed waste bills of lading and manifest forms.
   3. Confirmation that all site utilities in the work area have been identified and that work shall be performed in a manner to protect these utilities from damage. Confirmation that all site utilities directly associated with the work, including, but not limited to, electrical, steam, product supply and return lines, or other utility lines within the proposed work area have been identified, marked, locked, and tagged out.

4. Submit the analytical results for any borrow fill material used to fill the excavation in accordance with Part 2 Section 2.01 (A) of this specification.

1.08 NOTIFICATION

A. The Contractor shall notify all utilities prior to the work as necessary, and arrange for mark-outs of underground utilities in accordance with all applicable local, state and federal regulations.

B. The Contractor shall notify the Owner and the Engineer prior to any tank or petroleum-related project activities.

1.09 PROTECTION

A. Measures are addressed in Section 02 61 13 – Handling & Disposal of Contaminated Materials.

PART 2 PRODUCTS

2.01 MATERIALS

A. Suitable borrow fill material shall be free of organic, unsatisfactory soils and other deleterious material and shall have a maximum particle size no greater than 4". Borrow fill shall contain no industrial byproducts (e.g., ash, coal, slag). Borrow fill for placement at or below the observed water table shall be ¾-inch stone or approved equivalent. Backfill shall meet gradation requirements specified in Section 31 00 00 – Earthwork. Backfill shall not be stained, odorous, or exhibit elevated PID readings.

B. Unsatisfactory soils are USCS soil classification groups GC, OL, OH, and Pt as defined by ASTM D2487. Unsatisfactory soils cannot be used as controlled fill. The contractor should stockpile unsatisfactory soils separately from controlled fill material.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Contractor shall attend a Pre-Construction Meeting with Owner Representative, Owner, and the Engineer. At the meeting, Contractor's proposed plan, methods, and scheduling shall be discussed. Requirements discussed at this meeting shall be incorporated into the specification for this work. This meeting shall occur before Contractor mobilizes to the site.

B. At least 30 days before beginning UST removal at the site, the Engineer shall be notified in writing of the intent to remove the tank. Disposal of tanks, lines, sludge, residual liquids and contaminated soils shall be in accordance with the requirements and shall be the responsibility of the Contractor.

C. The Contractor shall remove and dispose of UST systems in accordance with this specification and federal, state, and local regulations.

D. Prior to removal of tanks, all liquids and accumulated sludge shall be removed from the tanks, to the extent possible, in accordance with the National Fire Protection Association Flammable and Combustible Liquids Code (NFPA-30) and any other applicable requirements.

E. All storage tanks removed from their location shall have flammable or combustible liquids removed, have the same lines disconnected; have sections of connecting lines not to be used further removed; and have inlets, outlets, and any leaks capped or plugged. The basic procedures for meeting these requirements are defined in the state and federal regulatory programs.

F. The Contractor shall continuously test the tank atmosphere and the excavation area for percent oxygen and combustible gas during the tank excavation and removal operations.

G. Verify the accuracy and existence of applicable codes, ordinances, and other regulations by obtaining and interpreting state, county, city, or local municipality by-laws for UST removal and

solid waste disposal.

H. Basic UST closure may require any combination of the following work items:
   1. Removal/disposal of tank contents by the Contractor.
   2. Excavation and removal of USTs by the Contractor.
   3. Site assessment by the Engineer.
   4. Excavation for removal of contaminated soils by the Contractor.
   5. Removal and disposal of contaminated water and free product by the Contractor.
   6. Disposal of contaminated soil at a proper facility by the Contractor.
   7. Post excavation endpoint soil sampling and analysis by the Engineer.
   8. Backfilling and compaction of the excavated area by the Contractor.
   9. Disposal of tank(s) by the Contractor.

3.02 SAFETY

A. Personnel working inside and in the general vicinity of the tanks shall be trained and thoroughly familiar with the safety precautions, procedures and equipment required for controlling the potential hazards associated with this work. Personnel shall use proper protection and safety equipment during work in and around the tanks.

B. All provisions of the Contractor's Health and Safety Plan and Confined Space Entry Permit (if applicable), shall be enforced during UST removal and excavation activities.

C. The Contractor shall maintain safe sidewall slopes or shall provide adequate shoring. The sheeting/shoring calculations shall be prepared and signed by a Connecticut licensed Professional Engineer.

D. The Contractor shall be responsible for the safety of his operation, and for any damage that may result from the Contractor's work. He shall erect and properly maintain at all times, as required by the conditions and progress of the Work, proper safeguards for the protection of Workers and the public and shall post danger warnings as required by law or otherwise required by the Contract Documents against hazards created by the Contractor's operation. The Contractor shall furnish, install and remove after completion of the work, all signs, lights, barricades, fencing and other equipment as may be necessary for the safe execution of the Work.

E. Prior to ending operations on any working day or at any time the Contractor is not on-site, the Contractor shall secure all areas of work in a safe manner in accordance with all regulatory agencies and to the satisfaction of the Owner and the Engineer.

F. Cutting of steel by thermal methods shall at all times, occur in a non-explosive environment. During such work, the tank, piping and the surrounding atmosphere shall be continuously monitored of explosive environment. Provide and maintain an adequate supply of fire extinguishers and other required safety equipment in close proximity to all demolition activity.

G. All soil and tank removal operations shall be conducted in a manner as required to prevent the spread of dust. If deemed necessary by the Engineer, the Contractor shall provide dust control with a water truck or other means approved by the Engineer and as described in the Handling & Disposal of Contaminated Materials Specification (Section 02 61 13).

3.03 PREPARATION

A. The Contractor shall perform all necessary site preparation, restoration, security and control including but not limited to temporary fencing, backfilling and shoring as necessary to protect structures, workers and public.

B. Prior to performing any intrusive work, the Contractor shall remove all manhole covers. The Contractor and Engineer shall inspect the condition of the tank, product dispenser, and remote fill, if present, to the extent required for safe work performance.

C. Assure that electrical power to the tanks and their ancillary equipment has been deactivated and

the actual wiring properly dismantled at the circuit breaker.

D. The Contractor shall remove the audible and visible overfill alarm system, and dismantle the UST leak detection system, if present.

3.04 UST CATEGORIES

For this specification, UST systems are categorized below.

A. Known USTs
   1. One 550-gallon inactive fuel oil UST and one inactive fuel oil UST of unknown capacity.
   2. One former on-site septic tank.

B. Unknown USTs
   If a UST system is discovered during construction, the Contractor shall notify the Engineer immediately, and take the following actions:
   1. Stop work in the vicinity of the UST(s) until arrangements for removal and disposal have been made.
   2. The Contractor shall provide all necessary information that the Engineer requires to register the UST(s) with the CTDEEP in order to obtain proper closure documentation following tank removal.
   3. Following the Engineer's approval, proceed with the removal activities.

3.05 REMOVAL OF TOP SLAB AND FILL MATERIAL FOR USTS

A. The Contractor shall remove any top slab, if present. The Contractor shall cut and break into pieces the top slab, and stockpile the material on-site until proper off-site disposal is arranged.

B. The Contractor shall carefully remove the fill material surrounding tanks using proper tools (i.e. shovels, vacuum truck) to ensure the UST and piping are not damaged during this process.

C. During the removal activities, the Contractor shall have equipment and manpower available at all times to assist the Engineer with screening of the fill material.

D. Excavation around the perimeter of the tanks shall be performed in a manner that shall limit the amount of excavated contaminated soil (if encountered). The Engineer shall observe excavation work and, based on visual observations and on measurements made with field monitoring instruments such as a photo-ionization detector or an organic vapor analyzer, shall determine the extent of excavation required.

E. Visibly contaminated soil shall be segregated and stockpiled on 8-mil thick plastic sheeting (or equivalent as approved by the Engineer). The soil shall be segregated and stockpiled separately from concrete and other debris and shall be kept covered with 8-mil thick plastic sheeting. The plastic sheeting covering the stockpiles shall be anchored firmly in place by weights, stakes, or both, and the Contractor shall maintain the plastic sheeting.

F. Soil and fill suitable as backfill material as outlined in the Excavation and Handling of Contaminated Materials Specification (Section 02 61 13) shall be stockpiled, if acceptable to the Engineer.

G. If dewatering is required during UST removal, the Contractor shall meet CTDEEP requirements regarding Groundwater Discharge to Sanitary or Combined Sewers.

3.06 CLEANING AND REMOVAL OF UST SYSTEMS

A. The Contractor shall disconnect associated product, vapor recovery and vent lines and drain the remaining liquid inside the product lines into the tank. The Contractor shall proceed with caution to ensure no product is spilled during this process.

B. The Contractor shall pump all residual waste from the tank via a temporary closed system into USDOT approved drums, containers or vacuum truck. If drums or containers are used, they

must be seal, properly labeled and stored in the contaminated stockpile area.

1. Drums or containers shall be labeled as follows:
   - Specific work site (38 Broadway)
   - Drum (container) number (in increasing sequence as filled)
   - Contents (e.g. rinse water from tank cleaning)
   - Date filled
2. The Contractor shall maintain a written inventory of drums and containers.

C. The Contractor shall clean and vent all associated product, vapor recovery and vent lines before disconnecting from the tank.

D. The Contractor shall clean the inside of the tank in accordance with API 2015 using high-pressure water rinse. The Contractor shall pump rinse water via a temporary closed system into USDOT approved drums, containers or vacuum truck. If drums or containers are used, seal the drums or containers, identify contents and store the containers in the contaminated stockpile area. Drums or containers shall be labeled as described in Article 3.06 (B).

E. The Contractor shall purge the tank of all flammable vapors and oxygen by displacement with inert gas using one of the following methods:
   1. Displacement with bottled, inert gas (e.g. carbon dioxide)
   2. Displacement with dry ice (minimum 15 lbs. per 1,000 gallon tank volume). The dry ice shall be crushed and distributed evenly over the greatest possible area to ensure rapid sublimation. All available tank openings shall be open to the atmosphere during this procedure to ensure rapid dissipation of the dry ice.

F. To evaluate the effectiveness of the dry ice procedure, the Contractor shall use an explosiometer to determine if the resultant vapor mixture within the tanks exceeds ten percent of the Lower Explosive Limit (LEL). Readings shall be taken throughout the tank's depth wherever access is possible. If the vapors within the tank tanks exceed ten percent of the LEL, the displacement procedure shall be repeated followed by a recheck of the LEL until the vapors are less than 10 percent of the LEL.

G. The Contractor shall remove the tank and all piping, including, but not limited to, supply piping, return piping, petrometer, heat piping, remote fill piping, vent piping and the vent riser, from the excavation.

H. The Contractor shall remove any tank foundations or tie down slabs, cradles, retaining walls, etc., if present and transport and dispose offsite at an approved facility.

3.07 SEPTIC SYSTEM REMOVAL

The removal of the former on-site septic system shall comply with all requirements of the Connecticut Department of Public Health Technical Standards for Subsurface Sewer Disposal Systems, and all other applicable Federal, State and local requirements.

3.08 SITE ASSESSMENT

A. Following excavation, the Contractor shall have equipment and manpower available at all times to assist the Engineer with the collection of post-excavation soil and groundwater samples.

B. The Contractor shall make provisions for leaving the excavation open until the Engineer and/or CTDEEP deems the work complete. No claims of delay shall be permitted for assisting the Engineer in the collection of soil samples or for keeping the excavation open until the requirements of the Engineer and/or CTDEEP are met.

3.09 CLEANING AND PREPARATION FOR DISPOSAL

A. The Contractor shall use an approved biodegradable cleaning solution, suitable for removal of fuel oil, to clean all residual material and soil from the interior and exterior surfaces of the piping.

(Note that solutions containing chlorinated solvents or volatile organic compounds are not acceptable. The Contractor shall submit applicable MSDS sheets to the Engineer and obtain approval for the cleaning solution in advance.).

B. Cleaning shall be done in an area specifically set up by the Contractor for that purpose, curbed, and lined with an impermeable membrane, to contain the used cleaning solution, including any overspray, and any contaminated debris removed during the cleaning process. All cleaning related materials and operations, and disposal of used cleaning solution and associated contaminated debris, shall be provided and performed by the Contractor at no additional cost to the Owner.

C. The integrity of the tank and piping shall be inspected for signs of corrosion, cracks, structural damage, staining or any other evidence of leakage. Tank inspection shall be documented in writing and by photographs, with particular emphasis on any evidence of corrosion, cracks, structural damage, or leakage.

D. Tanks may be reduced in size, if necessary, for removal and disposal. If tanks are not cut into pieces, they shall be perforated or in some other manner rendered unusable.

E. The tanks API identification numbers shall be removed from tank surfaces by the Contractor.

F. The tanks shall be properly labeled in accordance with all local, state and federal regulations. The Contractor shall permanently and legibly label both sides of the exterior shell of the tank with letters in orange spray paint not less than 2 inches high as follows:

TANK HAS CONTAINED (LIST TANK CONTENTS)

NOT VAPOR FREE, DO NOT ENTER

DATE OF REMOVAL (month, day, and year)

G. The tanks shall be removed from the site as promptly as possible after cleaning, dismantling and labeling procedures are completed. Tanks shall not be permitted to be stored on-site after they are removed.

3.10 TANK AND WASTE DISPOSAL

A. The fluid wastes generated and collected as a result of the tank emptying and the tank cleaning and the solid materials generated during tank excavation shall be sampled and classified by the Contractor in accordance with the approved disposal facilities' requirements. The Contractor shall provide the Engineer with two (2) copies of the analytical results prior to transporting to the approved disposal facility. Once classified and accepted by the approved facility in accordance with all federal, state and local requirements, the Contractor shall provide the Engineer with two (2) copies of any required hazardous or non-hazardous waste manifests, if applicable. The Contractor shall obtain all permits necessary to conform to these regulations. The Contractor shall identify, in writing, the facility at which this material shall be disposed.

B. The Contractor shall be responsible for loading the removed tanks, transporting and disposing of the tanks at an approved and permitted disposal facility.

C. The Contractor shall provide the Engineer with all waste disposal documentation, including permits, analytical data, manifests and bills of lading for soil, liquids and the tanks.

D. The Contractor shall keep an accurate record (log) of any contaminated material transported off-site and maintain a file of all facility-signed (completed) manifests for all materials leaving the site. The log and manifests shall be submitted to the Engineer daily.

E. Should it be determined that the tank(s) is not registered with the CTDEEP, the Engineer will be responsible for registering the tank(s) in order to obtain proper closure documentation following tank removal, if necessary.

3.11 DECONTAMINATION OF EQUIPMENT AND MATERIALS

A. All decontamination procedures for equipment and materials shall conform to the requirements of applicable USEPA and CTDEEP regulations, as appropriate.

B. All recoverable equipment and materials which have been in contact with excavated soil shall be decontaminated prior to removal from the site. As used herein “recoverable” shall mean all items which are non-absorptive in nature and which can be successfully decontaminated. All items for which decontamination is difficult or uncertain shall be considered non-recoverable, as determined by the Engineer.

C. Decontamination shall be completed within a specifically prepared Decontamination Area, preferably adjacent to the contaminated stockpile. A minimum 8-mil plastic, non-porous barrier membrane of appropriate size shall be laid down under items being decontaminated. The side boundaries of the Decontamination Area shall be bermed to catch and hold rinse fluids and protect adjacent grade area. This barrier membrane and the rinse fluids shall be considered non-recoverable.

D. Deposit non-liquid non-recoverable materials into USDOT containers as directed by the Engineer and dispose off-site properly.

E. Mark and placard drummed decontamination materials and place in the contaminated stockpile area. The waste shall be sampled and classified by the Contractor in accordance with the approved disposal facilities’ requirements. Once classified and accepted by the approved facility in accordance with all federal, state, and local requirements, the Contractor shall provide the Engineer with a photocopy of any required manifests.

3.12 GENERAL BACKFILL

A. Upon approval by the Engineer, any remedial excavations, if applicable, shall be backfilled promptly with controlled fill to meet proposed grades.

B. For remedial excavations, if applicable, certified clean ¾-inch stone will be backfilled to approximately 1 foot above the water table, if encountered. Between the stone and the subsequent backfill material the Contractor shall place a layer of Mirafi 140N geotextile fabric or Owner approved equivalent.

C. Suitable borrow fill material shall be free of organic, unsatisfactory soils and other deleterious material and shall have a maximum particle size no greater than 4". Borrow fill shall contain no industrial byproducts (e.g., ash, coal, slag). Borrow fill for placement at or below the observed water table shall by ¾-inch stone or approved equivalent. Backfill shall meet gradation requirements specified in the contract documents. Backfill shall not be stained, odorous, or exhibit elevated PID readings.

D. Controlled fill shall be placed on subgrades free of mud, frost, snow, ice, or debris in accordance with Specification Section 31 00 00.

END OF SECTION

SECTION 02 80 00.01

UNIT PRICES

PART 1 GENERAL

1.01 SUMMARY

A. A unit price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the project Scope of Work is altered.

B. Unit prices include material, any direct or indirect expenses of the Contractor or Sub-Contractor, profit, insurance, bonding and any applicable taxes. The same unit price shall apply whether the work is added or deducted.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 UNIT PRICE SCHEDULE

Unit Prices in accordance with the following schedule will apply to this Contract.

Item No. 1: SMALL CONTAINMENT PREPARATION CONTAINMENT (less than 160 square\260 linear feet of asbestos containing material)

$ _____ per containment.

Item No. 2: FLOOR TILE/FLOORING MATERIALS AND MASTIC (includes carpet over floor tile) REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

Item No. 3: FLOORING MASTIC (includes carpet over floor tile) REMOVAL AND DISPOSAL AS ACM

$ _____ per square foot.

Item No. 4: MUDDED PIPE FITTING INSULATION REMOVAL AND DISPOSAL AS ACM

$ _____ per fitting/joint.

Item No. 5: GLOVE BAG REMOVAL AND DISPOSAL AS ACM

$ _____ per bag.

Item No. 6: PIPE AND PIPE FITTING INSULATION REMOVAL AND DISPOSAL AS ACM

$ _____ per linear foot.

Item No. 7: DUCT INSULATION/PAPER DUCT REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

Item No. 8: FLASHING REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

Item No. 9: TEXTURED CEILING PAINT (INCLUDING SUBSTRATE) REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

Item No. 10: SHEETROCK/TAPING COMPOUND REMOVAL AND DISPOSAL AS ACM

$ _____ per square foot.

Item No. 11: CAULKING AND GLAZING COMPOUND REMOVAL AND DISPOSAL AS ACM.

$ _____ per linear foot.

Item No. 12: CAULKING AND GLAZING COMPOUND AND ADJACENT SURFACES/SUBSTRATES REMOVAL AND DISPOSAL AS PCB < 50 PPM.

$ _____ per linear foot.

$ _____ per square foot of adjacent surface/substrate

Item No. 13: CAULKING AND GLAZING COMPOUND AND ADJACENT SURFACES/SUBSTRATES REMOVAL AND DISPOSAL AS PCB > 50 PPM.

$ _____ per linear foot.

$ _____ per square foot of adjacent surface/substrate

Item No. 14: CAULKING AND GLAZING COMPOUND REMOVAL AND DISPOSAL AS ACM AND PCB < 50 PPM.

$ _____ per linear foot.

Item No. 15: CAULKING AND GLAZING COMPOUND REMOVAL AND DISPOSAL AS ACM AND PCB > 50 PPM.

$ _____ per linear foot.

Item No. 16: CERAMIC TILE THINSET/MASTICS/GROUT/CEMENT REMOVAL AND DISPOSAL AS ACM

$ _____ per square foot.

Item No. 17: SINK UNDERCOATING REMOVAL AND DISPOSAL AS ACM.

$ _____ per sink.

Item No. 18: TRANSITE BOARD REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

Item No. 19: ROOFING MATERIAL REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

Item No. 20: BOILER INSULATION REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

Item No. 21: CHIMNEY FLUE CEMENT REMOVAL AND DISPOSAL AS ACM.

$ _____ per square foot.

END OF SECTION

SECTION 02 82 10

SELECTIVE HAZARDOUS MATERIALS ABATEMENT DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. Provide selective demolition to remove existing carpeting and demolish partition walls/doors/millwork/shelving/countertops/etc. as well as window and door systems as necessary to access all floor tile and associated mastic adhesive and other asbestos and/or PCB containing materials (>1ppm and/or >50ppm) as specified herein, and as required for complete and proper abatement.

B. Provide selective demolition of interior/exterior ceilings, walls, ceiling, window and door systems as required for complete and proper abatement. Provide demolition necessary to perform asbestos/pcb/hazardous materials abatement.

C. Required permits shall be obtained by the Contractor at no additional cost to the Owner.

D. Notes: Contractor is responsible for removing all asbestos and/or PCB containing materials (behind walls, ceilings, windows, doors, etc.) in demolition areas as noted by the architect's specifications and drawings.

E. The contractor will be required to remove carpeting to gain access to the floor tiles and/or mastic in some areas. There may be more than one layer of floor tile in some locations. All layers of floor tile, leveling materials, mastic, etc. are included in the base work; no extra change will be accepted. Demolition or moving typical non-movable objects by the abatement contractor may be required to gain access to all flooring materials to be removed. MSD sheets for chemicals to be used during the project must be submitted to the owners' representative prior to site delivery.

F. The contractor will be required to remove roofing, windows, doors, siding applications and foundations to access all PCB and asbestos containing materials for abatement and packaging for recycling and disposal.

G. Related Sections:
   1. Section 02 82 13 – Asbestos Abatement
   2. Section 02 83 13 - Lead Paint Awareness
   3. Section 02 84 16 – Hazardous Building Materials Abatement – Universal Waste
   4. Section 02 84 33 – PCB Containing Building Materials Abatement
   5. HM 1.01 & 1.02 – Hazardous Materials Abatement Drawings

1.02 PROJECT CONDITIONS

A . Occupancy:
   1 Areas of the buildings in which demolition will occur will be unoccupied during work.

B. Existing Conditions:
   1. After the project is begun, the Contractor is responsible for the condition of the structures to be selectively demolished.
   2. Unforeseen Conditions: Should unforeseen conditions be encountered that affect design or function of project, investigate and fully submit an accurate, detailed, written report to the office of the Consultant. While awaiting a response, reschedule operations if necessary to avoid delay of overall project.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and sealed.

B. Insofar as is practicable, arrange operations to reveal unknown or concealed conditions for examination and verification before removal or demolition.

C. Verify actual conditions to determine, in advance, whether removal or demolition of any element will result in structural deficiency, overloading, failure, or unplanned collapse.
   1. Demolish and remove connections to all electrical gas, and plumbing fixtures required to remove asbestos and/or PCB containing materials.
   2. Remove carpet over asbestos containing floor tile and adjacent to asbestos containing cove trim only if such removal will not disturb ACM flooring and cove trim.

3.02 PREPARATION

A. Traffic: Do not obstruct walks or public ways without the written permission of governing authorities and of the Owner. Where routes are permitted to be closed, provide alternate routes if required.

B. Protection:
   1. Provide for the protection of persons passing around or through the area of demolition.
   2. Perform demolition so as to prevent damage to adjacent improvements and facilities to remain.
   3. Protect walls, floors, and other new or existing work from damage during demolition operations.

C. Damages: Without cost to the Owner and without delay, repair any damage caused to facilities to remain.

3.03 POLLUTION CONTROLS

A. Control as much as practicable the spread of dust and dirt.

B. Observe environmental regulations.

C. Do not allow water usage resulting in freezing or flooding.

D. Do not allow adjacent improvements to remain to become soiled by demolition operations.

3.04 DEMOLITION - GENERAL

A. Remove: Items indicated to be removed shall be removed by the Contractor.

B. Existing to Remain: Construction or items indicated to remain shall be protected against damage during demolition operations. Where practical, and with the Owner's permission, the Contractor may elect to remove items to a suitable storage location during demolition and then properly clean and reinstall the items.

C. Perform work in a systematic manner.

D. Demolish and remove existing construction only to the extent required, as indicated in the Contract Documents.

E. Perform selective demolition using methods that are least likely to damage work to remain and which will provide proper surfaces for patching.

F. Remove debris daily.

G. Use any methods permitted by governing regulations and the requirements of the Contract Documents.

3.05 DISPOSAL OF DEMOLISHED MATERIALS

A. Promptly dispose of materials resulting from demolition operations. Non-contaminated material (materials not containing residue asbestos, lead, pcb or other hazardous, regulated or special waste) may be disposed of as construction waste. Do not allow materials to accumulate on site.

B. All rubbish and waste material from the Work shall be neatly stacked or kept in suitable containers and removed from the premises daily. The premises shall be kept clean and in an orderly condition at all times to the satisfaction of the Owner and the Consultant.

C. Transport materials resulting from demolition operations and legally dispose of off-site.

D. Off-site disposal location shall not be within one-half mile of any portion of the project site or within sight of the project site.

E. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

3.06 CLEANING

A. Throughout the construction period, the Contractor shall maintain the building and site free of rubbish, debris, surplus materials, and other items not required for the Work.

B. Remove such material from the site daily to prevent accumulations.

C. Remove all construction debris from work areas, and remove all hazardous waste and asbestos waste as required by the most current federal, state, and local regulations and the requirements of the specifications.

END OF SECTION

SECTION 02 82 13

ASBESTOS ABATEMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Supplementary Conditions and Division 1 Specifications Sections, apply to this Section.

B. References
   1. "Pre-Demolition Hazardous Building Materials Inspection, 14, 20-22, 24, 38, and 46 Rockview Street and 488, 496-504, and 506 Boston Post Road", Eagle Environmental, Inc., 4 April 2013.
   2. "Pre-Demolition Hazardous Building Materials Inspection, 34 Rockview Street", Eagle Environmental, Inc., 26 April 2013.
   3. "Lead Waste Characterization Results, 38 Rockview Street", Eagle Environmental, Inc., 12 April 2013.
   4. "PCB Sealant and Adjacent Materials Sampling Results, Proposed Engineering and Science University Magnet School Site, Langan, 13 June 2013 (Revised 17 July 2013).

C. Sections containing requirements related to this Section include, but are not limited to:
   1. Section 02 82 10 – Selective Hazardous Materials Abatement Demolition
   2. Section 02 83 13 - Lead Paint Awareness
   3. Section 02 84 16 – Hazardous Building Materials Abatement – Universal Waste
   4. Section 02 84 33 – PCB Containing Building Materials Abatement
   5. HM 1.01 & 1.02 – Hazardous Materials Abatement Drawings

1.02 CONSULTANT

A. The Owner shall retain Langan for the purposes of project management and monitoring during Asbestos Abatement. The Consultant will represent the Owner in all phases of the abatement project at the discretion of the Owner. The Asbestos Abatement Contractor will regard the Consultant's direction as authoritative and binding as provided herein, in matters particularly but not limited to approval of work areas, review of monitoring results, completion of the various segments of work, final completion of the abatement, submission of data, and daily field punch list items. The State of Connecticut licensed Asbestos Consultant — Project Designer is Matthew Myers (license no. 000058).

1.03 USE OF THE CONTRACT DOCUMENTS

A. It shall be incumbent upon the Contractor to visit the Site and determine what exists, its condition, and what will be required to accomplish the Work intended by the Contract Documents. No increase in the Contract Sum will be permitted as a result of the Contractor's failure to visit the Site and understand the existing conditions.

B. All work shall comply with the Contract Documents and with applicable Codes, laws, regulations, and ordinances wherever applicable. The most stringent of all the foregoing shall govern.

C. It is not intended that the Specifications show every detail of the Work, but the Contractor shall be required to furnish within the Contract Sum all material and labor necessary for the completion of the Work in accordance with the intent of the Specifications.

D. In case of ambiguity among the Contract documents, the more stringent requirement as determined by the Consultant shall prevail.

E. The Work of this Contract includes making modifications as necessary, subject to approval by Owner in consultation with the Consultant, to correct any conflicts.

F. All items, not specifically mentioned in the Specifications but implied by trade practices to complete the work, shall be included.

1.04 EXAMINATION OF THE SITE

A. It is understood that the Contractor has examined the Site and made his own estimates of the facilities and difficulties attending the execution of the Work, and has based his price thereon.

B. Except for unforeseeable concealed conditions as determined by the Consultant, the Contractor shall make no claim for additional cost due to the existing conditions at the Site.

1.05 CONTRACTOR QUALIFICATIONS

A. All bidders shall submit a record of prior experience in asbestos abatement projects, listing no less than three (3) completed jobs in the past year, with all projects of similar size and scope. The Contractor shall list the experience and training of the project foremen and all on-site personnel. The information that should be included is as follows:
   1. Project Name and Address
   2. Owner's Name and Address
   3. Architect/Consultant
   4. Contract Amount
   5. Date of Completion
   6. Extras and Changes

B. The Contractor selected must appear on the approved list of Asbestos Abatement contractors on file at the State of Connecticut Department of Public Health (CTDPH) and hold a valid license for asbestos abatement within the State of Connecticut.

C. Submit a written statement regarding whether the Contractor has ever been found out-of-compliance with federal or state asbestos and/or lead regulations pertaining to worker protection, removal, transport, or disposal.

D. The Contractor shall be responsible for obtaining all necessary or required permits from the Federal, State and local agencies having jurisdiction over this asbestos abatement project. Failure on behalf of the Contractor to obtain these permits shall not result in any extension for the timely results of completion of the work set forth in the Contract. The Contractor shall be responsible and shall be required to pay any administrative penalties imposed on the owner for actions taken or lack thereof by the Contractor.

E. Work includes any and all selective demolition and protective measures required to access and remove ACM and maintain a safe working environment.

F. Upon completion of asbestos removal, the contractor shall provide completed, signed and notarized statements indicating that all asbestos-containing materials identified in the scope of work (Section 1.03) were properly removed and disposed of in accordance with applicable Federal, State, and local regulations.

G. All contractors submitting a bid for this work shall visit the work site, attend a pre-bid meeting and walk-through, to be scheduled by the Owner, and be familiar with the work in its entirety. The contractors pre-meeting attendance and bid submission affirms his/her acceptance of the work, site, and building conditions as is.

H. The contractor shall be responsible for paying the utility bills for the use of power and water. However, if any such temporary facilities cannot be provided, it shall be the contractor's responsibility to provide all temporary connections and hook-ups as well as obtaining permits and paying all fees for making such services available for his work as is necessary. If necessary, the Contractor shall provide temporary services as specified herein, and as required

or as necessary to carry out the work. This may include such items as portable generators, water tank trucks, pumps and necessary accessories or the means and equipment and services necessary to temporarily connect to and maintain such services from adjacent utility systems.

I. All Contractor personnel involved with asbestos removal work must be thoroughly familiar with the standard operating procedures of the Contractor for removal work as well as all applicable Federal and State regulations governing asbestos removal work.

J. The Supervisor and Asbestos Abatement workers shall be accredited in accordance with EPA regulation 40 CFR Part 763, subpart E, Appendix C; and CTDPH regulations as outlined in Section 19a-332a-1 through 19a-332a-16 (Standards for Asbestos Abatement), and Section 20-440-1 through 20-440-9 and 20-441 (Licensure and Training Requirements for Persons Engaged in Asbestos Abatement and Consulting Services).

K. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the work. Any discrepancies noted shall be brought to the attention of the Owner and Engineer prior to bidding the project. No claims for extras shall be made during construction.

L. Work includes necessary selective demolition and protective measures required to access and remove ACM and maintain a safe working environment. Asbestos containing materials that would be impacted by selective demolition of wall, ceiling and floor cavities shall be performed within negative pressure enclosure.

M. It is the sole responsibility of the Contractor to determine what, if any patents are applicable to the Project. The Contractor will pay all royalties and/or license fees, and will defend all suits or claims for infringement of any patent rights and save the Owner, Architect, Asbestos Safety Control Monitor, Design Sub-Consultant, and Construction Manager harmless from loss, including attorney's fees, on account thereof.

N. The Contractor shall coordinate with the Consultant and maintain the project schedule.

O. The abatement contractor shall hold and document daily pre-abatement safety tool box meeting to review safe work practices and emergency communication program for the project. The abatement contractor's supervisor and the consultant's project monitor must also ensure that proper fire extinguishing equipment is present. The supervisor shall be knowledgeable in use of fire extinguishing equipment, and emergency exit plans.

1.06 TESTING LABORATORY SERVICES

A. The Contractor shall submit to the Consultant the name; address and qualifications of proposed laboratories intended to be utilized for sample analysis as required by this section.

1.07 ADDITIONAL GENERAL REQUIREMENTS

A. The Asbestos Abatement Contractor shall employ a competent Asbestos Abatement Supervisor with at least three (3) years' experience on projects of similar scope and magnitude who shall be responsible for all work involving asbestos abatement as described in the specifications and defined in applicable regulations, and have full time daily supervision of the same. The Supervisor shall be the competent person as defined by OSHA regulations.

B. The Contractor shall allow the work of this contract to be inspected if required by local, state, federal, and any other authorities having jurisdiction over such work. The Contractor shall immediately notify the Owner and Consultant and shall maintain written evidence of such inspection for review by the Owner and Consultant.

C. The Contractor shall incur the cost of all fines resulting from regulatory non-compliance as issued by federal, state, and local agencies. The Contractor shall incur the cost of all work

requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance or negligence.

D. The Contractor shall immediately notify the Owner and Consultant of the delivery of all permits, licenses, certificates of inspection, of approval, or occupancy, etc., and any other such instruments required under codes by authorities having jurisdiction, regardless of to who issued, and shall cause them to be displayed to the Owner and Consultant for verification and recording.

1.08 SCOPE OF WORK

A. This specification and drawings HM 1.01 and 1.02 cover the proper and legal removal and disposal of all asbestos-containing materials (ACM) and asbestos contaminated waste from the Engineering and Science University Magnet School (ESUMS) Site located in West Haven, Connecticut. The abatement activities shall comply with all aspects of the contract documents and Federal, State and local requirements.

1.09 PROJECT DESCRIPTION

A. The approximately 4.8-acre ESUMS Site is located at 488, 496-504, 506 and 516 Boston Post Road; 4, 9, 14, 22, and 23 Daytona Street; 14, 20-22, 24, 34, 38 & 46 Rockview Street; and 3, 6, 7, 13 & 20 Waban Street in West Haven, Connecticut. The Site also consists of two “paper” streets owned by the City of West Haven: Daytona Street and Waban Street. The Site is bound by Rockview Street to the west, the University of New Haven to the east, residential properties followed by the Tile Street to the south, and Boston Post Road (Route 1) to the north. The Site is occupied by several vacant residential and commercial buildings and undeveloped parcels. The structures are located at 14, 20-22, 24, 34, 38 and 46 Rockview Street and 488, 496-504, and 506 Boston Post Road. The proposed redevelopment consists of demolition of the existing structures and construction of a new school facility.

B. The base bid includes the removal and disposal of all asbestos containing materials as identified herein, and on the architects drawings by workers meeting requirements of OSHA 1926.1101 for Class 1 and 2 work. The base bid will include the cost for removal and disposal of asbestos containing flooring materials, pipe and pipe fitting insulation, transite board, roofing materials, textured ceiling paint, sheetrock/taping compound, caulking and glazing compounds, ceramic tile thinset/mastics/grout/cement, sink under coating, boiler insulation, chimney flue cement, flashing materials, tars, gasketing, piping and insulation, papers, contaminated building materials and contaminated stored materials. Select caulking/glazing/expansion joint and miscellaneous building sealant samples will require removal and disposal as mixed ACM and PCB (greater than 1ppm but less than 50 ppm PCBs) waste. In certain instances, adjacent materials in contact with the sealants (i.e. brick, concrete, and or metal surfaces will be removed coincidentally with the sealants, and disposed of as mixed ACM and PCB waste.

C. Work includes filing and permitting all necessary applications, notifications, requirements and fees; insurance; necessary design services; providing skilled, licensed and certified labor; materials; and equipment necessary for proper preparation, handling, removal and legal disposal of all asbestos-containing materials and asbestos contaminated waste from the subject building in accordance with all requirements of applicable Federal, State and local regulations, these specifications and the contract drawings. Confirmed ACM (some mixed with other contaminants - PCB’s, Lead, etc.) and estimated quantities are provided in the referenced “Pre-Demolition Hazardous Building Materials Inspection, 14, 20-22, 24, 38, and 46 Rockview Street and 488, 496-504, and 506 Boston Post Road”, Eagle Environmental, Inc., 4 April 2013 and “Pre-Demolition Hazardous Building Materials Inspection, 34 Rockview Street”, Eagle Environmental, Inc., 26 April 2013. The contractor shall independently locate and quantify all ACM requiring abatement. All materials in these reports are part of the base bid work.

Some of the building materials were found to contain less than one percent asbestos and all applicable OSHA regulations must be complied with during all activities on-site including engineering controls (water during disturbance/demolition) and personal exposure compliance (exposure air testing, PPE, etc.).

The following asbestos containing materials requiring abatement and disposal were identified in the above-referenced reports:

14 Rockview Street

- Chimney flashing cement (3 SF)

20-22 Rockview Street

- Middle layer green and yellow linoleum (160 SF)
- Bottom layer green and yellow linoleum (160 SF)
- Flashing cement at chimney (8 SF)
- Flashing cement at vents (3 SF)

24 Rockview Street

- Basement window glazing compound (4 Sashes at 3'x1' EA)
- Basement door window glazing compound (1 Sash at 5'x3')
- Basement door caulk inside and outside (16 LF)
- Bilco door caulk (20 LF)
- 12"x12" White floor tile (138 SF)
- Gold pattern vinyl sheet flooring (138 SF)
- Textured ceiling paint (1,194 SF)
- Flashing cement at chimney (4 SF)
- Flashing cement at vents (1 SF)

38 Rockview Street

- Dark red floor tiles (12 SF)
- Tan linoleum (140 SF)
- Window caulk at brick (120 SF)
- Tar on former awning (5 LF)
- Storm window caulk (1 window at 1'x3')

46 Rockview Street

- Thinset under black ceramic tile (26 SF)
- Black sink basin coating (1 Sink)
- Chimney flashing cement (10 SF)

488 Boston Post Road

- Sheets of transite at wall (10 Sheets at 4'x8' EA)
- Sheets of transite at garage doors (2 Sheets at 2'x2' EA)
- White cementitious debris on floor near platform (3 SF)
- 9"x9" Tan floor tile (722 SF)
- Black floor tile adhesive (948 SF)
- 9"x9" White floor tile (70 SF)
- Caulk at front entry door (20 LF)
- Caulk at operable window frames (20 LF)
- Caulk at operable window sashes (30 LF)
- Front entry door side light panel (1 Panel at 16 SF, 1 Panel at 6 SF, 2 Panels at 3 SF EA, 2 Panels @ 1 SF EA)
- Panels at windows (8 Panels at 6 SF EA)
- Roof wall flashing (30 SF)

- Gaskets on work bench [stored] (<1 SF)
- Rolled asphalt roofing on platform [stored] (1 Roll)
- Black pipe [stored] (10'x4" Dia.)
- Caulk at panels (88 LF)

496-504 Boston Post Road

- Grey window glazing compound (8 Sashes at 4'x4' EA)
- Caulk in vertical block seam at B/C wall junction (15 LF)
- Caulk at C side door (3 LF)
- 12"x12" White floor tile (990 SF)
- 12"x12" Tan floor tile (990 SF)
- Black floor tile mastic (990 SF)
- Vent insulation (5 SF)

506 Boston Post Road

- Aircell pipe insulation (65 LF)
- Insulation - boiler 1 (40 SF)
- Insulation – boiler 2 (30 SF)
- Chimney flue patch (1 SF)
- Shed Roofing felt (10,000 SF)
- Shed Tar on tin sides (600 SF)
- Transite board on boiler 2 [stored] (40 SF)
- Rolled asbestos paper [stored] (1 Roll at 2')
- Aircell insulation [stored] (40 LF)
- Chimney flue cement (2 SF)
- Stored items [contaminated] (10 Cubic Yards)

34 Rockview Street

- Caulk at window blind stop and window casing (7 at 12 LF EA, 1 at 10 LF EA)
- Black flashing cement at chimney base (4 SF)
- Black flashing cement at vent pipe (3 Vents)

In addition to the materials listed above, the following materials were sampled at a later date and were also identified as asbestos containing and requiring abatement and disposal:

24 Rockview Street

- Exterior Pipe Caulking Compounds Throughout

488 Boston Post Road

- Exterior Building Expansion Joint Caulking Compounds Throughout

496-504 Boston Post Road

- Interior Window Caulking Compounds Throughout

The following materials were sampled at a later date and found not to contain asbestos:

14 Rockview Street

- Exterior Door Caulking Compounds

20-22 Rockview Street

- Exterior Door Caulking Compounds
- Exterior Foundation Damp-Proofing/ Vapor Barrier

24 Rockview Street

- Exterior Window Caulking Compounds

- Exterior Window Gasketing

34 Rockview Street

- Exterior Foundation Damp-Proofing/ Vapor Barrier

46 Rockview Street

- Exterior Window Caulking Compounds
- Exterior Foundation Damp-Proofing/ Vapor Barrier

488 Boston Post Road

- Exterior Window Sill Caulking Compounds
- Interior Window Glazing Compounds
- Black Damp-Proofing
- Brown Substrate Behind Brick Exterior

496-504 Boston Post Road

- Exterior Front Door Caulking
- Interior Rear Door Caulking Compound
- Interior Window Sealant (Adjacent Window Caulking is Asbestos)

Asbestos Abatement Work also includes removing/abating and disposing of all asbestos containing or assumed materials, stored and contaminated materials in the basement of 506 Boston Post Road as part of the base bid work. The contractor also must perform demolition of floor, wall and ceiling materials (sheetrock, plaster, wood, etc.) in all structures and locate and abate all suspect thermal system insulation (pipe/pipe fitting/duct insulation) in all structures as part of the base bid work. There are suspect asbestos containing materials located outside the structure at 506 Boston Post Road that are assumed to also contain asbestos and must be removed and disposed of such (transite, slate/soapstone countertops, roofing/shingle materials, tars, mastics, flashing, TSI, etc. as part of the base bid work. The contractor may wish to apply for an Alternative Work Practice for certain areas of abatement. These must be approved by CTDPH and also by Langan representatives. All areas of interior abatement require reoccupancy air sampling and containment tear down prior to building demolition.

D. Additional materials as discovered outside of those listed will be covered by unit prices. The quantities are estimates only and should be verified by the Contractor. Some of the work will be performed in multiple mobilizations at different periods of time in conjunction with other trades (i.e., other trades work, demolition work, etc.). MSD sheets for chemicals to be used during the project must be submitted to the Owner's Representative prior to site delivery. The contractor is responsible for providing temporary water, power, and heat as needed at the Site. Temporary lighting within the work areas must be connected to Ground Fault Circuit Interrupter (GFCI) Power Panels installed by a State of Connecticut licensed electrician and located outside of the work areas. The contractor shall be responsible for paying the use of power and water. It shall also be the contractor's responsibility to provide all fixed and temporary connections and hook-ups as well as obtaining permits and paying all fees for making such services available for his work as is necessary. The Contractor shall provide services as specified herein, and as required or as necessary to carry out the work. This will include such items as temporary hard line installation, portable generators for short term work, water tank trucks, pumps and necessary accessories or the means and equipment and services necessary to temporarily connect to and maintain such services from adjacent utility systems. The contractor is responsible for contacting all utility services and getting power connections from the electrical lines located on or adjacent to the properties. All power and water must be supplied 24 hours a day throughout the abatement project. CTDPH will be notified immediately if active containments do not have sufficient negative pressure throughout the abatement process until acceptable reoccupancy air results are received.

1.10 DEFINITIONS

A. The following definitions relative to asbestos abatement apply:

1. ABATEMENT - Procedures to control fiber release from asbestos-containing materials; includes removal, encapsulation, and enclosure.
2. AIR MONITORING - The process of measuring the fiber concentration of an area or of a person.
3. AMENDED WATER - Water to which a surfactant has been added.
4. ASBESTOS - The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically altered.
5. ASBESTOS FELT - a product made by saturating felted asbestos with asphalt or other suitable bindery, such as a synthetic elastomer.
6. ASBESTOS FIBERS - Those particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.
7. ASBESTOS WORK AREA - a regulated area as defined by OSHA 29 CFR 1926.1101 where asbestos abatement operations are performed which is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated area for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.
8. ASPHALT SHINGLES, COMPOSITION SHINGLES OR STRIP SLATES: (Pitched Roof Shingle) - a roofing material manufactured by saturating a dry felt with asphalt then coating the saturated felt with a harder asphalt mixed with a fine mineral, glass fiber, asbestos or organic stabilizer. All or part of the weather side may be covered with mineral granules, or with powdered talc or mica.
9. BASE FLASHING (roof) - the flashing provided by upturned edges of a water tight membrane on a roof. May contain metal and associated waterproofing material or combination of roofing felts and waterproofing at the joint between a roofing surface and a vertical surface such as a wall or parapet. Also base flashing may be present at perimeter of completely flat roof.
10. BUILT-UP ROOFING (Composition Roofing, Felt and Gravel Roofing, Gravel Roofing) - a continuous roof covering made up of laminations or plies of saturated or coated roofing felts, alternated with layers of asphalt or coal-tar pitch and surfaced with gravel, paint or finish coat.
11. CAULKING - resilient mastic compound often having a silicone bituminous or rubber base; used to seal cracks, fill joints, and prevent leakage. Typical applications: around windows, and doors. Caulking is at joints between two dissimilar materials. (i.e. masonry to wood, masonry to steel)
12. CLEAN ROOM - An uncontaminated area or room, which is a part of the worker decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.
13. CLEARANCE SAMPLING - Final air sampling performed aggressively after the completion of the abatement project in a regulated area.

    Air samples collected by the air sampling professional having a fiber concentration of less than 0.01 fibers/cc of air in each of five (5) samples collected inside the containment will denote acceptable clearance sampling by Phase Contrast Microscopy.

    or

    Five air samples collected inside the containment by the air sampling professional having an average asbestos concentration of less than 70 structures per square millimeter of air will denote acceptable clearance sampling for Transmission Electron Microscopy.

14. COMPETENT PERSON - As defined by 29 CFR 1926.1101, a representative of the Abatement Contractor who is capable of identifying existing asbestos hazards in the

workplace and selecting the appropriate control strategy for asbestos exposure. Who has authority to take prompt corrective measures to eliminate such hazards during asbestos removal. Competent person shall be properly trained in accordance with EPA's Model Accreditation Plan.

15. CURTAINED DOORWAY - A device to allow ingress and egress from one area to another while permitting minimal air movement between the areas. Two curtained doorways spaced a minimum of six feet apart can form an airlock.
16. DAMP PROOFING - application of a water impervious material to surface such as wall to prevent penetration of moisture, typically at foundation or below grade surface.
17. DECONTAMINATION ENCLOSURE SYSTEM - A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.
18. ENCAPSULANT - A liquid material which can be applied to asbestos-containing materials which controls the possible release of asbestos fibers from the materials either by creating a membrane over the surface (bridging encapsulant) or penetrating the material and binding its components together (penetrating encapsulant).
19. EQUIPMENT ROOM - Any contaminated area or a room that is part of the worker decontamination enclosure with provisions for storage of contaminated clothing and equipment.
20. FIXED OBJECT - Unit of equipment or furniture in the work areas that cannot be removed from the work area.
21. FRIABLE ASBESTOS MATERIALS - Any material that contains more than 1% asbestos by weight, that can be crumbled, pulverized or reduced to powder by hand pressure.
22. GLAZING COMPOUND - any compound used to hold window glass in place, also referred to as putty, or glazier's putty, is not field applied, usually installed during manufacture of windows.
23. HEPA FILTER - High Efficiency Particulate Air (HEPA) filter in compliance with ANSI Z9.2-1979.
24. HEPA VACUUM EQUIPMENT - Vacuum equipment equipped with an I IEPA filter system for filtering the effluent air from the unit.
25. MOVABLE OBJECT - Unit of equipment of furniture in the work area that can be removed from the work area.
26. NEGATIVE AIR PRESSURE EQUIPMENT - A portable local exhaust system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas) and capable of maintaining a constant, low velocity air flow into regulated areas from adjacent unregulated areas.
27. NESHAPS - National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.
28. PERMISSIBLE EXPOSURE LEVEL (PEL) - The maximum airborne concentration of asbestos fibers to which an employee is allowed to be exposed. The new level established by OSHA 29 CFR 1926.1101 is 0.1 fibers per cubic centimeter of air as an eight (8) hour time weighted average and 1.0 fibers /cc averaged over a sampling period of 30 minutes as an Excursion Limit. The Contractor is responsible for maintaining work areas in a manner that this standard is not exceeded.
29. PROJECT MONITOR - A professional capable of conducting air monitoring and analysis of schemes. This individual should be an industrial hygienist, an environmental scientist, or an engineer with experience in asbestos air monitoring and worker protection equipment and procedures. This individual should have demonstrated proficiency in conducting air sample collection in accordance with 29 CFR 1910.1001 and 29 CFR 1926.1101.
30. REGULATED AREA - An area established by the employer to demarcate where Class I, II, and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate, and a work area within which airborne concentrations of asbestos exceed or there is a reasonable possibility that they may exceed the PEL.

31. SHOWER ROOM - A room between the clean room and the equipment room in the work decontamination enclosure with hot and cold running water and suitably arranged for employee showering during decontamination. The shower room is located in an airlock between the contaminated area and the clean area.
32. WATERPROOFING - material, usually a membrane or applied compound (tar/mastic), used to make a surface impervious to water, includes concealed conditions (applications around doors, windows, and in wall cavities). Sometimes combined with felts.

1.11 SUBMITTALS

A. Pre-Work Submittals: Within 7 days prior to the pre-construction conference, the Contractor shall submit 3 copies of the documents listed below to the Owner and Engineer for review:
   1. Valid Contractor's Asbestos Removal license issued by the Connecticut Department of Public Health (CTDPH).
   2. Certificate of insurance covering work of this Contract.
   3. Name, experience of supervisors, and copies of valid Asbestos Supervisor permits issued by the CTDPH.
   4. Citations/Violations/Legal Proceedings: Submit a statement describing:
      a. Any citations, violations, criminal charges, or legal proceedings undertaken or issued within the past two years by any law enforcement, regulatory agency, or consultant concerning performance on previous abatement contracts. Briefly describe the circumstances citing the Project and involved persons and agencies as well as the outcome of any actions.
      b. Any litigation or arbitration proceedings arising out of performance on past Projects.
   5. Work Schedule:
      a. Show the complete sequence of abatement activities and the sequencing of Work within each building section.
      b. Show the dates for the beginning and completion of each major element of Work including substantial completion dates for each Work Area, building, or phase.
      c. Show projected percentage of completion for each item, as of the first day of each month.
      d. Show final inspection dates.
   6. Project Notifications: As required by Federal, State, and local regulatory agencies together with proof of transmittal (i.e. certified mail return receipt).
   7. Abatement Work Plan: The Contractor shall design, prepare and submit to the Authority for review and approval, a detailed asbestos removal plan for the project in accordance with the applicable regulations and these specifications. The plan shall, at minimum, show limits of containment and work areas, methods of removal, location of decontamination units, number and location of negative air units, waste routes, waste storage location, entrance and exits, emergency exits, and any necessary details. Work shall not commence until the Authority has reviewed, commented and approved the Contractor's asbestos removal plan. Provide plans which clearly indicate the following:
      a. All Work Areas/containment numbered sequentially.
      b. Locations and types of all decontamination enclosures.
      c. Entrances and exits to the Work Areas/containment.
      d. Type of abatement activity/technique for each Work Area/containment.
      e. Number and location of negative air units and exhaust. Also provide calculations for determining number of negative air pressure units.
      f. Proposed location and construction of storage facilities and field office.
      g. Location of water and electrical connections to building services.
      h. Waste transport routes through the building to the waste storage container.
      i. Contingency plan.
   8. Name, location, and applicable licenses for primary and secondary landfill for disposal of asbestos-containing material and asbestos contaminated waste.
   9. Summary of proposed materials, and equipment to be used.

10. Certification that vacuums, temporary ventilation equipment, and other equipment to be used meet the ANSI 29.2-79 requirement for airborne fiber filtration.
11. If rental equipment is to be used in work area or to transport asbestos contaminated waste, provide notice to rental agency stating intended use of equipment, with copy to the Authority.
12. Summary of the Contractor's workforce by disciplines. Include a notarized statement signed by the Contractor documenting that all proposed workers, by name, have received all required medical examinations and have been properly trained and certified in asbestos removal work, respirator use, to appropriate EPA and OSHA standards for asbestos removal. Include on statement Contractor's compliance with OSHA medical surveillance requirements.
13. The Contractor shall submit his/her Health and Safety Plan and Standard Operating Procedures for this project for use in complying with the requirements of these Specifications and applicable regulations. The Plan shall include, but shall not be limited to: distribution and use of amended water, the sequencing of asbestos work, detailed schedules and dates, shift times, and work activities during that shift, the interface of other trades involved in the performance of work, methods to be used to assure the safety of building occupants and visitors to the Site, security of the work areas, and a detailed description of the methods to be employed to control airborne fiber concentrations.
14. Written description of emergency procedures to be followed in case of injury or fire. This section must also include evacuation procedures, sources of medical assistance and procedures for access by medical personnel.
15. Level of respiratory protection intended for each operation for the project.

B. Project Closeout Submittals: Submit the following to Owner and Consultant at the close out of the Project (no later than 15 days subsequent to site demobilization):
   1. Originals of all waste disposal manifests, seals, and disposal logs.
   2. OSHA compliance air monitoring records conducted during the Work.
   3. Daily progress log.
      a. A list of all Workers used in the performance of the Project, including name, social security number, and CTDPH certification number.
      b. For each Worker used in the performance of the Project, submit required employee statements including Medical Examination Statement, Worker's Acknowledgment Statement, Respirator Fit Test, and Employee Training Statement.
      c. Certification for the laboratory that analyzed the OSHA personnel air samples.
      d. A notarized “Release of Liens” in a form acceptable to the owner. Such notarized release of liens shall certify that all sub-Contractors, labor suppliers, etc. have been paid their pro rate share of all payments to date for the project, that the Contractor has no basis for further claims, and will not make further claims for payment in any account after the first payment is made to him.

1.12 MEDICAL REQUIREMENTS

A. Prior to potential exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1910.1001, and 29 CFR 1926.1101.
   1. This examination is not required if adequate records show the employee has been examined as required by 29 CFR 1910.1001, and 29 CFR 1926.1101 within the past year.
   2. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos fibers and within thirty (30) calendar days before or after the termination of employment in such occupations.

B. As required by 29 CFR 1910.1001, and 29 CFR 1926.1101 maintain complete and accurate records of employees' medical examinations for a period of thirty (30) years after termination of employment and make records of the required medical examinations available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health, the Director of the National Institute for Occupational Safety and Health (NIOSH), authorized

representatives of either of them, and an employee's physician upon the request of the employee or former employee.

C. The Contractor shall furnish the Owner evidence of its firm's medical surveillance program required under 29 CFR 1910.1001, and 29 CFR 1926.1101.

1.13 REGULATIONS AND STANDARDS

Regulatory compliance includes but is not necessarily limited to applicable requirements set forth by:

A. Federal Regulations:
   1. 29 CFR 1910.1001, "Asbestos" (OSHA)
   2. 29 CFR 1910.1200, "Hazard Communication" (OSHA)
   3. 29 CFR 1910.134, "Respiratory Protection" (OSHA)
   4. 29 CFR 1910.145, "Specification for Accident Prevention Signs and Tags" (OSHA)
   5. 29 CFR 1926, "Construction Industry" (OSHA)
   6. 29 CFR 1926.1101, "Asbestos, Tremolite, Anthophyllite, and Actinolite" (OSHA)
   7. 29 CFR 1926.500 "Guardrails, Handrails and Covers" (OSHA)
   8. 40 CFR 61, Subpart A, "General Provisions" (EPA)
   9. 40 CFR 61, Subpart M, "National Emission Standards for Hazardous Air Pollutants (NESHAP)" (EPA)
   10. 40 CFR 763 Subpart E, "Asbestos in Schools Regulations" (EPA)
   11. 49 CFR 171-172, Transportation Standards (DOT)

B. Connecticut Regulations:

   State requirements which govern asbestos abatement work and hauling and disposal of asbestos waste materials include but are not necessarily limited to the following:
   1. Connecticut Department of Environmental Protection (Solid Waste Management Regulations).
   2. Connecticut Department of Public Health (CT-DPH) regulations outlined in Section 19a-332a-1 through 19a-332a-16 "Standards for Asbestos Abatement"
   3. CT-DPH regulations outlined in Section 20-440-1 through 20-440-9 and 20-441 "Licensure and Training Requirements for Persons Engaged in Asbestos Abatement and Consulting Services"
   4. Connecticut Department of Labor (CT-DOL)
   5. Connecticut Department of Transportation (DOT)

C. Local Regulations:

   Local agencies which may govern or have certain requirements regarding asbestos abatement work or hauling and disposal of asbestos waste materials include but are not necessarily limited to the following:
   1. Building Department
   2. Health Department
   3. Fire Department

D. Standards and Guidance Documents:
   1. American National Standard Institute (ANSI) Z88.2-80, Practices for Respiratory Protection
   2. ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems
   3. EPA 560/585-024, Guidance for Controlling Asbestos Containing Materials in Buildings (Purple Book)
   4. EPA 530-SW-85-007, Asbestos Waste Management Guidance

1.14 EXEMPTIONS

A. Any deviations from these specifications require the written approval and authorization from the Owner and Consultant.

B. Any modifications from the standard work practices identified in the CTDPH Standards for Asbestos Abatement, Sections 19a-332a-1 to 19a-332a-16, Sections 20-440-1 to 20440-9, Section 20-441 and Section 19a-332e-1 to 19a-332e-2, must be requested in writing, and approved in writing from the CTDPH.

1.15 FINAL AIR CLEARANCE

A. Following the completion of the encapsulation phase of the work, the Consultant shall collect final air clearance samples inside the work area per AHERA regulation 40 CFR Part 763, if necessary. The Owner of the facility shall be responsible for payment of the sampling and analysis of the initial final air clearance samples only. The Contractor shall be responsible for payment of all costs associated with the collection and analysis of additional final air clearance samples if the first set of samples fail to satisfy the clearance criteria.

1.16 NOTIFICATIONS, POSTINGS, SUBMITTALS, AND PERMITS

A. The Contractor shall make the following notifications, and provide the submittals to the following agencies prior to the commencement of removal work. This notification is required ten (10) calendar days prior to the start of the abatement project:
   1. Connecticut Department of Energy and Environmental Protection Health Services and Solid Waste Management Unit
      79 Elm St.
      Hartford, CT 06106
      (Only if asbestos waste is disposed of in Connecticut)
   2. Connecticut Department of Public Health
      410 Capital Avenue MS #51 AIR
      P.O. Box 340308 Hartford, CT 06134

B. The minimum information included in the notification to these agencies includes:
   1. Name and address of building Owner/Operator
   2. Building location
   3. Building size, age, and use
   4. Amount of friable asbestos
   5. Work schedule, including proposed start and completion date
   6. Asbestos removal procedures to be used
   7. Name and location of disposal site for generated asbestos waste, residue, and debris
   8. If landfill opens in Connecticut to accept ACM waste, Consultant will notify CTDEEP prior to utilizing said landfill.

1.17 WORK SITE SAFETY PLAN

A. The Contractor shall establish a set of emergency procedures and shall post them in a conspicuous place at the work site. The safety plan should include provisions for the following:
   1. Evacuation of injured workers.
   2. Emergency and fire exit routes from all work areas.
   3. Emergency first aid treatment
   4. Local telephone numbers for emergency services including ambulance, fire, and police.
   5. A method to notify occupants of the building in the event of a fire or other emergency requiring evacuation of the building.

B. The Contractor is responsible for training all workers in these procedures.

1.18 INDEPENDENT AIR SAMPLING AND ASBESTOS ABATEMENT MONITORING

A. This section describes independent air sampling work being performed on behalf of the Owner. This work is not in the Contract Sum. This section describes air monitoring carried out by the Owner's Consultant to verify that the building beyond the work area and the outside environment remains uncontaminated. (Personal air monitoring required by OSHA is work to be performed by the Contractor and is within the Contract Sum.)

B. The purpose of the Owner's Consultant's air monitoring is to detect faults in the work are isolation such as:
   1. Contamination of the building outside of the work area by airborne asbestos fibers
   2. Failure of filtration or rupture in the differential pressure system
   3. Contamination of air outside the building envelope by airborne asbestos fibers.

   Should any of the above occur the Contractor shall immediately cease asbestos abatement activities until the fault is corrected. Do not recommence work until authorized by the Owner's Consultant.

C. The Owner's Consultant will monitor airborne fiber counts in the Work Area. The purpose of this air monitoring will be to detect airborne asbestos concentrations, which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

D. To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to an acceptable level, the Consultant will sample and analyze air in accordance with clearance air sampling requirements.

E. The Owner's Consultant will perform on-site monitoring throughout the course of the project, as follows:
   1. All work procedures shall be continuously monitored by the Consultant to assure that areas outside the designated work locations in the buildings will not be contaminated.
   2. Prior to work on any given day, the Contractor's designated "competent person" shall discuss the day's work schedule with the Consultant to evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the building or the employees. This includes a visual survey of the work area and the decontamination of the building or the employees. This includes a visual survey of the work area and the decontamination enclosure systems.

1.19 CONTRACTOR’S AIR SAMPLING RESPONSIBILITY

A. The Contractor shall independently retain an air sampling professional to monitor airborne asbestos concentrations in the workers' breathing zone and to establish conditions and work procedures for maintaining compliance with OSHA Regulations 29 CFR 1910.1001 and 1926.1101.

B. The Contractor's air sampling professional shall document all air sampling results and provide a report to the Consultant within 48 hours after sample collection.

C. All air sampling shall be conducted in accordance with methods described in OSHA Standards 29 CFR 1910.1001 and 1926.1101.

1.20 PROPER WORKER PROTECTION

A. This section describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.

B. All workers are to be accredited as Abatement Workers as required by the AHERA regulation 40 CFR 763 Appendix C to Subpart E, February 3, 1994.

C. The Contractor is required to be certified and accredited as required by the State of Connecticut Department of Health Services.

D. In accordance with 29 CFR 1926, all workers shall receive a training course covering the dangers inherent in handling asbestos, the dangers of breathing asbestos dust, proper work procedures, and proper worker protective measures. This course must include but is not limited to the following:
   1. Methods of recognizing asbestos
   2. Health effects associated with asbestos
   3. Relationship between smoking and asbestos in producing lung cancer
   4. Nature of operations that could result in exposure to asbestos
   5. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
      a. Engineering controls
      b. Work Practices
      c. Respirators
      d. Housekeeping procedures
      e. Hygiene facilities
      f. Protective clothing
      g. Decontamination procedures
      h. Emergency procedures
      i. Waste disposal procedures
   6. Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1910.134
   7. Appropriate work practices for the work
   8. Requirements of medical surveillance program
   9. Review of 29 CFR 1926
   10. Pressure Differential Systems
   11. Work practices including hands on or on-job training
   12. Personal Decontamination procedures
   13. Air monitoring, personal and area

E. The Contractor shall provide medical examinations for all workers who may encounter an airborne fiber level of 0.1 Yee or greater for an 8 hour Time Weighted Average. In the absence of specific airborne fiber data provide medical examinations for all workers who will enter the Work Area for any reason. Examination shall, at a minimum, meet OSHA requirements as set forth in 29 CFR 1926 In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

F. Submit the following to the Consultant for review. The Contractor shall not start work until these submittals are returned with Consultant action stamp indicating that they are approved.
   1. Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the AHERA Regulation 40 CFR 763 Appendix C to Subpart E, February 3, 1994.
   2. Submit evidence that the Contractor is certified to perform asbestos abatement work by the State of Connecticut Department of Health services.
   3. Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the Work Area.
   4. Submit documents verifying that each worker has had a medical examination within the last 12 months as part of compliance with OSHA medical surveillance requirements. Submit, at a minimum, for each worker the following:
      a. Name and Social Security Number
      b. Physicians Written Opinion from examining physician including at a minimum the following:

5. Whether worker has any detected medical conditions that would place the worker at an increased risk of material health impairment from exposure to asbestos.
6. Any recommended limitations on the worker or on the use of personal protective equipment such as respirators.
7. Statement that the worker has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.
8. Copy of information that was provided to physician in compliance with 29 CFR 1926
9. Statement that worker is able to wear and use the type of respiratory protection proposed for the project, and is able to work safely in an environment capable of producing heat stress in the worker.
10. Effective June 4, 2000, submit copies of certificates for the site supervisor and the workers issued by CTDPH.

G. Submit certification signed by an officer of the abatement-contracting firm and notarized that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.

H. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:
1. Non-essential personnel are prohibited from entering the area
2. All authorized personnel entering the work area shall read the "Worker Protection Procedures" which are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing
3. All personnel who are exiting from the decontamination enclosure system shall be properly decontaminated
4. Asbestos waste that is taken out of the work area must be properly bagged and labeled in accordance with these specifications. The surface of the bags shall be decontaminated. Asbestos leaving the enclosure system must be immediately transported off-site or immediately placed in locked, posted temporary storage on-site, and removed within 24 hours of the project conclusion.
5. Any material, equipment, or supplies that are brought out of the decontamination enclosure system shall be cleaned and decontaminated by wet cleaning and/or HEPA vacuuming of all surfaces.

1.21 ALTERNATE WORK PRACTICES

A. The Contractor and/or Consultant may obtain services of a CTDPH certified asbestos project designer and submit application for variances to the CTDPH, as applicable for any alterations, modifications or non-conforming methods intended of asbestos removal. Methods requiring variances include but are not necessarily limited to glove-bagging, use of tent procedures, remote decons, etc. The alternative procedures shall be submitted in writing and hand delivered or post marked at least ten (10) days before the project start date. CT-DPH may approve an alternative procedure for an asbestos abatement project with certain conditions that would provide equivalent or a greater measure of asbestos emission control than the conventional work practices. The alternate work practice request form shall be signed and sealed by a Licensed Designer. Any fees associated with the application shall be paid by the Contractor. All alternative work practices must be approved and accepted by Langan's project designer regardless if they have been approved by CTDPH.

1.22 POST-PROJECT CLOSEOUT

A. The Contractor shall provide all required documentation as required by this specification once his/her work is complete, final clearances passed and asbestos waste disposed of. This should include but not be limited to: bound copy of the daily log containing log of daily work activities, all supervisor and worker certificates of training and Connecticut licenses, certificates of insurance, containment entry/exit logs, copy of recording manometer charts, waste shipment records, personal air monitoring laboratory reports and chain-of-custody documentation, and project

completion certificate. Final payment shall not be made to the Contractor until all required documentation is submitted and verified.

PART 2 PRODUCTS

2.01 MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed of as asbestos waste.

C. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to the job site with factory label indicating 4 or 6 mil.

D. Polyethylene disposable bags shall be six (6) mil with pertinent pre-printed label. Tie wraps for bags shall be plastic, five (5) inches long (minimum), pointed and looped to secure filled plastic bags.

E. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

F. Surfactant (wetting agent), shall consist of fifty (50) percent polyoxyethylene ether and fifty (50) percent polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of one (1) ounce surfactant to five (5) gallons of water or as directed by manufacturer.

G. Removal encapsulant shall be non-flammable factory prepared penetrating chemical encapsulant found acceptable to Consultant. Usage shall be in accordance with manufacturer's printed technical data.

H. The Contractor shall have available spray equipment capable of mixing wetting agent with water and capable of generating sufficient pressure and volume and having sufficient hose length to reach all areas with asbestos.

I. Impermeable containers are to be used to received and retain any asbestos-containing or contaminated materials until disposal at an acceptable disposal site. The containers shall be labeled in accordance with OSHA Standard 29 CFR 1926.1101. Containers must be both air and watertight.

J. Labels and signs, as required by OSHA Standard 29 CFR 1926.1101, will be used.

K. Encapsulant shall be bridging or penetrating type which has been found acceptable to the Consultant. Usage shall be in accordance with manufacturer's printed technical data.

L. HEPA filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports where asbestos-containing materials may be disturbed.

2.02 TOOLS AND EQUIPMENT

A. The Contractor shall provide all tools and equipment necessary for asbestos removal, encapsulation and enclosure.

B. The Contractor's air monitoring professional shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements.

C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape and air filters.

D. The Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and electrical power sources (such as generators). Any electrical connection work affecting the building electrical power system shall be performed by a State of Connecticut licensed electrician.

E. The Contractor shall have available shower stalls and plumbing to support same to include sufficient hose length and drain system or an acceptable alternate.

F. Exhaust air filtration system units shall contain HEPA filter(s) capable of sufficient air exhaust to create negative pressure of -0.02 inches of water within enclosure with respect to outside area. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of four (4) air changes per hour within the enclosure. No air movement system or air filtering equipment shall discharge unfiltered air outside.

G. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers in diameter or larger.

H. The Contractor will have reserve units so that the station system will operate continuously

2.03 RESPIRATORY PROTECTION

A. Select respirators from those approved by the Mine Safety and Health Administration (MSHA), and the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

B. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist on a yearly basis. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual. Fit-test records shall be maintained on-site for each employee.

C. Where fiber levels permit, and in compliance with regulatory requirements, Powered Air Purifying Respirators (PAPR) are the minimum allowable respiratory protection permitted to be utilized during gross removal operations. The Contractor shall use supplied air respirator for confined space requirements.

D. No respirators shall be issued to personnel without such personnel participating in a respirator training program.

E. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134 and 29 CFR 1926.1101.

F. A storage area for respirators shall be provided by the Contractor in the clean room side of the personnel decontamination enclosure where they will be kept in a clean environment.

G. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the Work day. Filters will be removed and discarded during the decontamination process. Filters cannot be reused. Filters must be changed if breathing becomes difficult.

H. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour work day.

I. Any authorized visitor, worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the project site and not be permitted to return.

J. The Contractor shall have at least two (2) Powered Air Purifying Respirators stored on-site designated for authorized visitors use. Appropriate respirator filters for authorized visitors shall be made available by the Contractor.

K. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134, and 29 CFR 1926.1101. Provide respirator training and fit-testing.

2.04 PROTECTIVE CLOTHING

A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber for comfort, but shall not be used alone. Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape, or provide disposable coverings with elastic wrists or tops.

B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing abatement Work.

C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.

D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area.

PART 3 EXECUTION

3.01 PRE-ABATEMENT MEETING

A. At least one week prior to the start of work a Pre-Construction Meeting will be scheduled and must be attended by the Contractor and any Sub-Contractors. The assigned Contractor Site Supervisor is also required to attend this meeting.

B. The Contractor shall present a detailed project schedule and project submittals at the Pre-Construction Meeting. Variations, amendments, and corrections to the presented schedule will be discussed, and the Owner and Consultant will inform the Contractor of any scheduling adjustments for this project.

C. Following the Pre-Construction Meeting, the Contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

3.02 WORK AREA PREPARATION

A. Where necessary, shut down electrical power, including receptacles and light fixtures. Under no circumstances during the decontamination procedures will lighting fixtures be permitted to be operating when the spraying of amended water may contact the fixture. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. <u>All installations are to be made by a State of Connecticut licensed electrician.</u>

B. Shut down and/or isolate heating, cooling, and ventilation air systems or zones to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents within the work area shall be "criticalled" with duct tape and polyethylene sheeting.

C. The Contractor shall be responsible for removing furniture from the work areas. The Contractor shall pre-clean moveable objects within the proposed work areas using HEPA vacuum equipment and/or wet cleaning methods as appropriate and remove such objects from work areas to a temporary location. For example, cabinets to gain access to floor tile and associated mastic.

D. Seal off all openings, including, but not limited to, windows, corridors, doorways, skylights, ducts, grills, diffusers, and any other penetration of the work areas, with polyethylene sheeting

a minimum of six (6) mils thick, sealed with duct tape. This includes doorways and corridors that will not be used for passage during work areas and occupied areas.

E. Pre-clean fixed objects within the work areas, using HEPA vacuum equipment and/or wet cleaning methods as appropriate, and enclose with a minimum six (6) mil plastic sheeting sealed with duct tape.

F. Clean the proposed work areas using HEPA vacuum equipment or wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

G. After HEPA vacuum cleaning, cover fixed walls with two (2) layers of four (4) mil polyethylene sheeting to the floor level. Where fixed walls are not used, two layers of six (6) mil polyethylene sheeting will be applied to a rigid framework of wood, metal, or PVC. Where floor tile/mastic is not being abated, cover the floor with two (2) layers of six-mil polyethylene sheeting. All overlaps shall be sealed with tape or spray adhesive.

H. Maintain emergency and fire exits from the work areas, or establish alternate exits satisfactory to fire officials.

I. Clean and remove ceiling mounted objects, such as lights and other items not sealed off, which interfere with asbestos abatement. Use hand-held amended water spraying or HEPA vacuuming equipment during fixture removal to reduce settled fiber dispersal.

J. Create pressure differential between work areas and uncontaminated areas by the use of acceptable negative air pressure equipment sufficient to provide four (4) air changes per hour and create negative pressure of -0.02 inches of water within enclosure with respect to outside area as measured on a water gauge.

3.03 DECONTAMINATION SYSTEM

A. The following requirements shall be followed for the worker decontamination unit:
   1. At all asbestos abatement projects, work areas shall be equipped with decontamination facilities consisting of: a clean room, a shower room, and an equipment room attached to each containment.
   2. The decontamination enclosure system chambers shall be constructed to meet the criteria of the Specification. The decontamination enclosure shall be installed watertight to prevent water leaks. The interior shall be lined with two layers of 6-mil fire-retardant plastic sheeting, with a minimum overlap of 16 inches at seams and sealed (airtight) by tape and adhesive. The interior floor shall be sheathed with (2) layers of reinforced fire retardant plastic sheeting with a minimum overlap on the wall of sixteen (16) inches. The contractor shall ensure compliance with local building codes and other regulations governing temporary structures.
   3. Curtained Doorways: Three overlapping sheets of 6-mil polyethylene shall be placed over a framed doorway and secured along the top of the doorway. Secure the vertical edge of the outer sheets along one vertical side of the doorway and the vertical edge of the center sheet along the opposite vertical side of the doorway. The sheets shall be weighted so that they close quickly after being released.
   4. Air Locks: Air locks shall consist of two curtained doorways placed a minimum of three feet apart.
      a. <u>Clean Room</u>: In this room, persons remove and leave all street clothes and put on clean disposable coveralls. Approved respiratory protection equipment is stored in this area. The floor of the clean room must be kept dry at all times. At the end of each shift, the room must be cleaned using wet rags. Also, a lockable door may be installed. No asbestos-containing materials are allowed in this room. The clean room shall be equipped with suitable hooks, lockers, shelves, etc. for workers to store personal articles and clothing. THIS IS <u>NOT</u> A CONTAMINATED AREA.

b. Shower Room: Provide a completely watertight operational shower to be used by cleanly dressed workers heading for the Work area from the clean room or for showering workers headed out of the Work Area after dressing in the Equipment Room. Shower must be constructed so that water leakage is minimized. The shower shall have one shower per six full shift abatement people, calculated on the basis of the largest shift. Any leaking water must be cleaned immediately. Showers must be equipped with hot and cold running water, soap and sufficient disposable towels for the number of workers at the job site. Arrange water shut off and drain pump operation controls, so that a single individual can shower without assistance from either inside or outside the Work Area. THIS IS A CONTAMINATED AREA.
Pump wastewater into a polyethylene lined 55-gallon drum located in the Work Area to be added to the asbestos waste. If the water is allowed by the work treatment workers to be pumped into a drain, provide 20 micron and 5 micron waste water filters in line to drain. Change filters at a minimum of once a day. Locate filters inside the shower unit, so that the shower pan catches the water lost during filter change.

c. Equipment Room: Work equipment, footwear, and all other contaminated work clothing are to be left here upon exiting Work Area. A walk-off pan filled with water shall be located in the work area just outside the equipment room for workers to clean foot coverings while exiting the work area. This is a change and transit area for workers. Provide a drop cloth layer of sheet plastic on the floor of the Equipment Room for every shift change. Roll drop cloth layer in upon itself at the end of each shift and dispose of as contaminated waste. THIS IS A CONTAMINATED AREA.
Each room shall be separated from the other and from the work area by airlocks such as will prevent the free passage of air or asbestos fibers and shall be accessible through doorways protected with three (3) overlapping 6 mil polyethylene sheets which shall be weighed, so as to fall into place when people pass through the area. The shower room shall be contiguous to the clean room and equipment room. All personnel entering or leaving the work area shall pass through the shower room. The number of showers provided shall satisfy the requirements of OSHA 29 CFR 1910.141. Hot and cold water shall be supplied to the showers. The equipment room (dirty room) shall be situated between the shower room and the work area and separated from both by means of suitable barriers or overlapping flaps such as will prevent the free passage of air or asbestos fibers.

Decontamination chamber doors shall be of sufficient height and width to enable replacement of equipment, which may fall, and to safely stretcher or carry an injured worker from the Site without destruction of the chamber or unnecessary risk to the integrity of the work area. Such doors must be at least four (4) feet wide, and the distance between sets of doors must be at least four (4) feet.

5. No person or equipment shall leave the asbestos abatement project work area unless first decontaminated by showering, wet washing or HEPA vacuuming to remove all asbestos debris. No asbestos contaminated materials or persons shall enter the clean room.
6. Where feasible, decontamination systems shall abut the work area. In situations where it is not possible, due to unusual conditions, to establish decontamination systems contiguous to the work area, personnel shall be directed to remove visible asbestos debris from their persons by HEPA-filtered vacuuming prior to donning clean disposable coveralls while still in the work area, and proceeding directly to a remote decontamination system to shower and change clothes to follow work area exit procedures.
7. In specific situations where the asbestos contractor determines that it is not feasible to establish a contiguous decontamination system at a work site, the asbestos contractor shall utilize a remote decontamination system. Such systems must be operated in conformance with 29 CFR 1926.1101, Appendix F.

B. Remote Decontamination Facility:
For exterior work on the roof, glove bag or tent procedures, when full containment enclosure is not feasible, the Contractor shall provide remote personnel decontamination enclosure system if approved by the Consultant.

C. Occupied areas and/or building space not within the work areas shall be separated from asbestos abatement work areas by means of airtight barriers.

D. Construct the decontamination system with wood or metal framing, 3/8" sheathing and cover both sides with a double layer of six (6) mil polyethylene sheeting, spray glued or taped at the joints. Caulk joints watertight at floor, walls, and ceiling.

E. The Contractor and the Consultant shall visually inspect barrier several times daily to assure effective seal and the Contractor shall repair defects immediately

F. Waste/Equipment Decontamination Enclosure System:
This system is located adjacent to the work area. The equipment decontamination enclosure system, consisting of two totally enclosed spaces, shall be constructed as follows:
1. Equipment Washroom: An equipment washroom shall have two air locks: one adjacent to the work area and one common air lock which separate it from the holding area. The washroom shall have facilities for washing material containers and equipment. Gross removal of dust and debris from contaminated material containers and equipment shall be accomplished in the work area, prior to moving to the washroom.
2. Holding Area: A holding area shall share a common air lock with the equipment washroom and shall have a curtained doorway to outside areas. A hinged, lockable door shall be placed at the holding area entrance to prevent unauthorized access into the work area.
3. Remote Decontamination Facility: For exterior work on the roof, glove bag or tent procedures, when full containment enclosure is not required, the Contractor shall provide remote Waste/Equipment decontamination enclosure system as specified.

3.04 ABATEMENT REMOVAL PROCEDURES

A. Regulatory compliance will include, but is not necessarily limited to, applicable requirements set forth by the Federal Environmental Protection Agency (EPA), Connecticut Departments of Public Health (CTDPH), Connecticut Department of Environmental Protection, and City of West Haven Health and Building Departments.

B. The following procedures shall be followed while performing the abatement activities:
1. No asbestos abatement work, including preparation, shall be performed or continued without having proper notification and a certified supervisor at the work area. The Contractor shall have a designated "competent person" on the job at all times to ensure establishment of a proper enclosure system and proper work practices throughout the project.
2. Abatement work will not commence until authorized by the Consultant.
3. Provide and display danger signs at every entrance to the work areas in clearly visible locations indicating that asbestos removal work is being conducted and unauthorized and not protected persons should not enter.
Signs must use the following legend:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

RESPIRATORS AND PROTECTIVE CLOTHINGS

ARE REQUIRED IN THIS AREA

Signs shall be posted which meet the specifications set forth in 29 CFR 1926.1101 at all approaches to the work area. Signs shall be posted a sufficient distance from the work area to permit a person to read the sign and take precautionary measures to avoid exposure to asbestos.

4. The worker decontamination enclosure system shall be installed or constructed prior to plasticizing the work area or before disturbing ACM. The waste decontamination enclosure system shall be installed or constructed prior to commencement of gross removal work.

5. All asbestos handlers shall wear disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment, after removing street clothes in the clean room.

6. Abatement of asbestos-containing materials shall be done by wet methods only.

7. ACM shall be sprayed with amended water in sufficient frequency and quantity for enhanced penetration. Sufficient time shall be allowed for penetration to occur prior to removal action or other disturbance-taking place. Dry removal of asbestos materials is prohibited.

8. In order to maintain indoor asbestos concentrations to the minimum, the wet asbestos must be removed in manageable sections. Material drop shall not exceed eight (8) feet. For heights up to 15 feet, provide inclined chutes or scaffolding to intercept drop.

9. Remove asbestos containing materials as appropriate by standard methods. Fill disposal containers as removal proceeds; seal filled containers and clean containers before removal to equipment decontamination system. Wet clean each container thoroughly, double bag and apply caution label. Ensure that workers do not exit the work area thorough the equipment decontamination enclosure.

10. After completion of stripping work, all surfaces from which asbestos has been removed shall be wet brushed, using a nylon brush, wet wiped, and sponged or cleaned by an equivalent method to remove all visible material (wire brushes are not permitted). During this work, the surfaces being cleaned shall be kept wet.

11. Remove and containerize all visible accumulations of asbestos-containing and/or asbestos-contaminated debris. During cleanup, utilize brooms, rubber dustpan, and rubber squeegees to minimize damage to floor covering.

12. Retrieve all free water in contaminated areas and place in plastic lined leak-tight drums.

13. Sealed disposal containers, and all equipment used in the work area, shall be included in the cleanup and shall be removed from work areas via the equipment decontamination enclosure at an appropriate time in the cleaning sequence. All asbestos waste in 6-mil polyethylene disposal bags shall be double bagged in the equipment decontamination enclosure before removal from the Site.

14. At any time during asbestos removal, should the Consultant suspect contamination of areas outside the work area(s), he shall cause all abatement work to stop until the Contractor takes steps to decontaminate these areas and eliminate the causes of such contamination. Unprotected individuals shall be prohibited from entering suspected contaminated areas until air sampling and visual inspections certify decontamination.

15. After completion of the initial final cleaning procedure including removal of the inner layers of polyethylene sheeting, but prior to encapsulation, a pre-sealant inspection shall be conducted by the Consultant. The pre-sealant inspection shall verify that ACM and residual dust has been removed from the work area.

16. After the work area has been inspected by the Engineer and rendered free of visible debris, a thin coat of a pigmented (non-transparent) encapsulating agent shall be applied to all surfaces in the work area from which ACM was removed, to lockdown nonviable fibers.

17. Removal of asbestos containing materials shall be done under negative pressure containment. At a minimum maintain a pressure of negative 0.02 inches of water column within the work area.

3.05 CONSULTANT

A. The Owner has retained Langan Engineering (Langan) as the Hazardous Materials Consultant for the purpose of project design, construction administration, and project monitoring during Asbestos Abatement. Mr. Matthew Myers (License #000058) of Langan is the DPH-approved Asbestos Project Designer for this project. The Consultant will represent the Owner in all tasks of the abatement project at the discretion of the Owner. The Asbestos Abatement Contractor will regard the Consultant's direction as authoritative and binding as provided herein, in matters particularly but not limited to approval of work areas, review of monitoring results, completion of the various segments of work, final completion of the abatement, submission of data, and daily field punch list items.

3.06 CONSULTANT'S RESPONSIBILITIES

A. Air sampling shall be conducted by the Consultant to ascertain the integrity of controls that protect the building from asbestos contamination. Independently, the Contractor shall monitor air quality within the work area to ascertain the protection of employees and to comply with OSHA regulations.

B. The Consultant's air sampling professional shall collect and analyze air samples during two time periods:
   1. Abatement Period: If required, the Consultant's project monitor shall collect samples on a daily basis during the work period. A sufficient number of area samples shall be taken outside of the work area, at the exhaust of the negative pressure system, and outside of the building to judge the degree of cleanliness or contamination of the building during removal. Additional samples may be taken inside the work area and decontamination enclosure system, at the discretion of the project monitor.
   2. Post-Abatement Period: If required, the Consultant's project monitor shall conduct air sampling following the final cleanup phase of the project, once the "no visible residue" criterion, as established by the project monitor, has been met. Five (5) samples shall be collected inside the work area utilizing aggressive methods to comply with the State of Connecticut Department of Public Health Standards for Asbestos Abatement, sections 19a-332a-12, and 19a-332a-13. Analysis of the samples to determine airborne concentrations of asbestos shall be conducted by Transmission Electron Microscopy (TEM) method with an average limit of 70.0 structures per square millimeter of filter surface or by Phase Contrast Microscopy (PCM) with a limit of 0.01 fibers per cubic centimeters of air in accordance with the above Connecticut regulation sections.

C. The Consultant's project monitor shall provide continual evaluation of the air quality of the building during removal, using his/her best professional judgment in respect to the State of Connecticut Department of Public Health guideline of 0.010 fibers/cc and the background air quality established during the pre-abatement period.

D. If the project monitor determines that the building air quality has become contaminated from the project, he/she shall immediately inform the Contractor to cease all removal operations and implement a work stoppage clean up procedure. The Contractor shall conduct a thorough cleanup of the areas of the building designated by the Consultant. No further removal work

can take place until the project monitor has assessed that the building air has been decontaminated.

E. Pre-abatement and abatement air samples shall be collected as required to obtain a volume of 1,200 liters. Samples shall be analyzed by Phase Contrast Microscopy (PCM) methodology using the NIOSH 7400 protocol.

3.07 CONSULTANT'S INSPECTION RESPONSIBILITIES

A. The Consultant shall conduct inspection throughout the progress of the abatement project. Inspections shall be conducted in order to document the progress of the abatement work as well as the procedures and practices employed by the abatement Contractor.

B. The Consultant shall perform the following inspections during the course of abatement activities:
   1. Pre-commencement Inspection: Pre-commencement inspections shall be performed at the time requested by the abatement Contractor. The Consultant shall be informed 12 hours prior to the time the inspection is needed. If, during the course of the pre-commencement inspection, deficiencies are found, the Contractor shall perform the necessary adjustments in order to obtain compliance.
   2. Work Area Inspections: Work area inspections shall be conducted on a daily basis at the discretion of the Consultant. During the course of the work inspections, the Consultant shall observe the Contractor's removal procedures, verify barrier integrity, monitor negative air filtration devices, assess project progress, and inform the abatement Contractor of specific remedial activities if deficiencies are noted.
   3. Pre-sealant Inspection: The Consultant, upon the request of the abatement Contractor, shall conduct a pre-sealant inspection. The Consultant shall be informed 12 hours prior the time that the inspection is needed. The pre-sealant inspection shall be conducted after completion of the initial cleaning procedures, but prior to encapsulation. The pre-sealant inspection shall verify that all ACM and residual debris have been removed from the work area. If, during the course of the pre-sealant inspection, the Consultant identifies residual dust or debris, the Contractor shall comply with the request of the Consultant in order to render the area "dust free."
   4. Final Visual Inspection: The Consultant, upon request of the abatement Contractor, shall conduct a final visual inspection. Following the removal of the inner layer of polyethylene sheeting and prior to final air clearance, the Consultant shall conduct a final visual inspection inside the work area. If residual dust or debris is identified during the course of the final inspection, the Contractor shall comply with the request of the Consultant in order to render the area "dust free."

3.08 CLEARANCE AIR TESTING

A. After the visual inspection is completed and all surfaces in the abatement area have dried, final air clearance sampling shall be performed by the Consultant. Aggressive air monitoring will be used. Selection of location and samples shall be the responsibility of the Consultant. Air monitoring volumes shall be sufficient to provide a detection limit of 0.010 f/cm' using NIOSH-approved method for PCM analysis. For air clearance by Transmission Electron Microscopy, air-monitoring volumes shall be sufficient to provide a detection limit of 0.005 f/cm3 using the AHERA Level II Yamate Method.

B. Areas which do not comply with the Standard for Cleaning for Initial Clearance shall continue to be cleaned by and at the Contractor's expense until the specified Standard of Cleaning is achieved as evidenced by results of air testing as previously specified.

3.09 ASBESTOS WASTE DISPOSAL

A. The Contractor shall package, label, and remove all asbestos waste from the work area in accordance with Connecticut DEEP regulations, all other applicable regulations, and as

specified below. Packaging shall be accomplished in a manner that minimizes waste volume, but insures waste containers shall not tear or break. All waste shall be transported in leak tight containers.

B. Asbestos wastes may include building materials, insulation, disposable clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, contractor equipment, or other materials designated by state or local authorities which have been potentially contaminated with asbestos and have not been fully cleaned.

C. Waste Labeling
   1. Warning labels, having waterproof print and permanent adhesive in compliance with OSHA, EPA and CTDEEP/DOT requirements, shall be affixed to or printed on the sides of all waste bags or transfer containers. Warning labels shall be conspicuous and legible, and contain the following words:

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

   2. In compliance with NESHAP, 40 CFR, Part 61.150, all waste containers or bags shall be labeled with the following generator information:
      a. Name of waste generator
      b. Location of where waste was generated

D. Wetting of Waste: A fine water spray shall be used to keep the top layers of waste in containers thoroughly wet at all times. When a waste bag is full, air within the bags shall be evacuated with a HEPA equipped vacuum and be securely sealed with tape or other secure fastener.

E. Use and Decontamination of Fiber Drums: The Contractor's use and decontamination of fiber drums shall be in accordance with CTDPH, EPA and DOT requirements. The drums shall be lined with a minimum of two layers of 6-mil asbestos waste bags. The waste will be appropriately labeled and sealed. The drums shall be sealed with an airtight lid and shall be decontaminated and/or additionally bagged if the drums are filled inside the containment and visible debris/contamination is observed on the exterior of the drums. All waste shall be labeled as previously described. The drums and waste will be re-containerized should their integrity be compromised and/or liquid is visibly passing through or staining the container.

F. Waste Container Storage: The container used for the storage of bagged contaminated waste shall be an enclosed dumpster. The dumpster shall have a solid metal roof and a solid metal door with padlock. At a minimum, line the cargo area with two layers of a 6-mil polyethylene sheeting to prevent contamination from damaged or leaking containers. Floor sheeting shall be installed first and shall extend up the sidewalls 24 inches minimum. Wall sheeting shall be overlapped and taped securely into place. No un-bagged contaminated waste or non-asbestos waste shall be stored in these dumpsters. Ensure that bags placed in dumpsters are undamaged. Warning signs shall be posted on the dumpster in accordance with Sections 29 CFR 1926.1101 of the OSHA regulations.

G. Waste Removal Scheduling: All waste containers shall be decontaminated and removed from the Site before final cleanup is started and isolation barriers are taken down.

H. Waste Transportation and Disposal
   1. It is the responsibility of the Contractor to determine and insure that the Contractor and his/her subcontractor are complying with: 1) current waste handling regulations; and 2) the

current regulations for transporting and disposing waste at the ultimate disposal landfill. The Contractor must comply fully with these regulations, and with all U.S. Department of Transportation, State, local, and EPA requirements.

2. The Contractor's waste hauler and disposal contractor shall maintain a valid hazardous waste transporter's permit and identification number; and obtain complete, and fully comply with any other local hazardous waste manifesting requirements.
3. Exercise care before and during transport to ensure that no unauthorized persons have access to the containerized ACW.
4. Do not transport ACW on open trucks. Treat and dispose of drums that have been contaminated as asbestos-containing waste.
5. A copy of ACW manifest forms shall be sent to the Owner after each disposal is completed and all required data and signatures have been inserted.
6. The Contractor shall return the original Disposal Certificate (landfill receipt) to the Owner within 10 working days of waste shipment from the Site.

END OF SECTION

SECTION 02 83 13

LEAD PAINT AWARENESS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. General Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Refer to all drawings and/or other Sections of these specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

C. References
   1. "Pre-Demolition Hazardous Building Materials Inspection, 14, 20-22, 24, 38, and 46 Rockview Street and 488, 496-504, and 506 Boston Post Road", Eagle Environmental, Inc., 4 April 2013.
   2. "Pre-Demolition Hazardous Building Materials Inspection, 34 Rockview Street", Eagle Environmental, Inc., 26 April 2013.
   3. "Lead Waste Characterization Results, 38 Rockview Street", Eagle Environmental, Inc., 12 April 2013.

D. Sections containing requirements related to this Section include, but are not limited to:
   1. Section 02 82 10 – Selective Hazardous Materials Abatement Demolition
   2. Section 02 82 13 – Asbestos Abatement
   3. Section 02 84 16 – Hazardous Building Materials Abatement – Universal Waste
   4. Section 02 84 33 – PCB Containing Building Materials Abatement

1.02 SUMMARY OF WORK

A. Work of this Section includes, requirements for worker protection and waste disposal related to the renovation/demolition work involving components and surfaces containing lead at the proposed Engineering and Science University Magnet School (ESUMS) site.

B. The procedures referenced herein shall be utilized during required renovation/demolition work specified elsewhere in the Architect's Specification that might impact lead.

C. The removal, painting or other renovations impacting lead based paint may result in dust and debris exposing workers to levels of lead above the OSHA Action Level. Worker protection, training, and engineering controls referenced herein shall be strictly adhered to, until completion of exposure assessment with results indicating exposures below the "Action Level". This section does not involve lead abatement, but identified worker protection requirements for trades involved in the renovation/demolition and disposal procedures if lead is involved in the waste stream.

1.03 DEFINITIONS

A. The following definitions relative to lead paint as used in this Section are offered:
   1. <u>ACTION LEVEL (AL):</u> The allowable employee exposure, without regard to use of respiratory protection, to an airborne concentration of lead over an eight (8) hour time weighted average (TWA), as defined by OSHA. The current action level is thirty micrograms per cubic meter of air (30 ug/m^3).
   2. <u>AREA MONITORING:</u> The sampling of lead concentrations, which is representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.
   3. <u>BIOLOGICAL MONITORING:</u> The analysis of a person's blood and/or urine, to determine the level of lead concentration in the body.

4. CHANGE ROOM: An area provided with separate facilities for clean protective work clothing and equipment and for street clothes, which prevents cross-contamination.
5. COMPETENT PERSON: A person employed by the Contractor who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions, and who has authorization to take prompt corrective measures to eliminate them as defined by OSHA.
6. EXPOSURE ASSESSMENT: An assessment conducted by an employer to determine if any employee may be exposed to lead at or above the action level.
7. "HIGH EFFICIENCY PARTICULATE AIR" (HEPA): A type of filtering system capable of filtering out particles of 0.3 microns diameter from a body of air at 99.97% efficiency or greater.
8. LEAD: Refers to metallic lead, inorganic lead compounds and organic lead soaps. Excluded from this definition are other organic lead compounds.
9. LEAD WORK AREA: An area enclosed in a manner to prevent the spread of lead dust, paint chips, or debris resulting from lead-containing paint disturbance.
10. LEAD PAINT: Refers to paints, glazes and other surface coverings containing a toxic level of lead.
11. PERMISSIBLE EXPOSURE LIMIT (PEL): The maximum allowable limit of exposure to an airborne concentration of lead over an eight (8) hour time weighted average (TWA), as defined by OSHA. The current PEL is fifty micrograms per cubic meter of air (50 ug/m^3). Extended workdays lower the PEL by the formula: PEL equals 400 divided by the number of hours of work.
12. PERSONAL MONITORING: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.62 and 29 CFR 1910.1025. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a sphere with a radius of 18 inches and centered at the nose or mouth of an employee.
13. RESOURCE CONSERVATION RECOVERY ACT (RCRA): RCRA establishes regulatory levels of hazardous chemicals. There are eight (8) heavy metals of concern for disposal: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Six (6) of the metals are typically found in paints, excluding selenium and silver.
14. TOXIC LEVEL OF LEAD: A level of lead, when present in dried paint or plaster, contains more than 0.50% lead by dry weight as measured by atomic absorption spectrophotometry (AAS) or 1.0 mg/cm' as measured by on-site testing utilizing an x-ray fluorescence analyzer. (Term is specific to State of CT regulations and HUD guidelines only)
15. TOXICITY CHARACTERISTIC LEACHATE PROCEDURE (TCLP): The U.S. Environmental Protection Agency (USEPA) required sample preparation and analysis for determining the hazard characteristics of a waste material.

1.04 REGULATIONS AND STANDARDS

A. The following regulations, standards, and ordinances of federal, state, and local agencies are applicable and made a part of this specification by reference:
   1. American National Standards Institute (ANSI) ANSI 288.2 - 1980 Respiratory Protection
   2. Code of Federal Regulation (CFR)
      a. 29 CFR 1910.134 - Respiratory Protection
      b. 29 CFR 1910.1025 - Lead
      c. 29 CFR 1926.62 - Lead in Construction Interim Final Rule
      d. 29 CFR 1910.1200 - Hazard Communication
      e. 29 CFR 1926.59 - Hazard Communication in Construction
      f. 29 CFR 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists
      g. 29 CFR 1926.57 - Ventilation
      h. 40 CFR 260 - Hazardous Waste Management Systems: General

i) 40 CFR 261 - Identification and Listing of Hazardous Waste
ii) 40 CFR 262 - Generators of Hazardous Waste
iii) 40 CFR 263 - Transporters of Hazardous Waste

i 40 CFR 264 - Owner and Operators of Hazardous Waste Treatment, Storage, and
j. Disposal Facilities
k. 40 CFR 265 - Interim Statutes for Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
l. 40 CFR 268 - Lead Disposal Restrictions
m. 40 CFR 172 - Hazardous Materials Tables and Communication Regulations
n. 40 CFR 178 - Shipping Container Specifications
o. 40 CFR 270 and 124 - Hazardous Waste Permits

3. Underwriters Laboratories, Inc. (UL) UL586 - 1990 High Efficiency Particulate Air Filter Units

1.05 QUALITY ASSURANCE

A. Hazard Communication Program
The Contractor shall establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

B. Compliance Plan (Site Specific)

The contractor shall establish a written compliance plan, which is specific to the project site, to include the following:

1. A description of work activity involving lead including equipment used, material included, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices.
2. Methods of engineering controls to be used to control lead exposure.
3. The proposed technology the Contractor will implement in meeting the PEL.
4. Air monitoring data documenting the source of lead emissions.
5. A detailed schedule for implementing the program, including documentation of appropriate supply of equipment, etc.
6. Proposed work practice which establishes proper protective work clothing, housekeeping methods, hygiene facilities, and practices.
7. Worker rotation schedule, if proposed, to reduce TWA.
8 A description of methods for informing workers of potential lead exposure.

C. Hazardous Waste Management

The Contractor shall establish a Hazardous Waste Management Plan, which shall comply with applicable regulations and address the following:

1. Identification of hazardous wastes
2. Estimated quantity of waste to be disposed of
3. Names and qualifications of each sub-contractor that will be transporting, storing, treating, and disposing of wastes
4. Disposal facility location and 24 hour point of contact
5. Establish EPA state hazardous waste and identification numbers if applicable
6. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes
7. List of waste handling equipment to be used in performing the work to include cleaning, volume reduction, if applicable, and transport equipment
8. Qualifications of laboratory to be utilized for TCLP sampling and analysis
9. Spill prevention, containment, and cleanup contingency measures
10. Work plan and schedule for waste containment, removal, treatment, and disposal

D. Medical Examinations
   1. Before exposure to lead contaminated dust, provide workers with a comprehensive medical examination as required by 29 CFR 1910.1025 and 29 CFR 1926.62.
   2. The examination shall not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62 within the last year.
   3. Medical examination shall include, at a minimum, approval to wear respiratory protection and biological monitoring.

E. Training
   1. The Contractor shall ensure that workers are trained to perform lead paint disturbing activities and disposal operations prior to the start of work in accordance with 29 CFR 1926.62.

F. Respiratory Protection Program
   1. The Contractor shall furnish each employee required to wear a negative pressure respirator with a respirator fit test at the time of initial fitting and at least once every six (6) months thereafter as required by 29 CFR 1926.62.
   2. The Contractor shall establish a Respiratory Protection Program in accordance with ANSI Z88.2, 29 CFR 1910.134, and 29 CFR 1926.62.

1.06 SUBMITTALS

A. The Contractor shall submit to the Owner the following submittals prior to start of work:
   1. Copies of medical records for each employee to be used on the project, including results of biological monitoring and a notarized statement by the examining physician that such an examination took place.
   2. Copies of workers' training certificates.
   3. Submit record of successful respirator fit testing performed by a qualified individual within the previous six (6) months, for each employee to be used on this project with the employee's name and social security number with each record.
   4. The name and address of Contractor's blood lead testing lab, OSHA-CDC listing, and Certification in the State of Connecticut.
   5. The name and address of Contractor's personal air monitoring and waste disposal lead testing laboratory/ies.
   6. Name, address, and ID number of the hazardous waste hauler, waste transfer route, and proposed disposal site.

B. The Contractor shall submit to the Owner the following submittals during the job:
   1. Results from personal air samples.
   2. Medicals, certificates, and fit test 24 hours in advance of any new employee starting on the project.

C. The Contractor shall submit to the Owner the following submittals upon completion of the work:
   1. Copies of manifests and receipts acknowledging disposal of all hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.

1.07 PERSONAL PROTECTION

A. Exposure Assessment
   1. The Contractor shall determine if any worker will be exposed to lead at or above the action level.
   2. The exposure assessment shall identify the level of exposure a worker would be subjected to without respiratory protection.
   3. The exposure assessment shall be achieved by obtaining personal monitoring samples representative of a full shift at least (8-hour TWA).
   4. During the period of the exposure assessment, the Contractor shall institute the following procedures for protection of workers.

a. Protective clothing shall be utilized
b. Respiratory protection
c. Change areas shall be provided
d. Hand washing facilities and shower
e. Biological monitoring
f. Training of workers

B. Respiratory Protection
1. The Contractor shall furnish appropriate respirators approved by NIOSH/MSHA for use in atmospheres containing lead dust.
2. Respirators shall comply with the requirements of 29 CFR 1926.62.
3. Workers shall be instructed in all aspects of respiratory protection.
4. The Contractor shall have an adequate supply of HEPA filter elements and spare parts on site for all types of respirators in use.
5. The following minimum respirator protection for use during paint removal or demolition of components and surfaces with lead paint shall be the 1/2 mask air purifying respirator with high efficiency filters for exposures (not in excess of 500 ug/m^3 or 10 x PEL).

C. Protective Clothing
1. Personal protective clothing shall be provided for all workers, supervisors, and authorized visitors entering the work area.
2. Each worker shall be provided with a minimum of two (2) complete disposable coverall suits.
3. Removal workers shall not be limited to two (2) suits, and the Contractor shall supply additional suits as necessary.
4. Under no circumstances shall anyone entering the abatement area be allowed to re-use a contaminated disposable suit.
5. Disposable suits, such as TYVEK suits, and other personal protective equipment (PPE) shall be donned prior to entering the lead control area. A change room shall be provided for workers to put on suits and other personal protective equipment with separate areas to store their street clothes.
6. Eye protection for personnel engaged in lead operations shall be furnished when the use of a full-face respirator is not required.
7. Goggles with side shields shall be worn when working with power tools or a material that may splash or fragment, or if protective eye wear is specified on the Material Safety Data Sheet (MSDS) for a particular product to be used on the project.

1.08 PERSONAL MONITORING

A. General: The Contractor is required to perform the personal air sampling activities during lead paint disturbing work. The results of such sampling shall be posted, provided to individual workers and submitted to the Owner as described herein.

B. Sampling: Samples shall be taken for the duration of the work shift or for eight hours, whichever is less. Personal samples need not be taken every day after the first day if working conditions remain unchanged, but must be taken every time there is a change in removal operations, either in terms of the location or the type of work. Sampling will be used to determine eight-hour Time-weighted averages (TWA). The Contractor is responsible for personal sampling as outlined in OSHA Standard 29 CFR 1926.62 and 29 CFR 1910.1025.

C. Sampling Results: Air sampling results shall be reported to individual workers in written form no more than forty-eight (48) hours after the completion of a sampling cycle. The reporting document shall list each sample's result, sampling time and date, personnel monitored and their social security numbers, flow rate, sample duration, sample yield, cassette size, and analysts' name and company, and shall include an interpretation of the results. Air sample analysis results will be reported in micrograms/cubic meter (µg/m').

D. Testing Laboratory: The Contractor's testing lab shall be participating in AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP). The Contractor shall submit to the Consultant for review and acceptance, the name and address of the laboratory, certification(s) of AIHA participation, a listing of relevant experience in air_lead analysis, and presentation of a documented Quality Assurance and Quality Control Program.

PART 2 PRODUCTS

2.01 GENERAL

A. Any substitution in materials, equipment, or methods to those specified shall be approved by the Owner prior to use. Any requests for substitution shall be provided in writing to the Owner. The request shall clearly state the rationale for the substitution.

B. Submit to the Owner product data of all materials and equipment and samples of all materials to be considered as an alternate.

C. Product data shall consist of manufacturer; catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, material safety data sheets (MSDS), and other standard descriptive data. Submittal data shall be clearly marked to identify pertinent materials, products or equipment and show performance characteristics and capacities.

D. Samples shall be of sufficient size and quantity to clearly illustrate the functional characteristics of the product or material with integrally related parts and attachment devices.

2.02 MATERIALS AND PRODUCTS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises.

C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape, and air filters.

D. Materials:
   1. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to job site with factory label indicating 6 mil.
   2. Polyethylene disposable bags shall be six (6) mil. Tie wraps for bags shall be plastic, five (5) inches long (minimum), pointed and looped to secure filled plastic bags.
   3. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.
   4. Impermeable containers are to be used to receive and retain any lead containing or contaminated materials until disposal at an acceptable disposal site. (The containers shall be labeled in accordance with EPA and DOT standards.)
   5 HEPA filtered exhaust systems shall be used during powered dust generating abatement operations. The use of powered equipment without HEPA exhausts is prohibited.

2.03 TOOLS AND EQUIPMENT

A. Provide suitable tools for all lead disturbing operations.

B. The Contractor shall have available power cables or sources such as generators (where required).

C. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter.

PART 3 EXECUTION

3.01 WORKER PROTECTION/TRAINING

A. The Contractor shall provide appropriate training, respiratory and other personal protection, and biological monitoring for each worker and ensure proper usage during potential lead exposure and the initial exposure assessment.

B. Workers who will perform procedures must have completed one of the following training courses:
- EPA Lead Abatement Supervisor (40 hours)
- EPA Lead Abatement Worker (32 hours)
- HUD/EPA course "Work Smart, Work Wet, and Work Clean to Work Lead Safe" (8 hours)
- HUD/NARI course "The Remodeler's and Renovator's Lead Based Paint Training Program" (8 hours).
- HUD "Lead Safe Work Practices" (8 hours)

3.02 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor is responsible for establishing and maintaining controls referenced herein to prevent dispersal of lead contamination from the lead work area.

B. The Contractor is also responsible for conducting work with applicable federal, state, and local regulations as referenced herein.

3.03 WORKER HYGIENE PRACTICES (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA ACTION LEVEL)

A. Work Area Entry: Workers shall don personal protective equipment prior to entering work area, including respiratory protection, disposable coveralls, gloves, headgear, and footwear.

B. Work Area Departure: While leaving respirators on, workers shall remove all gross contamination, debris, and dust from disposable coveralls and proceed to change room and remove coveralls and footwear and place in hazardous waste disposal container.

C. Hand washing Facilities: All workers must wash their hands and faces upon leaving the work area.

D. Equipment: All equipment used by workers inside the work area shall be wet wiped or bagged for later decontamination before removal from the work area.

E. Prohibited Activities: Under no circumstances shall workers eat, drink, smoke, chew gum, or tobacco, or remove their respirators in the work area.

F. Shock Hazards: The Contractor is responsible for using safe procedures to avoid electrical hazards. All temporary electrical wiring will be protected by ground fault circuit interrupters (GFI).

3.04 LEAD WORK AREA (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA ACTION LEVEL)

A. The Contractor shall place warning signs at all entrances and exits from the work area. Signage shall be a minimum of 20" x 14" and shall state the following:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING OR DRINKING
UNAUTHORIZED ENTRY PROHIBITED

B. The Contractor shall designate a change room as specified in this Section. The change room shall consist of two (2) layers of sheeting on the floor surface adjacent to the lead work area.

The change room shall have separate storage facilities for street clothes to avoid cross contamination.

C. The Contractor shall provide potable water for hand and face washing and provide a portable shower unit.

D. The Contractor shall place six-mil polyethylene drop cloths on floor/ ground surfaces prior to beginning removal work to facilitate clean-up.

3.05 WORK AREA CLEAN UP

A. The Contractor shall remove all loose chips and debris from floor surfaces and place in hazardous waste disposal bags.

B. The Contractor shall HEPA vacuum adjacent surfaces to remove dust and debris.

C. Polyethylene drop cloths shall be properly disposed of,

3.06 WASTE DISPOSAL

A. The Contractor's contractual liability shall be the proper disposal of all non-hazardous and hazardous wastes generated at the site in accordance with all applicable federal, state, and local regulations as referenced herein

END OF SECTION

SECTION 02 84 16

HAZARDOUS BUILDING MATERIALS ABATEMENT – UNIVERSAL WASTE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. General Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Refer to all drawings and/or other Sections of these specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

C. References
   1. "Pre-Demolition Hazardous Building Materials Inspection, 14, 20-22, 24, 38, and 46 Rockview Street and 488, 496-504, and 506 Boston Post Road", Eagle Environmental, Inc., 4 April 2013
   2. "Pre-Demolition Hazardous Building Materials Inspection, 34 Rockview Street", Eagle Environmental, Inc., 26 April 2013
   3. "Lead Waste Characterization Results, 38 Rockview Street", Eagle Environmental, Inc., 12 April 2013

D. Sections containing requirements related to this Section include, but are not limited to:
   1. Section 02 82 10 – Selective Hazardous Materials Abatement Demolition
   2. Section 02 82 13 – Asbestos Abatement
   3. Section 02 83 13 - Lead Paint Awareness
   4. Section 02 84 33 – PCB Containing Building Materials Abatement

1.02 SUMMARY OF WORK

A. Work of this Section includes, but is not necessarily limited to, all which is necessary for complete removal and recycling/disposal of all PCB-containing ballasts, mercury containing devices, other hazardous materials, wastes and special wastes that exist in the interior/exterior of the building structures and that might be impacted by proposed demolition of the buildings. The hazardous materials contractor will supply the packaging materials and pay for the proper disposal of these materials. The hazardous materials contractor will provide the labor to put the materials into the proper packaging for disposal.
   1. All work including the removal, characterization (any testing that may be required by disposal facility) and disposal of hazardous materials.
   2. Removal, characterization (any testing that may be required by disposal facility) and disposal of fluorescent light ballasts and capacitors throughout all site structures.
   3. Removal, characterization (any testing that may be required by disposal facility) and disposal of all containers, drums and unknown materials as well as fire extinguishers.
   4. Removal, characterization (any testing that may be required by disposal facility) and disposal of contained gear oils, hydraulic oils and refrigeration liquids, etc. from various pieces of equipment.
   5. Removal, characterization (any testing that may be required by disposal facility) and recycling/disposal of batteries, electronic devices, lighting signage, etc.
   6. File all necessary notices, obtain all permits and licenses, and pay all governmental taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction.
   7. Comply with Health and Safety Plans.

B. The Contractor, under this Section, shall provide all materials, labor, equipment and appliances as necessary to properly remove and recycle/dispose of materials.

1.03 DESCRIPTION OF WORK

A. This specification covers the proper and legal removal and disposal of all Hazardous/Universal Waste from the Engineering and Science University Magnet School (ESUMS) Site located in West Haven, Connecticut. The removal and disposal activities shall comply with all aspects of the contract documents and Federal, State and local requirements.

B. Universal Wastes shall include, but not be limited to, fluorescent bulbs, light fixture ballasts containing polychlorinated bi-phenyls (PCBs) or DEHP, mercury lamps, thermostats and switches, batteries, fire extinguishers, Halon fire suppression systems, paint, chemicals, refrigerants, electronic devices (computers, monitors and signage), and other compressed gases, mechanical fluids, oils, and lubricants.

C. Whenever there is a conflict or overlap within these specifications and between applicable codes and regulations, the most stringent provision specified shall apply.

D. The approximately 4.8-acre site ESUMS site is located at 488, 496-504, 506 and 516 Boston Post Road; 4, 9, 14, 22, and 23 Daytona Street; 14, 20-22, 24, 34, 38 & 46 Rockview Street; and 3, 6, 7, 13 & 20 Waban Street in West Haven, Connecticut. The site also consists of two "paper" streets owned by the City of West Haven: Daytona Street and Waban Street. The site is bound by Rockview Street to the west, the University of New Haven to the east, residential properties followed by the Tile Street to the south, and Boston Post Road (Route 1) to the north. The site is occupied by several vacant residential and commercial buildings and undeveloped parcels. The structures are located at 14, 20-22, 24, 34, 38 and 46 Rockview Street and 488, 496-504, and 506 Boston Post Road. The proposed redevelopment consists of demolition of the existing structures and construction of a new school facility.

E. During a site walkthrough performed by Langan on 29 May 2013, the following Hazardous/ Universal Waste materials were identified:

<u>Commercial Properties - 488 and 496-504 Boston Post Road, West Haven CT</u>

- Fluorescent bulbs (approximately 150)
- Fluorescent ballasts (approximately 75)
- Air conditioning units and refrigerants
- Fire extinguishers, signage and batteries
- Mercury switches, thermostats and gauges
- Liquids, oils, paints, chemicals
- Computer/office equipment (printers, fax machines, monitors, drives) and electronic devices

<u>Residential Structures & Garages – 506 Boston Post Road, 14, 20-22, 24, 34, 38 & 46 Rockview Street, West Haven, CT</u>

- Mercury switches, thermostats and gauges
- Liquids, oils, paints, chemicals, fire extinguishers, batteries
- Fluorescent lighting and ballasts
- Computer/office equipment (printers, fax machines, monitors, drives) and electronic devices

The Contractor shall independently quantify Universal Waste Items.

1.04 SUBMITTALS

A. Before Start of Work: Submit the following to the Owner's Representative for review. Do not start work until these submittals are returned with Owner's Representative's approval.
   1. Copy of State or local license for hazardous waste hauler;
   2. Certification of at least one on-site supervisor which has satisfactorily completed the OSHA 40 Hour Health and Safety Course for Handling Hazardous Materials;

3. Certificates of workers which have successfully completed at least the OSHA 40-Hour Health and Safety Course for Hazardous Materials;
4. Certificates of workers which have successfully completed the required employee training for universal/hazardous waste or appropriate type of training to the type of wastes being managed;
5. Name and address of the universal waste handler and/or a destination facility where the waste materials is to be treated, deposited or recycled in accordance with all regulatory requirements (include contact person and telephone numbers), if the universal waste meets the definition of hazardous waste, the name and address of the hazardous waste treatment, storage and disposal (TSD) facility;
6. Work Plan: Provide a detailed written work plan that describes the procedures for the removal,
   a. Proposed level of worker training for each type of regulated and/or hazardous material to be removed.
   b. Names and applicable licenses of key personnel.
   c. Proof of appropriate training for workers.
   d. Proof of a current medical surveillance program for all personnel.
   e. Material Safety Data Sheets (MSDS) for any chemicals to be used on the project. All products to be used on this project must have MSDS approved by the Owner's Environmental Consultant.
   f. Proposed detailed work schedule.

7. Following final removal, and disposal or destruction, provide Owner with waste transport and disposal documents (e.g., manifests), as well as certificates of destruction and recycling as appropriate.

1.05 CODES AND REGULATIONS

A. Regulatory compliance includes but is not necessarily limited to applicable requirements set forth by :
   1. Federal Regulations:
      a. 29 CFR 1910, "Occupational Safety and Health Standards"(General Industry Standards)
      b. 29 CFR 1910.134 "Respiratory Protection"
      c. 29 CFR 1910.1200 "Hazard Communication"
      d. 29 CFR 1926, "Safety and Health Regulations for Construction" (Construction Industry Standards)
      e. 40 CFR 50, "National Primary and Secondary Ambient Air Quality Standards"
      f. 40 CFR 60, "Standards of Performance for New Stationary Sources," Appendix B, "Test Methods"
      g. 40 CFR 117, "Determination of Reportable Quantities for Hazardous Substances"
      h. 40 CFR 122, "USEPA Administered Permit Program: The National Pollutant Discharge Elimination System"
         i) 40 CFR 172, "Hazardous Waste Transportation"
      i. 40 CFR 261, "Identification and Listing of Hazardous Waste"
      j. 40 CFR 262, "Standards Applicable to Generators of Hazardous Waste"

      k. 40 CFR 263, "Standards Applicable to Transporters of Hazardous Waste"
      l. 40 CFR 268, "Land Disposal Restrictions"
      m. 40 CFR 273, "Universal Waste Rule"
      n. 40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan"
      o. 40 CFR 302, "Designation, Reportable Quantities, and Notification"
      p. 40 CFR 112 (oil pollution prevention)
      q. 40 CFR 279 (used oil)
      r. 40 CFR 273 (Universal Wastes)

s. 40 CFR 761 (PCBs)
t. Toxic Substances Control Act (TSCA), US-EPA
   i) Resource Conservation and Recovery Act (RCRA)
u. Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) (Superfund Law)

2. Connecticut Regulations:

   State requirements which govern universal waste removal and disposal include but are not necessarily limited to the following:
   a. Connecticut Department of Environmental Protection (DEEP) (Hazardous and Universal Waste Management Regulations); Section 22a-454, 456 Waste Facility and Section 22a-449(c)-113 of the Regulations of Connecticut State Agencies (RCSA), respectively.
   b. Connecticut DEEP; 310 CMR 40 Connecticut Contingency Plan, 310 CMR 30 Hazardous Waste Regulations, 310 CMR 1-7 Clean Water Act, 310 CMR 16, 19 Solid Waste Regulations, 314 CMR 1-8 Clean Air Act
   c. Local Town, City or County Bylaws, rules and regulations.

B. Under TSCA, items that contain more than 500 parts per million (PPM) of PCB's are classified as PCB material, items that contain between 50 ppm and 500 ppm of PCB are classified as PCB-contaminated and items that contain less than 50 ppm of PCB's are classified as non-PCB items.

   Under the Small Capacitor Exemption, TSCA has allowed the disposal of <u>non-leaking</u>, <u>intact</u> "small capacitors", defined as containing less than three pounds of PCB dielectric fluid, in a municipal solid waste landfill. Light ballasts containing a small PCB capacitor are covered under this category. The intent of the "small capacitor" disposal rule is for "random disposal" in a landfill by "householders and other infrequent disposers". When commercial and industrial entities dispose of large quantities of small PCB capacitors, the EPA strongly encourages voluntary collection and disposal of PCB capacitors in chemical waste landfills or high-temperature incinerators.

C. Under the "Superfund" laws, PCB's are specifically listed as a hazardous substance. The "release" of more than one pound of PCB's into the environment triggers a "Superfund" notification and cleanup requirement.

   Since twenty-five ballasts collectively contain approximately one pound of PCB's, the disposal of twenty five or more PCB-containing ballast in a landfill would trigger a "Superfund" action.

D. The State of Connecticut General Hazardous Waste Statue 22A 454, 456 requires that PCB ballast must be incinerated or sent to a chemical waste landfill. The statue defines PCB waste, including PCB ballast, as Connecticut Regulated Wastes.

E. <u>Other Regulations:</u> The other relevant regulations affecting disposal of PCB's include the following:
   1. Department of Transportation (DOT) regulations – DOT regulation HM-181 regulates transportation of hazardous materials, including PCB's.
   2. Occupational Safety and Health Administration (OSHA) – OSHA regulates worker's safety and exposure to a variety of chemicals including PCB's.
   3. Resource Conservation and Recovery Act (RCRA) – RCRA regulates wastes, which fail Toxic Characteristic Leachate Procedure (TCLP) and which contain more than 50 ppm of PCB's.

PART 2 PRODUCTS

2.01 GENERAL

A. 35 or 55-gallon metal, fiber drums or containers with lids that can be secured and sealed, DOT approved.

B. Appropriate waste labels identifying contents as regulated and hazardous wastes as defined by 49 CFR 172.

C. Fluorescent Lamp Disposal (Crusher) units, such as DexTrite Fluorescent® Lamp Disposal equipment, or equivalent. Such equipment must be capable of capturing fugitive mercury vapors during the bulb crushing process, as well as the fractured and broken waste products.

D. HEPA and charcoal filter equipped mercury capture vacuum.

E. Cardboard boxes and sleeves for packaging lamps that will be removed from the site intact or unbroken.

F. Recovery tanks to temporarily hold compressed gasses.

G. Health & Safety equipment complying with health and safety plan.

PART 3 EXECUTION

3.01 GENERAL

A. Procedures and methods contained herein are to provide guidance to protect from the contamination of the environment, and exposure to workers, while handling hazardous waste and regulated waste-streams for disposal/recycling/destruction.

B. OWNER TO STOP WORK: The Owner's representative and the Owner's Environmental Consultant shall have the authority to stop the work at any time that conditions are not within Specification and/or applicable regulations. The stoppage of work shall continue until conditions have been corrected to the satisfaction of the Owner's representative or Owner's Environmental Consultant. Standby time to resolve the problems shall be at the Contractor's expense.

C. PERSONAL PROTECTIVE EQUIPMENT:
   1. Personal protective equipment shall consist of (at a minimum) safety goggles or other protective eye-ware, work shoes with non-slip soles (e.g., neoprene), chemical resistant gloves that cover the hand and an apron that covers the front of the worker's body from shoulder to toes (e.g., neoprene or nitrile gloves).
   2. Personal protective equipment contaminated by handling operations should be disposed of as contaminated waste.
   3. Hammering or sudden impact methods for removing ballast's from the light fixture shall not be employed, as such methods may cause leakage in an otherwise non-leaking ballast.
   4. Throwing and tossing of ballast's into disposal drums shall not be conducted, as such activities may cause leakage in an otherwise non-leaking ballast.

D. WORK PROCEDURES
   1. Contractor shall obtain a hazardous waste generator number from Region I, USEPA for the Owner.
   2. During the light fixture removal stage during demolition, the following procedures (or equivalent alternate but protective measures) shall be followed:
      a. Carefully remove fixtures, and stack them in a designated portion of the work area.
      b. Designate an area where the fixtures can be disassembled, and components removed and segregated (e.g., lamps, ballasts). The area should be remote from other demolition activities, and have adequate ventilation and lighting.
      c. The work area for fixture disassembly shall (at a minimum) have the floor lined with one layer of 6-mil fire-retardant polyethylene plastic to control accidental spills or

breakage. The work area should have a table or other solid work platform to facilitate disassembly of the fixtures, and the protective plastic sheeting should cover the work table area and waste drums/lamp crushing/lamp repackaging equipment.

d. Carefully remove lamps from fixtures, and either crush them or repackage them for disposal.

e. In the event a lamp breaks, utilize the mercury capture vacuum to remove all debris generated.

3. Carefully remove ballasts, and segregate for disposal in the following manner:

a. Ballasts labeled as "No-PCBs" shall NOT be segregated and shall be treated as PCB waste as potting material may contain PCBs and DEHP. Handle and dispose of in the same manner as ballasts containing PCBs and/or DEHP.

b. Non-leaking ballasts shall be segregated and drummed for disposal as hazardous wastes. These ballasts may be destroyed by high temperature incineration, or land filled at a properly permitted facility.

c. Leaking ballasts shall be segregated and drummed. Punctures or damage to these ballasts exposes an oily or tar-like substance. These ballasts, and all materials it contacts, MUST be incinerated under TSCA; they cannot be landfilled.

E. MISCELLANEOUS STORED MATERIALS IN CONTAINERS

1. Miscellaneous materials may include antifreeze, cleaning solutions, paints, and other miscellaneous materials.
2. During removing/recycling of materials enclosed in their original container, the Contractor shall package, and label (lab packed) by waste classification in accordance with appropriate RCRA and Connecticut Department of Transportation (ConnDOT). In turn these containers shall be transported, under proper manifesting procedures, to a recycling facility. The facility shall forward a certificate of recycling or disposal to the Contractor, who shall submit this information to the Owner.

F. UNIVERSAL WASTE

Universal waste includes, but is not limited to, fluorescent bulbs, light fixture ballasts containing polychlorinated bi-phenyls (PCBs) or DEHP, mercury lamps and switches, batteries, fire extinguishers, Halon fire suppression systems, paint, refrigerants, electronic devices (computers and monitors), and other compressed gases, mechanical fluids, oils, and lubricants, as defined in 40 CFR 273 and Section 22a-449(c)-113 of the Regulations of Connecticut State Agencies (RCSA). Follow procedures for handling, storage, labeling, shipping, recording keeping and other procedures as required in 40 CFR 273 and Section 22a-449(c)-113.

G. REGULATED WASTE

1. Non-thermostat mercury switches: Handle and dispose of in accordance with State regulation and applicable Federal regulations.
2. Used oil: Handle and dispose of in accordance with State regulations.
3. Refrigerants: Prior to disposal of refrigerant containing equipment, verify that refrigerant has been removed per the requirements of 40 CFR Part 82 (Protection of Stratospheric Ozone).
4. Diesel fuel: If possible, use on site to run equipment. Dispose of or recycle any remaining fuel as per applicable regulations.
5. Fire extinguishers: Contact manufacturer for recycling or donate to local fire department.
6. Halon Fire Suppression System: For recovery and management of Halon, utilize a technician EPA certified in appropriate level for the system. Technician is to use an EPA-certified reclaimer for disposal.

H. TRANSPORTATION

1. Transport waste materials using properly permitted vehicles operated by drivers with Commercial Drivers Licenses (CDLs) and Hazardous Materials endorsements. Coordinate transportation routes with Connecticut Department of Transportation (ConnDOT). Provide

Owner with copies of transporter certifications and EPA ID number a minimum of seven (7) days prior to first use. Chain of custody records shall be maintained which include the date of pickup, number of drums, name of transporter and destination.

I. WASTE DISPOSAL DOCUMENTATION
   1. Waste shipment records and manifests for all materials transported from the site as required by regulations and disposal facility are to be provided to the Owner every five (5) business days. Incorporate this information into the close out package to be provided to the Owner. Within thirty (30) days of generation, Contractor shall provide waste manifests/shipment records and Certificates of Recycling and Disposal (CRD) to Owner.
   2. Certificates of Discontinuance for all equipment and fixtures.

J. DISPOSAL FACILITIES
   1. Contractor shall use only disposal facilities which have been pre-approved by the Owner and its insurers and with valid regulatory permits for type of waste being handled. Provide Owner with copies of disposal facility regulatory permits and EPA identification number a minimum of seven (7) days prior to shipping to that facility. Provide disposal facility required documentation including additional waste sampling.

END OF SECTION

SECTION 02 84 33

PCB CONTAINING BUILDING MATERIALS ABATEMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General Supplementary Conditions apply to this Section.

B. References
   1. "Pre-Demolition Hazardous Building Materials Inspection, 14, 20-22, 24, 38, and 46 Rockview Street and 488, 496-504, and 506 Boston Post Road", Eagle Environmental, Inc., 4 April 2013.
   2. "Pre-Demolition Hazardous Building Materials Inspection, 34 Rockview Street", Eagle Environmental, Inc., 26 April 2013.
   3. "Lead Waste Characterization Results, 38 Rockview Street", Eagle Environmental, Inc., 12 April 2013.
   4. "PCB Sealant and Adjacent Materials Sampling Results, Proposed Engineering and Science University Magnet School Site, Langan, 13 June 2013 (Revised 17 July 2013).

C. Sections containing requirements related to this Section include, but are not limited to:
   1. Section 02 82 10 – Selective Hazardous Materials Abatement Demolition
   2. Section 02 82 13 – Asbestos Abatement
   3. Section 02 83 13 - Lead Paint Awareness
   4. Section 02 84 16 – Hazardous Building Materials Abatement – Universal Waste
   5. HM 1.01 & 1.02 – Hazardous Materials Abatement Drawings

1.02 CONSULTANT

A. Langan Engineering (Langan) has been retained as the Consultant for the purposes of construction administration and project monitoring during PCB Abatement. The Consultant will represent the Owner in all phases of the abatement project at the discretion of the Owner. The PCB Abatement Contractor shall regard the Consultant's direction as authoritative and binding as provided herein, in matters particularly but not limited to approval of work areas, review of monitoring results, completion of the various segments of work, final completion of the abatement, submission of data, and daily field punch list items.

1.03 USE OF THE CONTRACT DOCUMENTS

A. It shall be incumbent upon the PCB Abatement Contractor to visit the Site and determine what exists, its condition, and what will be required to accomplish the Work intended by the Contract Documents. No increase in the Contract Sum will be permitted as a result of the PCB Abatement Contractor's failure to visit the Site and understand the existing conditions.

B. All work shall comply with applicable Codes, laws, regulations, and ordinances wherever applicable. The most stringent of all the foregoing shall govern.

C. It is not intended that the Specifications show every detail of the Work, but the PCB Abatement Contractor shall be required to furnish within the Contract Sum all material and labor necessary for the completion of the Work in accordance with the intent of the Specifications.

D. In case of ambiguity among the Contract Documents, the more stringent requirement as determined by the Consultant shall prevail.

E. The Work of this Contract includes making modifications as necessary, subject to approval by Owner in consultation with the Consultant, to correct any conflicts.

F. All items, not specifically mentioned in the Specifications but implied by trade practices to complete the work, shall be included.

1.04 EXAMINATION OF THE SITE

A. It is understood that the PCB Abatement Contractor has examined the Site and made his/her own estimates of the facilities and difficulties attending the execution of the Work, and has based his price thereon.

B. Except for unforeseeable concealed conditions as determined by the Consultant, the PCB Abatement Contractor shall make no claim for additional cost due to the existing conditions at the Site.

1.05 CONTRACTOR QUALIFICATIONS

A. All bidders shall submit a record of prior experience in PCB abatement projects, specifically including removal of PCB-containing materials listing no less than three (3) completed jobs in the past year, with all projects being of similar size and scope. The PCB Abatement Contractor shall list the experience and training of the project foremen and all on-site personnel. The information that should be included is as follows:
   1. Project Name and Address
   2. Owner's Name and Address
   3. Architect/Consultant
   4. Contract Amount
   5. Date of Completion
   6. Extras and Changes

B. Submit a written statement regarding whether the PCB Abatement Contractor has ever been found out-of-compliance with federal or state regulations pertaining to worker protection, removal, transport, or disposal.

1.06 TESTING LABORATORY SERVICES

A. The PCB Abatement Contractor shall submit to the Consultant the name; address and qualifications of proposed laboratories intended to be utilized for sample analysis as required by this section.

1.07 ADDITIONAL GENERAL REQUIREMENTS

A. The PCB Abatement Contractor shall furnish all labor, materials, facilities, equipment, installation services, employee training, notifications, permits, licenses, certifications, agreements, and incidentals necessary to perform the specified work. Work shall be performed in accordance with the Contract Documents, the latest regulations from the Occupational Safety and Health Administration (OSHA), the United States Environmental Protection Agency (USEPA), and all other applicable federal, state, and local agencies. Whenever the requirements of the above references conflict or overlap, the more stringent provision shall apply.

B. All project personnel engaged in the work covered under this section shall be trained in accordance with OSHA Regulations 29 CFR 1910.1000 and 29 CFR 1910.1200. It should also be noted that work associated with PCB removal may also involve exposure to PCBs during demolition and removal activities specified herein and the PCB Abatement Contractor shall perform required exposure assessment for PCBs.

C. The PCB Abatement Contractor shall provide a Project Health and Safety Officer having a minimum of eight (8) hours of supervisor training in hazardous waste site operations in accordance with the requirements of 29 CFR 1910. The supervisor must be on-site at all times during abatement work.

D. This section specifies the procedures for removal of existing products containing polychlorinated biphenyls (PCBs) less than (<) 50 parts per million (ppm) in the form of caulking and glazing compounds (and additional sealants) and disposal of removed materials as PCB-Containing Waste. The product is not regulated for removal and disposal in accordance with federal requirements of 40 CFR Part 761 as they meet the definition of an "Excluded PCB product", however is regulated in accordance with State of Connecticut Department of Energy and Environmental Protection (CTDEEP) requirements as PCB-Containing Material due to the presence of more than 1 ppm of PCBs in the product.

E. Disturbance or removal of polychlorinated biphenyls (PCB) containing materials may cause a health hazard to workers and building occupants. The PCB Abatement Contractor shall disclose to all of his workers, supervisory personnel, subcontractors, and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.

F. Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of PCB-Containing Materials, appropriate, continuous measures as necessary to protect all workers from the hazard of exposure shall be taken. Such measures shall include the procedures and methods described herein, regulations of the OSHA, USEPA, and local requirements as applicable.

G. The PCB Abatement Contractor shall employ a Competent Person (Supervisor) with at least three (3) years' experience on projects of similar scope and magnitude who shall be responsible for all work involving PCB abatement as described in the specifications and defined in applicable regulations, and have full time daily supervision of the same. The Supervisor shall be the Competent Person as defined by OSHA regulations and have experience in the proper removal and disposal of PCB-Containing Materials.

H. The PCB Abatement Contractor shall allow the work of this contract to be inspected, if required, by local, state, federal, and any other authorities having jurisdiction over such work. The PCB Abatement Contractor shall immediately notify the Owner and Consultant and shall maintain written evidence of such inspection for review by the Owner and Consultant.

I. The PCB Abatement Contractor shall incur the cost of all fines resulting from regulatory non-compliance as issued by federal, state, and local agencies. The PCB Abatement Contractor shall incur the cost of all work requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance or negligence.

J. The PCB Abatement Contractor shall immediately notify the Owner and Consultant of the delivery of all permits, licenses, certificates of inspection, of approval, or occupancy, etc., and any other such instruments required under codes by authorities having jurisdiction, regardless of to who issued, and shall cause them to be displayed to the Owner and Consultant for verification and recording.

K. The PCB Abatement Contractor shall provide enough labor to guarantee completion of the work within the time frame given and within the normal operating hours of the buildings.

1.08 SCOPE OF WORK

A. This specification covers the proper and legal removal and disposal of all PCB sealant, caulking and glazing compounds, and building materials from the Proposed Engineering and Science University Magnet School (ESUMS) Site located in West Haven, Connecticut. The abatement activities shall comply with all aspects of the contract documents and Federal, State and local requirements.

B. Whenever there is a conflict or overlap within these specifications and between applicable codes and regulations, the most stringent provision specified shall apply.

C. The General Contractor or Remediation Subcontractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the General Contractor or Remediation Subcontractor of its obligation to furnish all labor and materials necessary to perform the Work.

D. Work outlined in this Section includes all work necessary for the complete removal and disposal of all PCB-Containing Materials impacted by the proposed work associated with the demolition of the Engineering and Science University Magnet School (ESUMS) Site located in West Haven, Connecticut.

E. Note the work in this section is not subject to TSCA regulation 40 CFR 761, but is subject to compliance with Connecticut General Statutes in accordance with CTDEEP requirements for materials containing >1 to <50 ppm PCBs (PCB-Containing Materials). The Owner or the Owner's Authorized Representative is responsible for notifying the CTDEEP.

F. The quantities given below are provided to establish the order of magnitude of the abatement project. Actual quantities may vary. The PCB Abatement Contractor is responsible for verification of all quantities scheduled for removal. This verification shall include an on-site walk-through inspection of the building.

G. Location, materials, and estimated quantities included in the base bid are noted below and may be found in, the following report, "PCB Sealant and Adjacent Materials Sampling Results, Proposed Engineering and Science University Magnet School Site, Langan, 13 June 2013 (Revised July 17, 2013). The report findings are summarized as the following:

PCB Sealant Bulk Sampling Analytical Results Summary

The following materials and approximate quantities were found to contain PCBs above the CTDEEP threshold:

24 Rockview Street

- Interior Door Caulking – Interior Basement Door (15 LF/1 Door)
- Exterior Window Glazing - Throughout (25 Window Openings Total – some openings have multiple windows)
- Bilco Door Caulking - East Side of Building (1 Door/15 LF)
- Pipe Caulking – East Side of Building (3 Penetrations)

38 Rockview Street

- Shed Window – West Side (1 Window)

488 Boston Post Road

- Exterior Concrete/Brick Joint Caulking –Between Office and Garage – East Side (15 LF)
- Interior Window Caulking - Office Area (100 LF – All throughout)
- Interior and Exterior Window Glazing - Garage Area (9 Large Window Openings Total – openings have multiple windows)
- Exterior Window Glazing – Front Door Window (1 Door/15 LF)

496-504 Boston Post Road

- Interior Wall Joint Caulking – Rear of Garage Bay – South Side (15 LF)
- Interior Window Caulking/Glazing/Sealant – Garage Bay Area (300/400/250 LF – All throughout)

Adjacent Building Materials Sampling Analytical Results Summary

Adjacent building materials samples were collected in the immediate vicinity of representative building sealant samples which exceeded the CTDEEP 1 ppm regulatory threshold. Samples included adjacent brick, concrete, asphalt, and soil samples. The concentration of PCBs

detected in adjacent materials was well below the CTDEEP 1 ppm regulatory threshold (or below method detection limits).

PCB Materials Removal and Disposal Summary

Based on the results of the PCB sealant and adjacent materials sampling, Langan recommends that the following PCB-containing materials be removed, managed, and disposed (i.e., removal under proper controls to minimize potential contaminant spread, and waste profiled accordingly to a facility that can accept this waste), as > 1 ppm and < 49 ppm PCB waste, in accordance with CTDEEP regulations. A removal and disposal summary is described following each identified PCB-containing material.

24 Rockview Street

- Interior Door Caulking – Interior Basement Door (1 Total), and Bilco Door Caulking - East Side of Building (15 LF)

  Remove Bilco door frame as single unit, with caulking. Saw cut adjacent basement concrete wall to a lateral distance of 6-inches from Bilco Door Caulk Joint and Interior Basement Door Caulk Joint (the concrete cut will incidentally remove the interior basement door frame caulking). Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

- Exterior Window Glazing - Throughout (25 Windows Total)

  Remove windows as single unit, with caulking and frames. Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

- Pipe Caulking – East Side of Building (3 Penetrations)

  Remove pipes and adjacent aluminum hose siding. Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

38 Rockview Street

- Shed Window – West Side (1 Window)

  Remove window as single unit, with caulking and frames. Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

488 Boston Post Road

- Exterior Concrete/Brick Joint Caulking – Between Office and Garage – East Side (15 LF)

  Remove caulking along with adjacent brick (approximately 3” at mortar joint) and concrete block (approximately 6” at mortar joint). Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

- Interior Window Caulking - Office Area (100 LF)

  Remove caulking along with adjacent wood trim. Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

- Interior and Exterior Window Glazing - Garage Area (9 Large Windows Total)

  Remove windows as single unit, with caulking and metal frames. Remove adjacent concrete block (approximately 6” at mortar joint). Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

- Exterior Window Glazing – Front Door Window (1 Door)

  Remove door as single unit. Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

496-504 Boston Post Road

- Interior Wall Joint Caulking – Rear of Garage Bay – South Side (15 LF)

  Remove caulking along with adjacent concrete block (approximately 6" at mortar joint). Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

- Interior Window Caulking/Glazing/Sealant – Garage Bay Area (300/400/250 LF)

  The above-mentioned three materials may be removed coincidentally. Remove windows as single unit, with caulking and metal frames. Remove adjacent wood trim. Dispose of in landfill permitted to accept materials with < 50 ppm PCBs.

  Select caulking/glazing/expansion joint and miscellaneous building sealant samples will require removal and disposal as mixed PCB (greater than 1ppm but less than 50 ppm PCBs) and ACM waste. In certain instances, adjacent materials in contact with the sealants (i.e. brick, concrete, and or metal surfaces will be removed coincidentally with the sealants, and disposed of as mixed PCB and ACM waste.

H. The General Contractor, or Remediation Subcontractor, is responsible for conducting all Work involving the removal, management, storage, and disposal of PCB waste materials in accordance with this specification, with all referenced documents included as part of this specification, with the standards and guidance documents listed below, and with all Federal, state and local regulations.

I. The General Contractor or Remediation Subcontractor shall provide all labor, materials, and equipment necessary to complete the work of this Section.

1.09 DEFINITIONS

A. The following definitions as used within this technical specification as well as references to specific sections of the Code of Federal Regulation section 40 CFR Part 761 are provided. Definitions are extracted in part from 40 CFR Part 761.3; for full definitions refer to the specified section of the regulations:
   1. CERCLA means the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601-9657).
   2. Containment means the enclosure within the building which establishes a contaminated area and surrounds the location where PCB and/or other toxic or hazardous substance removal is taking place and establishes a Control Work Area.
   3. Designated Facility means the off-site disposer or commercial storer of PCB-containing waste designated on the manifest as the facility that will receive a manifested shipment of PCB containing waste.
   4. Disposal means intentionally or accidentally to discard, throw away, or otherwise complete or terminate the useful life of PCBs and PCB items; Disposal includes spills, leaks, and other uncontrolled discharges of PCBs as well as actions related to containing, transporting, destroying, degrading, decontaminating, or confining PCBs and PCB items.
   5. DOT means the United States Department of Transportation.
   6. Excluded PCB Products means PCB materials which appear at concentrations less than 50 ppm as defined in 40 CFR §761.3.
   7. Fixed Object means mechanical equipment, electrical equipment, fire detection systems, alarms, and all other fixed equipment, fixtures, or other items which cannot be removed from the work area.

8. Generator of PCB Waste means any person whose act or process produces PCBs that are regulated for disposal under subpart D of 40 CFR Part 761, or whose act first causes PCBs or PCB Items to become subject to the disposal requirements of subpart D, or who has physical control over the PCBs when a decision is made that the use of the PCBs has been terminated and therefore is subject to the disposal requirements of subpart D. Unless another provision of 40 CFR Part 761 specifically requires a site-specific meaning, "generator of PCB waste" includes all of the sites of PCB waste generation owned or operated by the person who generates PCB waste.
9. HEPA means High Efficiency Particulate Air filtration efficiency of 99.97 percent down to 0.3 microns. Filtration provided on specialized vacuums and air filtration devices to trap particles.
10. Incinerator means an engineered device using controlled flame combustion to thermally degrade PCBs and PCB Items. Examples of devices used for incineration include rotary kilns, liquid injection incinerators, cement kilns, and high temperature boilers.
11. Laboratory means a facility that analyzes samples for PCBs and is unaffiliated with any entity whose activities involve PCBs.
12. Large PCB Mark—M L Mark means ML shall include letters and striping on a white or yellow background and shall be sufficiently durable to equal or exceed the life (including storage for disposal) of the PCB Article, PCB Equipment, or PCB Container. The size of the mark shall be at least 15.25 cm (6 inches) on each side. If the PCB Article or PCB Equipment is too small to accommodate this size, the mark may be reduced in size proportionately down to a minimum of 5 cm (2 inches) on each side.
13. Liquid PCBs means a homogenous flowable material containing PCBs and no more than 0.5 percent by weight non-dissolved material.
14. Manifest means the shipping document EPA form 8700-22 and any continuation sheet attached to EPA form 8700-22, originated and signed by the generator of PCB containing waste.
15. Mark means the descriptive name, instructions, cautions, or other information applied to PCBs and PCB Items, or other objects.
16. Marked means the marking of PCB Items and PCB storage areas and transport vehicles by means of applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets the requirements of the regulations.
17. Municipal Solid Wastes means garbage, refuse, sludges, wastes, and other discarded materials resulting from residential and non-industrial operations and activities, such as household activities, office functions, and commercial housekeeping wastes.
18. Non-liquid PCBs means materials containing PCBs that by visual inspection do not flow at room temperature (25°C or 77°F) or from which no liquid passes when a 100 g or 100 ml representative sample is placed in a mesh number 60 ±5 percent paint filter and allowed to drain at room temperature for 5 minutes.
19. Non-porous Surface means a smooth, unpainted solid surface that limits penetration of liquid containing PCBs beyond the immediate surface. Examples are: smooth un-corroded metal; natural gas pipe with a thin porous coating originally applied to inhibit corrosion; smooth glass; smooth glazed ceramics; impermeable polished building stone such as marble or granite; and high density plastics, such as polycarbonates and melamines that do not absorb organic solvents.
20. On-site means within the boundaries of a contiguous property unit.
21. PCB and PCBs means any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance. Refer to §761.1(b) for applicable concentrations of PCBs. PCB and PCBs as contained in PCB items are defined in §761.3. PCB Article means any manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. "PCB Article" includes capacitors, transformers, electric motors, pumps, pipes and any other manufactured item (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical

composition during its end use or only those changes of composition which have no commercial purpose separate from that of the PCB Article.

22. PCB Article Container means any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs.
23. PCB Bulk Product Waste means waste derived from manufactured products containing PCBs in a non-liquid state, at any concentration where the concentration at the time of designation for disposal is >50 ppm PCBs. PCB bulk product waste does not include PCBs or PCB Items regulated for disposal under §761.60(a) through (c), §761.61, §761.63, or §761.64. PCB bulk product waste is further defined in 40 CFR §761.3. Note in accordance with October 2012 reinterpretation from the U.S. Environmental Protection Agency (EPA), adjacent porous materials in contact with PCB Bulk Products shall be considered PCB Bulk Product Material for disposal purposes.
24. PCB Capacitor means any capacitor that contains >500 ppm PCB. Concentration assumptions applicable to capacitors appear under §761.2.
25. PCB Container means any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB Articles and whose surface(s) has been in direct contact with PCBs.
26. PCB — Containing Materials for purposes of this section means those materials containing <50 ppm which have been documented as Excluded PCB Products and therefore not subject to the requirements of EPA regulation 40 CFR part 761, but include CTDEEP regulated concentrations of PCBs requiring proper removal and disposal in accordance with this section.
27. PCB Equipment means any manufactured item, other than a PCB Container or a PCB Article Container, which contains a PCB Article or other PCB Equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.
28. PCB Item means any PCB Article, PCB Article Container, PCB Container, PCB Equipment, or anything that deliberately or unintentionally contains or has as a part of it any PCB or PCBs.
29. PCB Waste(s) means those PCBs and PCB Items that are subject to the disposal requirements of subpart D in 40 CFR Part 761.
30. Porous Surface means any surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal; corroded metal; fibrous glass or glass wool; unglazed ceramics; ceramics with a porous glaze; porous building stone such as sandstone, travertine, limestone, or coral rock; low-density plastics such as Styrofoam and low-density polyethylene; coated (varnished or painted) or uncoated wood; concrete or cement; plaster; plasterboard; wallboard; rubber; fiberboard; chipboard; asphalt; or tar paper. For purposes of cleaning and disposing of PCB remediation waste, porous surfaces have different requirements than non-porous surfaces.
31. RCRA means the Resource Conservation and Recovery Act (40 U.S.C. 6901 et seq.).
32. Standard Wipe Sample means a sample collected for chemical extraction and analysis using the standard wipe test as defined in §761.123. Except as designated elsewhere in part 761, the minimum surface area to be sampled shall be 100 cm2.
33. Storage for Disposal means temporary storage of PCBs that have been designated for disposal.
34. SW-846 means the document having the title "SW-846, Test Methods for Evaluating Solid Waste,"
35. Totally Enclosed Manner means any manner that will ensure no exposure of human beings or the environment to any concentration of PCBs.
36. Transfer Facility means any transportation-related facility including loading docks, parking areas, and other similar areas where shipments of PCB waste are held during the normal course of transportation. Transport vehicles are not transfer facilities under this definition, unless they are used for the storage of PCB waste, rather than for actual transport activities. Storage areas for PCB waste at transfer facilities are subject to the storage facility standards of §761.65, but such storage areas are exempt from the approval

requirements of §761.65(d) and the recordkeeping requirements of §761.180, unless the same PCB waste is stored there for a period of more than 10 consecutive days between destinations.

37. Transporter of PCB Waste means for the purposes of subpart K of 40 CFR Part 761, any person engaged in the transportation of regulated PCB waste by air, rail, highway, or water for purposes other than consolidation by a generator.
38. Transport Vehicle means a motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (e.g., trailer, railroad freight car) is a separate transport vehicle.
39. TSCA means the Toxic Substances Control Act (15 U.S.C. 2601 et seq.).

1.10 SUBMITTALS

A. A pre-abatement meeting shall occur with the PCB Abatement Contractor, Owner or the Owner's Authorized Representative, and environmental consultant two weeks prior to commencement of work. The following documents shall be submitted immediately upon project award to the Owner prior to commencement of PCB Removal work:

1. Site Specific Health and Safety Plan (HASP): The PCB Abatement Contractor shall prepare a site specific HASP plan for protection of workers and control of the work site in accordance with OSHA regulatory requirements. The HASP shall govern all work conducted at the Site during the removal of PCB-Containing Materials and related debris; waste handling, sampling, waste management; and waste transportation. At a minimum, the HASP shall address the requirements set forth in 29 CFR 1910.120, as further outlined below:
    - Health and Safety Organization
    - Site Description and Hazard Assessment
    - Training
    - Medical Surveillance
    - Work Areas
    - Personal Protective Equipment
    - Personal Hygiene and Decontamination
    - Standard Operating Procedures and Engineering Controls
    - Emergency Equipment and First Aid Provisions
    - Equipment Decontamination
    - Air Monitoring
    - Telephone List
    - Emergency Response and Evacuation Procedures and Routes
    - Site Control
    - Permit-Required Confined Space Procedures
    - Spill prevention and Containment Plan
    - Heat and Cold Stress
    - Record Keeping
    - Community Protection Plan
2. Training Documentation: Documentation of OSHA 40-Hour HAZWOPER Training for all employees and subcontractors to be used for the removal work, and 8-Hour HAZWOPER Supervisor Training for the designated on-site Health and Safety Officer for the abatement work.
3. PCB and or other Toxic or Hazardous Substances Disposal Plan: A written plan that details the PCB Abatement Contractor's plan for transportation and disposal of PCB-Containing Materials or other Toxic or Hazardous Substance wastes generated during the project. The Disposal Plan shall identify:
    - Waste packaging, labeling, placarding, and manifesting procedures.

- The name, address, and 24-hour contact number for the proposed treatment or disposal facility or facilities to which waste generated during the project will be transported.
- The name, address, contact person(s) and state-specific permit numbers for proposed waste transporters, and USEPA and DOT identification number for firms that will transport PCB Containing Material waste.
- The license plate numbers of vehicles to be used in transporting of the waste from the Site to the disposal facility.
- The route(s) by which the waste will be transported to the designated disposal facility, and states or territories through which the waste will pass.

4. Material Safely Data Sheets: Material Safety Data Sheets (OSHA Form 174 or equivalent) and manufacturer's information shall be provided for all chemicals and materials to be used during the project including but not limited to specialty cleaners and chemical stripping products.

B. The following documents shall be submitted to the Owner within fifteen (15) work days following removal of waste from the Site:
1. Waste Profile Sheets
2. Pre-Disposal Analysis Test Results (If required by disposal facility)
3. Manifests signed by the disposal facility
4. Tipping Receipts provided by the disposal facility
5. Certification of Final Treatment/Disposal signed by the responsible disposal facility official.

C. PCB Removal Work Closeout Submittals:
1 Disposal Site Receipts: Copy of waste shipment record and disposal site receiptshowing that PCB-Containing Materials or other Toxic or Hazardous Substances materials have been properly disposed.

D. Product Data: Catalog sheets, specifications, and application instructions for any removal products, if used.

1.11 REGULATIONS AND STANDARDS

A. The PCB Abatement Contractor shall be solely responsible for conducting this project and supervising all work in a manner that will be in conformance with all federal, state, and local regulations and guidelines pertaining to PCB Containing Material removal. Specifically, The PCB Abatement Contractor shall comply with the requirements of the following as applicable to the work to be performed:
1. Toxic Substance Control Act (TSCA) (40 CFR Part 761).
2. Comprehensive Environmental Response, Compensation, and Liability Act (Superfund Law).
3. Department of Transportation (DOT) regulations - DOT regulation HM-181 regulates transportation of hazardous materials, including PCBs.
4. Occupational Safety and Health Administration (OSHA) - OSHA regulates workers' safety and exposure to a variety of chemicals including PCBs.
5. Connecticut Basic Building Code (BOCA) (including Connecticut Supplements);
6. Life Safety Code (NFPA); and
7. Local health and safety codes, ordinances or regulations pertaining to hazardous materials remediation and all national codes and standards including ASTM, ANSI, and Underwriter's Laboratories.

1.12 FINAL VISUAL CLEARANCE

A. Following the completion of the work, the Consultant shall perform a final visual inspection of the work area per guidelines and State of Connecticut CTDEEP regulations to assess that the above-indicated PCB-containing materials were removed.

1.13 POSTING AND RECORD MAINTENANCE REQUIREMENTS

A. The following items shall be conspicuously displayed proximate but outside of removal work areas.
   1. Exit Routes -Emergency exit procedures and routes
   2. Emergency Phone Numbers - A list indicating the telephone numbers and locations of the local hospital(s); the local emergency squad; the local fire department; the local police department; the Poison Control Center; Chemical Emergency Advise (CHEMTREC); the local Department of Health's local office; the PCB Abatement Contractor (on-site and after hours numbers); and the environmental consultant (on-site and after hours numbers).
   3. Warning Signs - Warning signs shall be in English and the language of any workers on-site who do not speak English, and be of sufficient size to be clearly legible and display the following or similar language in accordance with 29 CFR 1910.1200:

WARNING
HAZARDOUS WASTE WORK AREA
PCBs-POISON
NO SMOKING, EATING OR DRINKING
AUTHORIZED PERSONNEL ONLY
PROTECTIVE CLOTHING IS REQUIRED IN THIS AREA

   4. In addition, all entrances to work areas shall be posted with a PCB M L large marker.

B. The PCB Abatement Contractor shall maintain the following items on-site and available for review by all employees and authorized visitors:
   1. Contractor's Project Specific Health and Safety Plan
   2. Certificates of Training for all employees and the project Supervisor
   3. Codes, Standards and Publications
   4. Material Safety Data Sheets (MSDS) for all chemicals used during the project.
   5. Copies of The PCB Abatement Contractor's written hazard communication, respiratory protection, and confined space entry programs.

C. Fees, Permits, and Licenses. The PCB Abatement Contractor shall pay all licensing fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or processing in the performance of the work specified in this Section.
   1. The PCB Abatement Contractor shall be solely responsible for costs, damages, or losses resulting from any infringement of these patent rights or copyrights. The PCB Abatement Contractor shall hold the Owner and the Owner's Authorized Representative harmless from any costs, damages, and losses resulting from any infringement of these patent rights or copyrights.
   2. The PCB Abatement Contractor shall be responsible for securing all necessary permits for work under this Section, including hauling, removal, and disposal, fire, and materials usage, or any other permits required to perform the specified work.

1.14 MINIMUM REQUIREMENTS FOR WORKER HEALTH AND SAFETY

A. The PCB Abatement Contractor is responsible and liable for the health and safety of all on-site personnel and the off-site community affected by the project. All on-site workers or other persons entering the abatement work areas, decontamination areas or waste handling and staging areas shall be knowledgeable of and comply with the requirements of the site specific Health and Safety Plan at all times. The PCB Abatement Contractor's HASP shall comply with all applicable federal, state, and local regulations protecting human health and the environment from the hazards posed by the work to be performed under this project.

B. Consistent disregard for the provisions of the HASP shall be deemed as sufficient cause for immediate stoppage of work and termination of the Contract or any Sub Contracts without compromise or prejudice to the rights of the Owner or the Owner's Authorized Representative.

C. Any discrepancies between the PCB Abatement Contractor's HASP and these specifications or federal and state regulations shall be resolved in favor of the more stringent requirements that provide the highest degree of protection to the project personnel and the surrounding community and environment

D. In addition to exposure concerns relating to the presence of PCBs, other health and safety considerations will apply to the work. The PCB Abatement Contractor shall be responsible for recognizing such hazards and shall be responsible for the health and safety of Contractor employees at all times. It is the PCB Abatement Contractor's responsibility to comply with all applicable health and safety regulations.

E. The HASP shall be reviewed by all persons prior to entry into the abatement, decontamination, or waste staging areas, whether a representative of the PCB Abatement Contractor, owner, architect/engineer, environmental consultant, subcontractor(s), waste transporter or federal, state or local regulatory agency. Such review shall be acknowledged and documented by the PCB Abatement Contractor's Health and Safety Officer by obtaining the name, signature, and affiliation of all persons reviewing the HASP.

F. The HASP shall be maintained so as to be readily accessible and reviewable by all site personnel throughout the duration of the abatement project and until all waste materials are removed from the Site and disposed of at the appropriate disposal facility.

G. The PCB Abatement Contractor's on-site Health and Safety Officer shall be responsible for ensuring that project personnel and site visitors are informed of and comply with the provisions of the HASP at all times during the project.

1.15 WORK AREAS AND ZONES

A. The PCB Abatement Contractor shall lay-out and clearly identify work areas in the field. Access by equipment, site personnel, and the public to the work areas shall be limited as follows:

1. Abatement Zone: The Abatement Zone(s) shall consist of all areas where removal of PCB-Containing Materials and other Toxic or Hazardous Substances and waste handling and staging activities are on-going and the immediately surrounding locale or other areas where contamination could occur. Each Abatement Zone for purposes of removal of PCB-Containing Materials or other Toxic or Hazardous Substances for disposal shall be performed within a regulated area (refer to section 3.1 and 3.2) to isolate work areas from non-work areas. The regulated area shall be visibly delineated with appropriate warning signs at all approaches to Abatement (including a large PCB M L marker), and be restricted from access by all persons except those directly necessary for the completion of the respective abatement tasks. The Abatement Zones shall be relocated and delineated as necessary as work progresses from one portion of the project site to another, to limit access to each abatement area and to minimize risk of exposure to site workers and the general public. Access shall be controlled at the periphery of the Abatement Zones to regulate the flow of personnel and equipment into and out of each zone and to help verify that proper procedures for entering and exiting are followed. All persons within the Abatement Zones shall wear the appropriate level of protection established in the HASP.
2. Decontamination Zone: The Decontamination Zone is the transition zone between the abatement area and the clean support zone of the project site, and is intended to reduce the potential for contaminants from being dispersed from the Abatement Zone to clean areas of the Site. The Decontamination Zone shall consist of a buffer area surrounding each Abatement Zone through which the transfer of equipment, materials, personnel and containerized waste products will occur and in which decontamination of equipment, personnel, and clothing will occur. The Decontamination Zones shall be constructed as a remote three chamber decontamination unit for workers and a two chamber equipment room for waste load out as detailed in Section 3.3. All emergency response and first aid equipment shall be readily maintained in these Zones. All protective equipment and

clothing shall be removed or decontaminated in the Decontamination Zone prior to exiting to the Support Zone.

3. Support Zone: The Support Zone will consist of the area outside the Decontamination Zones and the remainder of the project site. Administrative and other support functions and any activities that by nature need not be conducted in the Abatement or Decontamination Zone related to the project shall occur in the Support Zone, Access to the Abatement and Decontamination Zones shall be controlled by the Health and Safety Officer and limited to those persons necessary to complete the abatement work and which have reviewed and signed the HASP.

1.16 PERSONNEL PROTECTIVE EQUIPMENT

A. The PCB Abatement Contractor shall be responsible to determine and provide the appropriate level of personal protective equipment in accordance with applicable regulations and standards necessary to protect the PCB Abatement Contractor's employees from all hazards present.

B. The PCB Abatement Contractor shall provide all employees with the appropriate safety equipment and protective clothing to ensure an appropriate level of protection for each task, taking into consideration the chemical, physical, ergonomic and biological hazards posed by the Site and work activities.

C. The PCB Abatement Contractor shall establish in the HASP criteria for the selection and use of personal protective equipment (PPE). All personnel must utilize proper Personal Protective Equipment (PPE) during all work activities. Proper PPE may vary depending on the job task, but may include disposable gloves, disposable rubber boots, steel-toe boots, Tyvek suits, respirators, hard hats, hearing protection, and/or eye protection.

D. The PPE to be utilized for the project shall be selected based upon the potential hazards associated with the project site and the work to be performed. Appropriate protective clothing shall be worn at all times within the Abatement Zone.

E. The PCB Abatement Contractor shall provide the appropriate level of respiratory protection to all field personnel engaged in activities where respiratory hazards exist or there is a potential for such hazard to exit.

F. The PCB Abatement Contractor shall provide, as necessary, protective coveralls, disposable gloves and other protective clothing for all personnel that will be actively involved in abatement activities or waste handling activities or otherwise present in the Abatement Zones. Coveralls shall be of Tyvek or equivalent material. Should the potential for exposure to liquids exist, splash resistant disposable suits shall be provided and utilized. Provide sufficient quantities of protective clothing to assure that enough complete disposable outfits are available for each individual performing remediation Work each day.

G. Protective coveralls, and other protective clothing shall be donned and removed within the Decontamination Zone and shall be disposed of at the end of each day. Ripped coveralls shall be immediately replaced after appropriate decontamination has been completed to the satisfaction of the Health and Safety Officer. Protective clothing shall not be worn outside of the Decontamination Zone.

H. Hard Hats, protective eyewear, rubber boots and or other non-skid footwear shall be provided by the PCB Abatement Contractor as required for workers and authorized visitors.

I. All contaminated protective clothing, respirator cartridges and disposable protective items shall be placed into proper containers to be provided by the PCB Abatement Contractor for transport and proper disposal in accordance with 40 CFR 262.

1.17 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

A. The PCB Abatement Contractor shall provide and maintain at the Site, at a minimum, the following Emergency and First Aid Equipment:

1. Fire Extinguishers: A minimum one (1) fire extinguisher shall be supplied and maintained at the Site by the PCB Abatement Contractor throughout the duration of the project. Each extinguisher shall be a minimum of a 20 pound Class ABC dry fire extinguisher with Underwriters Laboratory approval per 29 CFR 1910.157.
2. First Aid Kit: A minimum 01 one (1) first aid kit meeting the requirements of 29 CFR 1910,151 shall be supplied and maintained at the Site by the PCB Abatement Contractor throughout the duration of the project.
3. Communications: Telephone communications (either cellular or land line) shall be provided by The PCB Abatement Contractor for use by site personnel at all times during the project.

B. The Health and Safely Officer shall be notified immediately in the event of personal injury, potential exposure to contaminants, or other emergency. The Health and Safety Officer shall then immediately notify the Owner's Authorized Representative.

1.18 STANDARD SAFETY AND HEALTH PROCEDURES AND ENGINEERING CONTROLS

A. The following provisions shall be employed to promote overall safety, personnel hygiene and personnel decontamination:
1. Each Contractor or Subcontractor shall ensure that all safety equipment and protective clothing to be utilized by its personnel is maintained in a clean and readily accessible manner at the Site.
2. All prescription eyeglasses in use on this project shall be safety glasses conforming to ANSI Standard Z87.1. No contact lenses shall be allowed on the Site.
3. Prior to exiting the delineated Decontamination Zone(s), all personnel shall remove protective clothing, and place disposable items in appropriate disposal containers to be dedicated to that purpose. Following removal of PPE, personnel shall thoroughly wash and rinse their face, hands, arms and other exposed areas with soap and tap water wash and subsequent tap water rinse. A fresh supply of tap water shall be provided at the Site on each work day by the PCB Abatement Contractor for this purpose.
4. All PPE used on-site shall be decontaminated or disposed of at the end of each work day. Discarded PPE shall be placed in sealed DOT approved 55-gallon barrels for off-site disposal.
5. Respirators, if necessary due to an upgrade to Level C PPE, shall be dedicated to each employee, and not interchanged between workers without cleaning and sanitizing.
6. Eating, drinking, chewing gum or tobacco, smoking, and any other practice that increases the likelihood of hand to mouth contact shall be prohibited within the delineated abatement and decontamination work zones. Prior to performing these activities, each employee shall thoroughly cleanse their face, hands, arms and other exposed areas.
7. All personnel shall thoroughly cleanse their face hands, arms and other exposed areas prior to using toilet facilities.
8. No alcohol, tobacco, illicit drugs or firearms will be allowed on the Site at any time.
9. Contact with potentially contaminated surfaces should be avoided, if possible. Field personnel should minimize walking through standing water/puddles, mud or other wet or discolored surfaces; kneeling on ground; and placing equipment, materials or food on ground or other potentially contaminated surface.
10. The use of the "Buddy System shall be employed at all times while conducting work at the Site. Each employee shall frequently monitor other workers for signs of heat stress or chemical exposure or fatigue: periodically examine others PPE for signs of wear or damage; routinely communicate with others; and notify the Health and Safety Officer in the case of an emergency.

B. Workers must wear protective suits, protective gloves, eye protection and a minimum of half-face respirator with HEPA filter cartridge for all projects. Respiratory protection shall be in accordance with OSHA regulation 1910.134 and ANSI Z88.2.

C. Workers must be trained as per OSHA and USEPA requirements, have medical clearance and must have recently received pulmonary function test (PFT) and respirator fit tested by a trained professional.
   1. A personal air sampling program shall be in place as required by OSHA.
   2. The use of respirators must also follow a complete respiratory protection program as specified by OSHA.

1.19 INDEPENDENT INSPECTION AND MONITORING

A. This section describes independent visual inspection and monitoring work being performed on behalf of the Owner. This work is not in the Contract Sum. This section describes monitoring carried out by the Owner's Consultant (Langan) to verify that the building beyond the work area and the outside environment remains uncontaminated.

B. The purpose of the Owner's Consultant's monitoring is to detect faults in the work area isolation such as:
   1. Contamination of the building outside of the work area by PCB dust.
   2. Failure of filtration or rupture in the differential pressure system as applicable.
   3. Contamination of the outside of the containment.

C. Should any of the above occur, the PCB Abatement Contractor shall immediately cease removal activities until the fault is corrected. Do not recommence work until authorized by the Owner's Consultant.

D. The Owner's Consultant may monitor the Work Area. The purpose of this monitoring will be to detect dust outside containment, which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination.

E. The Owner's Consultant will perform on-site monitoring throughout the course of the project, as follows:
   1. All work procedures shall be continuously monitored by the Consultant to assure that areas outside the designated work locations in the buildings will not be contaminated.
   2. Prior to work on any given day, The PCB Abatement Contractor's designated "competent person" shall discuss the day's work schedule with the Consultant to evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the building or the employees. This includes a visual survey of the work area and the decontamination of the building or the employees.

PART 2 PRODUCTS

2.01 MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with PCBs shall be decontaminated or disposed of as PCB waste.

C. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to the job site with factory label indicating 6 mil.

D. Polyethylene disposable bags shall be six (6) mil with pertinent pre-printed label. Tie wraps for bags shall be plastic, five (5) inches long (minimum), pointed and looped to secure filled plastic bags.

E. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

F. Cleaning Products: Contractor shall at their discretion utilize specialty cleaning products such as Capsur, TechXtract or other cleaners for use in decontaminating porous and nonporous surfaces to remain. All such products shall be utilized in accordance with manufacturer's specifications as intended. PCB Abatement Contractor shall ensure appropriate use and disposal associated with use in accordance with the MSDS sheets for each product utilized.

G. The PCB Abatement Contractor shall have available spray equipment capable of mixing wetting agent with water and capable of generating sufficient pressure and volume and having sufficient hose length to reach all areas with PCBs.

H. HEPA filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports where PCB-containing materials may be disturbed.

2.02 TOOLS AND EQUIPMENT

A. The PCB Abatement Contractor shall provide all tools and equipment necessary for PCB removal.

B. The PCB Abatement Contractor's air monitoring professional shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements.

C. The PCB Abatement Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape and air filters.

D. The PCB Abatement Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and electrical power sources (such as generators). Any electrical connection work affecting the building electrical power system shall be performed by a State of Connecticut licensed electrician.

E. The PCB Abatement Contractor shall have available shower stalls and plumbing to support same to include sufficient hose length and drain system or an acceptable alternate.

F. Exhaust air filtration system units shall contain HEPA filter(s) capable of sufficient air exhaust to create negative pressure of -0.02 inches of water within enclosure with respect to outside area. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of four (4) air changes per hour within the enclosure. No air movement system or air filtering equipment shall discharge unfiltered air outside.

G. Vacuum units, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

PART 3 EXECUTION

3.01 WORKER PROTECTION/TRAINING

A. Protection of Existing Construction: Perform PCB-Containing Materials removal work without damage or contamination of adjacent areas, soil, and existing construction.

B. Prior to commencement of PCB removal activities at each work area, a regulated area shall be constructed by The PCB Abatement Contractor to capture and contain all materials removed during the abatement. Regulated area procedures referenced for the abatement zone must be utilized for PCB-Containing Materials removal.

C. During all removal activities, the PCB Abatement Contractor shall maintain control of all entrances and exits to the project site to ensure only authorized personnel enter the work areas

and are afforded proper personal protective equipment and as required respiratory protection. All approaches to work areas shall be demarcated with appropriately worded warning signs.

D. Work zones shall be established in accordance with this section to include abatement zone, decontamination zone and support zone.

E. Negative pressure containments shall be constructed consisting of two layers of 4-mil polyethylene sheeting on wall surfaces and two layers of 6-mil polyethylene sheeting on floor surfaces if required.

F. All openings such as unit ventilation, ducts, grilles, lights, doorways, and windows shall be securely sealed with a single layer of 6-mil polyethylene sheeting.

G. Containments shall remain in place throughout work to collect dust and debris resulting from PCB removal. All debris generated during operations including but not limited to visible building materials, dust, and debris shall be HEPA vacuumed continuously throughout the work shift and at the end of a work shift to avoid accumulation. Any tears or rips that occur in protections shall be repaired or removed and replaced with new protections.

H. Warning Signage: Post warning signs in accordance with 29 CFR 1910.1200 at all approaches to the work area. Signs shall be conspicuously posted to permit a person to read signs and take precautionary measures to avoid exposure to PCBs or other Toxic or Hazardous Substances. These signs should include the large PCB MI, markers at each entrance to the work area.

I. Waste Containers for PCB-Containing Materials: Appropriate PCB waste containers shall be placed adjacent to abatement zones. Containers shall be lined covered and secured. The PCB waste containers shall be properly marked as described in 40 CFR part 761.40 and 45. Marking shall include a large PCB M L marker.

3.02 DECONTAMINATION SYSTEM

A. The PCB Abatement Contractor shall establish contiguous to the work area, a decontamination enclosure consisting of equipment room, shower room, and clean room in series. The only access between contaminated and uncontaminated areas shall be through this decontamination enclosure. If it is not feasible to set-up a contiguous decontamination unit, The PCB Abatement Contractor shall establish a remote decontamination unit.

B. Access between rooms in the decontamination system shall be through double flap curtain openings. The clean room, shower and equipment room within the decontamination enclosure, shall be completely sealed ensuring that the sole source of airflow through this area originates from uncontaminated areas outside the work area.

C. The PCB Abatement Contractor shall establish contiguous with the work area an equipment decontamination enclosure consisting of two (2) totally enclosed chambers divided by double flap curtained opening. This enclosure must be constructed so as to ensure no personnel enter or exit through this unit.

D. Occupied areas and/or building space not within the work areas shall be separated from PCB abatement work areas by means of airtight barriers.

E. Construct the decontamination system with wood or metal framing, 3/8" sheathing and cover both sides with a double layer of six (6) mil polyethylene sheeting, spray glued or taped at the joints. Caulk joints must be watertight at floor, walls, and ceiling.

F. The PCB Abatement Contractor and the Consultant shall visually inspect the barrier several times daily to assure an effective seal and the PCB Abatement Contractor shall repair defects immediately.

3.03 PCB-CONTAINING MATERIAL REMOVAL — PCB <50 PPM

A. PCB-Containing Materials summarized above containing less than 50 ppm and are to be removed from specified locations for proper disposal.

B. Materials shall be removed in a manner which does not breakdown the materials into fine dust or powder to the extent feasible. Equipment and tools to be utilized shall include hand tools and mechanical equipment such as demolition hammers to remove materials from adjacent substrates. Mechanical removal equipment shall as appropriate be fitted with dust collection systems.

C. Any dry or brittle materials or other PCB waste containing PCB <50 ppm shall be removed with additional engineering controls such as use of a HEPA vacuum to remove accumulated dust or debris during removal.

D. Sequence of removal shall follow the following general requirements:
   1. Construction of a negative pressure containment area shall be performed.
   2. Removal of PCB containing materials using hand tools and/or mechanical equipment fitted with dust collection systems.
   3. Use a solvent as appropriate to completely remove all visible materials for disposal as PCB Waste <50 ppm and asbestos.
   4. Clean all surfaces of adjacent materials using appropriate cleaning products or solvents to completely remove all dust and debris.

E. Waste shall be immediately containerized in 6-mil polyethylene disposal bags then placed into steel 55-gallon DOT approved drums for disposal. Waste generated includes PCB <50 ppm. The waste shall be containerized in six-mil polyethylene bags or sheeting. Facilities proposed for disposal shall be permitted to accept waste with PCB <50 ppm. See also requirements for asbestos waste disposal in Section 02 82 13.

F. The use of minimal quantities of water to moisten the generated dust prior to collection shall be utilized. Under no circumstances shall the PCB waste show evidence of free liquid water, pooling, or ponding within the waste stream. Any liquid used to wet the dust and debris to control fugitive emissions shall be properly containerized and decontaminated in accordance with 40 CFR Part §761.79 (b)(1) or disposed of in accordance with40 CFR Part §761.60 (a).

3.04 CLEANING AND DECONTAMINATION

A. The PCB Abatement Contractor shall be responsible for complete cleaning and decontamination of the Abatement Zone upon completion of work. The Abatement Zone will be required to meet proposed final visual inspection requirements.

B. The PCB Abatement Contractor shall utilize HEPA vacuum and wet cleaning products to remove all visible dust and debris from all surfaces within the work area. If specialty products are utilized The PCB Abatement Contractor shall utilize in accordance with manufacturer's specifications including any additional safety and disposal requirements for such use.

C. Cleaning of containment barriers shall be performed prior to removal leaving critical barriers at openings, decontamination units and negative air filtration devices in place until results of post verification sampling indicate acceptable limits. Cleaning shall be performed from ceiling to floors.

D. Any liquid used to wet the dust and debris to control fugitive emissions shall be collected and decontaminated in accordance with 40 CFR Part §761.79 (b)(1) or disposed of in accordance with §761.60 (a).

E. All rags and other cleaning materials used to clean shall also be properly disposed as PCB Waste. All PCB Waste shall be stored for disposal in accordance with 40 CFR Part §761.61(a)(5)(v)(A). All waste containers shall be appropriately marked in accordance with 40 CFR Part §761.40 and §761.45.

F. Equipment to be utilized in connection with the removal of PCB Containing Materials including waste collection or that will or may come in direct contact with the site contaminants shall be decontaminated prior to leaving the Site to prevent migration of the contaminated residues from the project site. Decontamination shall be in accordance with 40 CFR Part §761.79 and Subpart S procedures.

G. All non-disposable equipment and tools employed in the course of the project will be decontaminated at the conclusion of each work day through the following sequence:
   1. Initial tap water rinse, to remove gross soil
   2. Tap water and hexane or equivalent wash
   3. Tap water rinse
   4. Second tap water and hexane or equivalent wash
   5. Second tap water rinse

H. The wash water and decontamination liquids shall be captured and containerized in DOT approved 55-gallon barrels for off-site disposal.

3.05 CONSULTANT'S RESPONSIBILITIES

A. The PCB Abatement Contractor may monitor air quality within the work area to ascertain the protection of employees and to comply with OSHA regulations.

B. The Consultant's project monitor shall provide continual evaluation of the condition of the building during removal, using his/her best professional judgments in respect to the State of Connecticut Department of Energy and Environmental Protection guidelines.

3.06 CONSULTANT'S INSPECTION RESPONSIBILITIES

A. Consultant shall conduct inspections throughout the progress of the removal project. Inspections shall be conducted in order to document the progress of the removal work as well as the procedures and practices employed by the PCB Abatement Contractor.

B. The Consultant shall perform the following inspections during the course of abatement activities:
   1. Pre-commencement Inspection. Pre-commencement inspections shall be performed at the time requested by the abatement Contractor. The Consultant shall be informed 12 hours prior to the time the inspection is needed. If, during the course of the pre-commencement inspection, deficiencies are found, the PCB Abatement Contractor shall perform the necessary adjustments in order to obtain compliance.
   2. Work Area Inspections. Work area inspections shall be conducted on a daily basis at the discretion of the Consultant. During the course of the work inspections, the Consultant shall observe the PCB Abatement Contractor's removal procedures, verify barrier integrity, assess project progress, and inform the abatement Contractor of specific remedial activities if deficiencies are noted.
   3. Final Visual Inspection. The Consultant, upon the request of PCB Abatement Contractor, shall conduct final visual inspection. The final visual inspection shall be conducted after completion of the final cleaning procedures. The final visual inspection shall verify that all PCB- Containing Material and residual debris have been removed from the work area. If, during the course of the inspection, the Consultant identifies residual dust or debris, the PCB Abatement Contractor shall comply with the request of the Consultant in order to render the area "dust free".

3.07 MARKING OF WASTE CONTAINERS

A. All waste containers must be marked with the name of the waste contained; the date in which the first material was placed in the vessel; and the last date at which addition of waste occurred. All waste containers must be marked with a large PCB M L marker.

B. All waste containers containing PCB Waste and contaminated debris, containment system components, used personnel protective equipment, personal and equipment wash water and

decontamination fluids, or other wastes generated during the abatement work shall be labeled as follows:

DOT Class 9 UN3432 (solid)
Or UN2315 (liquid) PCB Waste
RQ
Waste for Disposal
Federal law prohibits improper disposal.
If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator's Information:
Manifest Tracking No.:
Accumulation Start Date:
EPA ID No.:
EPA Waste No.:
Total Weight:
Container No.:
HANDLE WITH CARE!

In addition, these containers must be marked with a PCB M_L marker.

C. Such marking must be durable, in English and printed on or affixed to the surface of the package or on a label, tag or sign; displayed on a background of sharply contrasting color; un-obscured by labels or attachments and located away from any other marking (such as advertising) that could substantially reduce its effectiveness.

3.08 ON-SITE WASTE MANAGEMENT AND DISPOSAL OF SOLID HAZARDOUS WASTES

A. All solid waste material, containment system components, used personnel protective equipment, and other solid wastes generated during the work, shall be placed directly in appropriate waste receptacles immediately upon removal from its in-situ position. Suitable waste receptacles may consist of roll-off containers or DOT-approved 55-gallon barrels.

B. The PCB Abatement Contractor shall be responsible for all packaging, labeling, transport, disposal, and record-keeping associated with PCB or PCB contaminated waste in accordance with all federal, state, and local regulations.

C. The PCB Abatement Contractor shall ensure that the person transporting the waste holds a valid permit issued in accordance with appropriate federal, state, and local regulations.

D. The PCB Abatement Contractor shall provide to the transporter at the time of transfer appropriate shipping records or uniform waste manifests as required by the federal, state, and local regulations with a copy to the Owner and Owner's Authorized Representative.

E. The PCB Abatement Contractor shall maintain proper follow up procedures to assure that waste materials have been received by the designated waste site in a timely manner and in accordance with all federal, state, and local regulations.

F. The PCB Abatement Contractor shall assure that disposal of PCB Waste material is at a facility approved to accept such waste and shall provide a tracking/manifest form signed by the landfill's authorized representative.

G. If roll-off containers are to be utilized for containerization of the abatement wastes the following shall apply:
   1. All roll-off containers or other similar vessels utilized shall be watertight and lined with 6-mil polyethylene sheeting or equivalent impermeable lining, and equipped with a secured and impermeable cover.

2. The impermeable cover shall remain securely in place at all times when material is not being actively placed in the vessels. The PCB Abatement Contractor shall be responsible for ensuring that the cover remains securely intact until the container is removed from the Site.

H. If 55-Gallon barrels are to be utilized for waste containerization, the barrels shall consists of suitable DOT-approved 55-gallon barrels that are watertight and free of corrosion, perforations, punctures, or other damage. All barrels shall be securely covered and sealed at the conclusion of each work day.

I. The waste containers shall remain staged at the Site with a secure impermeable cover in place until the materials are transported from the Site to be delivered to the designated disposal facility.

J. A waste roll-off and barrel staging area shall be designated prior to initiation of the abatement work, and approved by the Owner's Authorized Representative.

K. Materials containing <50 ppm will be transported to one of the following facilities:
   1. A facility permitted, licensed, or registered by a State to manage municipal solid waste subject to part 40 CFR Part §761.258.
   2. A facility permitted, licensed, or registered by a State to manage non-municipal non-hazardous waste subject to 40 CFR Part §761. 257.5 through 257.30, as applicable.
   3. A hazardous waste landfill permitted by EPA under section 3004 of RCRA, or by a State authorized under section 3006 of RCRA.
   4. Waste manifests must show chain of custody. Provide required copies of the waste shipment records for wastes to the Owner as required.

L. Any PCB Liquid Water Waste shall be properly containerized and decontaminated in accordance with 40 CFR Part §761.79 (b)(1) or disposed of in accordance with 40 CFR Part §761.60 (a).

M. Any chemicals, solvents or other products used during decontamination shall be properly containerized as PCB Liquid Waste. Waste must be properly decontaminated or disposed in accordance with 40 CFR Part §761.60 (a) or 40 CFR Part §761.79 (g). PCB Liquid Waste shall be transported by a licensed hauler and shipped for treatment or disposal. Provide required copies of the uniform waste manifests for hazardous wastes to the Owner, waste generation State and waste destination State as required.

N. All contaminated waste shall be carefully loaded on trucks or other appropriate vehicles for transport. Before and during transport, care shall be exercised to insure that no unauthorized persons have access to the material.

O. Transporters of the waste are prohibited from "back hauling" any freight after the disposition of the Owner's waste stream until decontamination of the vehicle and/or trailer is assured.

END OF SECTION

SECTION 03 31 00

SITE CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Site walls and foundations.
2. Site stairs and associated foundations.

1.03 ACTION SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 01 Specification Sections.

B. Product Data: For each type of product indicated, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, epoxy grout, nonshrink grout, and others if requested by the Engineer.

C. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Field water is not to be added.
2. Admixtures are not to be added in the field.

D. Submit a written description of cold weather and hot weather protection procedures for review and approval a minimum of 15 days prior to start of Work.

E. Submit a written description of curing procedures for review and approval a minimum of 15 days prior to start of Work. Description to include curing methods and duration of curing.

F. Shop drawings shall be reviewed and "checked" by the Fabricator prior to being submitted to the Engineer. Unchecked shop drawings shall be rejected and returned to the Contractor.

G. Contractor to provide a detailed submittal schedule identifying all submittals and the date they are to be received by BVH Integrated Services, Inc. Submittal schedule is to be submitted two weeks prior to the start of the submittal process and updated every two weeks.

H. Submit locations of all proposed construction joints in slabs and retaining walls for review and approval a minimum of 15 days prior to start of Work.

I. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Include special reinforcement required for openings through concrete structures.

1. Submit detailed shop drawings which clearly show location, splicing, cover, sizes, and spacing of all reinforcing and wire fabric. Schedules and diagrams shall indicate bends, sizes, and lengths of reinforcing members and splice lengths. All reinforcement in concrete footings, walls and grade beams shall be shown in elevation, 1/8" = 1'-0" scale with top of walls, top of shelves, and bottom of footings clearly indicated and sections indicating bar placement, spacing, size and cover. All construction joints, as required on the Contract Drawings or requested by the Contractor, shall be shown with any additional reinforcement required. Show and locate all concrete openings, including those required for other Divisions. Any drawings submitted without showing construction joints and openings will be rejected and will not be reviewed.

J. No reinforcing shall be cut, fabricated, shipped to the job site, or placed before shop drawings have been approved by the Engineer of Record. Only shop drawings bearing the appropriate engineer's stamp marked "Furnished as Submitted" or "Furnished as Corrected" or "Approved as Noted" shall be used in the field.

K. Laboratory test reports for concrete materials and mix design tests.

1.04 INFORMATIONAL SUBMITTALS

A. Welding Certificates: Submit certifications signed by an AWS Certified Welding Inspector of pre-qualified welding procedures, qualifications of welding procedures unless pre-qualified, qualification of welding operators, and qualifications of welders.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Curing compounds.
6. Bonding agents.
7. Adhesives.
8. Semirigid joint filler.
9. Repair materials.
10. Anchoring adhesive.

C. Field quality-control reports.

D. Minutes of preinstallation conference.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following Codes, Specifications, and Standards, except where more stringent requirements are shown or specified.

1. American Concrete Institute (ACI) 301, "Specification for Structural Concrete for Buildings."
2. ACI 318, "Building Code Requirements for Reinforced Concrete."
3. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
4. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

B. Concrete Testing Service: Engage a testing agency acceptable to Engineer to design concrete mixes and to perform material evaluation tests associated with the mix design.

C. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

D. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

E. Testing Agency Qualifications: Owner will engage an independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

F. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

G. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

H. Mockups: Cast mockup 14 days prior to start of concrete work of size indicated or as required to demonstrate typical joints, form tie spacing, and proposed surface finish, texture and color. Maintain sample panel exposed to view for duration of Project, after Architect’s acceptance of visual qualities.

1. Build mockups as indicated, or as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Obtain Architect’s approval of mockups before starting construction.
4. If Architect determines that mockups do not meet requirements, demolish and remove them from the site and cast another until the mockup is approved.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging for completed work.
6. Demolish and remove mockups when directed.

I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination," and the following:

1. At least 28 days prior to concrete work, conduct a meeting to review detailed requirements for preparing concrete design mixes and to determine procedures for satisfactory concrete operations. Review requirements for submittals, status of coordinating work, and availability of materials. Establish a preliminary work progress schedule and procedures for materials inspection, testing, and certifications. Require representatives of each entity directly concerned with cast-in-place concrete to attend conference, including but not limited to the following:

   a. Contractor's superintendent.
   b. Agency responsible for field quality control.
   c. Ready-mix concrete producer.
   d. Concrete subcontractor.
   e. Primary admixture manufacturers.
   f. Engineer of Record.
   g. Special Inspector, if applicable.
   h. Construction Manager's superintendent, if applicable.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, steel reinforcement installation, concrete repair procedures, and concrete protection.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. Forms for Exposed-to-View Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

   a. High-density overlay, Class 1 or better.

B. Forms for Unexposed-to-View Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: New 45-degree wood, metal, PVC, plastic or rubber strips, 3/4 by 3/4 inch unless otherwise noted, nailed 6 inches on center, and installed in inside corners of forms.

D. Form-Release Agent: Commercially formulated form-release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, adjustable length, removable or snap-off metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no metal closer than 1-1/2 inches to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.

2.02 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.03 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For slabs-on-grade, use full 4" x 3" x 8" concrete blocks with a compressive strength equal to or greater than the adjacent cast-in-place concrete.

2.04 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I/II.

B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal, unless otherwise noted.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.05 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding 0.15 percent by mass of cement material. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

2.06 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: Comply with ASTM C 171, polyethylene film or white burlap-polyethylene sheet or waterproof paper.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating. Moisture loss not more than 0.55 kg/sq. m when applied at 200 sq. ft./gal. Subject to compliance with current US EPA regulations for volatile organic compounds (VOC) emissions and floor finish adhesives.

2.07 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, 1/2 inch asphalt-saturated cellulosic fiber preformed into strips unless otherwise noted.

B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Anchoring Adhesive: ASTM C 881, two-compound material suitable for use on dry or damp surfaces. Epcon G5, Epcon A7 as manufactured by ITW Ramset/Red Head or HIT RE-500-SD as manufactured by HILTI. Holes shall be drilled with a rotary hammer drill and carbide-tipped drill bit.

2.08 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency acceptable to Engineer of Record for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Submit written reports including all statistical data to Engineer of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been approved by Engineer.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing or high-range water-reducing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

E. Use accelerating admixture in concrete slabs, as required, for placement and workability.

F. Add air-entraining admixture where specified at manufacturer’s prescribed rate to result in concrete at point of placement and having total air content with a tolerance of plus or minus 1-1/2 percent of the value indicated.

G. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer’s directions.

2.09 CONCRETE MIXTURES

A. Design mixes to provide concrete with the following properties:

1. Concrete for walls, foundations, and stairs to be normal weight concrete with a 4,000 psi, 28-day minimum compressive strength, minimum cement content of 6 sacks per cubic yard, water-cement ratio 0.45 maximum (water content shall include surface water in aggregates), maximum 3/4-inch aggregate, four plus or minus 1 inch slump. Provide six percent air content by volume at all exterior slabs. No additional air entrainment required at interior slabs.

B. Concrete for architectural exposed concrete to match mix design noted in Item 1 above and to have a high range water reducer that provides an 8-inch plus or minus 1 inch slump after admixture is added to concrete with a 4-inch slump.

C. If mixes are to be pumped, allowable slump can be increased to six plus or minus 1 inch. Submit separate mix designs, including all backup data, for each pump mix for approval by Engineer.

D. Adjustment to Concrete Mixes: Field water is not to be added. Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer before using in Work.

E. Do not air entrain concrete at trowel finished interior slabs and suspended slabs. Do not allow entrapped air content to exceed 3 percent.

2.10 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116/C 1116M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 GENERAL

A. Coordinate the installation of joint materials, embedded items, anchor bolts and other related materials with placement of forms and reinforcing steel.

B. Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and/or other debris just before placing concrete.

3.02 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch, tolerances for concrete surfaces exposed to view.
2. Class C, 1/2 inch, tolerances for other concrete surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of exposed concrete, and where indicated on Contract Documents to produce uniform smooth lines and tight edge joints.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items. Accurately place and securely support items built into forms.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

M. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed.

3.03 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.04 REMOVING AND REUSING FORMS

A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the Work may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements in place until concrete has achieved at least 80 percent of its 28-day design compressive strength.
2. Formwork to remain in place for a minimum of 14 days.
3. Determine compressive strength of in-place concrete by testing field cured test specimens representative of concrete location or members according to ACI 301.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect and Engineer.

3.05 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for details and methods of reinforcement placement and supports and as specified.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover as indicated for in ACI 318. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least two full panels. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.06 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated.
2. Provide formed keyways at least 1-1/2 inches deep by one-third the wall thickness in width in construction joints in walls, and between walls and footings.
3. Unless otherwise shown on the Drawings, walls shall have vertical construction joints located no more than 60 ft. apart. No vertical construction joint shall be within 4'-0" of any column pier, corner, or footing joint. Exposed foundation walls shall have control joints spaced at 20'-0" (maximum) on center between construction joints, unless otherwise noted.
4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction (Control) Joints in Slabs-on-Grade: Provide contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth.

1. Contraction joints shall be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
2. If joint pattern is not shown, provide joints not exceeding 15 ft. in each direction and located to conform to bay spacing whenever possible (at column centerlines, half bays, third bays).

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install smooth dowel bars and support assemblies at joints where indicated. Lubricate one-half of dowel length to prevent concrete bonding to one side of joint.

3.07 CONCRETE PLACEMENT

A. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.

B. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed. Notify other trades to permit installation of their work.

C. Do not add water to concrete during delivery, at Project site, or during placement.

D. Deposit concrete continuously or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

E. Deposit concrete in forms in horizontal layers no deeper than 48 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic, to avoid cold joints.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set and lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

G. Cold Weather Placement: Cold weather is defined as a period when for more than three consecutive days the average daily temperature is less than 40 deg F and the air temperature is not greater than 50 deg F for more than one-half of any 24-hour period. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures. Comply with ACI 306.1 and as indicated:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agent or chemical.
4. Slabs-on-Grade:

   a. Concrete operations for slabs indicated above are to take place within a heated enclosure where the air temperature is maintained between 50 deg F and 85 deg F for a minimum of 24 hours prior to concrete placement and 72 hours after concrete placement. Ground surface is to be free of frost or frozen materials for slabs-on-grade.

5. Formed Footings, Walls and Piers: The protection means listed below are guidelines only. It is the Contractor's responsibility to provide any and all additional measures necessary to maintain the concrete between 50 deg F and 85 deg F for the time period indicated below and to comply with ACI 306.1.

   a. Elements with a minimum dimension up to 16 inches are to be protected by the formwork (3/4-inch plywood minimum) and mineral wool blankets (minimum R value of 4.0) for unformed surfaces for 72 hours. If the air temperature is expected to go below 28 deg F, then formed surfaces of footings, walls and piers should be wrapped with mineral wool blankets (minimum R value of 5.0) and mineral wool blankets (minimum R value of 6.0) provided over unformed surfaces for 72 hours. Formed and unformed slab surfaces should be wrapped for 72 hours as described above for walls or a heated enclosure provided. If the air temperature is expected to go below 14 deg F, then mineral blankets of R value of 7 (minimum) and R value of 8 (minimum) are required for formed and unformed surfaces, respectively. Provide a heated enclosure for slabs. If the air temperature is expected to go below 0 deg F, then a heated enclosure is required.
   b. Elements with a minimum dimension above 16 inches to 22 inches are to be protected by the formwork (3/4-inch plywood minimum) and mineral wool blankets (minimum R value of 4.0) for uniformed surfaces for 72 hours. If the air temperature is expected to go below 20 deg F, then formed surfaces of footings, walls and piers should be wrapped with mineral wool blankets (minimum R value of 5.0) and mineral wool blankets (minimum R value of 6.0) provided over unformed surfaces for 72 hours. Formed and unformed slab surfaces should be wrapped for 72 hours as described above for walls or a heated enclosure provided. If the air temperature is expected to go below –7 deg F, then mineral blankets of R value of 7 (minimum) and R value of 8 (minimum) are required for formed and uniformed surfaces, respectively. Provide a heated enclosure for slabs. If the air

temperature is expected to go below –29 deg F, then a heated enclosure is required.

c. Elements with a minimum dimension above 22 inches to 34 inches are to be protected by the formwork (3/4-inch plywood minimum) and mineral wool blankets (minimum R value of 4.0) for unformed surfaces for 72 hours. If the air temperature is expected to go below –1 deg F, then formed surfaces of footings, walls and piers should be wrapped with mineral wool blankets (minimum R value of 5.0) and mineral wool blankets (minimum R value of 6.0) provided over unformed surfaces for 72 hours. If the air temperature is expected to go below –28 deg F, then mineral blankets of R value of 7 (minimum) and R value of 8 (minimum) are required for formed and unformed surfaces, respectively.

d. Elements with a minimum dimension above 34 inches are to be protected by the formwork (3/4-inch plywood minimum) and mineral wool blankets (minimum R value of 4.0) for unformed surfaces for 72 hours. If the air temperature is expected to go below 0 deg F, then formed surfaces of footings, walls and piers should be wrapped with mineral wool blankets (total minimum R value of 5.0) and mineral wool blankets (minimum R value of 6.0) provided over unformed surfaces for 72 hours.

6. The subcontractor and the Owner's Inspection Agency are each to maintain independent records of the following information during cold weather:

a. For each section of concrete placed, record the date, time, outside air temperature, enclosure temperature, temperature of concrete during placement, weather conditions, and methods used to protect the concrete.

b. For each section of concrete placed, record the maximum and minimum temperature in each 24-hour period for 72 hours after the concrete is placed. Temperature readings are to be taken at the concrete surface or at three-inch-deep probes into the concrete. A minimum of one thermometer shall be provided at each spread footing or pier placed and a minimum of three thermometers provided for each 60-ft. section of wall or wall footing placed. For walls greater than 10 ft. in height, provide two thermometers at the top of the wall (surface-mounted or probes) and one thermometer within two ft. of the base of the wall (probe at formed surface) per each 60-ft. length of wall. Temperature readings are to represent the severe conditions. Corners and edges of concrete are the most vulnerable to freezing and are to be considered the severe condition.

H. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist. Hot weather is any combination of high ambient temperature, high concrete temperature, low relative humidity, wind speed, or solar radiation that will impair the quality of freshly mixed or hardened concrete by accelerating the rate of moisture loss and rate of cement hydration.

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor' option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to the Engineer.

3.08 FINISHING FORMED SURFACES

A. Rough-Formed Finish: Provide a formed finish on formed concrete surfaces not exposed to view or concealed by other construction. Tie holes and defective areas are to be repaired and patched, and fins and other projections exceeding 1/4-inch in height rubbed down or chipped off.

B. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4-inch in height rubbed down or chipped off.

C. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove and smooth fins and other projections completely.

1. Apply to concrete surfaces exposed to view, or to be covered with a coating or covering material applied directly to concrete.

D. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Provide smooth-rubbed finish on schedule concrete surfaces that have received smooth-formed finish treatment. Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.09 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces. Finish slab to elevation indicated on Contract Documents.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

C. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, walls, and elsewhere as indicated, unless otherwise indicated on the Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.11 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than seven days.

C. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

D. Curing Methods: Cure concrete by curing compound, by moisture curing, by moisture-retaining cover curing, or by combining these methods, as specified.

E. Provide moisture curing by the following methods:

1. Keep concrete surface continuously wet by covering with water.
2. Use continuous water-fog spray.
3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4-inch lap over adjacent absorptive covers.

F. Provide moisture-retaining curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

G. Apply curing compound on all concrete not exposed to view, including slabs, unless otherwise noted.

H. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure if forms are loosened. If removing forms before end of curing period, continue curing for the remainder of the curing period.

I. Curing Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

J. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing and Moisture-Retaining Cover Curing:

   a. Moisture cure or use moisture-retaining covers to cure all concrete surfaces exposed to view (including slabs) and concrete to receive a concrete topping. Do not use moisture-retaining covers to cure concrete exposed to view if concrete surface will be marred.
   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
   c. Cure concrete surfaces not exposed to view and concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

2. Curing Compound:

   a. Apply curing compound to concrete surfaces as soon as final finishing operations are complete (within two hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer’s directions. Recoat areas subject to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
   b. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

K. Contractor to coordinate and verify that all curing methods and materials are compatible with architectural finishes. Submit appropriate data for review.

L. Cure all grout in accordance with the manufacturer’s requirements.

3.12 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.13 CONCRETE SURFACE REPAIRS

A. Patching Defective Concrete: Repair and patch defective areas immediately after removing forms when approved by Architect/Engineer. Remove and replace concrete that cannot be repaired and patched to Architect's/Engineer’s approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Remove and replace concrete having defective surfaces if defects cannot be repaired to the satisfaction of the Engineer.

1. Immediately after form removal, cut out honeycombs, rock pockets, holes left by tie rods and bolts, and voids more than 1/4 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect/Engineer. If defects cannot be repaired to the satisfaction of the Engineer, remove and replace the concrete.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment when acceptable to the Engineer. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping when acceptable to the Engineer. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar when acceptable to the Engineer. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's/Engineer's approval for method and procedure, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's/Engineer's approval.

3.14 ADHESIVE ANCHORING

A. All adhesive anchoring to be performed in accordance with the manufacturer's recommendations.

B. Drill appropriate sized hole to the required depth with rotary hammer drill and/or carbide drill bit.

C. Clean hole of all dust, debris and standing water with a nylon brush and compressed air.

D. Prepare adhesive in accordance with the manufacturer's requirements and follow required procedures for placement during cold weather applications.

E. Check initial adhesive color with provided color chart.

F. Inject adhesive into base of hole. Provide dosage control screens for overhead applications.

G. Install threaded anchor or reinforcing. Adhesive is to coat the entire length of hole and insert.

H. All adhesive to set prior to disturbing insert.

3.15 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture, plus one set for each additional 50 cu. yd. or fraction thereof.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. The Contractor shall notify the Owner's inspection agency 24 hours prior to placing concrete to inspect secured reinforcing. No concrete shall be placed until reinforcing has been inspected by the Owner's testing and inspection agency.

3. When concrete is pumped, test cylinders shall be made from concrete taken at discharge end of the pumping train.
4. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
5. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample at point of placement, but not less than one test for each day's pour of each concrete mixture. First truck to be tested of each placement. If first truck does not meet project requirements, test each additional truckload until two passing results are obtained.
6. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
7. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
8. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure one set of four standard cylinder specimens for each composite sample, unless otherwise directed.
    b. Provide one set of field cured cylinders for each concrete type for any days that are less than or expected to be less than 40 deg. F within 24 hours after concrete placement. Field cured cylinders to be cured under the same conditions and temperatures as the cast-in-place concrete.

9. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at 7 days and two specimens at 28 days, and one specimen retained in reserve for later testing if required.

    a. Test field-cured specimens as indicated for laboratory cured specimens.

10. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
11. Strength of each concrete mixture will be considered satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
12. Test results shall be reported in writing to Structural Engineer, Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
13. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
14. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Engineer.
15. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

16. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

C. Inspection of Adhesive Anchoring:

1. Testing agency shall randomly review anchoring procedures to verify conformance with manufacturer's installation requirements. Witness approximately 25 percent of total. The percentage of adhesive anchoring witnessed may be modified by the Structural Engineer of Record, depending upon initial results.

END OF SECTION
07/11/13

SECTION 03 45 05

PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural precast concrete.

B. Supports, anchors, and attachments.

C. Intermediate joint seals.

D. Grouting under panels and at other required locations.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.

B. ASTM A82, Specification for Steel Wire, Plain, for Concrete Reinforcement.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.

D. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2010.

F. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a.

G. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.

H. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.

I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2010a.

J. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

K. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete; 2009.

L. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.

M. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products; Precast/Prestressed Concrete Institute; 2007.

N. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; Seventh Edition, 2010.

O. PCI MNL-122 - Architectural Precast Concrete; Precast/Prestressed Concrete Institute; 2007, Third Edition.

P. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1988, Second Edition.

Q. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute; 2000.

1.04 DESIGN REQUIREMENTS

A. Design units to withstand design loads as calculated in accordance with current Connecticut Builiding code, and erection forces. Calculate structural properties of units in accordance with ACI 318.

B. Design units to withstand static loads and anticipated dynamic loading, including positive and negative wind loads and thermal movement loads.

C. Design units to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

D. Design component connections to accommodate building movement and thermal movement. Provide adjustment to accommodate misalignment of structure without unit distortion or damage.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.

C. Shop Drawings: Design precast concrete units under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in Connecticut.
   1. Elevation view, plan view, and location of each panel; include panel identity numbers.
   2. Dimensions and finishes.
   3. Sections and details showing connections, cast-in items, and their relations to the structure.
   4. Descriptions of materials for loose and cast-in anchoring devices.
   5. Field installed anchor locations.
   6. Erection sequences and handling requirements.
   7. Indicate sizes and locations of blockouts required for devices recess mounted within the panels which will be installed by other trades.
   8. Include structural design calculations.
   9. Shop drawings shall be stamped, and signed by the design professional engineer registered in Connecticut.

D. Mix Designs: Submit concrete mix designs.

E. Maintenance Data: Indicate surface cleaning instructions.

1.07 QUALITY ASSURANCE

A. Design Engineer Qualifications: Design precast concrete units under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in Connecticut.
   1. Submit design calculations prepared, stamped and signed by structural engineer.

1.08 MOCK-UP

A. Provide mock-up, finish in accordance with approved sample.

B. Include mock-up panel with typical window.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Handling: Lift and support precast units only from support points.

B. Protect units to prevent staining, chipping, or spalling of concrete.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Architectural Precast Concrete:
   1. Any manufacturer holding a PCI Group A Plant Certification for the types of products specified; see www.pci.org.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PRECAST UNITS

A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and ACI 318.
   1. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.
   2. Calculate structural properties of units in accordance with ACI 318.
   3. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
   4. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.

B. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

2.03 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M Grade 40 (280).

B. Steel Welded Wire Reinforcement: ASTM A185/A185M, plain type.

2.04 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.

B. Fine and Coarse Structural Aggregates: ASTM C33.

C. Lightweight Structural Aggregate: ASTM C330.

D. Surface Finish Aggregate: Conforming to sample in office of Architect.

E. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979.
   1. Color(s): To match Architect's sample(s) when incorporated into specified mix design(s).

F. Grout:
   1. Non-shrink, non-metallic, minimum 10,000 psi, 28 day strength.

2.05 SUPPORT DEVICES

A. Connecting and Support Devices: ASTM A36/A36M steel; hot-dip galvanized in accordance with ASTM A153/A153M.

1. Clean surfaces of rust, scale, grease, and foreign matter.

B. Bolts, Nuts, and Washers: ASTM A307 heavy hex bolts, Type A, hot-dip galvanized, with matching ASTM A563 (A 563M) nuts and matching washers.

2.06 MIX

A. Concrete: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent in accordance with ACI 301.

B. Separate face mix and backup mix:
   1. Face mix: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent in accordance with ACI 301.
   2. Backup mix: Same aggregate-cement ratio as face mix; achieve 28 day compressive strength of 5000 psi.

2.07 FINISH - PRECAST UNITS

A. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

2.08 FINISH - SUPPORT DEVICES

A. Clean surfaces of rust, scale, grease, and foreign matter.

B. Galvanize after fabrication in accordance with requirements of ASTM A 123/A 123M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building structure, anchors, devices, and openings are ready to receive work of this section.

3.02 PREPARATION

A. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.

3.03 ERECTION

A. Erect units without damage to shape or finish. Replace or repair damaged panels.

B. Erect units level and plumb within allowable tolerances.

C. Align and maintain uniform horizontal and vertical joints as erection progresses.

D. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Architect.

E. Fasten units in place with mechanical connections or welded connections in accordance with AWS D1.1.

F. Touch-up field welds and scratched or damaged galvanized surfaces.

G. Set vertical units dry, without grout, attaining joint dimension with lead or plastic spacers. Pack grout to base of unit.

H. Exposed Joint Dimension: 1/2 inch. Adjust units so that joint dimensions are within tolerances.

I. Seal perimeter and intermediate joints in accordance with manufactuers' requirements.

3.04 TOLERANCES

A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135.
   1. Plan Location from Building Grid Datum: Plus or minus 3/8 in.
   2. Top Elevation from Nominal Top Elevation: Plus or minus 3/8 inch.
   3. Maximum Plumb Variation Over Height of Structure or 100 ft (whichever is less): Plus or minus 1/2 inch.
   4. Exposed Joint Dimension: Plus or minus 3/16 inch.
   5. Maximum Jog in Alignment of Matching Faces or Edges: Plus or minus 3/16 inch.
   6. Differential Bowing or Camber as Erected Between Similar Adjacent Members: Plus or minus 3/16 inch.

3.05 CLEANING

A. After installation and sealant joint treatment, clean surface free of stains and other similar markings by use of detergent and water applied with a stiff fiber brush and followed with a clear water rinse.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Standard Concrete Block.
   1. Loadbearing and non-loadbearing.
   2. Face Block.

B. Clay Facing Brick.

C. Mortar and Grout.

D. Reinforcement and Anchorage.

E. Flashings.

F. Accessories.

1.02 RELATED REQUIREMENTS

A. Related Documents: General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specifications, shall apply to this Section.

B. The General Conditions state that the Contract Documents are complementary. Examine all Drawings and all other Sections of the Specifications for requirements therein effecting the work of this Section.

C. Section 05 50 00 - Metal Fabrications: Loose steel lintels.

D. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

E. Section 07 90 05 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.03 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.

B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.

C. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.

F. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a.

G. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

H. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2012.

I. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

J. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2011.

K. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2012.

L. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

M. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2012.

N. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

O. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.

P. The Brick Industry Association (BIA):
   1. BIA Technical Notes 20, Cleaning Brick Masonry.

Q. National Concrete Masonry Association (NCMA):
   1. NCMA TEK 8-2A, Removal of Stains from Concrete Masonry Walls.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Samples: Submit three samples of decorative block units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.

F. Shop drawings of base of wall condition and window head condition showing stainless steel and flexible membrane flashing and brick masonry and anchors. Include method for constructing and installing end dams.

G. Elevation Drawings indicating proposed Control Joint locations.

1.05 QUALITY ASSURANCE

A. Comply with all recommendations of Brick Industry Association.

B. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.
   1. Maintain one copy of each document on project site.

C. Fire Rated Assemblies: Conform to applicable code for requirements for fire rated masonry construction.

1.06 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include support foundation, mortar and accessories, structural backup, wall openings, flashings, and wall insulation in mock-up.

B. Include all bond patterns for visual approval.

C. Mock-up may not remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Handle and store ceramic glazed masonry units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depth as indicated on drawings.
   2. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block.
      b. Exposed faces: Manufacturer's standard color and texture.
   3. Non-Loadbearing Units: ASTM C 129, medium weight.
      a. Hollow block.
      b. Exposed faces:
         1) Standard color and texture unless otherwise noted on drawings. Interior surfaces painted.
         2) Integral color and ground face in Corridors and Gross Motor rooms.
         3) Integral color and split face in Ateliers.

2.02 BRICK UNITS

A. Manufacturers:
   1. Glen Gery Brick; (Basis of Design)
   2. Acceptable Alternate Manufacturers;
      a. Belden Brick; www.beldenbrick.com.
      b. Carolina Ceramics Brick Company; www.carolinaceramics.com.
      c. Endicott Clay Products Co; www.endicott.com.
   3. Colors and styles (Basis of Design): Five colors of brick to be determined shall be provided in a pattern as indicated on the drawings
      a. BR-1: Field, 40%
      b. BR-2: pattern, 15%
      c. BR-3: pattern, 15%
      d. BR-4: pattern, 15%
      e. BR-5: pattern, 15%

B. Facing Brick: ASTM C216, Type FBX, Grade SW.
   1. Color and texture to match Architect's sample.
   2. Color and texture: To be determined.
   3. Nominal size: Atlas, 4 inch x 4 inch x 16 inch.
   4. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.03 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C270, Type N.
   1. Colored mortar: Premixed cement as required to match Architect's color sample.
      a. For Brick; Provide two colors of mortar.

B. Hydrated Lime: ASTM C207, Type S.

C. Grout Aggregate: ASTM C404.

2.04 REINFORCEMENT AND ANCHORAGE

A. Manufacturers of Joint Reinforcement and Anchors:
   1. Dur-O-Wal: www.dur-o-wal.com.
   2. Hohmann & Barnard, Inc (including Dur-O-Wal brand): www.h-b.com.
   3. WIRE-BOND: www.wirebond.com.

B. Reinforcing Steel: ASTM A615/A615M Grade 40 (280) deformed billet bars; galvanized.

C. Single Wythe Joint Reinforcement: Ladder type; ASTM A 82/A 82M steel wire, mill galvanized to ASTM A 641/A 641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

D. Strap Anchors: Bent steel shapes configured as required for specific situations, 1-1/4 in width, 0.105 in thick, lengths as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face, corrugated for embedment in masonry joint, hot dip galvanized to ASTM A 153/A 153M, Class B.

E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.

F. Masonry Veneer Anchors:
   1. Stainless steel anchor plate with adjustable stainless steel wire pintle. Basis of Design: Dur-O-Wall DA-210.
   2. Masonry veneer at Cast-in-Place Concrete shall be installed with anchors set into dovetail slots.

2.05 FLASHINGS

A. Flexible Flashing with Elvaloy KEE: Solid-phase flexibilizer added to membrane flashing.

B. Stainless Steel Flashing: ASTM A666, Type 304, soft temper; 26 gage (0.45 mm) thick; finish 2B to 2D.

2.06 ACCESSORIES

A. Preformed Control Joints: Neoprene material. Provide with corner and tee accessories, fused joints.

B. Full-Height Airspace Maintenance and Drainage Material: Polymer mesh panels for fitting between masonry ties to loosely fill masonry cavity.

C. Weep Baffle: Ridgid Honeycomb cell vent, Basis of Design: Dur-O-Wall DA 1006

D. Weeps: Molded PVC grilles, insect resistant.

E. Cavity Vents: Molded PVC grilles, insect resistant.

F. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.

D. Brick Units:
   1. Bond: As indicated for different locations.
      a. Field Brick; Flemish Bond.
      b. Ornamental "Tree" Pattern; As indicated on drawings.
   2. Coursing: Three units and three mortar joints to equal 8 inches.
   3. Mortar Joints: Raked at horizontals; Concave at all other locations.

3.05 CONTROL JOINTS

A. Contractor shall provide Control Joints spacing as recommended by Industry Associations

3.06 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar and mortar smears as work progresses.

D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

G. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

H. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.07 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

B. Install cavity vents in veneer and cavity walls at 32 inches on center horizontally below shelf angles and lintels, and near top of walls.

3.08 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions. Verify that airspace width is no more than 3/8 inch greater than panel thickness. Install horizontally between joint reinforcement. Stagger end joints in adjacent rows. Fit to perimeter construction and penetrations without voids.

3.09 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place continuous joint reinforcement in first and second joint below top of walls.

C. Lap joint reinforcement ends minimum 6 inches.

D. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 16 inches horizontally and 16 inches vertically.

3.10 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

3.11 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install horizontal joint reinforcement 16 inches on center.

3.12 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY

3.13 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

B. Extend plastic flashings to within 1/4 inch of exterior face of masonry.

3.14 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.15 GROUTED COMPONENTS

A. Lap splices minimum 24 bar diameters.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

3.16 CONTROL AND EXPANSION JOINTS

A. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.17 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

3.18 TOLERANCES

A. Maximum Variation from Alignment of Columns: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.19 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.20 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140 for conformance to requirements of this specification.

C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.21 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

END OF SECTION

SECTION 05 52 13

PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Aluminum pipe handrails and guardrails.
   2. Aluminum pipe gate at service area.

B. Related Requirements:

   1. Section 03 30 00 “Site Cast-in-Place Concrete” for walks and walls.
   2. Section 03 45 05 “Precast Architectural Concrete” for precast concrete copings.

1.03 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.04 ACTION SUBMITTALS

A. Product Data: For the following:

   1. Manufacturer's product lines of mechanically connected railings.
   2. Railing brackets.
   3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

   1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
   2. Fittings and brackets including hardware for gate.

3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

   a. Show method of connecting and finishing members at intersections.

D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

F. Evaluation Reports: For post-installed anchors , from ICC-ES.

1.06 QUALITY ASSURANCE

A. Regulatory Requirements: comply with requirements of building authorities having jurisdiction in project location and the following:

   1. Handrail Standard: ANSI A1264.1

B. Codes and Regulations:

   1. Occupational Safety and Health Administration – 29 CFR 1910.23 – Guarding floor and wall openings.
   2. 2005 Connecticut State Building Code, including 2009 and 1013 Amendments.

C. Manufacturer Qualifications: Minimum three (3) years documented experience producing systems specified in this section.

D. Welding Qualifications: Qualify procedures and personnel according to the following:

   1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.08 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Aluminum Pipe and Tube Railings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. United Steel, Inc.
   b. General Welding & Fabrication

B. Source Limitations: Obtain each type of railing from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

   a. Uniform load of 50 lbf/ ft. applied in any direction.
   b. Concentrated load of 200 lbf applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

   a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
   b. Infill load and other loads need not be assumed to act concurrently.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F .

2.03 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.04 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

B. Extruded Bars and Tubing: ASTM B 221, Alloy 6063-T5/T52.

1. Provide ¾" square tube for all vertical and horizontal pickets.

C. Extruded Structural Pipe : ASTM B 429/B 429M, Alloy 6063-T6.

1. Provide Standard Weight NPS 1" (1.315" O.D.) Schedule 40 pipe for all mid and bottom rails.
2. Provide Standard Weight NPS 1 ½" (1.9" O.D.) Schedule 40 pipe for handrail attached to guardrail at service stairs.
3. Provide Standard Weight NPS 1 ½" (1.9" O.D.) Schedule 80 pipe for all posts and top rails.

D. Die and Hand Forgings: ASTM B 247, Alloy 6061-T6.

E. Castings: ASTM B 26/B 26M, Alloy A356.0-T6.

2.05 FASTENERS

A. General: Provide the following:
1. Aluminum Railings: [**Type 304**] [**Type 316**] stainless-steel fasteners.
2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:
1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
2. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

2.06 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.07 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.

J. Form Changes in Direction as Follows:

1. As detailed.
2. By radius bends of radius indicated .

K. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of railing members with prefabricated end fittings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

2.08 ALUMINUM FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Clear Anodic Finish: AAMA 611, AA-M12C22A41 .

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.02 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.03 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings. Use wood blocks and padding to prevent damage to railing members or fittings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.04 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout , mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Cover anchorage joint with flange of same metal as post, attached to post with set screws.

3.05 ADJUSTING AND CLEANING

A. Clean aluminum by washing thoroughly with clean water and soap and rinsing with clean water.

3.06 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. If minor damages to finish occur repair damaged sections in accordance with manufacturer’s recommendations or replace damaged sections if repaired finishes are unacceptable to Architect.

END OF SECTION

SECTION 06 15 33

WOOD PATIO DECKING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Wood decking.
2. Stairs for elevated decks.
3. Railings for elevated decks.
4. Wood benches on concrete seat steps.
5. Support framing for elevated decks.

B. Related Requirements:
1. Section 03 33 00 “Site Cast-in-Place” for concrete seat steps and footings.
2. Section 32 13 13 “Concrete Paving” for concrete sidewalks.

1.03 DEFINITIONS

A. Boards: Lumber of less than 2 inches nominal in thickness and 2 inches nominal or greater in width.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.04 ACTION SUBMITTALS

A. Product Data: For preservative-treated wood products .

1. For preservative-treated wood products. Include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.

1.05 INFORMATIONAL SUBMITTALS

A. Material Certificates:

1. For lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by ALSC's Board of Review.
2. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained.

B. Certificates of Inspection: Issued by lumber grading agency for exposed wood products not marked with grade stamp.

C. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood products.
2. Decking fasteners.

1.06 QUALITY ASSURANCE

A. Lumber Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Lumber Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store materials under cover and protected from weather and contact with damp or wet surfaces. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Handle and store plastic lumber to comply with manufacturer's written instructions.

PART 2 - PRODUCTS

2.01 LUMBER, GENERAL

A. Comply with DOC PS 20 and with grading rules of lumber grading agencies certified by ALSC's Board of Review as applicable. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by ALSC's Board of Review.

1. Factory mark each item with grade stamp of grading agency.
2. For items that are exposed to view in the completed Work, omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
4. Provide dressed lumber, S4S, unless otherwise indicated.

B. Certified Wood: Boards and dimension lumber shall be certified as "FSC Pure" according to FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship," and to FSC STD-40-004, "FSC Standard for Chain of Custody Certification."

C. Maximum Moisture Content:

1. Boards: 15 percent.
2. Dimension Lumber: 15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness .
3. Timber. 19 percent .

2.02 WOOD DECKING AND STAIR TREADS

A. Hand select wood for freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot holes, shake, splits, torn grain, and wane.

B. Wood for decking and stairs to be from one source to ensure color uniformity.

C. Selection and sample to be approved by Landscape Architect.

D. Board Decking and Stair Treads: 1-1/4-inch actual thickness radius-edged S4S boards, with one face free of planer skip, machine burn, and torn or chipped grain.

1. Species: Ipe or African Mahogany First Export Quality (FEQ).
2. Grade Characteristics:

a. Clear one face; small pin knots and worm holes allowed on back face.
b. Straight grained and parallel cut.
c. Free of heart centers.
d. No decay, incipient decay, honeycomb, knot holes, shakes, splits, or wane.
e. No discoloration.

2.03 WOOD RAILINGS

A. Hand select wood for freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot holes, shake, splits, torn grain, and wane.

B. Wood for decking and stairs to be from one source to ensure color uniformity.

C. Selection and sample to be approved by Landscape Architect.

D. Wood Railing Boards: Radius-edged Ipe or African Mahogany First Export Quality (FEQ) S4S boards, same grade as decking , straight grained and parallel cut.

2.04 WOOD BENCHES ON CONCRETE SEAT STEPS

A. Boards for Benches: Radius-edged Ipe or African Mahogany First Export Quality (FEQ) S4S boards, same grade as decking , straight grained and parallel cut.

2.05 POSTS

A. Dimension Lumber Posts: No. 2 grade

B. Timber Posts: Balsam fir, Douglas fir-larch, Douglas fir-larch (North), eastern hemlock tamarack (North), hem-fir, southern pine, western hemlock, or western hemlock (North); No. 2; NeLMA, NLGA, SPIB, WCLIB, or WWPA.

C. Round Wood Poles: Clean-peeled wood poles complying with ASTM D 3200, with at least 80 percent of inner bark removed and with knots and limbs cut flush with the surface.

2.06 PRESERVATIVE TREATMENT

A. Decking and railings to be sealed with Penofin Exotic Hardwood Finish penetrating oil with 99% ultraviolet protection.

B. Pressure treat boards and dimension lumber with waterborne preservative according to AWPA U1; Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

C. Pressure treat timber with waterborne preservative according to AWPA U1; Use Category UC4a.

D. Pressure treat poles with waterborne preservative according to AWPA U1; Use Category UC4a.

2.07 FASTENERS

A. General: Provide fasteners of size and type indicated, acceptable to authorities having jurisdiction, and that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.

1. Use stainless steel unless otherwise indicated.
2. For pressure-preservative-treated wood, use stainless-steel fasteners.
3. For wood decking, use stainless-steel fasteners.

B. Nails: ASTM F 1667.

C. Power-Driven Fasteners: ICC-ES AC70.

D. Wood Screws and Lag Screws: ASME B18.2.1, ASME B18.6.1, or ICC-ES AC233.

E. Carbon-Steel Bolts: ASTM A 307 with ASTM A 563 hex nuts and, where indicated, flat washers all hot-dip zinc coated.

F. Stainless-Steel Bolts: ASTM F 593, Alloy Group 1 or 2; with ASTM F 594, Alloy Group 1 or 2 hex nuts and, where indicated, flat washers.

G. Postinstalled Anchors: Stainless-steel, chemical or torque-controlled expansion anchors with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing according to ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Stainless-steel bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.08 METAL FRAMING ANCHORS

A. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated on Drawings . Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Stainless-Steel Sheet: ASTM A 666, Type 304 .

C. Joist Hangers: U-shaped, with 2-inch- long seat and 1-1/4-inch- wide nailing flanges at least 85 percent of joist depth.

D. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.

E. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch above base and with 2-inch- minimum side cover, socket 0.062 inch thick, and standoff and adjustment plates 0.108 inch thick.

F. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.

2.09 CONCEALED DECKING FASTENERS

A. Deck Splines: Corrosion-resistant metal or plastic splines that fit in grooves routed into the sides of decking material and are fastened to deck framing with screws. Splines provide uniform spacing of decking material.

B. Deck Clips: Black-oxide-coated, stainless-steel clips designed to be fastened to deck framing with screws, and to secure decking material with teeth that also provide uniform spacing of decking material.

C. Deck Tracks: Formed metal strips designed to be fastened to deck framing and to secure decking material from underside with screws. Made from epoxy-powder-coated, hot-dip galvanized steel or stainless steel.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.03 INSTALLATION, GENERAL

A. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit work to other construction; scribe and cope as needed for accurate fit.

B. Framing Standard: Comply with AF&PA WCD1 unless otherwise indicated.

C. Install wood decking and stair treads with crown up (bark side down).

D. Install plastic lumber to comply with manufacturer's written instructions.

E. Secure decking to framing with deck splines deck clips or deck tracks .

F. Install metal framing anchors to comply with manufacturer's written instructions.

G. Do not splice structural members between supports unless otherwise indicated.

H. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

I. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of members or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

J. Apply copper naphthenate field treatment to comply with AWPA M4, to cut surfaces of preservative-treated lumber.

K. Securely attach exterior rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. ICC-ES AC70 for power-driven fasteners.
2. "Fastening Schedule" in ICC's International Building Code.

L. Use common wire nails unless otherwise indicated. Select fasteners of size that do not fully penetrate members where opposite side is exposed to view. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads unless otherwise indicated.

M. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced and with adjacent rows staggered.

3.04 ELEVATED DECK JOIST FRAMING INSTALLATION

A. General: Install joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists where framed into wood supporting members by using wood ledgers as indicated or, if not indicated, by using metal joist hangers. Do not notch joists.

B. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches.

C. Lap members framing from opposite sides of beams or girders not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.

D. Provide solid blocking of 2-inch nominal thickness by depth of joist at intervals of 96 inches o.c., between joists.

3.05 STAIR INSTALLATION

A. Provide stair framing members of size, space, and configuration indicated or, if not indicated, to comply with the following requirements:

1. Stringer Size: 2 by 12 inches nominal, minimum.
2. Notching: Notch stringers to receive treads, risers, and supports; leave at least 3-1/2 inches of effective depth.
3. Stringer Spacing: At least three stringers for each 36-inch clear width of stair.

B. Provide stair framing with no more than 1/8-inch variation between largest and smallest treads and risers within each flight.

C. Treads and Risers: Secure by gluing and screwing to carriages. Countersink fastener heads, fill flush, and sand filler. Extend treads over carriages and finish with bullnose edge.

3.06 RAILING INSTALLATION

A. Balusters: Fit to railings, screw in place. Countersink fastener heads, fill flush, and sand filler.

B. Newel Posts: Secure to stringers and risers with through bolts .

C. Railings: Secure wall rails with metal brackets. Fasten freestanding railings to newel posts and to trim at walls with countersunk-head wood screws or rail bolts.

END OF SECTION

SECTION 06 43 16

EXTERIOR WOOD RAIL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricating, finishing and installing exterior wood wall rail in coordination with metal rail and posts as shown on the Drawings and as specified herein.

B. Coordination with fabrication and installation of metal wall rail components including shop drawing coordination and preparation.

1.02 RELATED DOCUMENTS

B. **T**he general provisions of the contract, including the General Conditions, Supplementary Conditions, and General Requirements, apply to the work specified in this section.

1.03 RELATED SECTIONS

A. Section 03 33 00 “Site Cast-in-Place Concrete” for concrete site walls.
B. Section 03 45 05 “Precast Architectural Concrete” for precast copings.

1.04 QUALITY ASSURANCE

A. Firms experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful performance.

B. Architectural Woodwork Institute (AWI) Quality Standards.

1.05 SUBMITTALS

A. Sample of wood rail – 6 inch length min. indicating finished surface.

B. Fully dimensioned shop drawings detailing all profiles, sizes, connection attachments, size and type of fasteners, joints and accessories. Coordinate shop drawings with metal wall rail components specified in Section 05 52 13.2.

C. Product certificates signed by manufacturers certifying that product furnished complies with requirements.

D. Product data for sealant.

1.06 DELIVERY, STORAGE AND HANDLING

A. Keep materials dry during delivery and site storage. Stack materials above ground to ensure proper drainage and ventilation. Protect from weather damage and direct sunlight.

1.07 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation of exterior woodwork only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish to be applied without exposure to rain, snow or dampness.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings.

1.07 COORDINATION

A. Coordinate installation of wood rail with wall rail specified in Section 05520 to ensure that woodwork can be supported and installed as indicated.

PART 2 PRODUCTS

2.01 WOOD RAIL

A. Wood rail shall be Ipe (Tabebuia spp. Hardwood) or African Mahogany, First Export Quality (FEQ). Wood shall come from one source to ensure color uniformity. Selection and sample to be approved by Landscape Architect.

2.02 SEALANT

A. Sealant shall be Penofin Exotic Hardwood Finish, penetrating oil finish with 99% ultraviolet protection.

2.03 WOOD FASTENERS

A. Stainless steel.

PART 3 EXECUTION

3.01 FABRICATION - GENERAL

A. Fabricate woodwork to dimensions, profiles and details indicated. Ease all edges. Finished surface shall be smooth.

3.2 PREPARATION

A. Obtain measurements and verify dimensions and details before proceeding with carpentry work.

B. Condition woodwork to average prevailing humidity conditions in installation areas before installation.

3.3 INSTALLATION

A. Install woodwork true and straight with no distortions.

B. Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches long, except where shorter pieces are necessary.

C. Accurately align wood across seams. Sand flush and smooth.

D. Secure to metal rail components with countersunk fasteners. Pre-drill fastener holes close to the actual fastener diameter.

3.4 FINISHING

A. All exposed edges should be sanded to produced eased edges and to eliminate all rough areas and surface irregularities.

B. Apply sealant per manufacturer's recommended instructions.

3.5 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork.

B. Clean woodwork on exposed and semiexposed surfaces.

END OF SECTION

SECTION 10 75 16

FLAGPOLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes ground-set flagpoles made from aluminum .

B. Owner-Furnished Material: Flags.

C. Related Sections:

1. 03 30 00 “Site Cast-in-Place Concrete” for concrete footings.

2. 32 13 13 “Concrete Paving” for concrete sidewalks.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

B. Shop Drawings: For flagpoles.

1. Include plans, elevations, and attachment details. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.
2. Include section, and details of foundation system.

C. Samples for Verification: For each type of exposed finish, in manufacturer's standard sizes.

D. Delegated-Design Submittal: For flagpoles.

1.04 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design flagpole assemblies.

B. Seismic Performance: Flagpole assemblies shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and to the Connecticut State Building Code requirements.

C. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.

1. Wind Loads: Determine according to NAAMM FP 1001, “Guide Specifications for Design of Metal Flagpoles, and to the Connecticut State Building Code Requirements.
2. Base flagpole design on nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

2.03 ALUMINUM FLAGPOLES

A. Aluminum Flagpoles: Cone []-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch.

1. Shaft base diameter: 7 inches
2. Shaft top diameter: 3.5 inches.

3. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
   a. American Flagpole; a Kearney-National Inc. company.
   b. Concord Industries, Inc.
   c. U.S. Flag & Flagpole Supply, LP..

B. Exposed Height: 35 feet.

C. Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

1. Fabricate shop and field joints without using fasteners, screw collars, or lead calking.
2. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.

D. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch wall thickness with 3/16-inch steel bottom plate and support plate; 3/4-inch- diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.

1. Flashing Collar: Same material and finish as flagpole.

2.04 FITTINGS

A. Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. 0.063-inch spun aluminum, finished to match flagpole.

B. Internal Halyard, Cam Cleat System: 5/16-inch- diameter, braided polypropylene halyard; cam cleat; and concealed revolving truck assembly with plastic-coated counterweight and sling. Furnish flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

1. Halyard Flag Snaps: Chromium-plated bronze swivel snap hooks. Furnish two per halyard.

2.05 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

B. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

C. Sand: ASTM C 33/C 33M, fine aggregate.

D. Elastomeric Joint Sealant: Multicomponent nonsag urethane joint sealant complying with requirements in Section 079200 "Joint Sealants."

2.06 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41 Class 1, 0.018 mm or thicker.

PART 3 - EXECUTION

3.01 PREPARATION

A. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

B. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

C. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

D. Place concrete, as specified in Section 03 30 00 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.

E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.02 FLAGPOLE INSTALLATION

A. General: Install flagpoles where indicated and according to Shop Drawings and manufacturer's written instructions.

B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.

C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

END OF SECTION

SECTION 12 93 00

SITE FURNISHINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Bench
   2. Stone Bench
   3. Bicycle Racks
   4. Trash/Recycling Receptacles
   5. Stone Boulder
   6. Granite Bollard
   7. Concrete Filled Pipe Bollard

B. Related Requirements:

   1. Section 03 30 00 "Site Cast-in-Place Concrete" for concrete footings.
   2. Section 06 15 33 “Wood Patio Decking” for boardwalk.
   3. Section 32 13 13 “Concrete Paving” for concrete sidewalks.
   4. Section 31 20 00 "Earth Moving" for excavation for installing concrete footings.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

C. Samples for Initial Selection: For units with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish, not less than 6-inch- long linear components and 4-inch- square sheet components.

E. Product Schedule: For site furnishings. Use same designations indicated on Drawings.

1.04 INFORMATIONAL SUBMITTALS

A. Material Certificates: For site furnishings.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For site furnishings to include in maintenance manuals.

PART 2 - PRODUCTS

2.01 BENCH

A. Basis-of-Design Product: Subject to compliance with requirements, provide product specified and indicated on Drawings or a product from another manufacturer of equal or better quality and performance as approved by Landscape Architect.

1. “NeoRomantico Liviano” bench and “NeoRomantico Banquetta” backless bench by Santa & Cole, 2005 Charleston Trace, Roswell, GA 30075. Phone: (404) 858-4610.

B. Frame: Cast aluminum.

C. Seat and Back: Jarrah wood slats with a thickness of 1 3/16 inch

D. Banqueetta (backless) bench dimensions:

1. Height: 17 ¼”
2. Width: 19 ¼”
3. Length: 57”
4. Arm Ht: No arms.

E. Liviano (backed) bench dimensions:

1. Seat Ht: 18”
2. Overall Ht:30 ¾”
3. Width: 26 ¼”
4. Length: 69”
5. Arm Ht: 26 ¼”

F. Aluminum Finish: Manufacturer’s standard finish

G. Wood Finish: Manufacturer's standard finish.

2.02 STONE BENCH

A. Basis-of-Design Stone Source: Subject to compliance with requirements, provide Jonesboro granite, as available from Fletcher Granite CO., 534 Groton Road, Westford, Massachusetts 01886, (800) 253 -8168 or comparable granite by one (1) of the following:

1. Cold Spring Granite Company, 17482 Granite West Road, Cold Spring, Minnesota 56320 (800)-551-7502.
2. Polycor Granite Bussiere Inc., 1040 rue Bussiere Saint Sebastien Quebec Canada, (819) 652-2000.

B. Granite Benches Construction

1. Stone shall come from a single quarry, with sufficient reserves to satisfy the requirements of the project. The granite supplier shall have the capabilities to cut and finish the stone without delaying the project.
2. Stone Source Examination: Make quarried blocks available for examination by Landscape Architect.
3. Granite: ASTM C 615.

4. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
5. Finish: Stone shall be sawn to conform to dimensions on drawings. Top and bottom faces of the bench shall be sawn, and the top shall be sand-blasted. Vertical sides shall be rough-finished.
6. Thickness: As indicated on drawings.

C. Stainless Steel Dowels: Shall be ½-inch diameter, 10-inches long.

D. Grout:

1. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M; recommended in writing by manufacturer, for exterior applications.

E. Concrete:

1. Connecticut Department of transportation Standard Specifications Form 816-2004, Article M.03.01, Class 'C'.

2.03 BICYCLE RACKS

A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. United Steel, Inc.
2. General Welding Fabrication.

B. Bicycle Rack Construction:

1. Frame: Aluminum.

   a. Schedule 40 Extruded Pipe OD: Not less than 1-5/8 inches .

2. Style: Double-side parking.

   a. Overall Height: As indicated .
   b. Overall Depth: As indicated .
   c. Capacity: Designed to accommodate no fewer than two bicycles per rack (10 racks to be provided).

3. Accessories: Aluminum decorative flange for each pipe anchored end.

4. Installation Method: Embedded in concrete.

C. Aluminum Finish: Mill finish.

2.04 TRASH AND RECYCLING RECEPTACLES

A. Basis-of-Design Product: Subject to compliance with requirements, provide "Petosky" Litter and Recycling Containers as manufactured by Landscapeforms, 431 Lawndale Avenue, Kalamazoo,

MI 49048. Telephone: (800) 521-2546.or a product from another manufacturer of equal or better quality and performance as approved by Landscape Architect.

B. Style:

1. Diameter: 20 Inches
2. Capacity: 30 Gallons
3. Hinged Lid Height: 42”
4. Surface Mounted
5. Standard Opening 7 x 20 Inches (both litter and recycling receptacles)

C. Liner color: Black

D. Material:

1. Supports: Constructed of tubular 3” outer diameter, 0.120” wall thickness.
2. Perforated Metal: constructed of 11 gauge HRPO steel with ¼” square holes on 7/16” straight centers with a 3” solid metal border.
3. Lid: 11 gauge domed spun steel with minimum spin lines. Size: 20-1/2” diameter x 5” high at top of dome.
4. Liner: Constructed of linear low-density polyethylene of 0.100” nominal thickness.

E. Fabrication:

1. Shop assembled litter receptacles.

F. Accessories:

1. Anchor bolt:1/2“ dia. x 3-3/4” stainless steel “Ankr-Tite II” Wedge Anchors and nuts to be provided by contractor. Two (2) anchor bolts required for each Litter Receptacles.

G. Finishes:

1. Finish on Metal Landscape Forms, Inc. “Pangard II”.
   a. Primer: Rust inhibitor on ferrous supports.
   b. Topcoat: Thermosetting TGIC polyester powder coat. UV, chip, and flake resistant.
   c. Test Results: “Pangard II”.
      1) Gloss Consistency, Gardner 60 Degrees, ASTM D 523: Plus or minus 5 percent from standard.
      2) Gloss Consistency, Gardner 60 Degrees, ASTM D 523: Plus or minus 5 percent from standard.
      3) Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
      4) Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
      5) Erichsen Cupping, ISO 1520: 8 mm
      6) Impression Hardness, Buchholz, ISO 2815: 95
      7) Impact Test, ASTM D 2794: 60 inch-pounds at 2.5 mils
      8) Pencil Hardness, ASTM D 3363: 2H minimum
      9) Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max. undercutting 1 mm
      10) Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max. blisters 1 mm
   d. Color: Silver

2.05 STONE BOULDER

A. Boulder shall be hard and durable field stone of light color and uniform texture neither stratified nor laminated. It shall be free from dirt, cracks, scratches, chips, and evidence of weakening or disintegration and shall be of good smooth appearance. Boulders to be selected by Landscape Architect.

1. Boulders shall come from a single quarry, with sufficient reserves to satisfy the requirements of the project.
2. Boulders excavated on site during demolition are eligible for consideration.
3. Boulder Source Examination: Make quarried boulders and/or on-site boulders available for examination by Landscape Architect.

B. Dimension: As indicated on drawing.

2.06 GRANITE BOLLARDS

A. Hard and durable granite, generally of light color and uniform texture, free from seams or imperfections and containing only those color variations characteristic of material source and approved sample.

B. Shape of above finish grade portion of bollard to be asymmetric and pyramidal with a minimum top dimension inscribed within an 8” circle and a base which has a maximum dimension of 16 inches square. It is the design intent for no two bollards to look exactly alike but the bollards taken together should have a family resemblance.

C. Shape of below finish grade portion of bollard to be a rough hewn square 16 inches by 16 inches.

D. Overall height: As indicated on drawings.

E. Installation Method: Cast in concrete.

2.07 CONCRETE FILLED PIPE BOLLARD

A. Schedule 40 galvanized standard-weight steel pipe complying with ASTM A 53/A, 53M or electric-resistance-welded pipe complying with ASTM A 135/A135M filled with concrete.

1. Pipe: NPS 5 (5.563 inches O.D.)
2. Dome Cap: Welded on and finished to match bollard.
3. Overall height: As indicated on drawings.
4. Overall depth of burial: As indicated on drawings.
5. Installation Method: Cast in concrete.
6. Steel finish: Galvanized.

B. Concrete:

1. Connecticut Department of Transportation Standard Specifications Form 816-2004, Article M.03.01 Class ‘C’.

2.08 MATERIALS

A. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials; commercial quality, tamperproof, vandal and theft resistant .

B. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M; recommended in writing by manufacturer, for exterior applications.

C. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:

1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, polymer film. Internal, same as external or consisting of 81 percent zinc pigmented coating, not less than 0.3 mil thick.

2. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

2.09 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.

B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Preservative-Treated Wood Components: Complete fabrication of treated items before treatment if possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces.

E. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

F. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.10 GENERAL FINISH REQUIREMENTS

A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.11 STEEL AND GALVANIZED-STEEL FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

B. PVC Finish: Manufacturer's standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout , mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

END OF SECTION

SECTION 22 13 13

FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. State of Connecticut Department of Transportation, Standard Specification for Roads, Bridges and Incidental Construction, latest edition.

1.02 SUMMARY

A. Section Includes:

1. Pipe and fittings.
2. Nonpressure couplings.
3. Cleanouts.
4. Manholes.
5. Resilient pipe connector.
6. Manhole waterproof coating.
7. Special pipe fittings.
8. Warning tape.

1.03 DEFINITIONS

A. FRP: Fiberglass-reinforced plastic.

B. DI: Ductile-iron.

1.04 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure, Drainage-Piping Pressure Rating: At least equal to system test pressure.

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product indicated:

1. Cleanouts.
2. Manhole waterproof coating.
3. Resilient pipe connector.

B. Shop Drawings: For manholes. Include plans, elevations, sections, details, and frames and covers.

1.06 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.

B. Field quality-control reports.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic pipe and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes according to manufacturer's written rigging instructions.

1.08 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Do not proceed with interruption of service without Engineer's and Owner's written permission.

PART 2 - PRODUCTS

2.01 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 74, Service class.

B. Gaskets: ASTM C 564, rubber.

C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.02 PVC PIPE AND FITTINGS

A. PVC Sewer Pipe and Fittings (NPS 15 and Smaller):

1. Pipe: ASTM D 3034, SDR 35, PVC sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

2.03 NONPRESSURE-TYPE TRANSITION COUPLINGS

A. Sleeve-Type Pipe Coupling: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to mate with OD of pipes being joined, for nonpressure joints.

1. Sleeve Material for Cast-Iron and Ductile Iron Soil Pipe: ASTM C 564, rubber.
2. Sleeve Material for Plastic Pipe: ASTM F 477, elastomeric seal.
3. Sleeve Material for Dissimilar Pipe: Compatible with pipe materials being joined.
4. Bands: Stainless steel, at least one at each pipe insert.

B. Bushing-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric bushing fabricated to mate with OD of smaller pipe and ID of adjoining larger pipe, for nonpressure joint.

1. Sleeve Material for Cast-Iron and Ductile Iron Soil Pipe: ASTM C 564, rubber.
2. Sleeve Material for Plastic Pipe: ASTM F 477, elastomeric seal.

3. Sleeve Material for Dissimilar Pipe: Compatible with pipe materials being joined.

2.04 CLEANOUTS

A. Cast-Iron Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Josam Company.
   b. MIFAB, Inc.
   c. Smith, Jay R. Mfg. Co.
   d. Tyler Pipe.
   e. Watts Water Technologies, Inc.
   f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.

2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
3. Top-Loading Classification(s): Heavy Duty.
4. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

2.05 MANHOLES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section; with separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, of length to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated; with top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.

   a. Kor-n-Seal.

9. Steps: Individual FRP steps; wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 36 inches.
10. Install frame over a minimum of three layers (8 inches) of concrete brick, continuous around frame to allow vertical adjustment.
11. Mortar for Chimney, Frame and Cover Joints: Comply with ASTM C 270, Type M, except for quantities less than 2.0 cu. ft. where packaged mix complying with ASTM C 387, Type M, may be used.

12. Protective Coating: Plant-applied, waterproofing; 15-mil minimum thickness applied to exterior surfaces, including chimneys.

B. Manhole Frames and Covers:

1. Description: Ferrous; size as indicated on drawings. Include indented top design with lettering cast into cover, using wording equivalent to "SANITARY SEWER" or as required by local authority.
2. Material: ASTM A 48/A 48M, Class 35 gray iron unless otherwise indicated. Designed for AASHTO H20 structural loading.

2.06 CONCRETE

A. General: Cast-in-place concrete; refer to Section 033000 "Cast-In-Place Concrete" unless specified below.

B. Portland Cement Design Mix for Precast Concrete: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

C. Manhole Channels and Benches: If factory-formed, use same concrete as specified above for pre-cast. If field-formed, refer to Section 033000 "Cast-In-Place Concrete."

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

   a. Invert Slope: 1 percent through manhole.

2. Benches: Concrete, sloped to drain into channel.

   a. Slope: 4 percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

2.07 MISCELLANEOUS MATERIALS

A. Waterproof Coating:

1. Hydrocide 700B.
2. PPS 922 Superseal.
3. Bay Oil, "Ebony."

PART 3 - EXECUTION

3.01 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.02 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. Install gravity-flow, nonpressure, drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 2 percent unless otherwise indicated.
2. Install piping NPS 6 and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place-concrete supports or anchors.
3. Install piping with 48-inch minimum cover, unless otherwise indicated.
4. Install hub-and-spigot, cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
5. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

F. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.03 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure, drainage piping according to the following:

1. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
3. Join dissimilar pipe materials with nonpressure-type, flexible couplings.

B. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

1. Use nonpressure flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.

3.04 MANHOLE INSTALLATION

A. General: Install manholes complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections with sealants according to ASTM C 891.

C. Form continuous concrete channels and benches between inlets and outlet.

D. Set covers flush with finished surface for manholes that occur in pavements. Set covers flush with topsoil and provide a graded transition away from covers to surrounding grade.

3.05 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.06 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts, and use cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use Heavy-Duty, top-loading classification cleanouts. Provide round 12-inch deep double flanged housing with secured scoriated cast-iron cover with lifting device, gasket seal, vandal-proof screws and bronze plug.

B. Refer to detail on Contract Drawings for cleanout installation.

3.07 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Section 221316 "Sanitary Waste and Vent Piping."

B. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

2. Grout between edge of manhole knockout and exterior wall of piping at manhole connection.
3. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

C. Connect to grease interceptors specified in Section 221323 "Sanitary Waste Interceptors."

3.08 CLOSING ABANDONED SANITARY SEWER SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch- thick, brick masonry bulkheads.
2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Manholes: Excavate around manhole as required and use either procedure below:

1. Remove manhole and close open ends of remaining piping.
2. Remove top of manhole down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

C. Backfill to grade according to Section 312000 "Earth Moving."

3.09 IDENTIFICATION

A. Comply with requirements in Section 312000 "Earth Moving" for underground utility identification devices. Arrange for installation of detectable warning tapes 18 to 24 inches directly over piping and at outside edges of underground manholes.

3.10 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:

   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.

5. Gravity PVC Pipe Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction. If there are no requirements by the authorities having jurisdiction, use one of the following:

    a. Air Test: UNI-B-6 and ASTM F 1417.
    b. Hydrostatic Test (Infiltration): When the groundwater is 2 feet or more above the crown of the pipe at the upper end of the sections to be tested, an infiltration test shall be made. The upper end of the section to be tested shall be plugged and a V-notch weir of appropriate size shall be fitted into the lower end so as to prevent leakage around the weir plate. The gain of water into the system over a period of at least 4 hours shall then be measured and the leakage rate calculated. The infiltration leakage rate shall not exceed 100 gallons per inch of pipe diameter per mile of pipe per 24 hours.
    c. Hydrostatic Test (Exfiltration): When the groundwater is not present as described in the hydrostatic (infiltration) test, an exfiltration test shall be made. The sewer shall be plugged at the lower manhole in the outlet pipe and at the upper manhole in the inlet pipe. Water shall be introduced at the lower manhole and the line filled to a point 2 feet above the crown of the pipe at the upper manhole. Before any measurements are made, a period of 2 hours shall be permitted to allow for absorption and escape of trapped air. Water shall be reintroduced at the lower manhole and the line filled to a point 2 feet above the crown of the pipe at the upper manhole. The loss of water from the system over a period of at least 4 hours shall then be measured and the leakage rate calculated. The exfiltration leakage rate shall not exceed 100 gallons per inch of pipe diameter per mile of pipe.

6. Manhole Tests:

    a. If any part of the manhole is within the water table, perform a negative air pressure test in accordance with ASTM C 1244.
    b. If manhole is not within the water table, perform hydrostatic test in accordance with ASTM C 969.

C. Damage, leaks and loss in test pressure below limits stated above, constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.11 CLEANING

A. Clean dirt and superfluous material from interior of piping. Flush with potable water.

3.12 AS-BUILT DRAWINGS

A. The contractor shall provide as-built drawings including as-built ties and markups on a monthly basis. As work progresses, all construction activities shall be documented. The record documents shall include:

1. All demolition and abandonment of underground utilities and structures.
2. Location, elevation, and type (size and quantity) of installed underground utilities and piping. Location, elevation, and type of existing exposed utilities during installation of new work, vaults, manholes, transformers, valves, above- and below-ground conduits,

walls, bridges, signs, fences, structural fill, and any other surface and subsurface elements as defined in the specifications.

3. The contractor shall hire the services of a surveyor licensed in the state where the work is being performed to determine parameters stated above of completed work and record the results and update the electronic files. As-builts shall include lateral and vertical (depth) locations of all utilities at 50 foot increments.
4. Document installation with photographs in digital format, especially but not limited to, installation and restraints, tapping sleeves, joining of dissimilar materials, anchors and thrust blocks, valves and hydrants, bedding material, and pipe connections to buildings.
5. Final documents (drawings and electronic files in AutoCAD format, latest edition), shall be submitted to the designated Owner's representative not later than 30 days after substantial completion of the project. All comments shall be incorporated to the final documents within 14 days after receiving them from the Owner's representative. The final record set (hard copy and the electronic files) shall be submitted to the Owner's representative.

END OF SECTION
07/11/13

SECTION 22 13 23

SANITARY WASTE INTERCEPTORS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following types of interceptors outside the building:

1. Grease interceptors.

1.03 DEFINITIONS

A. FRP: Fiberglass-reinforced plastic.

B. HDPE: High-density polyethylene plastic.

C. PE: Polyethylene plastic.

D. PP: Polypropylene plastic.

1.04 SUBMITTALS

A. Shop Drawings: For each type and size of cast-in-place-concrete interceptor indicated.

1. Include materials of construction, dimensions, rated capacities, retention capacities, location and size of each pipe connection, furnished specialties, and accessories.

B. Shop Drawings: For each type and size of precast concrete interceptor indicated.

1. Include materials of construction, dimensions, rated capacities, retention capacities, location and size of each pipe connection, furnished specialties, and accessories.

C. Coordination Drawings: Interceptors, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Interceptors.
2. Piping connections. Include size, location, and elevation of each.
3. Interface with underground structures and utility services.

1.05 PROJECT CONDITIONS

A. Interruption of Existing Sewer Services: Do not interrupt services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sewer services according to requirements indicated:

1. Notify Owner no fewer than seven days in advance of proposed interruption of service.
2. Do not proceed with interruption of sewer services without Owner's written permission.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 GREASE INTERCEPTORS

A. Grease Interceptors: Precast concrete structure complying with requirements of the authority having jurisdiction.

B. Grease Interceptors: Precast concrete complying with ASTM C 913. Include rubber-gasketed joints, vent connections, manholes, compartments or baffles, and piping or openings to retain grease and to permit wastewater flow.

1. Protective Coating: Plant-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 15-mil minimum thickness applied to all exterior and interior concrete surfaces.
2. Structural Design Loads:

    a. Heavy-Traffic Load: Comply with ASTM C 890, A-16 (ASSHTO HS20-44).

3. Resilient Pipe Connectors: ASTM C 923, cast or fitted into interceptor walls, for each pipe connection.
4. Steps: Individual FRP steps wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of interceptor to finished grade is less than 60 inches.
5. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover.
6. Manhole Frames and Covers: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch-minimum width flange and 26-inch- diameter cover.

    a. Ductile Iron: ASTM A 536, Grade 60-40-18, unless otherwise indicated.
    b. Gray Iron: ASTM A 48, Class 35, unless otherwise indicated.
    c. Include indented top design with lettering cast into cover, using wording equivalent to "GREASE INTERCEPTOR."
    d. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; 15-mil minimum thickness applied to all ferrous surfaces.

C. Grease Interceptor Capacity and Characteristics:

1. As specified on drawings.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 22 Section "Earth Moving."

3.02 INSTALLATION

A. Install interceptor inlets and outlets at elevations indicated.

B. Place concrete for cast-in-place interceptors according to ACI 318/318R and ACI 350R.

1. Refer to Division 03 Sections "Cast-in-Place Concrete" and "Miscellaneous Cast-in-Place Concrete"for formwork, reinforcement, and concrete.

C. Install precast concrete interceptors according to ASTM C 891. Set level and plumb.

D. Install manhole risers from top of underground concrete interceptors to manholes and gratings at finished grade.

E. Set tops of manhole frames and covers flush with finished surface in pavements.

3.03 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Make piping connections between interceptors and piping systems.

3.04 IDENTIFICATION

A. Identification materials and installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tapes directly over piping and at outside edges of underground interceptors.
1. Use detectable warning tape over piping and over edges of underground structures.

END OF SECTION
07/11/13

SECTION 26 05 43

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, latest edition.

1.02 SUMMARY

A. This Section includes the following:

1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct banks and in single duct runs.
2. Handholes.
3. Manholes.
4. Manhole and handhole waterproof coating.

1.03 DEFINITION

A. RNC: Rigid nonmetallic conduit.

1.04 ACTION SUBMITTALS

A. Product Data: For the following:

1. Duct-bank materials, including separators and miscellaneous components.
2. Ducts and conduits and their accessories, including long radius sweeps, end bells, bends, fittings, and solvent cement.
3. Accessories for manholes and handholes.
4. Waterproof coating.
5. Sump pumps.
6. Concrete mix design.

B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:

1. Duct entry provisions, including locations and duct sizes.
2. Reinforcement details.
3. Frame and cover design and manhole frame support rings.
4. Grounding details.
5. Dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
6. Joint details.

C. Shop Drawings for Factory-Fabricated Handholes Other Than Precast Concrete: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:

1. Duct entry provisions, including locations and duct sizes.
2. Cover design.
3. Grounding details.
4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.05 INFORMATIONAL SUBMITTALS

A. Product Certificates: For concrete and steel used in precast concrete manholes and handholes, as required by ASTM C 858.

B. Source quality-control test reports.

C. Field quality-control test reports.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Comply with ANSI C2.

C. Comply with NFPA 70.

D. Comply with ASTM C 857 Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

B. Store precast concrete and other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

C. Lift and support precast concrete units only at designated lifting or supporting points.

1.08 PROJECT CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Do not proceed with interruption of electrical service without Architect's and Owner's written permission.

1.09 COORDINATION

A. Coordinate layout and installation of ducts, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field.

B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Engineer.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

B. Furnish cable-support stanchions, arms, and associated fasteners in quantities equal to 5 percent of quantity of each item installed.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Comply with requirements in Part3 articles for where materials shall be applied.

2.02 CONDUIT

A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.

2.03 NONMETALLIC DUCTS AND DUCT ACCESSORIES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:

1. ARNCO Corp.
2. Beck Manufacturing.
3. Cantex, Inc.
4. CertainTeed Corp.; Pipe & Plastics Group.
5. Condux International, Inc.
6. ElecSys, Inc.
7. Electri-Flex Company.
8. IPEX Inc.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT; a division of Cable Design Technologies.
11. Spiraduct/AFC Cable Systems, Inc.
12. Prime Conduit

D. Underground Plastic Utilities Duct: NEMA TC 2, Schedule 40 PVC and Schedule 80 PVC, UL 651, with matching fittings by the same manufacturer as the duct, complying with NEMA TC 3.

E. Duct Accessories:

1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and selected to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
2. Warning Tape: Underground-line warning tape specified in Division 31 Section "Earth Moving."

2.04 DUCT BANK CONCRETE DESIGN MIX

A. Concrete to be normal weight concrete with a 2,500 psi, 28-day compressive strength; water-cement ratio of 0.55 maximum (water content shall include surface water in aggregates); minimum cement content of 5-1/2 sacks per cubic yard, maximum 3/8-inch aggregate, four +/- 1 inch slump; 6 percent air content by volume.

1. Portland Cement: ASTM C 150, Type I/II.
2. Normal Weight Aggregates: ASTM C33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

   a. Maximum Coarse Aggregates Size: 3/8-inch nominal, unless otherwise noted.
   b. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

3. Water: ASTM C94, potable.

2.05 PRECAST CONCRETE HANDHOLES

A. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:

1. Carder Concrete Products.
2. Christy Concrete Products.
3. Elmhurst-Chicago Stone Co.
4. Oldcastle Precast Group.
5. Riverton Concrete Products; a division of Cretex Companies, Inc.
6. Utility Concrete Products, LLC.
7. Utility Vault Co.
8. Wausau Tile, Inc.
9. Arrow Precast.
10. United Precast.

B. Comply with ASTM C 858 for design and manufacturing processes.

C. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.

1. Configuration: Handholes shall be designed for AASHTO H20 loading, soil loading to depths of 5 ft. and anticipated construction loading. Handholes shall be designed for hydrostatic pressure from groundwater assuming the handhole is empty and the hydrostatic head is the full height of the handhole.
2. Frame and Cover: Refer to part entitled "Utility Structure Accessories."
3. Cover Legend: Refer to part entitled "Utility Structure Accessories."

4. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches vertically and horizontally to accommodate alignment variations.

    a. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
    b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
    c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.

5. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

    a. Type and size shall match fittings to duct or conduit to be terminated.
    b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.

6. Handholes shall have inserts for cable racks and pulling-in irons installed before concrete is poured.
7. Protective Coating: Plant-applied waterproofing, 15 mil minimum thickness applied to exterior surfaces, including chimneys.

D. Concrete Knockout Panels: 1-1/2 to 2 inches thick, for future conduit entrance and sleeve for ground rod.

2.06 HANDHOLES OTHER THAN PRECAST CONCRETE

A. Description: Comply with SCTE 77.

1. Color: Green.
2. Configuration: Units shall be designed for flush burial and have open bottom, unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering, "ELECTRIC" or "TELEPHONE" As indicated for each service.
6. Direct-Buried Wiring Entrance Provisions: Knockouts equipped with insulated bushings or end-bell fittings, selected to suit box material, sized for wiring indicated, and arranged for secure, fixed installation in enclosure wall.
7. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Handholes shall have factory-installed inserts for cable racks and pulling-in irons.

B. Polymer Concrete Handholes with Polymer Concrete Cover: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.

1. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:

    a. Armorcast Products Company.
    b. Carson Industries LLC.
    c. CDR Systems Corporation.
    d. NewBasis.
    e. Hubbell Quazite.

2.07 PRECAST MANHOLES

A. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:

1. Carder Concrete Products.
2. Christy Concrete Products.
3. Elmhurst-Chicago Stone Co.
4. Oldcastle Precast Group.
5. Riverton Concrete Products; a division of Cretex Companies, Inc.
6. Utility Concrete Products, LLC.
7. Utility Vault Co.
8. Wausau Tile, Inc.
9. Arrow Precast.
10. United Precast.

B. Comply with ASTM C 858 for design and manufacturing processes.

C. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of manhole.

1. Configuration: Manholes shall be designed for AASHTO H20 loading, soil loading to depths of 5 ft. and anticipated construction loading. Manholes shall be designed for hydrostatic pressure from groundwater assuming the manhole is empty and the hydrostatic head is the full height of the manhole.
2. Frame and Cover: Refer to part entitled "Utility Structure Accessories."
3. Cover Legend: Refer to part entitled "Utility Structure Accessories."
4. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches vertically and horizontally to accommodate alignment variations.

    a. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
    b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
    c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.

5. Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

    a. Type and size shall match fittings to duct or conduit to be terminated.

b. Fittings shall align with elevations of approaching ducts and be located near interior corners of manholes to facilitate racking of cable.

D. Concrete Knockout Panels: 1-1/2 to 2 inches thick, for future conduit entrance and sleeve for ground rod.

E. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

F. Protective Coating: Plant-applied waterproofing, 15 mil thickness applied to exterior surfaces, including chimneys.

2.08 UTILITY STRUCTURE ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Bilco Company (The).
2. Campbell Foundry Company.
3. Carder Concrete Products.
4. Christy Concrete Products.
5. East Jordan Iron Works, Inc.
6. Elmhurst-Chicago Stone Co.
7. McKinley Iron Works, Inc.
8. Neenah Foundry Company.
9. NewBasis.
10. Oldcastle Precast Group.
11. Osburn Associates, Inc.
12. Pennsylvania Insert Corporation.
13. Riverton Concrete Products; a division of Cretex Companies, Inc..
14. Strongwell Corporation; Lenoir City Division.
15. Underground Devices, Inc.
16. Utility Concrete Products, LLC.
17. Utility Vault Co.
18. Wausau Tile, Inc.

B. Precast Manhole and Handhole Frames, Covers, and Chimney Components: Comply with structural design loading specified for manhole.

1. Frame and Cover: Weatherproof, gray cast iron complying with ASTM A 48/A 48M, Class 30B with milled cover-to-frame bearing surfaces; diameter as indicated on drawings.

   a. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
   b. Special Covers: Recess in face of cover designed to accept finish material in paved areas.

2. Cover Legend: Cast in. Selected to suit system.

   a. Legend: "ELECTRIC" for electrical systems.
   b. Legend: "COMMUNICATIONS" for communications, data, and telephone duct systems.

3. Precast Manhole and Handhole Chimney Components: Precast concrete rings with dimensions matched to those of roof opening or install frame over a minimum of three layers (8 inches) of concrete brick, continuous around frame, to allow vertical adjustment.

   a. Mortar for Chimney Ring Concrete Brick and Frame and Cover Joints: Comply with ASTM C 270, Type M, except for quantities less than 2.0 cu. ft. where packaged mix complying with ASTM C 387, Type M, may be used.

C. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- diameter eye, and 1-by-4-inch bolt.

   1. Working Load Embedded in 6-Inch, 4000-psi Concrete: 13,000-lbf minimum tension.

D. Pulling-In and Lifting Irons in Concrete Floors: 7/8-inch- diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.

   1. Ultimate Yield Strength: 40,000-lbf shear and 60,000-lbf tension.

E. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch ID by 2-3/4 inches deep, flared to 1-1/4 inches minimum at base.

   1. Tested Ultimate Pullout Strength: 12,000 lbf minimum.

F. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch bolt, 5300-lbf rated pullout strength, and minimum 6800-lbf rated shear strength.

G. Cable Rack Assembly: Nonmetallic. Components fabricated from nonconductive, fiberglass-reinforced polymer.

   1. Stanchions: Nominal 36 inches high by 4 inches wide, with minimum of 9 holes for arm attachment.
   2. Arms: Arranged for secure, drop-in attachment in horizontal position at any location on cable stanchions, and capable of being locked in position. Arms shall be available in lengths ranging from 3 inches with 450-lb minimum capacity to 20 inches with 250-lb minimum capacity. Top of arm shall be nominally 4 inches wide, and arm shall have slots along full length for cable ties.

H. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F. Capable of withstanding temperature of 300 deg F without slump and adhering to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

I. Fixed Manhole Ladders: Arranged for attachment to manhole. Ladder and mounting brackets and braces shall be fabricated from nonconductive, structural-grade, fiberglass-reinforced resin.

J. Portable Manhole Ladders: UL-listed, heavy-duty wood specifically designed for portable use for access to electrical manholes. Minimum length equal to distance from deepest manhole floor to grade plus 36 inches. One required.

K. Cover Hooks: Heavy duty, designed for lifts 60 lbf and greater. Two required.

2.09 SOURCE QUALITY CONTROL

A. Test and inspect precast concrete utility structures according to ASTM C 1037.

B. Nonconcrete Handhole Prototype Test: Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Strength tests of complete boxes and covers shall be by either an independent testing agency or the manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
2. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

2.10 MISCELLANEOUS MATERIALS

A. Waterproof Coating:

1. Hydrocide 700B.
2. PPS 922 Superseal.
3. Bay Oil, "Ebony."

PART 3 - EXECUTION

3.01 UNDERGROUND DUCT APPLICATION

A. Ducts for Electrical Cables: RNC, NEMA Schedule 40 PVC, in concrete-encased duct bank, unless otherwise indicated.

B. Ducts for Electrical Cables: RNC, NEMA Schedule 80 PVC, in direct-buried duct bank, unless otherwise indicated.

C. Underground Ducts for Telephone, Communications, or Data Utility Service Cables: RNC, NEMA Schedule 40 PVC, in concrete-encased duct bank, unless otherwise indicated.

D. Underground Ducts for Telephone, Communications, or Data Utility Service Cables: RNC, NEMA Schedule 80 PVC installed in direct-buried duct bank, unless otherwise indicated.

3.02 EARTHWORK

A. Excavation and Backfill: Comply with Division 31 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329200 "Turf and Grasses" and Section 329300 "Plants."

D. Cut and patch existing pavement in the path of underground ducts and utility structures according to Section 017329 "Cutting and Patching."

3.03 DUCT INSTALLATION

A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.

B. Curves and Bends:

1. Direct-Buried Duct Banks: Use manufactured RGS long radius sweeps for all bends with a radius of 6 ft. or less. All other bends are to be heated long radius sweeps. Conduit is not to be distorted.
2. Concrete-Encased Duct Banks: Use heated long radius sweeps. Conduit is not to be distorted.

C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

D. Duct Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch ducts, and vary proportionately for other duct sizes.

1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct line slope and without forming a trap in the line.
2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.
3. Grout end bells into structure walls from both sides to provide watertight entrances.

E. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 feet outside the building wall without reducing duct line slope away from the building, and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

F. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

G. Pulling Cord: Install 100-lbf- test nylon cord in ducts, including spares.

H. Concrete-Encased Ducts: Support ducts on duct separators.

1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than 4 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
2. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.

a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion

fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.

b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing rod dowels extending 18 inches into concrete on both sides of joint near corners of envelope.

3. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.
4. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
5. Minimum Space between Ducts: 3 inches between ducts and exterior envelope wall, 3 inches between ducts for like services, and 24 inches between power and signal ducts.
6. Depth: As indicated on the Contract Documents.
7. Stub-Ups: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.

   a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
   b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.

8. Warning Tape: Bury detectable warning tape approximately 18 to 24 inches directly over all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches of the centerline of duct bank. Refer to Division 31 Section "Earth Moving" for additional information.

I. Direct-Buried Duct Banks:

1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
2. Space separators close enough to prevent sagging and deforming of ducts, with not less than 4 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches between tiers.
3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Division 31 Section "Earth Moving" for pipes less than 6 inches in nominal diameter.
4. Install backfill as specified in Division 31 Section "Earth Moving."
5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."
6. Install ducts with a minimum of 3 inches between ducts for like services and 24 inches between power and signal ducts.

7. Depth: As indicated on the Contract Documents.
8. Install manufactured rigid steel conduit long radius sweeps for stub-ups at poles and equipment and at building entrances through the floor.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
    b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.

9. Warning Tape: Bury detectable warning tape approximately 18 to 24 inches directly over all direct-buried ducts and duct banks. Align tape parallel to and within 3 inches of the centerline of duct bank. Refer to Division 31 Section "Earth Moving."

3.04 INSTALLATION OF CONCRETE MANHOLES AND HANDHOLES

A. Precast Concrete Handhole and Manhole Installation:

1. Comply with ASTM C 891, unless otherwise indicated.
2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed as indicated on drawings and compacted per Division 31 Section "Earth Moving."

B. Elevations:

1. Precast Manhole and Handhole Roof: Install with rooftop at least 18 inches below finished grade.
2. Precast Manhole and Handhole Chimney Frame and Cover: In paved areas and trafficways, set frame and cover flush with finished grade. Set other frame and cover flush with topsoil and provide graded transition away from cover to surrounding grade.
3. Where indicated, cast handhole cover frame integrally with handhole structure.

C. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

D. Manhole Access: Circular opening in manhole roof; sized to match cover size.

1. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.
2. Install chimney, constructed of precast concrete collars and rings or concrete brick to support frame and cover and to connect cover with manhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for cast-iron frame to chimney.

E. Waterproofing: Apply waterproofing to exterior surfaces of precast manholes and handholes after concrete has cured at least three days. Waterproofing materials and installation are specified in Part 2. After ducts have been connected and grouted, and before backfilling, waterproof joints and connections and touch up abrasions and scars. Waterproof exterior of manhole and handhole chimneys after mortar has cured at least three days.

F. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, as required for installation and support of cables and conductors and as indicated.

G. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.

H. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches for manholes and 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

I. Warning Sign: Install "Confined Space Hazard" warning sign on the inside surface of each manhole cover.

3.05 INSTALLATION OF HANDHOLES OTHER THAN PRECAST CONCRETE

A. Install handholes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use handhole extension if required to match depths of ducts, and seal joint between handhole and extension as recommended by the manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone as indicated on drawings and compacted per Division 31 Section "Earth Moving."

C. Elevation: Set so cover will be flush with topsoil and provide a graded transition away from cover to surrounding grade.

D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

E. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.06 GROUNDING

A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.07 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.08 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes, including sump. Remove foreign material.

3.09 AS-BUILT DRAWINGS

A. The Contractor shall provide as-built drawings including as-built ties and markups on a monthly basis. As work progresses, all construction activities shall be documented. The Record Documents shall include:

1. All demolition and abandonment of underground utilities and structures.
2. Location, elevation and type (size and quantity) of installed underground utilities. Location, elevation and type of existing exposed utilities during installation of new work.
3. The Contractor shall hire the services of a surveyor licensed in the state where the work is being performed to determine parameters stated above or complete work and record the results and update the electronic files. As-builts shall include lateral and vertical (depth) locations of all utilities at 50-foot increments.
4. Document installation with photographs in digital format, especially but not limited to, field joints, bedding material, concrete encasement, duct spacers, sweeps, bends and connections to manholes and buildings.
5. Final documents (drawings and electronic files in AutoCAD format, latest edition) shall be submitted to the designated Owner's Representative not later than 30 days after substantial completion of the project. All comments shall be incorporated to the final documents within 14 days after receiving them from the Owner's Representative. The final record set (hard copy and electronic files) shall be submitted to the Owner's Representative.

END OF SECTION
07/11/13

SECTION 31 00 00

EARTHWORK

PART 1 GENERAL

1.01 DESCRIPTION

A. General: Perform earthwork in accordance with the Contract Documents.

B. Work Included: Work of this Section includes all labor, materials, equipment, and services necessary to complete the excavation, foundations, subgrade preparation, filling and grading as shown on the Drawings and specified herein including, but not limited to the following:
   1. All earth excavation to the bottom of foundations, walls, pits, slabs, manholes, etc. as required and indicated on the Contract Drawings or to a lower elevation to achieve required bearing capacity, as directed by the Geotechnical Engineer.
   2. Excavation, filling and rough grading of site area at adjacent structures and roadways as required and within the Contract Limit Line.
   3. Excavation, filling, grading and compacting to required elevations for all floors, slabs on grade, and structural slabs.
   4. Excavation, filling, grading and compacting to required elevations for appurtenances and site work.
   5. Filling and compacting of soil below foundation slab-on-grades, behind below grade walls, and beneath structural slabs.
   6. Legal disposing off the site, of surplus excavated materials unsuitable for filling or backfilling.
   7. Pumping and dewatering as required for work of this section and for foundation work.
   8. Subgrade preparation for foundations.
   9. Protection and monitoring of adjacent structures, utilities and pavements.
   10. Other labor and materials as may be reasonably inferred to be required to make the work under this Section complete.

1.02 RELATED SECTIONS

A. Concrete Work – Section 03 30 00

B. Underground Storage Tank Removal – Section 02 65 00

C. Rock Removal – Section 31 08 01

D. Dewatering – Section 31 08 02

1.03 REFERENCES

A. General: All work and materials under this section shall conform to the latest revision of the following standard specifications, where not otherwise required by the Contract Documents:

B. American Society for Testing and Materials (ASTM) – latest edition.
   1. C 136 Test for Sieve Analysis of Fine and Coarse Aggregates
   2. D 422 Method for Particle Size Analysis of Soils
   3. D 698 Test for Moisture - Density Relations of Soils - Standard Proctor Method
   4. D 1140 Test for Amount of Material in Soils Finer than No. 200 (75 mm) Sieve
   5. D 1556 Test for Density and Unit Weight of Soil in Place by the Sand-Cone Method
   6. D 1557 Test for Moisture-Density Relations of Soils Using 10-lb (4.5 Kg) Hammer and 18-inch (457 mm) Drop (Modified Proctor)
   7. D 2216 Laboratory Determination of Moisture content of Soil
   8. D 2487 Classification of Soils for Engineering Purposes
   9. D 2922 Tests for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth)

10. D 3017 Test for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
11. D 4253 Test Method of Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
12. D 4254 Test Methods for Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density
13. D 4318 Test for Plastic Limit, Liquid Limit, and Plasticity Index of Soils

C. American Association of State Highway and Transportation Officials (AASHTO) – Latest edition.
   1. T 88 Mechanical Analysis of Soils

D. All work shall comply with the requirements of the Connecticut State Building Code (IBC 2003 with 2009 Connecticut Supplement), and the requirements and regulations of any other Federal, State, or Local ordinances having jurisdiction.

E. Previous Reports: where discrepancies are present, the more stringent requirement shall apply.
   1. Geotechnical Engineering Study, prepared by Langan CT, Inc. dated February 15, 2012 and revised November 8, 2013.

1.04 SUBMITTALS

A. Within ten days after award of the contract, the Contractor shall submit to the Architect a schedule detailing the sequence, and time of completion of all phases of work under this section.

B. At least two weeks in advance of imported fill use, the Contractor shall submit either the following laboratory test data or a 50-pound soil sample to the Geotechnical Engineer for each type of imported soil/gravel material to be used as compacted fill:
   1. Test reports on borrow material as follows:
      a. Moisture and Density Relationship: ASTM D1557.
      b. Mechanical Analysis: AASHTO T-88.
      c. Moisture content in accordance with ASTM D 2216.
      d. Relative Density: ASTM D2049.
      e. California Bearing Ratio (CBR): ASTM D1883.
      f. Plasticity Index: ASTM 4318.
   2. Include data for all samples indicating the exact location and methods of transportation and placement of all materials.

C. Together with the above test data, the Contractor shall submit a 5 pound sample of each type of off-site fill material in an air tight container for the approval of the Geotechnical Engineer.

D. Submit the name of each material supplier and specific type and source of each material. Any change in source or soil type throughout the job requires approval of the Builder and the Geotechnical Engineer.

E. Samples: Submit a 12 inch by 12 inch sample of filter fabric.

F. Shop Drawings:
   1. Submit detailed shop drawings and calculations, to be reviewed by the Owner's Geotechnical Engineer, of earthwork procedures and sequences including temporary excavation support systems.
   2. The drawings shall bear the signature and seal of a Professional Engineer registered in the State of Connecticut.

G. Pre-Construction Conditions Survey: The Contractor will perform a pre-construction conditions survey of all immediate adjacent structures, the results of which will be made available to the Owner and Design Team upon completion of the survey.

H. Certification for Examination of Site and Records: Before proceeding with the Work, submit

certification in an acceptable form, signed by the Contractor, stating that careful examination has been made of the site, existing structures, records of utility lines, test boring records, and subsurface exploration reports by the Geotechnical Engineer, the Drawings, and all other Contract Documents.

I. Submit approvals and permits to the General Contractor a minimum of 15 days prior to commencement of construction.

1.05 ENVIRONMENTAL CONSIDERATIONS

A. Install erosion control measures in the sequence shown of the plans or as directed by the Architect or regulatory agencies to protect adjacent properties and water resources from erosion and sediment damage.

B. Any off-site soil disposal requirement shall be performed in accordance with all applicable Local, State, and Federal regulations governing soil movement and disposal.

C. Dust and Erosion Control:
   1. The Contractor shall take all necessary measures and provide equipment and/or materials to minimize dust from rising and blowing across the site and also to control surface water throughout the operation so that it does not run onto paved ways without being filtered. In addition, the Contractor shall control all dust created by construction operation and movement of construction vehicles, both on site and on paved ways. Comply with 2002 Connecticut Sediment and Erosion Control Guidelines.

1.06 PROJECT CONDITIONS

A. The ESUMS site is approximately 4.6-acre in size, and is bordered by Boston Post Road to the north, commercial property and the University of New Haven (UNH) to the east, residential property to the south, and Rockview Street to the west in West Haven, Connecticut.

B. The site is bordered by existing structures, athletic fields, wetland areas, and roadways. The site is occupied by multiple residential and commercial structures.

C. The general subsurface conditions encountered at the site consists of a surficial layer of asphalt pavement or topsoil where encountered, underlain by miscellaneous fill material where encountered, a thin layer of silt where encountered, glacial till, followed by weathered rock and greenstone bedrock. The thin layer of silt was encountered in three of the 12 borings and generally north and south of the proposed building footprint. Bedrock was encountered between 1 and 24 feet below existing site grades and generally slopes downward from north to south and from west to east. Groundwater was encountered between 2 to 7.5 feet below the existing site grades at the boring locations and was observed to stabilize between 3.2 and 9.5 feet below existing site grades at the observation well locations. See the Geotechnical Engineering Report referenced herein for additional subsurface information.

D. The Contractor, by careful examination, shall inform himself as to the nature and location of the work; the conformation of the ground, the nature of the subsurface conditions; the locations of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; the conditions of adjacent structures and utilities and all other matters which can in any way effect the work.

E. The Contractor shall be held to have visited the site and to have familiarized himself with the existing conditions of adjoining utilities and structures.

F. The Contractor shall make his own deductions of the subsurface conditions which may affect the methods or cost of construction of the work hereunder, and he agrees that he will make no claims for damages or compensations, except as are provided under the agreement, should he find conditions during the progress of the work different from those as calculated and/or

anticipated by him. Additional borings and other exploratory operations may be performed by Contractor, at the Contractor's option and following the Owner's approval. No change in the Contract Sum will be authorized for such additional exploration undertaken by the Contractor.

G. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of the site of the work. The Contractor shall conform to all City and State, and Federal regulations concerning the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.

1.07 PRE-CONSTRUCTION CONDITION SURVEY

A. The Contractor shall perform a pre-construction conditions survey of the structures immediately adjacent to the work area, prior to the start of work and shall include the results of this survey with their shop drawings submittal to the Owner and Design Team before commencement of said work.

1.08 PROTECTION

A. Protection of Adjacent Structures, Utilities and Pavements
   1. Prior to commencement of any work, consult the records for existing utilities, and note all conditions and limitations, which might affect the work required under this section.
   2. The Contractor shall become acquainted with the existence and location of all surface and subsurface structures and utilities within the project area. Contractor shall not damage any of those that are to remain and shall leave them accessible.
   3. The work shall be executed so that no damage or injury will occur to existing public and adjoining or adjacent structures, streets, paving, sewers, gas, water, electric or any other pipes. Should any damage or injury caused by the contractor, or anyone in Contractor's employ, or by the work under this Contract occur, the Contractor shall, at his own expense, make good such damage and assume all responsibility for such injury.
   4. Provide barricades and warning lights, barriers, etc, to prevent accidents, to avoid all necessary hazards and protect the public, the work, and property at all times, including Saturdays, Sundays, and holidays.
   5. The above shall also include the protection of all existing utilities (including sewers, electrical lines and telecommunication lines) to remain in use within and adjacent to the area affected by the work of this project.
   6. Monuments, bench marks and other reference features on streets bounding this project, shall be protected. Should these be disturbed in any manner, the Contractor shall have them replaced at own expense.
   7. Excavation work shall be restricted to hours indicated in the Contract Documents.
   8. The Contractor's surveyor shall install control points on the adjacent structures and pavement for vertical and horizontal monitoring (to the nearest 0.005 ft.). Control points shall be monitored weekly during excavation and foundation construction work.

B. Protection of Excavation Bottoms
   1. Facilities and materials needed to prevent earth at bottom of excavation from becoming frozen or unsuitable to receive the foundations shall be furnished.
   2. The excavation shall not be carried to final grades during freezing weather without providing complete protection against freezing of the subgrades as specified hereinafter. Complete protection against freezing shall also be provided if freezing weather sets in after completion of the excavation to final subgrade. This protection shall include adequate heating and coverage of the area to maintain temperatures above freezing until foundations have been concreted and backfilled.
   3. Where excavations have been brought to the bottom elevations called for on the drawings, and the bottom of these excavations become unsuitable in the opinion of the Owner's Geotechnical Engineer because of inadequate protection by the Contractor, these

excavations shall be carried to lower depths sufficient to provide stable bearing as determined by the Owner's Geotechnical Engineer.

1.09 ERRORS IN DEPTH

A. In the event that any part of the excavation is carried, through error, beyond the depth and the dimensions indicated on the drawings of called for in the specifications, then the Contractor, at his own expense, shall furnish and install gravel or stone with which to fill to the required level, in all locations except beneath footings and piers. At these locations, Contractor shall be required to fill to level of bottom footing with concrete mixed in the proportion of the foundations bearing on them. Where established bottoms as shown on drawings have not been maintained or have been disturbed by operations under this contract, they shall be cleaned out and filled with concrete mixed in the proportion of the footings bearing upon them, without additional cost to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural or Engineered Fill: Well-graded sand and gravel having no more than 15% by dry weight passing the No. 200 sieve, free of organic material, clay, excessive silt, other deleterious or compressible materials, cinders, frozen material, trash, masonry or rubble and free of particle having dimensions greater than 3-inches in all directions. The on-site fill and natural glacial till conforming to the above gradation criteria and material that is not regulated as waste that requires off-site disposal can be reused as structural fill. Structural fill shall be used as backfilling material within 4 feet of any structure, including footings, slabs, below-grade walls, utilities, manholes, catch basins, in areas greater than 2 feet above pavement subgrade, if acceptable with the project Civil Engineer.

B. General Fill: Well-graded sand and gravel having no more than 20% by dry weight passing the No. 200 sieve, free of organic material, clay, excessive silt, other deleterious or compressible material, cinders, frozen material, trash, masonry or rubble and free of particles having dimensions greater than 3-inch in all directions. The on-site fill and natural glacial till conforming to the above gradation criteria and material that is not regulated as waste that requires off-site disposal can be reused as general fill. The use of recycled concrete aggregate as general fill shall be permitted provided it meets the gradation requirements above. General fill shall be used as backfilling material in non-finished areas (i.e. landscaped areas) or in areas greater than 2 feet below pavement subgrades, if acceptable with the project Civil Engineer.

C. Imported Fill: Well-graded sand and gravel having no more than 15% by dry weight passing the No. 200 sieve, free of organic material, clay, excessive silt, other deleterious or compressible materials, cinders, frozen material, trash, masonry or rubble and free of particle having dimensions greater than 2-inches in all directions. Any approved imported fill should be "certified clean fill" free of hazardous substances and meeting all site, local and federal regulations.

D. Drainage or Granular Fill: Free draining natural crushed stone free of deleterious materials and conforming to the gradation requirements commercially known as clean, durable, ¾-inch crushed stone. Recycled concrete shall not be acceptable.

E. The use of recycled concrete aggregate (RCA) is not permeated as backfill material behind permanent below grade walls.

F. Filter Fabric: Mirafi 140 manufactured by TC Mirafi or approved equivalent woven geotextile filter fabric where specified.

PART 3 EXECUTION

3.01 CODES, PERMITS AND REGULATIONS

A. Comply with all applicable laws, rules, and ordinances and regulations of the Federal Government, Connecticut, and other jurisdictions.

B. Obtain and pay for all permits and licenses required to execute and complete the work.

C. In case of conflict between regulations and specifications, the Contractor shall comply with the most stringent applicable codes, regulations or specifications.

3.02 PUMPING AND DEWATERING

A. All pumping and dewatering work shall be conducted in accordance with the dewatering Specification 31 08 02.

B. Provide adequate pumps, or other equipment, appurtenances, power, drains, materials and labor necessary to excavation continuously dry during excavation, foundation construction, and backfilling and at such other times as the progress of the work may demand or as necessary to insure safety to the structure shall be provided.

C. All pumping both inside and outside the areas of the building shall be performed, continued and maintained as required for the completion of all work, including the work of the mechanical trades, throughout the period of the contract.

D. Contractor shall manage runoff to limit impact on construction.

E. The dewatering system or systems shall be installed and operated in such a manner as to avoid the movement of fines or loss of ground from below the bearing level and shall not influence the stability of surrounding areas. The facilities needed to eliminate loss of ground shall be included.

F. The Contractor shall not use any portion of the building foundation units or any part thereof as a sump for drainage resulting from pumping in any other area. The Contractor shall not conduct water to privately owned properties.

G. Any pumped groundwater which will require off-site disposal shall comply with all Local, State, and Federal Environmental Regulations.

3.03 EXCAVATION

A. General
   1. Excavation shall be unclassified and shall include removal and disposal of all materials encountered regardless of the nature of the materials and shall be understood to include but not limited to rock, boulders, earth, glacial till, silt, hardpan, fill, foundations, structures, slabs, walls, utilities, pavements, curbs, piping and debris, and others.
   2. All excavation shall extend to the dimensions and elevations required for the installation of the work described herein and as indicated on the Drawings. Excavation shall be made to a depth that will allow installation of full depth of concrete slabs, and sub-base as shown on drawings and 1 inch tolerance. Excavation lines shall provide sufficient clearance for the proper execution of all concrete work, including allowances for form work, shoring and inspection.
   3. Materials that in the opinion of the Owner's Geotechnical Engineer are not suitable for fill and any surplus earth shall be removed from the site and legally disposed of.
   4. Existing utility lines to be retained that are shown on the drawings or the locations of which are made known to the Contractor prior to excavation operations, shall be protected from damage during excavation and backfilling, and if damaged, shall be repaired by the Contractor, at own expense.

B. Excavation for Foundations
   1. Foundation subgrades shall be observed and approved by the Owner's Geotechnical Engineer before proceeding with the construction of foundations. Bottoms of footings shall be founded on competent/fresh bedrock, slightly weathered bedrock, completely weathered rock, glacial till or structural fill having a net allowed uniform bearing pressures as specified in the Structural Drawings and as approved by the Owner's Geotechnical Engineer.
   2. Subgrade of foundations shall be level and free of loose soil, debris, standing water and frost prior to acceptance for placing concrete. A professional Geotechnical Engineer should observe and approve the foundation subgrade to verify that the subgrade material is adequate to provide the recommended allowable bearing pressure.
   3. Unauthorized Excavation: When suitable bearing material is encountered at subgrade elevations shown on Drawings and excavation is made to greater depth, the foundations and foundation walls shall be extended to the lower elevation with concrete of the same strength used for the foundations, at no additional cost to the Owner.

C. Subgrade Preparation
   1. Natural undisturbed material shall be graded and compacted to attain a uniform surface. These areas shall be determined by the Geotechnical Engineer.
   2. Prior to constructing foundations the subgrade shall be proofrolled in the presence of the Geotechnical Engineer for the following conditions:
      a. Proofrolling for footings shall be accomplished with a minimum of six passes of a 1-ton walk-behind vibratory roller. Proofrolling for slabs shall be accomplished with several passes of a vibratory roller having a static weight of 5 tons. Foundation elements shall not be placed until the subgrade is approved by the Geotechnical Engineer.
      b. Soft Areas during Compaction: If any areas show pumping, noticeable weaving, or which are otherwise unsatisfactory, undercut material within the limits and extent ordered by the Geotechnical Engineer. These areas shall be replaced with either concrete of the same strength used for the foundation or structural fill, compacted to 95% of maximum dry density by ASTM D1557. The appropriate water content at the time of compaction should be plus or minus 2 percentage points of optimum moisture content as determined by the laboratory compaction test aforementioned, unless otherwise directed by the Engineer of Record.

D. Excavation for General Grading:
   1. Excavations made below the elevations shown or specified, unless authorized by Change Order, shall be filled and compacted as hereinafter specified, at no additional cost. A Change Order will be issued for authorized additional excavation.

E. Trench Excavation:
   1. Unless otherwise shown, specified or required, make trenches for piping and utilities not less than 16 inches or more than 24 inches wider than the outside width of the piping or utilities. Accurately grade bottoms of trenches with bell holes scooped out to provide uniform bearing and support of pipe and utilities on undisturbed soil throughout its entire length, except where other means of supporting pipe are indicated.
   2. Trenches for underground conduit and piping, where necessary, shall be excavated to the required depth and bell holes shall be provided where necessary to insure uniform bearing. Trench excavation lines shall provide sufficient clearance for the proper execution of underground mechanical work.
   3. Trenches shall be by open cut from the surface. No tunneling will be allowed except by consent of the Geotechnical Engineer. Irregularities at bottom of trench, or where excavation is below required depth, shall be refilled to required grade with compacted granular fill.
   4. Pipe trenches shall be excavated and minimum cover shall be provided to required depths as per the Connecticut State Building Code. Excavated materials adjacent to trench as directed shall be neatly banked.

5. Where trenches are in wet or soft ground that in the opinion of the Geotechnical Engineer is unsuitable for supporting the piping, concrete cradles or approved equivalent shall be installed.
6. Where necessary, the sides of trenches and excavations shall be supported by adequate sheeting and bracing and conform with applicable OSHA regulations to insure proper construction and safety of the workers. The Contractor will be held responsible for the sufficiency of sheeting and bracing and for all damages to property or injury to persons resulting from improper quality, strength, placing, maintaining and removing of same.
7. Prior to utility installation, soil subgrades in the utility trenches should be proofrolled as specified herein. Pipe bedding should be placed and compacted in accordance with the pipe manufacturer's requirements or as indicated in the Drawings, whichever is more stringent.
8. Immediately after piping has been installed, tested, inspected, and accepted, piping shall be filled around with special care to solidly fill voids without causing injury to piping. Up to two feet above the pipe's crown, the utility excavation shall be backfilled using structural fill placed in 4-inch thick loose lifts. For the remainder of trench backfill, the excavation shall be backfilled using structural fill placed in 12-inch thick loose lifts. Each layer shall be compacted before placing the next layer. Backfill shall be in such a manner so as to prevent future settlement.

3.04 FILLING AND COMPACTING

A. General
1. Do not commence filling and backfilling operations until construction below finish grade has been approved, underground utilities and mechanical items inspected and tested, forms removed, waterproofing or damproofing and other improvements installed, trash and debris removed, and temporary and permanent bracing installed.
2. Do not commence backfilling, filling and grading until existing subgrade has been compacted to 95% of the material's maximum dry density as determined by the Modified Proctor Compaction Test (ASTM D1557).
3. Fill all excavations, backfill against all walls, and do all filling and grading necessary to bring the surfaces to the level required.
4. No fill material shall be placed on areas where free water is standing, or frozen subsoil area, or on surface which have not been approved for fill placement by the Geotechnical Engineer.
5. Do not backfill against concrete elements until the concrete has obtained its specified compressive strength.
6. Perform backfilling around foundation walls when the first floor provides sufficient bracing to withstand the backfill pressure. All other fill, backfill, and rolling to approximately finished grades shall then be completed.
7. Take particular care when rolling over areas where trenches or other excavations have been made and backfilled.
8. Grade bottoms of pavements and area way bottoms toward sediment pits or catch basins to maintain uniform thickness of the slabs.

B. Grading
1. Prior to placing fill or backfill in any area, grading is to be performed as required to provide for drainage. Ditching or filling around the area will be performed to intercept or divert all surface water. Within the area the ground which fill is to be placed on will be graded so as to provide for unobstructed drainage from every point to a sump or other disposal point.
2. On completion of grading as specified above, closely examine to determine whether excessive wetness, springs, or other seepage of water can be observed at any point. If such conditions exist, positive drainage in suitable form, such as french drains or tilling, must be provided before placement of fill is undertaken.

C. Placement and Compaction of Controlled Fill and Backfill
   1. Placement
      a. Begin fill and backfilling in the lowest section of the area. Spread material evenly by mechanical equipment or by manual means above the approved compacted subgrade in lifts not exceeding 10 to 12 inches for material compacted by heavy machinery and 4 inches for material compacted by hand tamping. Build layers as horizontally as practical to prevent thickness of lift from exceeding that specified but provide with sufficient longitudinal and transverse slope to provide for runoff of surface water from every point.
      b. Moisture Control: The moisture-density curve for the fill use shall be supplied to the Contractor as a guide in controlling moisture to achieve the required degree of compaction. If, in the opinion of the Geotechnical Engineer, fill material becomes too wet for the required compaction, the fill shall be dried by a method approved by the Geotechnical Engineer prior to commencing or continuing compaction operations. Likewise, if, in the opinion of the Geotechnical Engineer, the fill material becomes too dry for the required compaction, the fill shall be moistened by a method approved by the Geotechnical Engineer prior to commencing or continuing compaction operations. The water content at the time of compaction should be within 2% points of the optimum water content.
   2. Compaction: Compact each lift to 95% of the maximum dry laboratory density by ASTM D1557. The degree of compaction shall be checked by the Geotechnical Engineer and each successive lift shall not be placed or compacted until the previous lift is observed and approved by the Geotechnical Engineer. Compact the fill and backfill to elevations and limits shown on Drawings and is subject to final observation and approval by the Geotechnical Engineer.
   3. Drainage During Fill Operation: At all times, maintain and operate proper and adequate surface and subsurface drainage to the satisfaction of the Geotechnical Engineer in order to keep the construction site dry and in such condition that placement and compaction of fill may proceed unhindered by saturation of the area.
   4. Frost: Do not place fill materials when either the fill materials or the previous lift (or subgrade) on which it is placed is frozen. In the event that any fill which has already been placed on the surface shall become frozen, it shall be scarified and recompacted, or removed, to the approval of the Geotechnical Engineer before the next lift is placed. Remove or recompact any soft spots resulting from frost to the satisfaction of the Engineer before new fill is placed.

3.05 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.06 QUALITY CONTROL AND INSPECTION

A. The Owner will employ, at his own expense, a Geotechnical Engineer to review all laboratory test results and submitted reports specified in this Section.

B. The Owner's Geotechnical Engineer will interpret the tests, state in each report whether or not the test specimens and results comply with all requirements of the Contract Documents and

note any deviations.

C. The Owner's Geotechnical Engineer will identify when and where samples are to be obtained. Contractor shall collect samples and forward them to the Owner's Testing Laboratory for testing. Testing Laboratory will submit the following laboratory test reports to the Geotechnical Engineer:
   1. Laboratory results conducted on each type of borrow and fill material:
      a. Gradation Analysis ASTM D422.
      b. Atterberg limits ASTM D 4318.
      c. Modified Moisture-density curve determination ASTM D1557.
   2. Owner's Geotechnical Engineer will determine the conformance of materials to be used for fills.

D. Field Observation:
   1. Foundation Subgrades: Foundation subgrades shall be observed by Owner's Geotechnical Engineer to verify the design bearing capacities. No foundation shall be constructed unless the Owner's Geotechnical Engineer approves the subgrade.
   2. Paved Area and Building Slab Subgrades: Owner's Geotechnical Engineer shall observe Subgrades for paved areas and building slabs. No pavement or slab shall be constructed unless the subgrade approved by the Owner's Geotechnical Engineer.
   3. Proofrolling: Proofrolling where required shall be inspected by Owner's Geotechnical Engineer.
   4. Backfilling and Compaction: Backfilling and compaction below paved areas, building slabs, behind the foundation walls, and any other backfilling and compaction work shall be observed by the Owner's Geotechnical Engineer. No fill shall be placed unless the previous lift is approved by the Owner's Geotechnical Engineer. Owner's Geotechnical Engineer will take field density tests of the subgrade for every 2500 sq- ft. but not less than 3 tests in each compacted fill layer. Perform field density tests in accordance with ASTM D2922.

E. Contractor shall cooperate with the Geotechnical Engineer in the performance of the required tests.

3.07 DISPOSAL OF EXCAVATED MATERIALS

A. Legally dispose the excavated material to an off-site disposal facility, in accordance with all Local, State, and Federal Environmental regulations.

END OF SECTION

SECTION 31 08 01

ROCK EXCAVATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. General Rock Excavation & Blasting through the use of breaking, chipping and/or expansive tools and explosives or otherwise deemed acceptable techniques - The encountering and removal of rock as defined in this section will be paid as part of the project excavation unless stated elsewhere in the contract documents.
   1. Rock Required Removal Lines:
      a. To the depth, amount and at such locations that will not produce damaged rock surfaces or loosened/damaged rock beyond the prescribed excavation limit;
      b. Cut rock to form level bearing at bottom of footing and trench excavations. Provide sound and unshattered base for footings or foundations.

B. The contractor shall furnish all labor, equipment, materials and incidentals necessary to excavate and dispose of rock encountered as part of the excavation work as shown on the Drawings and as specified herein. Perform operations such that damage to adjacent utilities, structures, property and work is prevented and such that resulting ground vibrations are maintained below the maximum levels specified herein or levels established by other project related documents, if more stringent.

C. Protect existing structures, adjacent property, workers, all abutters and the general public from damage or injury from improper handling of explosives, fly rock, excessive ground vibrations overpressure, and rock movements.

D. Furnish, install and put into operation an audible working system to indicate impending blasting. Familiarize workers, all abutters and the general public with the system implemented.

E. Perform vibration monitoring (i.e. by engaging a licensed professional in Connecticut with at least 5 years of vibration monitoring for blasting) during all rock excavation operations using the vibration monitoring procedures and equipment specified herein.

F. Perform pre-construction and post-construction documentation (i.e. preconstruction blast condition and post-construction blast condition survey) of adjacent structures.

G. In-progress top of rock surveys to determine quantities of required rock excavation based on criteria provided herein or agreed upon at pre-construction meeting.

1.02 RELATED SECTIONS AND DOCUMENTS

A. Civil Engineering Construction Drawings Architectural Plans and Specifications as they relate to building and sitework construction.

B. Geotechnical Engineering Study prepared by Langan CT, Inc. dated February 15, 2012 and revised November 8, 2013.

C. Site Preparation

D. Soil Erosion and Sediment Control

E. Trenching and Backfilling

F. Earthwork – 31 00 00

1.03 REFERENCE STANDARDS

A. National Fire Protection Association (NFPA) latest edition 495 Code for Explosive Materials.

B. United States Department of Interior, Bureau of Mines, Seismic Effects of Blasting.

C. State of Connecticut, Department of Public Safety Regulations Section 29-349 et. Seq. – Storage, Transportation and Use of Explosives and Blasting Agents.

1.04 EXISTING CONDITIONS

A. Site Information
   1. Borings have been performed at the site by the Owner. The logs of the borings are available from the Owner for review by the Contractor and are included in the Geotechnical Engineering Documents.
   2. The Owner makes no predictions or representations regarding the character or extent of soil, rock, groundwater, or other subsurface conditions to be encountered during the work. The Contractor shall make their own deductions of the subsurface conditions which may affect the methods or cost of construction of the work hereunder. The Contractor shall agree that he will make no claims for damages or compensations, except as are provided under the agreement, should he find conditions during the progress of the work different from those as calculated and/or anticipated by him. Additional borings and other exploratory operations may be performed by the Contractor, at the Contractor's option and following the Owner's approval. By submitting his bid, the Contractor warrants that they have visited the site, made their own examinations, and additional investigations they deem necessary with the Owner's permission, of the surface and subsurface conditions. No change in the Contract Sum will be authorized for such additional exploration undertaken by the Contractor, or for lost time or other problems caused by the surface and subsurface conditions.
   3. The Contractor, by careful examination, shall inform himself as to the nature and location of the work; the conformation of the ground, the nature of the subsurface conditions; the location of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; and all other matters that can in any way affect the work.
   4. The Contractor shall be held to have visited the site and to have familiarized themselves with the existing conditions of adjoining utilities and structures.
   5. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, and ingress and egress of the site. The Contractor shall conform to all Town, State, and Federal regulations in regard to the transportation of materials to and from and at the job site, and shall secure in advance such permits as may be required.
   6. The Contractor shall be familiar with applicable federal, state and local requirements for performing this work, including all specific requirements, as they relate to storage, transportation, use of explosives and blasting agents, and permitted work hours.

B. Protection
   1. Active utilities and structures exist on-site, on the existing parking lot and the adjacent roadways. Prior to commencement of any work, the Contractor shall consult the appropriate records for existing structures and utilities, and note all conditions and limitations which might affect the work required under this section. The locations of any utilities and structures shall be verified in the field by the Contractor prior to performing any below-grade work. The Contractor shall be responsible for protecting all active utilities from disturbance and/or damage, including those located off site.

1.05 DEFINITIONS

A. "Rock" is defined as Greenstone or similar bedrock, and is defined as a green to gray-green massive well-foliated metamorphic rock in the geotechnical report referenced herein. Further classification of rock is determined by the equipment method required to excavate and remove such rock. "Type 1 Rock" is rock which can be broken or removed by typical earth excavation equipment such as a large tracked excavator fitted with rock ripping teeth or a dozer equipped with a ripper. "Type 2 Rock" is rock which cannot be broken or removed using the aforementioned "Type 1" heavy duty excavation equipment, but can be broken using chipping/splitting or dynamic chiseling equipment. "Type 3 Rock" is rock which cannot be broken/removed using the aforementioned "Type 1" and "Type 2" equipment, but requires blasting to break the rock for excavation and removal. Use of particular rock removal equipment/methods by the Contractor for reasons of economy shall not alter the rock type classifications.

B. "Rock" is also defined as boulders over two (2) cubic yards in volume in open areas and one (1) cubic yard in volume in trenches.

C. A "trench" shall mean an excavation having vertical sides with a depth exceeding its width.

1.06 SUBMITTALS FOR REVIEW

A. Submit pre-construction blast condition inspection and survey report to the Owner and Engineer for review prior to the start of rock excavation.

B. Submit to the Owner and Site Engineer in-progress top-of-rock surveys when requested by the Owner and/or Site Engineer to determine the rock excavation quantities for "Type 1 Rock", "Type 2 Rock", and "Type 3 Rock" as defined herein. The location of surveyed points along the top-of-rock surfaces used to generate the aforementioned surveys shall be as agreed upon by the Site Engineer and the Contractor at the site at the time of the surveys.

C. Contractor shall provide a description of his means and methods for non-explosive rock excavation techniques including size and energy of any impact equipment and chemical properties of any chemical agents to be used for chemical splitting.

D. When controlled blasting operations are to be performed, submit a blasting plan prepared by a professional engineer registered in the State of Connecticut with the following information:
   1. Drilling patterns.
   2. Number, location, inclination, diameter, and depth of drilled holes.
   3. Amount, type, and distribution of explosives per hole.
   4. Sketches to show blast locations at the site relative to the existing structures.
   5. Powder factor; time delays; weight of explosives in each delay.
   6. Sequence of firing.
   7. Time of blast.
   8. Total pounds of explosive.
   9. Methods of transportation, storage and handling of explosives.
   10. Manufacturer's data sheets for all explosives, primers and initiators to be employed.
   11. Type of drilling equipment to be used and when last serviced.
   12. Scaling and stabilization procedures and methods to remove or stabilize all rock on the cut face which is loose, hanging, or which creates a potentially dangerous situation. Drilling of the next lift shall not be allowed until rock scaling and stabilization has been completed.
   13. Any other pertinent data indicating Contractor's intent and purpose to produce smooth and sound surfaces of excavation.
   14. Plan for the fragmentation of large boulders and rubble.
   15. Calculations of anticipated ground vibration levels at existing structures and facilities.

16. Methods for protection of the existing structures and utilities including special perimeter control blasting procedures. Include a depiction of areas where such measures will be used.
17. Methods of matting or covering of the blast area in open excavations to prevent fly rock and excessive air blast overpressure.
18. List of permits and clearances required, when applied for, and date or approval or anticipated approval.
19. Name and address of Contractor's representative to which any claims for damage due to blasting should be addressed.
20. Contingency plan for lightning hazard.

E. A revised blasting plan shall be produced and forwarded to the Engineer if conditions change, the results of blasting do not produce the intended results, or blasting causes excessive dispersal of material.

F. Complete project team organization with duties, responsibilities and authorities clearly defined. The organizational outline shall also include a listing of all personnel authorized to sign for, receive and use explosives on this contract.

G. Written evidence of the licensing, experience and qualifications of the blasters who will be directly responsible for the blasting operations.

H. Name and qualifications of the person(s) responsible for design and directing the blasting. This submittal shall document by project lists that the person has the required experience in controlling blast vibrations in blasting rounds of the type required on the project.

I. Submit a copy of the blasting permit(s) obtained to conduct blasting on the site. Obtain and pay for all permits and licenses required to complete the work herein. Original permits shall be prominently displayed on the site prior to initiating blasting operations.

J. Within 24 hours following each blast, the Contractor shall submit to the Owner and Engineer, a Blast Monitoring Report. East Blast Monitoring Report shall include a copy of strip chart (or other permanent record of velocity/time waveform) with calibration and monitoring record marked with the date, time and location of the blast as well as the monitoring location. Provide name, model number, and catalog sheet describing the vibration monitoring equipment indicating location of the blast, location of seismograph(s), seismograph data (max. ppv, etc.) overpressure, and pounds of explosive per delay used.

K. Submit the firm name and qualifications of the person(s) responsible for monitoring and reporting vibrations and air blast overpressures.

L. In the event that the rock excavation operations result in ground vibrations which approach the threshold vibration limit criteria specified herein, the Contractor shall immediately submit a revised rock excavation plan and submit to the Engineer for review, identifying the procedures being taken to mitigate the vibrations.

M. The Contractor shall submit to the Owner and Engineer in writing all blasting complaints received by the contractor within 24 hours of receipt. Each blast complaint report shall include the name and address of the complainant, time received, date and time of blast complained about and a description of the circumstances which lead to the complaint.

N. Review by the Engineer the material submitted by the Contractor, shall not relieve the Contractor of responsibility for the accuracy, adequacy and safety of the blasting, exercising proper supervision and field judgment and producing the results within the vibration and blasting limits required.

O. Submit post-excavation condition inspection report as specified herein.

P. Should rock slope stability and safety measures be required, submit proposed means and methods to the Geotechnical Engineer for review.

1.07 Quality Assurance

A. Persons responsible for blasting shall be licensed blasters in the State of Connecticut and shall have at least 5 years of experience in responsible charge of similar excavations in rock and controlled blasting techniques.

B. Vibration and blast monitoring shall be conducted, analyzed and reported by a qualified professional engineer registered in the State of Connecticut.

C. The Contractor shall be responsible for achieving the final rock cut limits and grades as shown on the Constructions Drawings. The Contractor shall use baseline information referenced and drawings for his use in establishing the correct location and grades.

1.08 Regulatory Requirements – General

A. The Contractor shall comply with applicable laws, rules, ordinances, and regulations of the Federal, State and local agencies governing the transportation, storage, handling, and use of explosives. All labor, materials, equipment and services necessary to make the blasting operations comply with such requirements shall be provided at no additional cost.

B. The Contractor shall obtain and pay for permits and licenses required to complete the work of this section.

C. In case of conflict between regulations or between regulations and this section, the Contractor shall comply with the most stringent applicable codes, regulations or Specification.

D. If required by local or state regulations, blasting plans shall be reviewed by the appropriate agency or authority and revised as required to meet with their approval.

E. All handling, loading and detonation of explosives shall be conducted by or in the presence of a person licensed in accordance with state regulations and shall be done in accordance with the permit issued by the local Fire Marshall, or local authority having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS

A. The Contractor shall furnish all equipment and labor necessary for the excavation and removal of rock as specified herein.

B. Explosives, detonator/delay device, and blast mat materials shall be of a type recommended by the explosive supplier and shall comply with requirements specified herein.

PART 3 EXECUTION

3.01 PRE-CONSTRUCTION AND PRE-EXCAVATION DOCUMENTATION

A. Prior to start of any earth/rock excavation or blasting work, the contractor shall engage the services of a professional engineer registered in the State of Connecticut to conduct a pre-construction blast condition survey of the existing structures and conditions within 500 feet of rock excavation and blasting areas including conditions of the roads, parking lots and sidewalks within 500 feet of blasting areas. Structures shall be photographed and/or videotaped inside and out provided the permission of the individual Owner's is granted.

1. Coordinate activities, issue notices, obtain clearances and provide photographic and assistance necessary to accomplish the survey.
2. Give notice in writing to the property owner and any representative of local authorities required to be present at such survey. Provide the dates on which surveys are planned so that representatives are present during the examination. The survey shall consist of a video and still photo documentation of selected interior and exterior facades. Descriptions shall include location of cracks, sketches, age of structures, damage or other defects existing and shall include information to make it possible to determine the effect, if any, of the construction operations on the defect. Significant cracks should be monitored. The conditions of utilities should also be documented.
3. Contractor's record of the pre-construction condition survey shall consist of written documentation and photographs of the conditions identified.

3.02 ROCK EXCAVATION

A. Perform all rock excavation work so as not to disturb or disrupt the neighboring off-site structures and their occupants. Rock excavation shall be performed in such a manner as to not impact or alter any ongoing construction activities or cause damage to the temporary construction systems (i.e. support excavation systems). Additional limiting construction vibration requirements given in Article 3.04 herein apply to all rock excavation. Perform work in accordance with local and state requirements for permissible noise and work hours. The Contractor is cautioned that the on-site and adjacent structures will remain in operation during the time rock excavation is to be performed. Facilities, access ways, and utilities, including gas service, water service, sewer service, electric service, oil tanks, etc. associated with the above mentioned structures will also remain operational and shall be coordinated and protected by the Contractor at all times.

B. Cut rock to form level bearing at bottom of footing and trench excavations. Perform excavation so as to provide sound and unshattered base for footings or foundations.

C. Perform rock excavation in a manner that will produce material of such size as to permit it to be removed or processed. Remove rock to limits as indicated on Construction Drawings and/or specified herein. Remove loose or shattered rock, overhanging ledges and boulders which might dislodge. Provide rock stabilization, if necessary.

D. Provide lean concrete or approved fill materials satisfying requirements for structural fill to replace rock overblast or over-excavation at no additional cost to the Owner to facilitate placement of utilities or slabs. Provide lean concrete to replace rock over blast or over-excavation at no additional cost to the Owner for future footings.

E. If encountered above finished pavement grades or above site utility subgrades, rock shall be removed to a minimum of 12 inches below pavement base or subbase, and site utility structures or as shown on the Construction Drawings.

F. Rock Cut Face

1. Protect all resultant final rock cut faces from excavation damage and disturbance is necessary.
2. Where necessary and so as to avoid overbreak, the Contractor shall perform line drilling of the rock so as to form a uniform rock cut face. Line drilling shall consist of drilling maximum two-inch (2'') diameter holes spaced no greater than three feet (3') apart laterally.
   a. The intent of the line drilling is to produce a plane of weakness for the rock to split along during the subsequent rock excavation. This plane shall be formed to follow the design of rock slope lines and shall be extended from the top of the bedrock surface to the top of finished rock slope or to the depths specified

on the plans. This technique shall be used as necessary along all ledge faces that will be exposed.

b. The line drilling shall be performed as necessary prior to rock excavation.
c. Contractor shall adjust his excavation operations according to the characteristics and structure of the rock formation to obtain the required slope without fracturing the rock beyond the pre-split face.
d. Surfaces of slope in rock cuts shall be free from all loose stone or shattered edges. Rock stabilization shall be provided as necessary.
e. All unsuitable material, breakage and slides shall be removed at no additional cost to Owner.

3.03 ROCK BLASTING

A. General:

1. Blasting shall be employed as a means to assist rock excavation in areas where mechanical means have been deemed unsuccessful or incapable of providing the final layout shown on the Construction Drawings within the project schedule.
2. Drilling and blasting methods and programs shall be those necessary to accomplish the rock excavation shown on the Contract Drawings in accordance with the procedure specified herein. The blasting Contractor shall carry the following insurance: Workman's Compensation, Comprehensive General Liability, Broad Form Property Damage, Contractual Liability and Explosion, Collapse and Underground Hazard, (naming the Owner as additionally insured).
3. Perform blasting only after receiving written approval from Owner and appropriate authorities having jurisdiction. Provide as necessary heavy mats to minimize concussion, handle, store, and use explosives in accordance with the Manual of Accident Prevention in Construction by the Associated General Contractors of America, Inc., latest edition. Blasting work shall take place only after all persons in the vicinity have had ample notice and have reached positions of safety. Adequate means shall be taken to prevent all persons from entering the blasting area. The Contractor shall use methods and programs that will prevent damage to adjacent dwellings, and other structures, landscape features and temporary excavation support system or underpinning and that will minimize the scattering of rock, stumps, and/or other debris.
4. The Contractor shall be responsible for any and all damages and/or injury from the use of explosives. Contractor shall save and hold harmless the Owner, Owner's representative, Architect and Engineer from all claims growing out of the use of explosives. Removal of materials of any nature by blasting shall be done in such a manner and at such times as to avoid damage affecting integrity of existing construction and damage to new or existing dwellings, and other structures, utilities, septic systems, and/or water wells in or adjacent to the area of the work. It shall be the Contractor's responsibility to determine the method of operation to ensure desired results and integrity of completed work. All damage caused by the Contractor's blasting operations shall be repaired to the full satisfaction of the affected property's Owner at no additional cost to the proposed development property Owner.
5. Approval of blasting and excavation methods and procedures for completion of the work, including, but not limited to, maximum blast particle criteria specified herein, shall not relieve the Contractor of his responsibilities in connection with the work, safety, the work adequacy and accuracy, exercising proper supervision and field judgment, producing the results within the blasting limits required by these Specifications, and for direct or indirect damages to existing or new structures.
6. Prior to commencement of production blasting, the Contractor shall prepare a test blast program which shall be used to define the propagation characteristics of blast-induced vibrations. The test blast program as specified herein shall be submitted to the Owner and the Geotechnical Engineer for review.

7. Blasting shall be conducted in such a manner so as not to disrupt surrounding residences and businesses, and in accordance with local ordinances with regard to noise and work hours or as otherwise mandated by local agencies.
8. The Contractor shall take all precautions necessary to warn and/or protect any individuals exposed to his operations prior to any blasting. Blasting mats or other approved flyrock protection shall be employed as necessary to protect areas adjacent to blasting. The blasting Contractor shall obtain all Federal, State and Local permits that are applicable to the blasting operations. The blasting Contractor shall conduct the blasting operations according to all regulatory authorities having jurisdiction, laws, regulations and ordinances. The blasting Contractor shall conduct the blasting operations in accordance with all industry standards and shall coordinate with the grading Contractor to insure that appropriate safety procedures are followed, including signage and signaling devices. Nothing contained in this document shall limit the blasting Contractor's obligations or duties under regulatory authorities having jurisdiction laws, regulations and ordinances.
9. The Contractor shall develop and maintain records covering pertinent data on the location, depth and area of the blast, the diameter, spacing, depth, overdepth, pattern, amount, distribution, charge weights per delay, and powder factor for the explosives used per hole and per blast; the sequence and pattern delays, and description and purpose of special methods. Contractor shall provide a copy of the records to the Owner upon the Owner's request. Receipt and acceptance by the Owner of blasting data will not relieve the Contractor of his responsibility to produce satisfactory results as set forth in these specifications. Drilling and blasting shall be done only to the depth, amount and at such locations using explosives of such quantity distribution and density that will not produce unsafe or damaged rock surfaces, or loosened/damaged rock beyond the prescribed excavation limits. The Contractor shall be responsible for the cost of removal of overblast beneath the pay depths and also for the cost of placement and compaction of suitable replacement structural fill or placement of lean concrete where overblast removal beneath paylines occurs. As excavation operations progress, the drilling and blasting procedures shall be determined only by satisfactory results achieved by the Contractor.
10. The blasting Contractor shall prepare and maintain post-blast reports which include the amount of material displaced by each blast, the amount of explosive utilized in each blast, and the number of shots detonated. All reports shall be forwarded to the Owner.
11. Should the drilling and blasting program result in damage to the excavation or unacceptable peak particle velocity or frequency values, the Contractor shall be required to devise and employ methods at no additional cost to the Owner that will prevent such damage or unacceptable ground motions. Revisions may include special methods such as refined line drilling or channel drilling, pre-split and zone blasting, shallow lifts, reduction in size of individual blasts, small diameter blast holes, closely spaced blast holes, reduction of explosives, greater distribution of explosives by use of decking and primacord or variation in density of explosives and chemical or mechanical splitting of the rock.
12. Holes shall be stemmed with coarse sand or free-running gravelly sand having a maximum size of three-eights (3/8") of an inch. Stemming may be required between each explosive charge in areas where the rock contains open seams, joints or faults. Pre-split blast holes shall be detonated prior to drilling and blasting of adjacent rock except when conditions will not permit this method or when it can be demonstrated to the satisfaction of the Owner that in special cases a millisecond delay system will produce acceptable rock surfaces.
13. Any and all damage caused by the Contractor's excavation/blasting operations shall be repaired at the expense of the Contractor to the satisfaction of the governing agencies and the property Owner at no additional cost to the Owner.

B. Explosives:
   1. The Contractor shall take special precautions for proper use of explosives to prevent harm to human life or contamination of the environment, and damage to surface structures, utility lines, or other subsurface structures.
   2. Explosives shall be stored, handled and employed in accordance with State and local regulations, or in the absence of such, in accordance with the provisions of the Manual of Accident Prevention in construction issued by the Associated General Contractors of America, Inc. and OSHA, as well as standards of the United States Department of Interior, Bureau of Mines.
   3. The Contractor shall submit shop drawings showing the location, access to the type of construction of the proposed storage magazine for the explosives and detonation cap house. The contractor shall provide and maintain access to the explosive storage area at his own expense.

C. Test Blasting:
   1. The Contractor shall prepare a test blast program which shall be used to define the propagation characteristics of blast-induced vibrations.
   2. Pre-blast holes shall be similar diameter and spacing as those to be used for production blasts. At least one of the tests shall contain holes having the same diameter and spacing as those to be used for pre-splitting. Depths of holes and type and quantities of explosives per hole shall match the expected depths and quantities respectively for use in production blasting.
   3. The Contractor shall utilize the information from the test blast program and develop a plan showing allowable explosive charge weights per delay which will result in the attenuation of ground motions less than the limiting velocities and air blast overpressures defined herein.

3.04 BLASTING VIBRATION AND LIMIT CRITERIA

A. The Contractor shall limit vibrations from rock excavation or blasting to prevent damage to any existing structure, facility, utility any on-going construction operations, recently placed features, recently cast concrete or other features near the site. In no case shall the following be exceeded.

B. The maximum peak particle velocity (PPV) shall not exceed the limits indicated on Figure B-1, Appendix B, of the United States Bureau of Mines Report of Investigations, RI 8507, 1980.

C. Air blast Overpressure Limit:
   1. The Contractor shall conduct all blasting activity in such a manner that the peak air blast overpressure measured at the location of the nearest above ground, occupied structure to air blast does not exceed 0.014 psi.

D. Additionally, rock excavation by impact methods or controlled blasting be performed such that concrete or other critical recently constructed elements are not adversely impacted. If adjacent on-going construction is underway during blasting operations, vibration levels shall be submitted along with information indicating the induced vibration levels are not adversely impacting on-going construction activities.

E. Vibration and Blast Monitoring:
   1. The Contractor's Engineer will monitor vibrations and air overpressures at the site during rock excavation activities with seismographs equipped with an appropriate geophone and microphone during rock excavation operations at the site. Seismograph locations shall be such that they are between the nearest structures and the blast site. The Contractor should be notified of any exceedance of blast vibration and limit criteria and the Contractor shall modify their procedures as necessary such that the above vibration and limit criteria are not exceeded.

Vibration monitoring performed by their Engineer shall not relieve the Contractor of any of his/her responsibility to perform such work.

2. Vibration monitoring for blasting operations requires that time of firing to be precisely known so that the seismographs can be started before firing. The Contractor shall establish a notification and signal system which will allow the seismographs to be initialized prior to the start of each blasting operation to allow the blast induced vibrations and air overpressures to be recorded.

F. The Contractor shall cooperate with their pre-approved Engineer in permitting observation of the rock excavation operation including the drilling and loading procedures, as well as providing detailed information on blasting operations.

G. The Contractor shall be completely responsible for all damages resulting from the blasting operations and shall, as a minimum, take whatever measures are necessary to maintain peak particle velocities within the specified limits. Modifications to blasting and other rock excavation methods required to meet these requirements shall be undertaken at no additional cost to the Owner.

3.05 PROCESSING EXCAVATED ROCK

A. The Contractor shall process excavated rock for re-use on-site in accordance with the project specifications.

B. Processed materials shall be stockpiled at locations approved by the Owner.

3.06 POST EXCAVATION

A. The Pre-excavation Survey Engineer shall conduct a post-excavation inspection and survey of any site or structure which was included in the pre-excavation survey. As a minimum, a post-excavation inspection and survey shall be made upon completion of the excavation work, with the results transmitted to the Owner and the Geotechnical Engineer.

B. The Contractor will be solely responsible for any damage and associated delay costs caused by the excavation operation.

3.07 MEASUREMENT AND PAYMENT

A. Rock excavation and disposal will be made at the unit price per cubic yard. The Contractor shall perform rock excavation in accordance with the requirements herein.

B. When rock is encountered, the material shall be uncovered and the Engineer notified. Rock excavation and disposal shall be measured in accordance with the number of cubic yards and fraction thereof of calculated in-situ volume of rock excavated as defined herein. The volumetric calculations shall be based on the average end-area method with profiles generated every ten feet measured horizontally based upon the rock type removed, if the unit cost is subdivided by rock type defined herein.

END OF SECTION

SECTION 31 08 02

DEWATERING

PART 1 GENERAL

The work specified in this section consists of furnishing, arranging, locating, determining required depths of, maintaining, operating and removing dewatering systems as indicated.

1.01 SCOPE OF WORK

A. This Section specifies the requirements for control of groundwater and surface water within the site during subsurface construction activities.

B. The work includes:
   1. Control of surface water runoff to prevent flooding of excavations, trenches and adjacent properties, and the saturation and loosening of soils.
   2. Removal of subsurface water from excavations and trenches.
   3. Providing equipment and facilities to remove sediment and control the flow rates and volumes of surface and subsurface waters removed from the work areas.
   4. Work performed under this section shall be subject to all the Contract Documents including the Drawings, the General Conditions and the Special Conditions.

1.02 RELATED SECTIONS AND DOCUMENTS

A. References
   1. Geotechnical Engineering Report by Langan CT, Inc. dated February 15, 2012 and revised November 8, 2013.

B. Sections containing requirements related to this Section include, but are not limited to:
   1. Construction Drawings
   2. Health & Safety - 01 35 29.13
   3. Soil Erosion and Sediment Control
   4. Handling & Disposal of Contaminated Materials - Section 02 61 13
   5. Earthwork - Section 31 00 00

C. Regulatory Requirements and Reference Standards
   1. All applicable OSHA requirements and other Federal, State and Local codes, laws, ordinances, regulations and guidelines for related Work.
   2. State of Connecticut Department of Energy and Environmental Protection (DEEP) Remediation Standard Regulations (RSRs) and solid waste regulations (section 22A-209 of the Connecticut General Statutes)
   3. Resource Conservation and Recovery Act (RCRA) Subtitle D – Solid Waste Regulations (40 CFR Parts 239-258)
   4. All applicable Federal, State and Local permits necessary to complete the work (i.e. CTDEEP General Permits).

1.03 DEWATERING SYSTEM REQUIREMENTS

A. The Contractor shall design the dewatering system to:
   1. Effectively reduce the hydrostatic pressure and lower the groundwater levels to a minimum of 2 feet below the bottom of proposed excavations (if groundwater is encountered) or, if encountered, to the top of rock elevation;
   2. Develop a substantially dry and stable subgrade for the proposed work;
   3. Prevent damage to adjacent properties, buildings, structures, utilities and other facilities.
   4. Ensure that, after 12 hours of initial pumping, no soil particles will be present in the discharge;
   5. Retain all sediments on-site within the work area.

B. Prevent all hydrostatic uplift forces which act on a structure base.

C. Consider pre-construction water elevations and low permeability rates characteristic of the local soils when developing dewatering plan.

D. Locate dewatering facilities where they will not interfere with utilities and construction work to be completed by others.

E. Modify dewatering equipment and procedures when operations threaten to cause damage to new or existing facilities or adjacent areas not within the limit of work.

1.04 QUALIFICATIONS

A. Contractor for work of this section shall be one specializing in the installation and operation of dewatering equipment and shall submit evidence substantiating a minimum of five years satisfactory experience in the installation and maintenance of such systems.

1.05 SUBMITTALS

A. Prior to installation of the dewatering system, submit working drawings and design data prepared by a registered professional engineer in the state of Connecticut with the following information:
   1. The proposed type of dewatering system(s);
   2. Arrangement, location and depths of system components;
   3. Complete description of equipment and instrumentation to be used including installation, operation, maintenance, and winterization procedures;
   4. Types and sizes of treatment components (filters, carbon units, etc.);
   5. Design calculations demonstrating adequacy of the proposed system and equipment in achieving the necessary discharge parameters;
   6. Provisions and methods of sediment removal and disposal of water (which shall prevent damage to existing structures, roadways and utilities); and
   7. All permits required for the work.

B. If required, submit working drawings and details section, showing previously installed Langan observation wells and method of maintaining throughout construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Dewatering pump(s); and

B. Engineer approved groundwater treatment system.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. It is anticipated, but not guaranteed, that groundwater is present at approximately 2 to 9.5 feet below the surface, elevations 91.5 to 129.5 feet (NAVD 88) respectively, throughout the site.

B. The dewatering system shall be installed for the purpose of dewatering the excavation to provide a stable, dry subgrade for the prosecution of the proposed work.

C. The dewatering system must be kept in full operation as required for the excavation and construction of foundation elements.

D. Dewatering activities shall continue until installed underdrain and perimeter foundation drainage systems are tested and operational and after lowest level foundation walls and lowest level slabs are constructed. Contractor shall obtain approval from Engineer before discontinuing any dewatering activities.

3.02 CLEANING/PROTECTION/ADJUSTMENT

A. The Contractor shall patch, repair, or replace any existing improvements, or work of other Sections, damaged or cut by work of this Section, subject to approval by the Engineer.

B. At termination of pumping activities, the Contractor shall remove from the site all equipment and installations of the dewatering system.

C. Any system carrying discharge water shall be protected and maintained and left in satisfactory condition upon completion of the work of this Section.

3.03 DRAINAGE AND PUMPING

A. It is the responsibility of the Contractor to furnish, operate and maintain sufficient drainage and pumping facilities to dewater the site and its underlying soil/rock so that the excavation can proceed while maintaining stable slopes, without disturbing the bearing subgrades for the structure.

B. Take appropriate surface water control measures to minimize surface water accumulation in open excavations (see section 3.04). Contractor shall provide and maintain ample means and devices to remove promptly, and to dispose of properly, all water entering excavations and to keep them dry until the proposed work is completed.

C. A minimum of two weeks prior to the start of excavation, the Contractor shall prepare and submit to the Engineer his dewatering plans including procedures for initial pump tests and shall not proceed until they are approved. Subsequently, the dewatering plans are to be adjusted as necessary to accomplish the above listed goals and other requirements in this section. Keep the Engineer advised of any changes required to accommodate field conditions and, upon completion of the dewatering system installation, revise and resubmit the information required to show the installed system.

D. Discharge of the pumped water must be performed in strict accordance with the regulations and directives of all applicable local, State and Federal authorities and permits.

E. The Contractor will comply with the requirements of the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

F. The Owner's Engineer will evaluate the discharge and, if at any time impacts are noted, will obtain a CTDEEP general permit for Discharge of Groundwater Remediation Wastewater to a Sanitary Sewer, which the Contractor must comply with.

G. The dewatering system shall be installed and operated in such a manner as to avoid the movement of fines or loss of ground from below the bearing level and shall not influence the stability of surrounding areas.

H. No pipe shall be laid in water. No masonry shall be laid in water, and no water shall be allowed to inundate new concrete within 48 hours after installation. Contractor shall constantly guard against the possibility of flotation of pipe or structures after installation. Backfill or other means shall be placed promptly to prevent this occurrence.

3.04 SURFACE RUNOFF CONTROL

A. On-site surface water shall be intercepted and diverted away from excavations and collected into local sumps by means of dikes, curb walls, ditches, trenches, pipes, or other approved means. At the perimeter streets, surface water is to be directed into the storm water system and not permitted to enter the excavation.

B. Provide and maintain ditches of adequate size to collect and prevent surface and subsurface water seepage from entering the excavations.

C. Water shall be diverted to frac tanks or settling basins or other approved equipment required to reduce the amount of fine particles. If a drainage system of water course is silted or becomes blocked due to dewatering operation, it shall be cleaned at the expense of the Contractor.

D. Under no circumstances is water to be discharged directly to wetlands or other protected areas, and any enforcement actions or fines resulting from improper dewatering and/or discharge of turbid water and sediment shall be the sole responsibility of the Contractor.

E. Curbs shall be maintained and, where necessary, extended across intersections, curb cuts and defective curb sections.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. The work of this Section will not be measured for payment.

4.02 PAYMENT

A. The work of this Section will be paid for as part of the Contract price for associated pay items.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, latest edition.

1.02 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing site utilities and abandoning site utilities in place.

1.03 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and as indicated on Drawings.

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.04 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.05 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1.07 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises.

D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.

5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

I. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.

1. Use coating with a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Wrap a 1-inch blue vinyl tie tape flag around each tree trunk at 54 inches above the ground.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control drawings and specifications.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.03 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.04 EXISTING UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Do not proceed with utility interruptions without Architect's written permission.

E. Excavate for and remove underground utilities indicated to be removed.

3.05 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.06 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to required depth to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.07 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Neatly saw-cut along line of existing pavement to remain at existing joint location before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.08 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION
07/11/13

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, latest edition.

C. American Society for Testing and Materials (ASTM) Standards:

1. ASTM C 136: Method for sieve analysis of fine and coarse aggregates.
2. ASTM C 117: Standard test method for materials finer than No. 200 sieve in mineral aggregate washing.
3. ASTM D 422: Standard test method for particle size analysis of soils.
4. ASTM D 1140: Test for amount of material in soils finer than No. 200 sieve.
5. ASTM D 1556: Test method for density of soil in place by the sand cone method.
6. ASTM D 1557: Test methods for moisture-density relations of soils and soil aggregate mixtures using 10 lb. hammer and 18-inch drop. AASHTO Standard T-180 may be substitute for ASTM D 1557.
7. ASTM D 2922: Test methods for density of soil and soil-aggregate in place by nuclear methods (shallow depth).
8. ASTM D 4318: Test method for liquid limit, plastic limit and plasticity index of soils.

1.02 SUMMARY

A. Section Includes:

1. Preparing subgrades for equipment pads, walks, pavements.
2. Excavating and backfilling for structures.
3. Base and subbase course for concrete walks and pavements.
4. Subbase course and base course for asphalt paving.
5. Subsurface drainage backfill for walls and trenches.
6. Excavating and backfilling trenches for utilities and pits for buried utility structures.
7. Excavation and off-site disposal of all unsuitable and excess materials, and stockpiling of all suitable on-site materials required for reuse.
8. Provision, transportation and placement of all required fill and backfill materials.
9. Drainage and dewatering required to perform the work in the dry.

1.03 UNIT PRICES

A. Work of this Section is affected by unit prices for earth moving specified in Section 012200 "Unit Prices."

B. Quantity allowances for earth moving are included in Section 012100 "Allowances."

C. Rock Measurement: Volume of rock actually removed, measured in original position. See Part 3 for rock paylimits. Unit prices for rock excavation include replacement with approved materials. Unit prices for rock are included in Division 01 Section "Unit Prices."

1.04 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Geotechnical Engineer and/or Owner's Testing Agency. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Geotechnical Engineer and/or Owner's Testing Agency. Unauthorized excavation, as well as remedial work directed by Geotechnical Engineer and/or Owner's Testing Agency, shall be without additional compensation.

F. Fill: Soil materials used to raise existing grades.

G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

H. Structures: Retaining walls, equipment pads, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase.

K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within building limits.

1.05 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Warning tapes.

B. Earth Material Samples: Contractor shall be responsible for obtaining samples (50 pounds minimum) of earthwork materials proposed to be used and transporting them to the site 7 calendar days in advance of the time planned for incorporating them into the work. Use of proposed materials by the Contractor prior to testing and approval or rejection shall be at the Contractor's risk. The following information shall be submitted:

1. Location of borrow source site.
2. Present and past usage of the source site and material.
3. Any previously existing report(s) associated with an assessment of the source site, as relates to the presence of oil or hazardous material.
4. Location within the source site from which the material will be obtained.

C. Up to three test series (gradation and laboratory compaction) will be completed by the Geotechnical Engineer or Owner's Testing Agency for off-site borrow sources for each category of earth materials defined in Part 2 of this Section at the Owner's cost. Testing of additional samples or sources shall be at the Contractor's cost.

1. Sieve analysis to be based on washed sieve analysis in accordance with appropriate ASTM standard.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

D. Flowable Fill Mix Design: Submit mix design with admixture information for review and approval a minimum of 15 days prior to start of work.

1.07 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

B. Earthwork Observation and Testing:

1. The Owner will retain a qualified Geotechnical Engineer and/or Testing Agency to perform on-site observation and testing during work under this and related sections and as indicated in the "Schedule of Special Inspections." The services of the Geotechnical Engineer and/or Owner's Testing Agency may include, but not be limited to the following:

   a. Observation during excavation, subgrade preparation and backfill for footings, pavements, walks, utility trenches, equipment pads and subsurface drainage construction, etc.
   b. Determination of requirements for additional excavation to remove unsuitable materials.
   c. Observation and testing during placement and compaction of fill and backfill.
   d. Laboratory testing and analysis of fill material specified.
   e. Review of submittals.

2. During the course of construction, the Geotechnical Engineer and/or Owner's Testing Agency shall advise the Owner's Agent, in writing, with a copy to the Architect and Contractor, if at any time, in his opinion, the work is not in substantial conformity with the plans and specifications. The Geotechnical Engineer's and/or the Owner's Testing Agency's presence does not include supervision of direction of the actual work by the Contractor, his employees, subcontractors or agents. Neither the presence of the Geotechnical Engineer and/or Owner's Testing Agency, nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.
3. Testing equipment will be provided by and testing performed by the Geotechnical Engineer and/or Owner's Testing Agency, except as otherwise provided by contract. Upon request by Owner's Agent, the Contractor shall provide such auxiliary personnel and services as needed to accomplish testing work and to repair damage caused thereby to permanent work.
4. References herein to observations, testing, and determinations by the "Engineer" include services to be provided by the Geotechnical Engineer and/or Owner's Testing Agency when appropriate and when so authorized by the Engineer or Owner.
5. The Contractor shall not proceed without the Testing Agency in place. Contractor to coordinate with Testing Agency.

C. Preexcavation Conference: Conduct conference at Project site.

1. Before commencing tree clearing and grubbing, have tree clearing limits staked and meet with representatives of the governing authorities, Owner, Engineer and other concerned entities to review the area in question. Notify the participants at least three working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.
2. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, Engineer, consultants, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Record discussions and agreements and furnish a copy to each participant.

1.08 PROJECT CONDITIONS

A. Existing Utilities:

1. Notify utility locator service for area where project is located before site clearing or excavating. Hire private utility mark-out service for areas not marked by utility companies. See General Conditions of the construction contract.
2. Before starting excavation, establish location and extent of any underground utilities occurring in work area. Make arrangements with appropriate utility company for removal and relocation of lines which are in the way of excavation. If utilities are to remain in-place, provide adequate means of support and protection during earthwork operations.
3. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner, Owner's Agent, and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
4. Inactive or abandoned utilities encountered during construction operations shall be removed, plugged or capped. The location of such utilities shall be noted on record drawings and reported in writing to Owner's Agent. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are inactive.
5. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Owner's Agent and then only after arranging to provide acceptable temporary utility services. Provide minimum of 48 hours notice to Owner's Agent and receive written notice to proceed before interrupting any utility. Do not proceed with utility interruptions without Owner' written permission.
6. When in the course of the work it is necessary to connect a utility to a main in a public way, all the requirements of both the authorities governing the utility and those governing the public way shall be met. Pavement shall be temporarily and permanently replaced as directed by these authorities at no additional cost to the Owner.

B. Site Information:

1. Information in the Contract Plans and in the Specifications relating to subsurface conditions, existing utilities and structures is from the best sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy and completeness of this information is not guaranteed. The opinions expressed in this report are those of the Geotechnical Engineer and represent interpretations of the subsoil conditions, tests, and results of analyses conducted by the Geotechnical Engineer. The Owner will not be responsible for interpretations or conclusions drawn from this data by the Contractor.
2. Refer to Division 01, SUPPLEMENTAL INFORMATION – GEOTECHNICAL REPORT, for available subsurface data. The report is not part of the Contract Documents. The Contractor may, at his own expense and upon application to the Owner, conduct additional subsurface explorations and testing.

C. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

D. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

E. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures are in place.

F. Do not commence earth moving operations until plant-protection measures are in place.

G. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

H. Do not direct vehicle or equipment exhaust towards protection zones.

I. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations. All rock and soil materials furnished for use as fill or backfill shall be free of grease, oil, solvents, pesticides, herbicides or other hazardous or deleterious materials and/or contaminants. All rock and soil materials specified in this Section shall also be free from ice, snow, trash, debris, stumps, roots and organic material.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, contaminated soils or a combination of these groups. Symbols shall not be used as fill or backfill except where impervious fill is specified or detailed. Satisfactory soils which have been rendered wet, such that the contractor cannot establish a stable soil mass compacted as specified in this Section, also shall not be used as fill or backfill.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Backfill and Fill: Satisfactory soil materials.

E. 3/4-Inch Crushed Stone: Crushed stone shall be a quarry product or washed gravel stone obtained from offsite sources for use as detailed on the drawings. Crushed stone shall consist of durable crushed rock or gravel stone essentially free of silt, clay, loam or other deleterious

materials and shall conform to the following graduation requirements for the nominal size indicated.

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
Pass 1 Inch	100
Pass 3/4 Inch	90 - 100
Pass 1/2 Inch	20 - 55
Pass 3/8 Inch	0 - 15
Pass No. 4	0 - 5

F. Base: Naturally or artificially graded non-plastic mixture of durable, sound coarse and fine aggregate and obtained from suitable excavated onsite soils or offsite sources. Mixture to be free of debris, waste, frozen materials, and organics, and shall be well graded within the following limits (processed stone, no gravel):

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
Pass 2-1/2 Inch	100
Pass 2 Inch	95 - 100
Pass 3/4 Inch	50 - 75
Pass 1/4 Inch	25 - 45
Pass No. 40	5 - 20
Pass No. 100	2 - 12

G. Subbase: Subbase material for use as pavement subbase course and other uses as detailed shall be obtained from suitable excavated onsite soils or offsite sources. Base shall consist of a non-plastic mixture of durable, sound coarse and fine aggregate with no more than 15 percent by weight of recycled bituminous concrete and shall be well graded within the following limits:

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
Pass 3-1/2 Inch	100
Pass 1-1/2 Inch	55 - 100
Pass 1/4 Inch	25 - 60
Pass No. 10	15 - 45
Pass No. 40	5 - 25
Pass No. 100	0 - 10
Pass No. 200	0 - 5

H. Bedding Material: Sand or sandy soil free of debris, waste, frozen materials, and organics with 100 percent passing a 3/8-inch sieve and not more than ten percent passing a No. 200 sieve.

I. Granular Fill (Also Termed Structural Fill): Granular fill shall be obtained from suitable excavated onsite soil or offsite borrow sources for use as fill and backfill below and interior to building areas except where other materials are specified or detailed, and as details on the drawings. Granular fill shall consist of non-plastic naturally or artificially graded mixture of sound coarse and fine aggregates free of debris, waste, frozen materials and organics and conforming to the following gradation:

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
Pass 3-1/2 Inch	100
Pass 1-1/2 Inch	55 - 100
Pass 1/4 Inch	25 - 60
Pass No. 10	15 - 45
Pass No. 40	5 - 25

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
Pass No. 100	0 - 10
Pass No. 200	0 - 5

J. General Fill: Clean, sound mixture of material free of debris, waste, frozen materials and organics with 5-inch maximum size aggregate and not more than 12 percent passing the No. 200 sieve.

K. Sand: ASTM C 33; fine aggregate.

L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

M. Flowable / Excavatable Fill: Mixture of cement, GranCem, sand, water and admixtures to produce a flowable / excavatable fill with a compressive strength at 28 days of 100 psi to 200 psi.

2.02 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

D. Provide protective construction fence around all landscaping in work area to remain.

3.02 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. The contractor shall grade and ditch the site as necessary to direct surface runoff away from open excavations. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding project site and surrounding areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. The Contractor shall provide, at his own expense, adequate pumping and drainage facilities to keep all excavations and work sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction product or procedures nor cause excessive disturbance of underlying natural ground or footing and slab subgrades. Contractor shall similarly control water entering the excavation as a result of construction operations, such as washing of concrete equipment and tools and the like.
3. Protect subgrades and foundation soils from softening, undermining, washout, and damage by water accumulation.
4. Install dewatering as required to keep subgrades dry and convey groundwater away from excavations. Maintain until dewatering is no longer required.
5. Water from trenches and excavations shall be disposed of in such a manner as will not cause injury to public health, nor damage to public or private property, existing work, or work in progress, nor to the surface of roads, walks and streets, nor cause any undue interference with the use of the same by the public. The Contractor shall comply with all applicable environmental protection and/or sediment/erosion control regulations.
6. Under no circumstances place concrete or fill, or lay piping or install appurtenances in excavations containing free water. Keep utility trenches free from water until pipe joint material has hardened.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not disintegrate or excavate rock until it has been classified by the Geotechnical Engineer and/or Owner's Agent and cross-sectioned by the Owner's registered land surveyor. The Contract Sum will be adjusted for rock excavation according to contract provisions for changes in the work. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

    a. Intermittent drilling; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock and includes replacement with approved materials.

    a. Uncover and expose all rock surfaces to be removed.
    b. Notify Owner in writing before rock removal proceeds.

c. The Owner will engage a registered land surveyor to cross section the top of rock and determine the quantity of rock for payment. Measurements for payment will be based on in place cubic yards of rock removed to paylines, as defined:

1) For Walls with Footings: The measurements will be taken horizontally parallel to and 12 inches outside of the edges of the concrete footings and vertically 12 inches below bottom of footing elevation as indicated in the Contract Documents.
2) For Walls without Footings: The measurements will be taken horizontally parallel to and 12 inches outside of the edges of the concrete limits and vertically 12 inches below bottom of concrete elevation as indicated in the Contract Documents.
3) For Walks, Pavements and Equipment Pads: The measurement will be taken vertically 12 inches below slab subgrade elevation as indicated in the Contract Documents.
4) For Utility Trenches: The measurement will be taken vertically 6 inches below bottom of pipe and horizontally 24 inches wider than the nominal diameter of pipe/conduit as indicated in the Contract Documents.
5) For Structures: The measurement will be taken horizontally 24 inches greater in both length and width or diameter than the actual exterior dimensions of the structures and vertically 12 inches below bottom elevation of structure as indicated in the Contract Documents.

d. No payment will be made for overblasted rock and/or shattered layers below paylimits, associated removal and replacement with suitable fill material.

B. Dimensions:

1. Excavate to elevations and dimensions indicated on the drawings or as otherwise required for the work. Do all necessary excavation, including, but not limited to, excavation for structures, footings, foundations, grade beams, walls and slabs below grade, paving, utility lines, mechanical work, mechanical and drainage structures, drains, and other below grade work. Excavate sufficient material so as to allow ample space for construction operations including placing and removal of forms, installation of waterproofing, dampproofing or utilities and inspection of excavated areas.
2. Side forms will be required for all concrete work unless omission of forms is requested by the Contractor, in writing, to the Engineer. Where omission of forms is requested by the Contractor, and accepted by the Engineer, the Contractor shall bear the cost of any additional concrete volume required beyond the minimum profiles and dimensions of the footing, wall, or utility trench as detailed.

C. Disposition of Excavated Material:

1. Sort and stockpile excavated material according to its suitability for re-use and job requirements. Onsite stockpile room will be limited and the Contractor shall plan his operations to facilitate prompt reuse of excavated material or provide offsite stockpile locations as required.
2. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
4. Offsite Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris and legally dispose of it off Owner's property.

D. Unauthorized Excavation: Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimension without specific direction of the Engineer or Owner's agent. Unauthorized excavation, as well as remedial work specified by the Engineer, shall be at the Contractor's expense.

1. In areas below structures, pavements and walks, backfill unauthorized excavation with granular fill placed and compacted in accordance with this Section, unless otherwise directed by the Engineer.
2. Elsewhere, backfill and compact unauthorized excavations with general fill, compacted to the requirements of this Section.
3. Where the excavation of otherwise suitable materials is required due to these materials being rendered unsuitable due to disturbance, construction activity, freezing, or lack of protection from the elements, the Contractor shall excavate these materials and provide remedial work as specified above at no additional cost to the Owner.

E. Authorized Additional Excavation: In the case that unsuitable materials, as determined by the Engineer, are encountered at the specified subgrade elevation, the Engineer may direct the removal of the unsuitable material and refill will granular fill placed and compacted in accordance with the requirements of this Section. Authorized addition excavation with granular fill backfill will be paid according to Unit Prices and Allowances. Backfilling Prior to Acceptance of Work Installed:

1. Do not allow or cause the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections, tests, and acceptances.
2. Should any of the work be so enclosed or covered up before it has been accepted, uncover all such work at no additional cost to the Owner.
3. After the work has been completed, tested, inspected, and accepted, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the Owner.

F. Sheeting, Shoring, and Bracing:

1. Provide sheeting, shoring and/or bracing at excavations as required to assure safety against collapse of earth or rock at sides of excavations; as required for support of adjacent structures, streets, or utilities; or as required to comply with federal, state or local regulations, codes or ordinances.
2. Provide materials for sheeting, shoring and bracing, such as sheet piling, uprights, stringers and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down sheeting, shoring and bracing as excavation progresses.
3. All sheeting and bracing not ordered left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities or property whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand and rammed with tools especially adapted to that purpose or otherwise compacted as directed to achieve the required density.
4. Wood sheeting shall not be completely withdrawn if driven below mid-diameter of any pipe, and under no circumstances shall any wood sheeting be cut off at a level lower than one foot above the top of pipe.
5. Refer to related requirements in Section 315000 "Excavation Support and Protection."

G. Dust and Erosion Control:

1. The Contractor shall take all necessary measures and provide equipment and/or materials to minimize dust from rising and blowing across the site and also to control

surface water throughout the operation so that it does not run onto paved ways without being filtered. In addition, the Contractor shall control all dust created by construction operations and movement of construction vehicles, both on site and on paved ways.

2. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors and performance of other work on the site.
3. Repair any broken or damaged sections of hay bales or other erosion and siltation control measures damaged during excavation and grading operations and install any additional sections necessary for proper control.

H. Frost Protection and Snow Removal:

1. The Contractor shall, at his own expense, keep the operations under this contract clear and free of accumulations of snow or as required to carry out the work.
2. Do not excavate to full indicated depth when freezing temperatures may be expected, unless footings or slabs can be cast immediately after excavation has been completed. Protect the excavation from frost if placing of concrete is delayed. Do not cast concrete on frozen ground.
3. Completed foundations which have not been backfilled or which have less than 42 inches of earth cover above the bottom of the foundation shall be protected from freezing by temporary additional earth cover, insulating blankets, heaters, or other methods. See Section 033000 for additional requirements.

I. Protection of Persons and Property:

1. The work shall be executed in such manner as to prevent any damage to adjacent property and any other property and existing improvements, such as but not limited to, streets, curbs, paving, service utility lines, structures, monuments, bench marks and other public or private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout, vibration and other hazards created by earthwork operations.
2. In the case of any damage or injury caused in the performance of the work, the Contractor shall, at his own expense, make good such damage or injury to the satisfaction of and without cost to, the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to their original condition at the commencement of operations. The Contractor shall replace, at his own expense, existing bench marks, monuments and other reference points which are disturbed or destroyed.
3. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and otherwise as required.
4. Buried structures, utility lines, etc., including those which project less than 18 inches above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard.
5. Provide protective construction fence around all landscaping in work area to remain.

3.05 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. General: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavation for Structures and Piping, Etc.:

1. Excavate to elevations and dimensions indicated within a tolerance of plus or minus one inch. Do not disturb bottom of excavations intended for bearing surface.
2. Allow the Geotechnical Engineer to view the excavated subgrade. The Geotechnical Engineer shall determine whether authorized additional excavation is required to remove unsuitable material. Remove and replace such unsuitable material as directed by the Engineer.

C. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks, pavements and equipment pads to indicated lines, cross sections, elevations, and subgrades.

1. Walks, pavements and equipment pads shall be supported on subbase/base course(s) as indicated on the drawings.
2. Remove and replace excessively wet, disturbed or unstable material and proof compact the subgrade for the subbase/base course with at least six passes of a vibratory plate or vibratory roller compactor immediately prior to placement of slab base course material unless otherwise directed.
3. The final surface of the subgrade for the walks, pavements and equipment pads shall be proof rolled with at least four passes of an approved vibratory plate or vibratory drum compactor immediately prior to placing the reinforcing and/or concrete (as may be applicable).

3.07 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe, conduit or ductbank. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe, conduit or ductbank unless otherwise indicated.

1. Clearance: As indicated on Contract Documents.

C. Trench Bottoms: Excavate trenches to depth indicated on Contract Documents to allow for bedding course. Hand-excavate deeper for bells of pipe.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.08 SUBGRADE INSPECTION

A. Notify Geotechnical Engineer and/or Owner's Testing Agency when excavations have reached required subgrade.

B. If Geotechnical Engineer and/or Owner's Testing Agency determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed and in accordance with excavation requirements of this Section.

C. Unforeseen additional excavation and replacement material will be paid for according to contract provisions for changes in the work.

D. Proof-roll subgrade as directed by the Geotechnical Engineer and/or Owner's Testing Agency.

E. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.

F. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Geotechnical Engineer and/or Owner's Testing Agency, without additional compensation.

3.09 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 PLACEMENT AND COMPACTION OF FILL AND BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

C. Unless otherwise specified or indicated on the drawings, the products specified in Part 2 of this Section shall be employed in the various fill and backfill applications indicated in the part. Place and compact fill material in layers to required elevations as follows:

1. Under grass, use common fill material.
2. Under walks, use base material.

3. Under pavements, use subbase and base material.
4. Under steps, ramps, and site walls, use granular fill material.
5. Under footings, use granular fill.
6. Under utilities, use either bedding material or granular fill (see drawings).
7. Under equipment pads and structures, use crushed stone.

D. All vegetation, peat, organic topsoil or subsoil, trash, debris, roots, stumps, and any compressible or otherwise deleterious materials shall be stripped from the existing ground surface and removed from excavations prior to placement of fill or backfill.

E. All fill and backfill materials shall be placed in horizontal layers. Each layer shall be spread evenly and thoroughly mixed during spreading to ensure uniformity of material in each layer. Layer thickness shall not exceed that specified in Paragraph L of this Section.

F. Where horizontal fill layers meet a natural or excavated slope, the layer shall be keyed into the slope by cutting a bench. The surface of benches shall be compacted to the same requirements as apply to the area being filled.

G. In no instance place fill over materials that were permitted to freeze prior to compaction or over ice or snow. Removal of such materials will be required as directed by the Engineer. In no case will frozen material be allowed for use in fill or backfill.

H. No fill shall be placed or compacted during unfavorable weather conditions. When work is interrupted by heavy rains or snow, fill operations shall not be resumed until the moisture content and density of previously placed fill are as specified hereinafter.

I. Allow the Geotechnical Engineer and/or Owner's Testing Agency sufficient time to make necessary observations and tests. The degree of compaction shall be based on a maximum dry density as determined by ASTM D 1557 or AASHTO Standard T180. All fill and backfill placed in various areas shall be compacted in individual layers to minimum dry densities as follows:

1. Under Site Walls, Within Building Foundations Backfill Limits, Equipment Pads, Structures, Steps and Pavements (Other Than Stone Base): 95 percent.
2. Under and Around Utilities (Other Than Stone): 95 percent.
3. Under Walkways: 92 percent.
4. Under Lawn or Unpaved Areas: 90 percent.
5. Uniformly graded crushed stone materials which are not suited to field density testing shall be compacted in accordance with the minimum compactive effort indicated in Paragraph 3.11 L of this Section.

J. The term "under," as applied to buildings, structures and paved areas, shall be construed to include all materials immediately below the plan area of the building, as well as those materials within a line sloping at one vertical and one horizontal drawn downward and outward from the exterior of building foundation, structure foundation or paved area.

K. Compaction shall be by mechanical means designed specifically for compaction and approved by the Engineer. The Engineer reserves the right to disapprove any device of inadequate capacity or of type unsuited to the character of the material being compacted. In areas which are too restricted to permit the use of mechanical compactors, fill may be placed in 3-inch layers and compacted by hand rammer or pneumatic tools.

L. In addition to the stated degree of compaction, all fill and backfill shall receive at least the compactive effort given in the following table. Lift thickness shall not exceed that shown for the compaction method selected, except that the first lift of fill or backfill placed over natural ground in wet conditions may be as much as 12 inches thick. Application of the minimum compactive effort does not relieve the Contractor from his requirement to achieve the specified degree of compaction.

Compaction Method	Maximum Stone Size	Maximum Loose Lift Thickness		Minimum Number of Passes	
		Below Structures and Pavement	Less Critical Areas	Below Structures and Pavement	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	4"	6"	8"	6	4
Hand-operated vibratory drum rollers weighing at least 1,000 lbs.	6"	8"	10"	6	4
Light vibratory drum roller, minimum dynamic force 3,000 lbs. per ft. of drum width	6"	10"	14"	6	4
Medium vibratory drum roller, minimum dynamic force 5,000 lbs. per ft. of drum width	8"	12"	18"	6	4
Large vibratory drum roller, minimum dynamic force 8,000 lbs. per ft. of drum width	10"	16"	24"	6	4

M. Moisture Control:

1. Water shall be added to fill material which does not contain sufficient moisture to be compacted to the specified densities. Fill and backfill material containing excess moisture shall be required to dry prior to or during compaction to a moisture content not greater than two percentage points (2%) above optimum except that material which displays pronounced elasticity or deformation underfoot or under load shall be required to dry to optimum moisture content before it is placed and compacted, if that is required to achieve specified compaction. At the Contractor's option, material which is too wet may be removed and replaced with satisfactory material at no additional cost to the Owner.
2. The Contractor is alerted to the potential silty nature of the on-site soil which renders them sensitive to moisture. On-site silty soils are difficult to handle and compact and are easily disturbed when wet. The Contractor shall plan and conduct his excavation and filling operations considering the nature of the onsite materials.

N. Where the Engineer, Geotechnical Engineer and/or Owner's Testing Agency determines that fill or backfill does not conform to the compacted density specified, or did not receive the minimum compactive effort specified, such fill shall be removed and replaced with conforming materials at the Contractor's own cost.

O. Backfilling of Walls:

1. In placing backfill, take special care to prevent any wedge action, eccentric loading or overloading by equipment used in backfilling and compaction. See Contract Documents for additional requirements.
2. Do not use equipment weighing more than 5,000 lbs. within 10 feet of all walls. Equipment weighing more than 5,000 lbs. shall not be used adjacent to walls, except as expressly approved by the Engineer.
3. Prevent damage to wall waterproofing or dampproofing when backfilling.

3.11 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION

A. The Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations. Methods of excavation and filling shall be revised as necessary to avoid disturbance of the subgrade, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures. The Contractor shall cooperate with the Engineer to modify his operations as necessary to mitigate disturbance and protect bearing soils, based on the Engineer's observations.

B. All excavated or filled areas disturbed during construction; damaged by freezing temperatures, frost, rain, accumulated water, or construction activities; all loose or saturated soil, and other areas that do not meet compaction requirements as specified herein shall be removed and replaced with compacted fill materials specified. Costs of removal of disturbed material and refill with compacted fill shall be borne by the Contractor.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits and ductbanks.

C. Do not excavate trenches under new or existing footings unless approved by Engineer. If approved, backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to an elevation of 4 inches above bottom of footings.

D. Backfill voids with satisfactory soil while removing shoring and bracing.

E. Place and compact initial backfill of material as shown on the drawings, free of particles larger than 1 inch in any dimension, to a height over the pipe or conduit as indicated in the Contract Documents.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

G. Coordinate backfilling with utilities testing.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Place base course material over subbase course under hot-mix asphalt pavement.
2. Shape subbase course and base course to required crown elevations and cross-slope grades.
3. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
4. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
5. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry density according to ASTM D 1557.

B. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry density according to ASTM D 1557.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, each soil stratum will be verified by Geotechnical Engineer and/or Owner's Testing Agency based on the required design bearing capacities.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

1. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
2. When field in-place density tests are performed using nuclear methods, make calibration checks for both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.

E. Tests will be performed at the following locations and frequencies, subject to the discretion of the Geotechnical Engineer and/or Owner's Testing Agency.

1. Paved Areas and Walks: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
2. Site Wall Backfill and Base, Structure Base: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests along a wall face.
3. Trench Backfill and Base: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.16 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Geotechnical Engineer and/or Owner's Testing Agency; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION
07/11/13

SECTION 31 20 05

SEDIMENTATION AND EROSION CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. The work under this Section includes, but is not limited to, the following:

1. Provide all labor, equipment and materials for the installation of required site related erosion control measures if not otherwise directed on the plans. Erosion control shall be in strict conformance with the latest revision of the local and state guidelines for soil erosion and sediment control.

B. All sedimentation and erosion control measures and installations shall conform to the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

1.02 GENERAL NOTES

A. The discharge of sediment-laden water from the project site is prohibited. All discharged water from dewatering operations shall discharge into approved dewatering measures as required by the latest revision of the local and state guidelines for soil erosion and sediment control.

B. The Contractor shall install all erosion control measures as depicted on the plans and as required to adhere to latest revision of the local and state guidelines for soil erosion and sediment control.

C. The Contractor shall also be responsible for inspecting and maintaining all erosion control measures until the project is completed.

1.03 SUBMITTALS

A. Provide product data for the following:

1. Erosion control blankets.
2. Filter fabric.
3. Silt fence.
4. Separation fabric.

PART 2 - PRODUCTS

2.01 EROSION CONTROL BLANKETS

A. Erosion control blankets shall be North American Green or Engineer-approved equal. The type of blanket shall be applicable to the use it is intended as indicated on the Contract Documents.

2.02 FILTER FABRIC

A. When filter fabric is required, it shall conform to the following requirements.

1. Grab Tensile Strength: 120 lbf (minimum); ASTM D 4632.

2. Tear Strength: 50 lbf (minimum); ASTM D 4533.
3. Puncture Resistance: 65 lbf (minimum); ASTM D 4833.
4. Flow Rate: 120 gal/min/ft^2 (minimum); ASTM D 4491.
5. Apparent Opening Size: No. 70 (maximum); ASTM D 4751.

2.03 SILT FENCE

A. When silt fence is required, it shall conform to the following requirements.

1. Grab Tensile Strength: 100 lbf (minimum); ASTM D 4632.
2. Tear Strength: 65 lbf (minimum); ASTM D 4533.
3. Puncture Resistance: 60 lbf (minimum); ASTM D 4833.
4. Flow Rate: 10 gal/min/ft^2 (minimum; ASTM D 4491.
5. Apparent Opening Size: No. 30 (maximum); ASTM D 4751.

2.04 SEPARATION FABRIC

A. When separation fabric is required, it shall conform to the requirements of TC MIRAFI Product 500X or an approved equal.

1. Grab Tensile Strength: 200 lbf (minimum); ASTM D 4632.
2. Tear Strength: 75 lbf (minimum); ASTM D 4533.
3. Puncture Resistance: 90 lbf (minimum); ASTM D 4833.
4. Flow Rate: 5 gal/min/ft^2 (minimum); ASTM D 4491.
5. Apparent Opening Size: No. 40 (maximum); ASTM D 4751.

2.05 CALCIUM CHLORIDE

A. Calcium chloride shall conform to the requirements of AASHTO M 144. Either regular flake calcium chloride, Type 1, or concentrated flake, pellet or other granular calcium chloride, Type 2, may be used.

2.06 WATER

A. All water used shall be clean and free of harmful amounts of oil, salt, acids, alkalis, sugar, organic matter, and other substances incurious to the finished product, plant life, or the establishment of vegetation.

2.07 STONE

A. Refer to Division 31 Section "Earth Moving" for additional information.

2.08 SEEDING

A. Permanent Seeding: Refer to the Landscape Architect’s drawings and specifications for additional information.

B. Temporary Seeding: Refer to the latest revision of the local and state guidelines for soil erosion and sediment control for additional information.

PART 3 - EXECUTION

3.01 ADDITIONAL INFORMATION AND REQUIREMENTS

A. Refer to the soil erosion and sediment control narrative and specification on the Contract Drawings for additional information and requirements.

3.02 EROSION CONTROL BLANKETS

A. Erosion control blankets shall be placed where indicated on the Contract Drawings, where directed by the erosion control supervisor and as required to adhere to the latest revision of the local and state guidelines for soil erosion and sediment control.

B. Erosion control blankets shall also be placed on all exposed cut/fill slopes to protect against rainfall, in areas where seed and mulch will not stay in place alone and where seeding is outside the growing season.

C. Grade and smooth the slope to provide good adhesion to soil surface.

D. When erosion control blankets are installed to enhance plant growth, apply fertilizer, lime, and seed prior to placing blankets.

E. Anchor erosion control blankets as recommended by the erosion control blanket manufacturer.

3.03 FILTER FABRIC

A. Inlet Protection:

1. Install filter fabric between the grate and frame of inlet structures that have the potential to receive construction stormwater.
2. Install filter fabric around subsurface drainage as required by the Contract Drawings.

3.04 SILT FENCE

A. Install silt fence as indicated on the Contract Drawings and per the latest revision of the local and state guidelines for soil erosion and sediment control. When two sections adjoin each other, they shall be overlapped by 6 inches, folded and stapled.

B. Inlet structures are to be surrounded by silt fence as indicated on the Contract Drawings.

C. All stockpile material (topsoil, borrow, etc.) shall have a silt fence constructed around the perimeter. Topsoil stockpiles left in place for a greater than 14 days shall be temporarily seeded to minimize erosion of the soil constituents and release of soluble nutrients. During windy conditions, stockpiled material shall be covered or watered appropriately to prevent wind erosion.

3.05 SEPARATION FABRIC

A. Install as indicated on the Contract Drawings.

3.06 CALCIUM CHLORIDE

A. Control dust through the application of calcium chloride or water. An average application of one pound of calcium chloride per square yard of exposed area should be considered for each treatment. The exact number of applications and amount of dust control shall be based upon field and weather conditions. It shall be spread in such a manner and with such devices so that uniform distribution is attained. Calcium chloride shall not be applied within 50 feet of a stream bank or wetland.

3.07 RESTORATION

A. As soon as construction is completed in a given area, it shall be top-soiled, seeded, fertilized and/or mulched as specified on the drawings and in Part 2 of this Specification.

B. The responsibility for satisfactory results on the work carried out under this item rests on the Contractor regardless of the prior approval of materials and methods on the part of the Engineer. The Contractor shall maintain the restored areas until such time as the work is accepted by the Owner. Maintenance shall include all regarding, refertilizing, reseeding, remulching, etc., which may be necessary in the opinion of the Owner and the Engineer.

3.08 CONSTRUCTION ENTRANCE

A. A stabilized pad of crushed stone located at any point where traffic will be entering or leaving the construction site to or from a public right-of-way or street or as shown on the drawings shall be constructed for the purpose of preventing the tracking of sediments onto public rights-of-way.

B. Design Criteria:

1. Use 1-1/2 to 2-1/2 inch diameter stone.
2. Use an 8 inch layer of stone.
3. Stone pad shall be full width of entrance.
4. Minimum length shall be 50 feet, unless otherwise authorized by the Engineer.

END OF SECTION
07/11/13

SECTION 31 35 00

SLOPE PROTECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes stone paving slope protection for areas as indicated on the plan.

B. Related Sections:

1. Section 03 30 00 “Site Cast-in-Place Concrete” for site walls adjacent to Work.
2. Section 32 13 13 “Concrete Paving” for concrete walks.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification:

1. Representative stone samples to be delivered to project site for approval by Landscape Architect.
2. Crushed Stone: 2 quart volume required in sealed plastic bag labeled with product name and source of material.
3. Geotextile: 12 x 12 inch square.

C. Sieve Analysis: for crushed stone materials according to ASTM C 136.

1.04 INFORMATIONAL SUBMITTALS

A. Pesticides and Herbicides: product label and manufacturer’s application instructions specific to Project.

1.05 QUALITY ASSURANCE

A. Pesticide Applicator: State licensed, commercial.

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of full-thickness sections of slope paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
2. Build mockup of slope paving in the location directed by Landscape Architect of not less than 10 feet by 10 feet square.
3. Rework mockup panel until acceptable to Landscape Architect. Upon acceptance panel will be the standard for all site sloped pavement.

4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.06 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.

1.07 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, and dimensions of plantings and construction contiguous with areas to receive slope paving by field measurements before proceeding with the Work.

B. Establish and maintain the required lines and grades during construction operations.

C. Do not install slope paving over wet, saturated, muddy or frozen base.

D. Protect adjacent work from damage.

PART 2 - PRODUCTS

2.01 STONE

A. Regional Materials: Provide stone that has been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Stone shall consist of sound, tough, durable rock, free from decomposed stone or other defects impairing its durability. Each piece shall have an area on its exposed surface of not less than 2 square feet and a thickness of not less than 3 inches or greater than 5 inches.

C. Only one type or source of stone may be used throughout the project site.

2.02 WASHED STONE BASE

A. Regional Materials: Provide stone that has been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Hard durable, crushed stone, washed free of loam, sand, clay and other foreign substances and shall conform to ConnDot, Form 816, Subarticle M.01.01 – Gradation 8.

2.03 MORTAR

A. Masonry Cement: ASTM C270, Type N.
1. Colored mortar: Premixed cement as required. Color to be approved by Landscape Architect.

B. Hydrated Lime: ASTM C207, Type S.

2.04 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

2.05 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Nonselective).

PART 3 - EXECUTION

3.01 INSTALLATION

A. Excavate for stone slope protection at locations indicated on the Drawings. Note that not all areas where stone slope protection is called for are sloping. Uniformly compact the subgrade and apply nonselective pre-emergent herbicide.

B. Install weed control barrier according to manufacturer's written instructions. Overlap edges a minimum of 6 inches and secure seams with galvanized pins.

C. Place indicated thickness of washed stone base, fully covering weed barrier.

D. Embed the approved paving stones into the washed stone base. Stones shall be individually laid one tight against the other with the sides in contact. The finish of the surface of the slope paving shall present an even tight surface true to the lines, grades and sections given.

E. Maximum differential between exposed stone surfaces shall be 1/4 inch.

F. Maximum separation between placed stones shall be 3/4 inch.

G. Mortar all joints between stones removing excess mortar and mortar smears as work progresses. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

3.02 CLEANING AND PROTECTING

A. Keep adjacent landscaping, paving and construction clean and work area in an orderly condition.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, latest edition.

1.02 SUMMARY

A. Section Includes:

1. Hot-mix asphalt paving.
2. Pavement-marking paint.
3. Hot-mix asphalt curbs.

1.03 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: For each job mix proposed for the Work.
2. Traffic marking paint.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified manufacturer and Installer.

B. Material Certificates: For each paving material, from manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of all governing authorities for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

D. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review condition of subgrade and preparatory work.
c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Tack Coat: Minimum surface temperature of 60 deg F.
2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and in accordance with the manufacturers requirements.

PART 2 - PRODUCTS

2.01 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

2.02 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO MP 1a, performance grade as required by state DOT specifications where the project is located.

B. Tack Coat: ASTM D 977 emulsified asphalt, or ASTM D 2397 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application. Verify acceptance with state DOT where the project is located.

C. Water: Potable.

D. Undersealing Asphalt: ASTM D 3141, pumping consistency.

2.03 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

C. Joint Sealant: ASTM D 6690 or AASHTO M 324, Type II or III, hot-applied, single-component, polymer-modified bituminous sealant.

D. Pavement-Marking Paint:

1. Waterborne pavement marking paint complying with state DOT where the project is located.

   a. Color: As determined by the Architect.

2. Epoxy resin pavement marking paint complying with state DOT where the project is located.

   a. Color: As determined by the Architect.

2.04 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Surface Binder Course: Per state DOT where the project is located. Refer to drawings for additional information.
3. Surface Wearing Course: Per state DOT where the project is located. Refer to drawings for additional information.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.02 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.03 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.

1. Clean cracks and joints in existing hot-mix asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.04 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.05 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses as specified by the state DOT where the project is located.
2. Place hot-mix asphalt surface course in number of lifts and thicknesses as specified by the state DOT where the project is located.
3. Spread mix at minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.06 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.07 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: Each course placed at a depth of 1-1/2 inches or greater shall have the mat and longitudinal joints compacted to a minimum of 92.0 percent and no more than 97.0 percent density as determined by AASHTO T209 (modified).

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.08 ASPHALT CURBS

A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat unless pavement surface is still tacky and free from dust. Spread mix at minimum temperature of 250 deg F.

1. Asphalt Mix: Per state DOT where the project is located. Refer to drawings for additional information.

B. Place hot-mix asphalt to curb cross section indicated or, if not indicated, to local standard shapes, by machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

3.09 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Surface Binder Course: Plus or minus 1/2 inch.
2. Surface Wearing Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Surface Binder Course: 1/4 inch.
2. Surface Wearing Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect and/or Engineer.

B. Allow paving to age for 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Additional testing and inspecting, at Contractor’s expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Field density of in-place compacted pavement shall be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. In-Place Density: Field density of in-place compacted pavement may also be determined by testing agency taking samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

G. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.12 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow milled materials to accumulate on-site.

3.13 AS-BUILT DRAWINGS

A. The Contractor shall provide as-built drawings markups on a monthly basis. As work progresses, all construction activities shall be documented. The record documents shall include:

1. Location and extend of curbs, pavements.
2. The Contractor shall hire the services of a surveyor licensed in the state where the work is being performed to determine parameters stated above or completed work and record the results and update the electronic files. As-builts shall include horizontal and vertical locations (elevations) at 50-foot increments.
3. Final documents (drawings and electronic files in AutoCAD format, latest edition), shall be submitted to the designated Owner's Representative not later than 30 days after substantial completion of the project. All comments shall be incorporated to the final documents within 14 days after receiving them from the Owner's Representative. The final record set (hard copy and the electronic files) shall be submitted to the Owner's Representative.

END OF SECTION
07/11/13

SECTION 32 13 13

CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, latest edition.

1.02 SUMMARY

A. Section Includes:

1. Curbs.
2. Walks.
3. Site paving.
4. Wheel stops.
5. Detectable warning material.

B. Related Sections:

1. Division 03 Section "Site Cast-in-Place Concrete" for general building applications of concrete.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Indicate joint pattern.

C. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.

D. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compounds.
5. Applied finish materials.
6. Bonding agent or epoxy adhesive.
7. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates. Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

D. Field quality-control reports.

E. Material Information:

1. Wheel stops.
2. Detectable warning material.

1.06 QUALITY ASSURANCE

A. Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

E. ACI Publications: Comply with ACI 301 unless otherwise indicated.

F. Preinstallation Conference: Conduct conference at [Project site] <Insert location>.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture design.
b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

    a. Contractor's superintendent.
    b. Independent testing agency responsible for concrete design mixtures.
    c. Ready-mix concrete manufacturer.
    d. Concrete paving subcontractor.
    e. Manufacturer's representative of stamped concrete paving system used for detectable warnings.

1.07 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.01 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.02 STEEL REINFORCEMENT

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from steel wire into flat sheets.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Epoxy-Coated, Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain-steel bars.

E. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

F. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

G. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

2.03 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, portland cement Type II.

B. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.04 CURING MATERIALS

A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

B. Water: Potable.

2.05 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.06 DETECTABLE WARNING MATERIALS

A. Detectable Warning Tile: Tile to be cast into wet concrete.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. ADA Solutions, Inc.
   b. Ultra Tech.

2. Color: By Landscape Architect

2.07 WHEEL STOPS

A. Wheel Stops: Precast, air-entrained concrete, 4000-psi minimum compressive strength, 7 inches high by 10 inches wide by 72 inches long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4 inch in diameter, 24-inch minimum length.

2.08 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Design Mixes:

1. Concrete for curbs

2. to be normal weight concrete with a 3,000 psi 28-day compressive strength; water-cement ratio 0.50 maximum (water content shall include surface water in aggregates); minimum cement content of 5-1/2 sacks per cubic yard, 4 plus or minus 1 inch slump. Provide 6 percent air content by volume plus or minus 1 percent.
3. Concrete for walkways and site paving to be normal weight concrete with a 4,000 psi 28-day compressive strength, minimum cement content of 6 sacks per cubic yard, water-cement ratio 0.45 maximum (water content shall include surface water in aggregates), 4 plus or minus 1 inch slump. Provide 6 percent air content by volume plus or minus 1 percent.

C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete according to ACI 301 requirements for concrete exposed to deicing chemicals.

2.09 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Division 31 Section "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.03 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.04 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.05 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints as shown on drawings.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 3/8-inch radius. Repeat grooving of contraction joints after applying surface finishes.

   a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.
   b. Locate joints at intervals as shown on drawings.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes.

3.06 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 304 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 309 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

K. Hot-Weather Placement: Comply with ACI 305 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.07 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.08 SPECIAL FINISHES

A. Monolithic Exposed-Aggregate Finish: Expose coarse aggregate in paving surface as follows:

1. Immediately after float finishing, spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
2. Cover paving surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
4. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

3.09 DETECTABLE WARNINGS

A. Install per manufacturer’s recommendations.

3.10 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306 for cold-weather protection.

C. Curing Methods: Cure concrete by moisture-retaining-cover curing, curing compound or a combination of these as follows:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.
2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected

to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.11 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/2 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.12 PRECAST CONCRETE CURBING

A. Install curbing as per manufacturer's specifications. All sections of curb shall be doweled as detailed and have 1 cubic foot of dry mix concrete behind each joint as detailed.

B. Standard "transition end" sections to be used for sloped curb (i.e., handicap ramps).

C. Standard "90 degree inside/outside corner" sections are required at all 90 degree corners.

D. Precast curb sections shall be set in place with a 1/8 inch joint; use spacers while placing. Remove spacers only after concrete curb sections are secured in place.

E. Care shall be taken not to chip precast curb during placement.

3.13 WHEEL STOPS

A. Install wheel stops in bed of adhesive applied as recommended by manufacturer.

B. Securely attach wheel stops to paving with not less than two galvanized-steel dowels located at one-quarter to one-third points. Install dowels in drilled holes in the paving and bond dowels to wheel stop. Extend upper portion of dowel 5 inches into wheel stop and lower portion a minimum of 19 inches into pavement. Recess head of dowel beneath top of wheel stop.

3.14 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each day's pour of each concrete class exceeding 5 cubic yards, but not less than 25 cubic yards, plus one set for each additional 50 cubic yards.

a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.15 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

3.16 AS-BUILT DRAWINGS

A. The Contractor shall provide as-built drawings including as-built ties and markups on a monthly basis. As work progresses, all construction activities shall be documented. The record documents shall include:

1. Location and extent of hardscape (pavement, walks, wheel stops, etc.).
2. Final documents (drawings and electronic files in AutoCAD format, latest edition) shall be submitted to the designated Owner's Representative not later than 30 days after substantial completion of the project. All comments shall be incorporated to the final documents within 14 days after receiving them from the Owner's Representative. The final record set (hard copy and electronic files) shall be submitted to the Owner's Representative.

END OF SECTION
07/11/13

SECTION 32 13 16

DECORATIVE CONCRETE PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes stamped concrete paving.

B. Related Sections:

1. Section 03 30 00 "Site Cast-in-Place Concrete" for concrete footings and walls.
2. Section 32 13 13 "Concrete Paving" for concrete walks.

1.03 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 301: Specification for Structural Concrete for Buildings
2. ACI 302.1R: Recommended Practice for Concrete Floor and Slab Construction.
3. ACI 303.1: Standard Specification for Cast-in-Place Architectural Concrete.
4. ACI 304: Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete.
5. ACI 305R: Recommended Practice for Hot Weather Concreting.
6. ACI 306R: Recommended Practice for Cold Weather Concreting.

B. ASTM International (ASTM):

1. ASTM C 260: Standard Specification for Air Entraining Admixtures for Concrete.
2. ASTM C 309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
3. ASTM C 979: Standard Specification for Pigments for Integrally Colored Concrete.

C. Portland Cement Association (PCA):

1. PA124: Finishing Concrete with Color and Texture.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color, pattern, or texture selection.

C. Samples for Verification: For each type of exposed color, pattern, or texture indicated.

D. Other Action Submittals:

1. Design Mixtures: For each decorative concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Field quality-control reports.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer of decorative concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

C. Source Limitations: Obtain decorative concrete paving products and each type or class of cementitious material of the same brand from same manufacturer's plant, and obtain each aggregate from single source.

D. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

E. ACI Publications: Comply with ACI 301unless otherwise indicated.

F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of full-thickness sections of decorative concrete paving to demonstrate typical joints; surface color, pattern, and texture; curing; and standard of workmanship.
2. Build mockups of decorative concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Landscape Architect and not less than 96 inches by 96 inches .
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Preinstallation Conference: Conduct conference at Project site .

1.07 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.

C. Do not place concrete if rain, frost, or snow is forecast within 24 hours of placement. Protect fresh concrete from moisture and freezing conditions.

D. Compliance Standards: ACI 305R and ACI 306R.

PART 2 - PRODUCTS

2.01 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves of a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.02 STEEL REINFORCEMENT

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.

E. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

F. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar

supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.03 CONCRETE MATERIALS

A. General: Refer to Section 321313 “Concrete Paving” for basic concrete paving requirements, including formwork, reinforcement, concrete materials, and mixing.

B. Minimum Cement Content: 5-1/2 sacks per cubic yard of concrete.

C. Mix design must not permit segregation of concrete materials during pumping, placing, or consolidation of concrete. Slump not to exceed 4 inches.

D. Do not add calcium chloride to concrete mix.

E. Use of fly ash as a cement replacement may be acceptable, subject to manufacturer’s current recommendations

F. Water: Potable and complying with ASTM C 94/C 94M. Do not add water to the mix in the field.

G. Air-Entraining Admixture: ASTM C 260.

H. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A[**, colored**].
2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D[**, colored**].
3. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.

I. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

2.04 SURFACE COLORING MATERIALS

A. Pigmented Mineral Dry-Shake Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Products: Subject to compliance with requirements, provide one of the following :
   a. Bomanite Corporation; Color Hardener.
   b. Scofield, L. M. Company; LITHOCHROME Color Hardener.
   c. Stampcrete International Ltd.; Color Hardener.

B. Pigmented Powder Release Agent: Factory-packaged, dry combination of surface-conditioning and dispersing agents interground with color pigments that facilitates release of stamp mats. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Products: Subject to compliance with requirements, provide one of the following :
   a. Bomanite Corporation; Release Agent.

b. Scofield, L. M. Company; LITHOCHROME Antiquing Release.
c. Stampcrete International Ltd.; Colored Release Agent.

C. Liquid Release Agent: Manufacturer's standard, clear, evaporating formulation that facilitates release of stamp mats and texture rollers.

1. Products: Subject to compliance with requirements, provide one of the following :
   a. Artcrete, Inc.; Faux Brick Release Agent - Liquid.
   b. Scofield, L. M. Company; LITHOTEX Liquid Release.
   c. Stampcrete International Ltd.; Stampcrete Liquid Release.

2.05 STAMPING DEVICES

A. Stamp Mats: Semirigid polyurethane mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
   a. Bomanite Corporation.
   b. Scofield, L. M. Company.
   c. Stampcrete International Ltd.

2.06 STAIN MATERIALS

A. Reactive Stain: Acidic-based stain with wetting agents and high-grade, UV-stable metallic salts that react with calcium hydroxide in cured concrete to produce permanent, variegated, or translucent color effects.

1. Products: Subject to compliance with requirements, provide one of the following :
   a. Bomanite Corporation; Chemical Stain.
   b. Scofield, L. M. Company; Lithochrome Chemstain Classic.
   c. Stampcrete International Ltd.; Patina Stain.

B. Penetrating Stain: Water-based, acrylic latex, penetrating stain with colorfast pigments.

1. Products: Subject to compliance with requirements, provide one of the following :
   a. Bomanite Corporation; Con-Color.
   b. Scofield, L. M. Company; Lithochrome Tintura Stain.

2.07 CURING AND SEALING MATERIALS

A. Curing Paper: Nonstaining, waterproof paper, consisting of two layers of kraft paper cemented together and reinforced with fiber, and complying with ASTM C 171.

B. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

C. Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type I, Class B, manufactured for colored concrete.

1. For integrally colored concrete, curing compound shall be pigmented type approved by coloring admixture manufacturer.
2. For concrete indicated to be sealed, curing compound shall be compatible with sealer.

D. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type I, Class A, manufactured for use with colored concrete.

E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type I, Class A, manufactured for use with colored concrete.

F. Clear Acrylic Sealer: Manufacturer's standard, waterborne, nonyellowing and UV-resistant, membrane-forming, medium-gloss, acrylic copolymer emulsion solution, manufactured for colored concrete, containing not less than 15 percent solids by volume.

1. Products: Subject to compliance with requirements, provide one of the following :
   a. Bomanite Corporation; Bomanite Hydrocoat.
   b. Scofield, L. M. Company; CEMENTONE Clear Sealer.

G. Slip-Resistance-Enhancing Additive: Manufacturer's standard finely graded aggregate or polymer additive, designed to be added to clear acrylic sealer to enhance slip resistance of sealed paving surface.

2.08 RELATED MATERIALS

A. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

B. Polyethylene Film: ASTM D 4397, 1 mil thick, clear.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below decorative concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

B. Protect adjacent construction from discoloration and spillage during application of color hardeners, release agents, stains, curing compounds, and sealers.

3.03 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.04 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.05 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
4. Dowelled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent decorative concrete paving:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 3/8-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.

   a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.

2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging tool marks on concrete surfaces.

3.06 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

K. Hot-Weather Placement: Comply with ACI 301and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.07 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

3.08 PIGMENTED MINERAL DRY-SHAKE HARDENER

A. Pigmented Powder Release Agent: Uniformly distribute onto dry-shake-hardened and still-plastic concrete at a rate of 3 to 4 lb/100 sq. ft..

B. Liquid Release Agent: Uniformly mist surface of dry-shake-hardened and still-plastic concrete at a rate of 5 gal/1000 sq. ft..

3.09 STAMPING

A. Mat Stamping: After floating and while concrete is plastic, apply mat-stamped finish.

1. Pigmented Powder Release Agent: Uniformly distribute onto concrete at a rate of 3 to 4 lb/100 sq. ft..
2. Liquid Release Agent: Apply liquid release agent to the concrete surface and the stamp mat. Uniformly mist surface of concrete at a rate of 5 gal/1000 sq. ft..
3. After application of release agent, accurately align and place stamp mats in sequence.
4. Uniformly load mats and press into concrete to produce required imprint pattern and depth of imprint on concrete surface. Gently remove stamp mats. Hand stamp edges and surfaces unable to be imprinted by stamp mats.
5. Remove residual release agent according to manufacturer's written instructions, but no fewer than three days after stamping concrete. High-pressure-wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.

3.10 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Compound: Apply curing compound immediately after final finishing. Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after application. Maintain continuity of coating, and repair damage during curing period.
   1. Cure concrete finished with pigmented mineral dry-shake hardener with a pigmented curing compound.

F. Curing and Sealing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

G. Curing Paper: Cure with unwrinkled curing paper in pieces large enough to cover the entire width and edges of slab. Do not lap sheets. Fold curing paper down over paving edges and secure with continuous banks of earth to prevent displacement or billowing due to wind. Immediately repair holes or tears in paper.

3.11 SEALER

A. Clear Acrylic Sealer: Apply uniformly in two coats in continuous operations according to manufacturer's written instructions. Allow first coat to dry before applying second coat, at 90 degrees to the direction of the first coat using same application methods and rates.

1. Begin sealing dry surface no sooner than 14 days after concrete placement.
2. Allow stained concrete surfaces to dry before applying sealer.
3. Thoroughly mix slip-resistance-enhancing additive into sealer before applying sealer according to manufacturer's written instructions. Stir sealer occasionally during application to maintain even distribution of additive.

3.12 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/2 inch.
4. Lateral Alignment and Spacing of Dowels: 1 inch.
5. Vertical Alignment of Dowels: 1/4 inch.
6. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
7. Joint Spacing: 3 inches.
8. Contraction Joint Depth: Plus 1/4 inch, no minus.
9. Joint Width: Plus 1/8 inch, no minus.

3.13 FIELD QUALITY CONTROL

A. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each [**100 cu. yd.**] [**5000 sq. ft.**] or fraction thereof of each concrete mixture placed each day.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

B. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

C. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

E. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

F. Decorative concrete paving will be considered defective if it does not pass tests and inspections.

G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

H. Prepare test and inspection reports.

3.14 REPAIRS AND PROTECTION

A. Remove and replace decorative concrete paving that is broken or damaged or does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Detailing: Grind concrete "squeeze" left from tool placement. Color ground areas with slurry of color hardener mixed with water and bonding agent. Remove excess release agent with high-velocity blower.

C. Protect decorative concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain decorative concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

3.15 DECORATIVE CONCRETE PAVING SCHEDULE

A. Patterned Decorative Concrete Paving :

1. Locations: Install at drives and walks in areas shown on drawings.

2. Coloring Method: Pigmented mineral dry-shake hardener.

   a. Color: As selected by Landscape Architect from manufacturer's full range .

END OF SECTION

SECTION 32 13 73

CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within cement concrete pavement.

1.03 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

C. Qualification Data: For Installer and testing agency.

D. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for sealants.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.06 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When joint substrates are wet or covered with frost.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.07 WARRANTY

A. Special Warranty: Contractor shall furnish the Owner with a written warranty guaranteeing the horizontal joint sealant system to be free of defects, water penetration and chemical damage related to installation, workmanship and/or material deficiency, consisting of:

1. Any adhesive or cohesive failures.
2. Weathering.
3. Abrasion or tear failure resulting from normal traffic use.

B. If material surface shows any of the defects listed above, contractor is to supply all labor and materials to repair all defective areas.

C. Guarantee period shall be a five year warranty commencing with date of acceptance of work.

D. Perform any repair under this guarantee at no cost to Owner.

E. Snowplows, vandalism, and abnormally abrasive maintenance equipment are not normal traffic use and are exempted from warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.02 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.03 COLD-APPLIED JOINT SEALANTS

A. Multicomponent Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements for formulation and with ASTM C 920 for type, grade, class, and uses indicated:

1. Urethane Formulation: Type M; Grade P; Class 25; Use T.

a. Products:

1) Pecora Corporation; Urexpan NR-200.
2) Tremco; THC-901.

B. Single-Component Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

1. Products:

a. Sonneborn, Div. of ChemRex, Inc.; Sonomeric 1.
b. Sika; Sikaflex-1CSL.

C. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.

1. Products:

a. Crafco Inc.; RoadSaver Silicone.
b. Dow Corning Corporation; 888.

D. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.

1. Products:

a. Crafco Inc.; RoadSaver Silicone SL.
b. Dow Corning Corporation; 890-SL.

2.04 JOINT-SEALANT BACKER MATERIALS

A. General: Coordinate with joint backer materials and joint substrates indicated in Division 32 Section "Concrete Paving." Contractor to confirm compatibility between joint sealant and joint backer materials and joint substrates.

1. Provide bond breaker at backing materials as required by joint sealant manufacturer.

2.05 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Provide bond breaker at backing materials as required by joint sealant manufacturer.

3.03 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.04 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION
07/11/13

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 specification sections, apply to this section.

1.02 SUMMARY

A. Section Includes:

1. PVC-coated chain link fencing and accessories.
2. PVC-coated gates and related hardware.

B. Related Sections:

1. Section 03 30 00 "Site Cast-in-Place Concrete" for concrete footings.
2. Section 32 13 13 "Concrete Paving" for concrete pavements.

C. References:

1. ASTM F 567: Installation of Chain Link Fence.
2. ASTM F 626: Fence Fittings.
3. ASTM 668: Polyvinyl Chloride (PVC)-Coated Steel Chain Link Fence Fabric.
4. ASTM F900: Industrial and Commercial Horizontal Swing Gates.
5. ASTM F934: Colors for PVC Coated Chain Link Fence Material.
6. ASTM F 1043: Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
7. ASTM F 1083: Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures.
8. ASTM B117: Practice for Operating Salt-Spray (Fog) Apparatus.
9. ASTM B221: Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
10. ASTM D523: Test Method for Specular Gloss.
11. ASTM D822: Practice for Conducting Tests on Paint and related Coatings and Materials using Filtered Open-Frame Carbon-Arc Light and Water Exposure Apparatus.
12. ASTM D1654: Test Methods for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
13. ASTM D2244: Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
14. ASTM D 2794: Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
15. ASTM D3359: Test Method for Measuring Adhesion by Tape Test.
16. ASTM F1184: Industrial & Commercial Horizontal Slide Gates.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.

1. Fence and gate posts, rails, and fittings.
2. Chain-link fabric, reinforcements, and attachments.
3. Gates and hardware.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, gate operation, and operational clearances.

C. Samples for Initial Selection: For components with factory-applied color finishes.

1.04 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of chain-link fence, and gate, from manufacturer. Provide Manufacturer's catalog cuts indicating material compliance and specified options.

B. Product Test Reports: For framing strength according to ASTM F 1043.

1.05 QUALITY ASSURANCE

A. Provide fences and gates as complete units produced by a single manufacturer, including necessary erection accessories, fittings, and fastenings.

B. Installation shall be performed by the manufacturer or by an experienced chain link fence installer approved by the manufacturer.

C. Provide a rigid, plumb finished fence structure, with fabric tight and in tension.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.01 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:

1. Fabric Height: As indicated on Drawings.
2. Steel Wire Fabric: Wire with a diameter of 0.148 inch (9 gauge) and a breakload of 1290 lbf.

   a. Mesh Size: 2 inches diamond mesh.

b. Polymer-Coated Fabric: PVC coated thermally fused and adhered to a primer that is thermally cured onto galvanized steel core wire, in conformance with ASTM F 668, Class 2b, 7 mil thickness thermally fused.

1) Color: Black, complying with ASTM F 934.

3. Selvage: knuckled top and bottom.

2.02 FENCE FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 or ASTM F 1083 based on the following:

1. Fence Height: As indicated on Drawings.

2. Heavy Industrial Strength: Material Group IA, round steel pipe, Schedule 40 .

a. Line Posts: As indicated on Drawings.
b. End, Corner and Pull Posts: As indicated on Drawings.

3. Horizontal Framework Members: Intermediate top and bottom rails complying with ASTM F 1043.

a. Top Rail: 1.66 inches in diameter.

4. Brace Rails: Comply with ASTM F 1043.
5. Metallic Coating for Steel Framing:

a. Hot-dipped galvanized with a minimum average 1.8-oz./sq. ft. of coated surface area.

6. Polymer coating over metallic coating.

a. Color: Match chain-link fabric, complying with ASTM F 934.

2.03 SWING GATES

A. General: Comply with ASTM F 900 for gate posts and single and double swing gate types as indicated on the plans.

1. Gate Leaf Width: As indicated.
2. Gate Fabric Height: As indicated.

B. Gate Frames:

1. Fabricate chain link swinging gates in accordance with ASTM F900 using galvanized steel tubular members, 2” square, weighing 2.60 lb/ft. Weld all joints to form a rigid one-piece unit. Vinyl coated frames thermally fused with 10 to 15 mils of PVC per ASTM 1043. For gates over 8’ high or 15’ wide, provide minimum 1-1/2” square additional horizontal and vertical interior members to ensure proper strength. Gate height to match adjoining fence. Color to match adjacent fence.

C. Chain Link Fabric:

1. PVC thermally fused to metallic coated steel wire. ASTM F 668, Class2b, in color, mesh and gauge to match fence. Install fabric with hook bolts and tension bars at all 4 sides. Attach to gate frame at not more than 15" on center.

D. Hardware: Hot dipped galvanized steel or malleable iron shapes to suit gate size. Field coat moveable parts (e.g. hinges, latch, keeper, and drop bar) with PVC touch up paint, provided by manufacturer, to match adjacent finishes.

1. Hinges: Structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180 degrees as indicated on the drawings.
2. Latch: Forked type capable of retaining gate in closed position permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate. Latch shall comply with ADA requirements and shall have a shape easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate.
3. Keeper: Provide keeper for each gate leaf over 5' wide. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.
4. Double gates: Provide drop rod to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock for locking both gates leaves.

2.04 FITTINGS

A. General: Comply with ASTM F 626.

B. Post Caps: Formed steel, cast malleable iron, or aluminum alloy cap for tubular posts to provide weather tight closure. Provide dome caps for terminal posts. Provide loop caps for line posts to permit passage of top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: 6" sleeve allowing for expansion and contraction of top rail.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: One piece lengths equal to 2 inches less than full height of fabric, with a minimum cross-section of 3/16" x ¾". Provide tension bars where chain link fabric meets terminal posts.

G. Truss Rod Assemblies: Steel rods with minimum diameter of 5/16".

H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:

a. 9 gauge (0.148") galvanized steel wire for attachment of fabric to line posts. Double wrap 13 gauge (0.092") for rails and braces. Hog ring ties of 12-1/2 gauge (0.0985") for attachment of fabric to tension wire.

I. Nuts and Bolts: Galvanized. Field-coat with PVC touch up paint.

J. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. zinc.

a. Polymer coating over metallic coating.

2.05 SETTING MATERIALS

A. Concrete: CDOT Form 816-2004, Article M.03.01; Class “A”.

B. Grout: CDOT Form 816-2004, Article M.03.01-12; Non-shrink, non-staining grout.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.03 INSTALLATION, GENERAL

A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.

3.04 CHAIN-LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
b. Concealed Concrete: Top [2 inches] below grade as indicated on Drawings to allow covering with surface material.
c. Posts Set into Voids in Concrete: Form or core drill holes not less than 5 inches deep and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout , mixed and

placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 30 degrees or more as indicated on Drawings.

D. Line Posts: Space line posts uniformly at 10 feet o.c.

E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at midheight of fabric 6' or higher, on fences with top rail and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

F. Tension Wire: Provide tension wire at bottom of fabric where indicated on the drawings. Install tension wires before stretching fabric and attach to each post with ties. Secure tension wire to fabric with 12-1/2 gauge (0.0985") hog rings 24" oc.

G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

H. Intermediate and Bottom Rails: Install and secure to posts with fittings.

I. Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 3 inches between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.

K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side for added security.

3.05 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.06 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

END OF SECTION

SECTION 323119

DECORATIVE METAL FENCES AND GATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Decorative steel fences.

B. Related Requirements:

   1. Section 03 30 00 "Site Cast-in-Place Concrete" for concrete footings .
   2. Section 04 20 00 “Unit Masonry” for brick columns.
   3. Section 32 13 13 “Concrete Paving” for concrete walks.

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fence sections. Include plans, elevations, sections, details, and attachments to other work.

   1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified engineer responsible for their preparation.

C. Samples: For each fence material and for each color specified.

   1. Provide Samples 12 inches in length for linear materials.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data for fabricator.

B. Welding certificates.

1.06 QUALITY ASSURANCE

A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of Connecticut and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installation of decorative metal fences similar to those indicated for this Project in material, design, and extent.

C. Fabricator Qualifications: Firm experienced in producing decorative metal fences similar to that indicated for this Project with a record of successful in-service performance and sufficient production capability to produce required units.

D. Installer Qualifications: Fabricator of products.

E. Source Limitations: Obtain decorative fence panels through one source from a single manufacturer.

F. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, “Structural Welding Code – Steel”

G. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Include typical length of fence complying with requirements including attachment to brick column.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.07 PROJECT CONDITIONS

A. Field measurements: Verify actual locations of walls, brick columns and other construction contiguous with fence sections by field measurements before fabrication and indicate on Shop Drawings.

1.08 COORDINATION AND SCHEDULING

A. Schedule installation so fence section attachments are made only to completed walls and columns. Do not support fence sections temporarily by any means that do not satisfy structural performance requirements

1.09 PRODUCT HANDLING AND STORAGE

A. Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Lightning-Protection System: Maximum grounding-resistance value of 25 ohms under normal dry conditions.

2.02 DECORATIVE STEEL FENCES

A. Decorative Steel Fences: Fences made from steel tubing bars and shapes, hot-dip galvanized.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. A & T Iron Works, Inc.
   b. United Steel, Inc.
   c. General Welding & Fabrication

B. Posts: Square steel tubing.

1. Posts: 1 ½ by 1 ½ inches with 12 guage wall thickness.

C. Steel Tube Rails: Square steel tubing 1 ½ by 1 ½ inches with 14 gauge wall thickness.

D. Pickets: 3/4 inch square by 18 gauge wall thickness steel tubes .

1. Terminate tops of pickets at bottom of top rail for flush top appearance .
2. Picket Spacing: 3 15/16 inches clear, maximum.

E. End Mounting Bars: 1 ½ inch by ¾ inch thick steel flat bars.

F. Fasteners: ½ inch dia. by 7” stainless-steel concrete expansion bolts.

G. Fabrication: Assemble fences into complete sections by welding pickets to rails and rails to posts and end bars. Each complete section will extend between brick columns. Welding of fence components in field is not permitted.

H. Finish exposed welds to comply with NOMMA Guideline 1, .

2.03 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.

C. Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

2.04 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Section 03 30 00 " Site Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch maximum aggregate size.

C. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M and specifically recommended by manufacturer for exterior applications.

2.05 GROUNDING MATERIALS

A. Grounding Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.

1. Material above Finished Grade: Copper .
2. Material on or below Finished Grade: Copper.
3. Bonding Jumpers: Braided copper tape, 1 inch wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.

B. Grounding Connectors and Grounding Rods: Comply with UL 467.

2.06 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.

B. Assemble railings in the shop such that each complete section will extend between brick columns.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Form changes in direction as detailed on Drawings and as standard with system selected.

G. Provide anchorage devices capable or withstanding loads imposed on railings for connecting railings to masonry work.

2.07 HOT-DIP GALVANIZING AND FACTORY-APPLIED ARCHITECTURAL FINISH

A. Hot-Dip Galvanizing: For steel exposed to the elements, provide coating for iron and steel fabrications applied by the hot dip process.

1. Basis of Design: Duragalv by Duncun Galvanizing.
2. Comply with ASTM A 123 for fabricated products and ASTM A 153 for hardware.
3. Provide thickness of galvanizing specified in referenced standards.
4. Galvanizing bath shall contain special high grade zinc and other earthly materials.
5. Fill vent holes after galvanizing and grind smooth, if applicable.

B. Hot-Dip Galvanizing: For steel exposed to the elements, provide coating for iron and steel fabrications applied by the hot dip process.

1. Basis of Design: Colorgalv by Duncun Galvanizing.
2. Primer coat shall be factory-applied polyamide epoxy primer. Apply primer within 12 hours after galvanizing at the same galvanizer's plant in a controlled environment meeting applicable environmental regulations as recommended by the primer coating manufacturer.

3. Finish coat shall be factory-applied color pigmented architectural finish. Aplly finish coating at the galvanizer's plant, in a controlled environment meeting applicable environmental regulations as recommended by the finish coating manufacturer. Finish coat shall exhibit a rugosity (smoothness) not greater than 4 rug (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of architectural and structural elements that are less than 24 pounds per running foot. Profilometer shall be capable of operating in 1 imcron increments.
4. Coatings shall be certified OTC/VOC compliant and conform to applicable regulations and EPA standards.
5. Apply the galvanizing, primer and finish coating within the same facility and provide single source responsibility for galvanizing, priming and finish coating.
6. Clean galvanized surface to create an acceptable profile for coatings. Galvanizer shall certify that performance will be met without blast cleaning and coating will be applied within 12 hours of galvanizing at the galvanizing plant. If blasted, galvanizer shall certify that rugosity standards are met.
7. Primer shall meet or exceed the following performance criteria:
   a. Abrasion resistance per ASTM D 4060 (CS17 Wheel, 1000 grams load),1kg Load: 200 mg loss.
   b. Adhesion per ASTM D4541: 1050 psi.
   c. Corrosion Weathering per ASTM D5894, 13 Cycles, 4368 Hours: Rating 10 per ASTM for blistering; Rating 7 per ASTM D610 for rusting.
   d. Direct Impact Resistance per ASTM D2794: 160 in. lbs.
   e. Flexibility per ASTM D522: 180 degrees Bend, 1 in. Mandrel: Passes.
   f. Pencil Hardness per ASTM D3363: 3B
   g. Moisture Condensation Resistance per ASTM D4585, 100 degrees F, 2000 Hours: Passes, no cracking or delamination.
   h. Dry heat Resistance per ASTM D24585: 250 degrees F.
8. Topcoat shall meet or exceed the following performance criteria:
   a. Abrasion resistance per ASTM D 4060 (CS17 Wheel, 1000 grams load),1kg Load: 87.1 mg loss.
   b. Adhesion per ASTM D4541: 1050 psi.
   c. Direct Impact Resistance per ASTM D2794: less than 28 in. lbs.
   d. Indirect Impact Resistance per ASTM D2794: 12-14 in. lbs.
   e. Dry Heat Resistance per ASTM D2485: 200 degrees F.
   f. Salt fog Resistance per ASTM B 117 9000 Hours: Rating 10 per ASTM D714 for blistering.
   g. Flexibility per ASTM D522: 180 degrees Bend, 1 in. Mandrel: Passes.
   h. Pencil Hardness per ASTM D3363: 2H.
   i. Moisture Condensation Resistance per ASTM D4585, 100 degrees F, 1000 Hours: Passes, no cracking or delamination.
   j. Xenon Arc Test per ASTM D4798: Pass 300 hours.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, construction of brick posts, concrete walls with precast concrete copings and seat steps and other conditions affecting performance of the Work.

B. Do not begin installation before final grading is completed unless otherwise permitted by Landscape Architect.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 DECORATIVE FENCE INSTALLATION

A. Install fences according to manufacturer's written instructions.

B. Install fences by attaching completed fence sections to brick columns with 4 stainless steel concrete expansion bolts per side using predrilled holes in end mounting bars.

C. Mid-Post Setting for fence sections located on ground:

1. Drill or hand-excavate holes for mid-posts in firm, undisturbed soil. Excavate holes to a diameter of not less than 4 times post size and a depth of not less than 24 inches plus 3 inches for each foot or fraction of a foot that fence height exceeds 4 feet.
2. Set mid-posts in concrete at indicated spacing into firm, undisturbed soil.
3. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
4. Place concrete around posts and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
5. Top concrete below grade as indicated on Drawings to allow covering with surface material. Slope top surface of concrete to drain water away from post.
6. Extend post to within 6 inches of specified excavation depth, but not closer than 3 inches to bottom of concrete.

D. Mid-Posts Setting for fence sections located on top of walls:

1. Core drill holes through precast concrete coping into concrete wall not less than 3/4 inches larger than outside diagonal dimension of post.
2. Extend posts at least 5 inches into concrete.
3. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink grout, mixed and placed to comply with grout manufacturer's written instructions. Finish and slope top surface of grout to drain water away from post.

3.03 GROUNDING AND BONDING

A. Fence Grounding: Install at maximum intervals of [**1500 feet**] <**Insert a lesser distance if grounding resistance is high**> except as follows:

1. Fences within 100 Feet of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of [**750 feet**] <**Insert a lesser distance if grounding resistance is high**>.

B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet on each side of crossing.

C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

D. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

E. Bonding to Lightning-Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning-protection down conductor or lightning-protection grounding conductor, complying with NFPA 780.

3.04 FIELD QUALITY CONTROL

A. Testing Agency: [**Owner will engage**] [**Engage**] a qualified testing agency to perform tests and inspections.

1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.
2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify Architect promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.
3. Report: Prepare test reports of grounding resistance at each test location certified by a testing agency. Include observations of weather and other phenomena that may affect test results.

END OF SECTION

SECTION 32 31 40

TIMBER GUIDE RAIL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Sections

1. 03 33 00 “Site Cast-in-Place Concrete” for concrete footings.

1.02 SUMMARY

A. Section Includes:

1. Timber Guide Rail.

1.03 SUBMITTALS

A. Wood Treatment Data: Submit certification by treating plant indicating chemicals and process used and compliance with specified requirements and all governing ordinances.

1.04 REFERENCES

A. American Wood Preservers Association (AWPA) Standards:

1. AWPA Analytical Standards A2-98, A3-00, A9-00, A-16-93, A17-97, A18-99.
2. AWPA Commodity Standards C1-00, C2-00, C4-99, C5-00, C9-00, C15-00, C17-00, C22-00.
3. Preservative Standard P5-01.

B. Form 816-2004, State of Connecticut Standard Specifications for Roads, Bridges, and Incidental Construction.

1.05 QUALITY ASSURANCE

A. Wood Treatment: Comply with American Wood Preservers Association (AWPA) standards for wood preservative treatment scheduled.

B. Grade Mark: All lumber shall be grade marked by an agency accredited by the American Lumber Standard Committee (ALSC).

C. Quality Mark: All copper quaternary preservative-treated wood members shall bear an end tag or permanent ink stamp indicating the following:

1. Name of wood treating company.
2. Treatment plant city and state.
3. Symbol for alkaline copper quaternary (ACQ).

4. Preservative retention level.
5. Approved use.
6. Code report number.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Keep materials dry during delivery and site storage. Stack materials above ground to ensure proper drainage and ventilation. Protect from moisture, weather damage and deterioration.

1.07 PROJECT CONDITIONS

A. Do not install guiderail prior to completion of grading.

B. Allowable Tolerances: Guiderail shall not deviate more than 1/2" in line to grade in each section.

PART 2 - PRODUCTS

2.01 TIMBERS

A. Rough Sawn, No. 2 or better Southern Yellow Pine timbers.

B. AWPA grade stamped for ground contact with 0.40 lbs., p.c.f. retention of waterborne ACQ-C preservative.

C. Timbers shall be properly seasoned when dressed and at time of treatment to 20% maximum moisture content.

D. Air or kiln dry after treatment.

2.02 CARRIAGE BOLTS

A. Conform to CDOT Form 816-2004, Article M.10.02-06. Hot-dipped galvanized in conformance with ASTM A153, Class D. Size: 1/2” diameter.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Drill post holes into firm undisturbed or thoroughly compact soil. The bottoms of dug holes shall be thoroughly rammed so that the posts have a stable foundation. Backfill for all dug holes shall be approved material and is to be machine-tamped in 4-inch layers in such a way as not to shift the posts from the correct alignment. Gate posts shall be set in concrete as detailed.

B. Align each post both vertically and laterally. Secure in position during backfilling operations. Posts shall be set at a constant vertical alignment above finished grade. Posts shall be set at a constant distance from edges of pavements

C. Install rails as detailed. Core posts as shown in detail to produce tightly fitted joints. Predrill holes, and install carriage bolts with double washers. Draw nut tight, cut excess bolt length, and weld or peen threads to prevent removal of nut.

D. Smoothly finish grade around posts to prepare for replacement conditions. Provide topsoil for all proposed lawn areas. Do not allow water to stand adjacent to post bases.

3.02 FINISHING

A. Exposed edges of all timbers shall be chamfered 1/2" and lightly sanded to produce eased edges.

3.03 CLEANING

A. Clean up debris and cuttings on a regular periodic basis.

B. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, tools, and equipment. Repair damage resulting from rough carpentry work.

C. Dispose of all treated waste lumber in a satisfactory legal manner.

END OF SECTION

SECTION 32 32 23

SEGMENTAL RETAINING WALLS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes single- depth segmental retaining walls without soil reinforcement at student gardens.

B. Related Sections:

1. Section 03 30 00 "Site Cast-in-Place Concrete" for site walls adjacent to Work.
2. Section 04 20 00 "Unit Masonry" for decorative concrete masonry units with faces required to match segmental retaining wall units.
3. Section 31 20 00 "Earth Moving" for excavation for segmental retaining walls.
4. Section 32 91 15 “Soil Preparation” for topsoil to be used within raised planter beds.

1.03 PERFORMANCE REQUIREMENTS

A. Basis of Design: Design of segmental retaining walls is based on products indicated. If comparable products of other manufacturers are proposed, provide engineering design for proposed products, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Engineering design shall be based on the following loads and be according to NCMA's "Design Manual for Segmental Retaining Walls."

1. Gravity loads due to soil pressures resulting from grades indicated.
2. Superimposed loads (surcharge) indicated on Drawings.

1.04 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform the following preconstruction testing:

1. Test soil reinforcement and backfill materials for pullout resistance according to ASTM D 6706.
2. Test soil reinforcement and backfill materials for coefficient of friction according to ASTM D 5321.

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For concrete units.

C. Samples for Verification: For each color and texture of concrete unit required. Submit full-size units .

1. Include one full-size unit for each type of concrete unit required delivered to project site for approval by Landscape Architect.

D. Delegated-Design Submittal: For segmental retaining walls indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Compliance Review: Qualified professional engineer responsible for segmental retaining wall design shall review and approve submittals and source and field quality-control reports for compliance of materials and construction with design.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified professional engineer .

B. Product Certificates: For segmental retaining wall units, from manufacturer.

1. Include test data for shear strength between segmental retaining wall units according to ASTM D 6916.
2. Include test data for connection strength between segmental retaining wall units and soil reinforcement according to ASTM D 6638.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for segmental retaining wall units[**and soil reinforcement**].

1. Include test data for freeze-thaw durability of segmental retaining wall units.
2. Include test data for shear strength between segmental retaining wall units according to ASTM D 6916.
3. Include test data for connection strength between segmental retaining wall units and soil reinforcement according to ASTM D 6638.

D. Preconstruction test reports.

E. Source quality-control reports.

F. Field quality-control reports.

1.07 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects.

1. Build mockup of segmental retaining wall approximately 72 inches long by not less than 36 inches high above finished grade at front of wall.
   a. Include typical base and cap or finished top construction.
   b. Include backfill to typical finished grades at both sides of wall.
   c. Include typical end construction at one end of mockup.
   d. Include 36-inch return at 1 end of mockup, with typical corner construction.

2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Preinstallation Conference: Conduct conference at Project site .

1. Review methods and procedures related to segmental retaining walls including, but not limited to, the following:

a. Structural load limitations.
b. Construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store and handle concrete units and accessories to prevent deterioration or damage due to contaminants, breaking, chipping, or other causes.

B. Store geosynthetics in manufacturer's original packaging with labels intact. Store and handle geosynthetics to prevent deterioration or damage due to sunlight, chemicals, flames, temperatures above 160 deg F or below 32 deg F, and other conditions that might damage them. Verify identification of geosynthetics before using and examine them for defects as material is placed.

PART 2 - PRODUCTS

2.01 SEGMENTAL RETAINING WALL UNITS

A. Concrete Units: ASTM C 1372, Normal Weight, except that maximum water absorption shall not exceed 7 percent by weight and units shall not differ in height more than plus or minus 1/16 inch from specified dimension.

1. Manufacturers: Subject to compliance with requirements, provide products by licensees of one of the following:

a. Allan Block Corporation.
b. Anchor Wall Systems, Inc.
c. Nicolock
d. Versa-Lok Retaining Wall Systems; a division of Kiltie Corporation.

2. Provide units that comply with requirements for freeze-thaw durability.
3. Provide units that interlock with courses above and below by means of integral lugs or lips or pins .

B. Color: As selected by Architect from manufacturer's full range.

C. Shape and Texture: Provide units of basic shape and dimensions indicated with machine-split textured exposed faces.

D. Shape and Texture: Provide units matching basic shape, dimensions, and face texture indicated by referencing manufacturer's pattern designation.

E. Shape and Texture: Provide units of any basic shape and dimensions that will produce segmental retaining walls of dimensions and profiles indicated without interfering with other elements of the Work and with machine-split textured, flat exposed face .

F. Batter: Provide units that offset from course below to provide at least 1:24 batter.

G. Cap Units: Provide cap units of shape indicated with smooth, as-cast top surfaces without holes or lugs.

H. Special Units: Provide corner units, end units, and other shapes as needed to produce segmental retaining walls of dimensions and profiles indicated and to provide texture on exposed surfaces matching face .

2.02 INSTALLATION MATERIALS

A. Pins: Product supplied by segmental retaining wall unit manufacturer for use with units provided, made from nondegrading polymer reinforced with glass fibers.

B. Cap Adhesive: Product supplied or recommended by segmental retaining wall unit manufacturer for adhering cap units to units below.

C. Leveling Base: Comply with requirements in Section 31 20 00 "Earth Moving" for base material .

D. Drainage Fill: Comply with requirements in Section 33 46 00 "Subdrainage."

E. Nonreinforced-Soil Fill: Comply with requirements in Section 31 20 00 "Earth Moving" for satisfactory soils.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for excavation tolerances, condition of subgrades, and other conditions affecting performance of segmental retaining walls.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 RETAINING WALL INSTALLATION

A. General: Place units according to NCMA's "Segmental Retaining Wall Installation Guide" and segmental retaining wall unit manufacturer's written instructions.

1. Lay units in running bond .
2. Form corners and ends by using special units or cutting units with motor-driven saw .

B. Leveling Base: Place and compact base material to thickness indicated and with not less than 95 percent maximum dry unit weight according to ASTM D 698.

C. First Course: Place first course of segmental retaining wall units for full length of wall. Place units in firm contact with each other, properly aligned and level.

1. Tamp units into leveling base as necessary to bring tops of units into a level plane.

D. Subsequent Courses: Remove excess fill and debris from tops of units in course below. Place units in firm contact, properly aligned, and directly on course below.

1. For units with lugs designed to fit into holes in adjacent units, lay units so lugs are accurately aligned with holes, and bedding surfaces are firmly seated on beds of units below.
2. For units with lips at front of units, slide units as far forward as possible for firm contact with lips of units below.
3. For units with lips at bottom rear of units, slide units as far forward as possible for firm contact of lips with units below.
4. For units with pins, install pins and align units.

E. Cap Units: Place cap units and secure with cap adhesive.

3.03 FILL PLACEMENT

A. General: Comply with requirements in Section 312000 "Earth Moving" NCMA's "Segmental Retaining Wall Installation Guide," and segmental retaining wall unit manufacturer's written instructions.

B. Fill voids between and within units with drainage fill. Place fill as each course of units is laid.

C. Place, spread, and compact drainage fill and soil fill in uniform lifts for full width and length of embankment as wall is laid. Place and compact fills without disturbing alignment of units. Where both sides of wall are indicated to be filled, place fills on both sides at same time. Begin at wall and place and spread fills toward embankment.

1. Use only hand-operated compaction equipment within 48 inches of wall, or one-half of height above bottom of wall, whichever is greater.

2. Compact nonreinforced-soil fill to comply with Section 312000 "Earth Moving."

D. Slope grade at top of wall away from wall unless otherwise indicated. Slope grade at base of wall away from wall. Provide uniform slopes that will prevent ponding.

3.04 CONSTRUCTION TOLERANCES

A. Variation from Level: For bed-joint lines along walls, do not exceed 1-1/4 inches in 10 feet, 3 inches maximum.

B. Variation from Indicated Batter: For slope of wall face, do not vary from indicated slope by more than 1-1/4 inches in 10 feet.

C. Variation from Indicated Wall Line: For walls indicated as straight, do not vary from straight line by more than 1-1/4 inches in 10 feet.

3.05 ADJUSTING

A. Remove and replace segmental retaining wall construction of the following descriptions:

1. Broken, chipped, stained, or otherwise damaged units. Units may be repaired if Architect approves methods and results.

2. Segmental retaining walls that do not match approved Samples and mockups.
3. Segmental retaining walls that do not comply with other requirements indicated.

B. Replace units so segmental retaining wall matches approved Samples and mockups, complies with other requirements, and shows no evidence of replacement.

END OF SECTION

SECTION 32 91 15

SOIL PREPARATION (PERFORMANCE SPECIFICATION)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes planting soils specified according to performance requirements of the mixes.

B. Related Requirements:
1. Section 31 10 00 "Site Clearing" for topsoil stripping and stockpiling.
2. Section 32 92 00 "Turf and Grasses" for placing planting soil for turf and grasses.
3. Section 32 93 00 "Plants" for placing planting soil for plantings.

1.03 DEFINITIONS

A. CEC: Cation exchange capacity.

B. Imported Soil: Soil that is transported to Project site for use.

C. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

E. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

F. SSSA: Soil Science Society of America.

G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

H. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

I. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

J. USCC: U.S. Composting Council.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include recommendations for application and use.
   2. Include test data substantiating that products comply with requirements.
   3. Include sieve analyses for aggregate materials.
   4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:
      a. Manufacturer's qualified testing agency's certified analysis of standard products.
      b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
      c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, 1-gal. volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.05 INFORMATIONAL SUBMITTALS

A. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

B. Field quality-control reports.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1.07 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil and on imported soil.
   1. Notify Landscape Architect seven days in advance of the dates and times when laboratory samples will be taken.

B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
   1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.08 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Landscape Architect.
   1. Number and Location of Samples: Minimum of three representative soil samples for each soil to be used or amended for landscaping purposes.

2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.09 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:
1. Soil Texture: Soil-particle, size-distribution analysis by the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
   a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
   b. Hydrometer Method: Report percentages of sand, silt, and clay.

C. Chemical Testing:
1. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil fertility analysis according to standard laboratory protocol of SSSA NAPT NEC-67 , including the following:
1. Percentage of organic matter.
2. Soil reaction (acidity/alkalinity pH value).
3. Nitrogen ppm.
4. Phosphorous ppm.
5. Potassium ppm.
6. Manganese ppm.
7. Calcium ppm.
8. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.

E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3-Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.

2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Regional Materials: Imported soil and soil amendments and fertilizers shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.02 PLANTING SOILS SPECIFIED ACCORDING TO PERFORMANCE REQUIREMENTS

A. Planting-Soil Type I: Existing, on-site surface soil, with the duff layer, if any, retained; and stockpiled on-site; modified to produce viable planting soil. Using preconstruction soil analyses and materials specified in other articles of this Section, amend existing, on-site surface soil to become planting soil complying with the following requirements:
   1. Percentage of Organic Matter: Minimum 5 to 8 percent by volume.
   2. Soil Reaction: pH of 6 to 7 , except for acid loving plants the pH shall be 4.5 to 5.5.
   3. Fertility: amount, P, K, Mg and Ca in amounts recommended by the testing laboratory for the turf types and plant groups to be installed..

B. Planting-Soil Type II: Imported, naturally formed soil from off-site sources and consisting of sandy loam soil according to USDA textures; and modified to produce viable planting soil. Amend imported soil with materials specified in other articles of this Section to become planting soil complying with the following requirements:
   1. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep, not from bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass.
   2. Additional Properties of Imported Soil before Amending: Minimum of 2 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration. Clean soil to be of the following:
      a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
      b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 5 percent by dry weight of the imported soil.
      c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1-1/4 inch in any dimension.
   3. Percentage of Organic Matter: Minimum 5 to 8 percent by volume.
   4. Soil Reaction: pH of 6 to 7 , except for acid loving plants the pH shall be 4.5 to 5.5.
   5. Fertility: amount, P, K, Mg and Ca in amounts recommended by the testing laboratory for the turf types and plant groups to be installed..

2.03 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
   1. Percent by weight passing through square mesh sieves:
      a. 100 percent passing No. 10 sieve.
      b. Minimum 90 percent passing No. 20 sieve.
      c. Minimum 40 percent passing No. 100 sieve.
   2. Form: Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

2.04 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
   1. Feedstock: May include biosolids.
   2. Reaction: pH of 5.5 to 8 .
   3. Soluble-Salt Concentration: Less than 4 dS/m.
   4. Moisture Content: 35 to 55 percent by weight.
   5. Organic-Matter Content: 40 to 60 percent of dry weight.
   6. Particle Size: Minimum of 98 percent passing through a 3/4 inch sieve.

2.05 FERTILIZERS

A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

PART 3 - EXECUTION

3.01 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.02 PLACING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply planting soil on-site in its final, blended condition. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth of 4 inches . Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   1. Apply approximately half the thickness of planting soil over prepared, loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

C. Application: Spread planting soil to total depth of 6 inches, but not less than required to meet finish grades after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

D. Compaction: Compact each lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.03 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests:
   1. Performance Testing: For each amended planting-soil type, demonstrating compliance with specified performance requirements. Perform testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.

C. Soil will be considered defective if it does not pass tests.

D. Prepare test reports.

E. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

3.04 PROTECTION

A. Protection Zone: Identify protection zones according to Section 01 56 39 "Temporary Tree and Plant Protection."

B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Vehicle traffic.
   4. Foot traffic.
   5. Erection of sheds or structures.
   6. Impoundment of water.

7. Excavation or other digging unless otherwise indicated.

C. If planting soil or subgrade is overcompacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Architect and replace contaminated planting soil with new planting soil.

3.05 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.

END OF SECTION

SECTION 32 92 00

TURF AND GRASSES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Hydroseeding.
   2. Sodding.

B. Related Requirements:

   1. Section 32 93 00 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings.

1.03 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 32 91 15 "Soil Preparation (Performance Specification)"] and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in turf installation in addition to requirements in Section 01 40 00 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Pesticide Applicator: State licensed, commercial.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.08 PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.
1. Spring Planting: April 1 to June 15.
2. Fall Planting: August 15 to October 1.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

C. The Contractor shall bear sole responsibility for the furnishing and application of irrigation water.

PART 2 - PRODUCTS

2.01 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species:
   1. Proportioned by weight as follows:

      a. 35 percent Kentucky Bluegrass .
      b. 35 percent Creeping Red Fescue.
      c. 20 percent Fiesta 4 Perennial Ryegrass.
      d. 10 percent Express Perennial Ryegrass.

C. Grass-Seed Mix: Proprietary seed mix as follows:

   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

      a. Hart's Wear 'N Tear Mixture: The Chas. C. Hart Seed Co., Wethersfield, CT 06109. (860) 529-2537.

2.02 TURFGRASS SOD

A. Turfgrass Sod: Approved, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted. The sod shall be composed of three or more turf-type Kentucky bluegrass cultivars cut at a uniform thickness of ¾ inch plus or minus ¼ inch and shall be free of weeds, disease and other imperfections. The sod shall come from a field in which the sod is grown on a loamy sand, sandy loam, or loam without the use of netting and shall have been mowed at a mowing height of no greater than 1 ½ inches high. The names of the cultivars compromising the sod shall be submitted and approved by the Landscape Architect before delivery to the site.

2.03 INORGANIC SOIL AMENDMENTS

A. Lime: Agricultural liming material containing a minimum of 90 percent calcium carbonate equivalent and as follows:

   1. 100 percent passing through No. 10 sieve, a minimum of 90 percent passing through No. 20 sieve, and a minimum of 40 percent passing through No. 100 sieve.

   2. Provide lime in form of ground dolomitic limestone..

2.04 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.05 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

D. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.06 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.07 WATER

A. Potable

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.

3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.02 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.03 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Section 32 91 15 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Place planting soil in place over exposed subgrade .

1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.04 HYDROSEEDING

A. Hydroseeding: Mix specified seed, commercial fertilizer , and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Spray-apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydromulching) at a rate of 1000 lb/acre.

3.05 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil

or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.06 TURF MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
1. Mow to a height of 1-1/2 to 2 inches.

D. Turf Postfertilization: Apply commercial fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.07 SOD MAINTENANCE

A. The contractor shall maintain the sod furnished and installed under this Contract for three months from the date the sod installation is complete, following the program outlined below. The three month grow-in period may be discontinuous, and may require maintaining the lawn

through the following spring should the sodding schedule be delayed or growth of grasses cease in the fall prior to end of the three month maintenance period.

B. Irrigate the sod area daily with ¼ inch of water per day using 3 sets to keep the surface moist and to maintain soil moisture at or near capacity so that the sodbed does not dry out and adequate rooting takes place. The amount of water per day and the number of sets may be adjusted at the request of the Owner for the first three weeks from sodding and weekly thereafter.

C. The sodded lawn shall be mowed as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain a growing height of 1 ½ - 2 inches.

D. Fertilize the new sod with a 31-0-0 (IDBU) fertilizer three weeks after the sod installation at 142 pounds per acre to supply 44 pounds of Nitrogen per acre. Follow with a second treatment of IDBU four weeks from the first treatment, applying 142 pounds per acre. A third treatment shall be made three weeks prior to the end of the maintenance period. Adjustments in the scheduled fertilizer treatment may be made by the Owner based upon the needs and performance of the sod.

E. The Contractor will be responsible for the control of weeds that ingress into the sodded areas during the three month maintenance period. The need to treat will be determined by the Owner. The herbicide or method of control will be based on the weed species present. Herbicide treatments must be applied by an applicator with a pesticide license issued by the State of Connecticut, Department of Energy and Environmental Protection.

3.08 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Landscape Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.09 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

3.11 MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Seeded Turf: 60 days from date of planting completion.

   a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 90 days from date of planting completion.

   a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

END OF SECTION

SECTION 32 93 00

PLANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Plants.
2. Landscape edgings.

B. Related Requirements:

1. Section 01 56 39 "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
2. Section 32 92 00 "Turf and Grasses" for turf (lawn) and hydroseeding.

1.03 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

D. Finish Grade: Elevation of finished surface of planting soil.

E. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

F. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

G. Planting Area: Areas to be planted.

H. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 32 91 15 "Soil Preparation (Performance Specification)" for drawing designations for planting soils.

I. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

J. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

K. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

L. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.04 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Nursery Sources: Submit a list of all proposed nursery sources for approval, confirming the availability of plant varieties, sizes and other conditions as indicated on the plant list. This nursery source list shall be submitted prior to the Nursery Visit Schedule.
3. Planting Schedule: Submit the projected planting schedule including nursery visits, digging, delivery, storage and installation dates, to the Architect for review and approval. Schedule the dates for each type of landscape work during normal seasons for such work in each area of the site. Correlate with specified maintenance periods to provide maintenance until conclusion of planting establishment and maintenance period. Revise schedule as necessary to keep current, subject to the Architect’s approval
4. Nursery Visit Schedule: Coordinate with the Landscape Architect and the proposed nurseries to arrange the specified nursery visits. The final schedule for nursery visits shall be submitted not later than 45 days before the plants are scheduled to be dug.
5. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 10 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B. Samples for Verification: For each of the following:

1. Organic Mulch: 1-quart volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
2. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

D. Sample Warranty: For special warranty.

1.07 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.08 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Experience: Five years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."
2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

3. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Other Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. All plants are subject to inspection and selection for overall form, vigor and condition by the Landscape Architect at the nursery source or place of growth. Do not dig plant material until inspected and sealed by the Landscape Architect. Contractor must provide all transportation and shall accompany the Landscape Architect for all source inspections.
2. Coordinate with approved nurseries and the Landscape Architect to schedule the Architect's nursery visits, to secure approved plants, and to confirm digging and shipping dates in conformance with the approved planting schedule. Arrange nursery visits as far in advance of the scheduled installation as possible, which will generally occur during the September or October preceding the installation. In all cases, tagging shall be scheduled for completion prior to the onset of anticipated winter conditions that will make the grower's fields inaccessible. All tagging shall be completed by December 15. Summer or fall digging of deciduous plants will not be permitted without the Landscape Architect's prior approval.
3. Plants designated as "balled and burlapped" shall be field-grown, and shall not be dug until inspected, approved and sealed by the Landscape Architect.
4. All plants shall arrive at the site with the Landscape Architect's permanent seals intact.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball.

E. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.

F. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

G. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

H. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Notify the Landscape Architect of delivery schedule at least two (2) days in advance, to arrange for inspections upon arrival to the job site
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.10 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting:
   a. Deciduous plants: March 1 through May 15.
   b. Evergreen plants: March 1 through June 1.
   c. Perennial plants and ornamental grasses: Plant in spring after all danger of frost has passed. Do not plant while ground is still wet or sticky after thawing or heavy from prolonged rain. Complete this work before June 1.

2. Fall Planting:
   a. Deciduous plants: October 15 until the ground freezes.
   b. Evergreen plants: August 15 through October. 1
   c. Bulbs: September 1 until the ground freezes.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

D. Examine the areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected. Coordinate Work with other related site work that is not included in this Section. Maintain proper sequencing of operations.

E. Commencement of Work will constitute the Contractor's acknowledgement and acceptance of the proposed plant list, the plant locations as shown on the drawings, and the suitability of all site

conditions for the planting Work; and the Contractor's acceptance of the requirements of this Section, including replacement of unacceptable plants during the Plant Establishment and Warranty Period.

F. Notify the Landscape Architect at least 2 days prior to commencing any planting operations.

G. Proceed with and complete the landscape work as rapidly as portions of the site become available, working within the seasonal limitations for each kind of landscape work required.

H. The Contractor shall bear sole responsibility for the furnishing and application of irrigation water.

I. Plant Locations on the Drawings are approximate and are to be used only as a guide. Contractor shall provide all field engineering services to accurately stake out locations for all plants and outlines of plant beds. Do not begin excavation until Landscape Architect has approved specific layout. Relocate the planting, without extra compensation if directed prior to final installation.

J. Protection of Prepared Beds: Protect topsoil and planting mixtures in prepared planting beds from erosion and displacement until permanent plantings and mulch surfaces become established and stabilized. Provide temporary erosion control blankets or other measures as necessary.

1.11 WARRANTY

A. The Contractor shall warranty to the Owner and Landscape Architect that all plants installed under this Section will remain alive and be in a healthy, vigorous condition for the duration of the period. Warranty period will commence upon the completion of all planting work. A sum sufficient to cover the cost of possible replacement plantings will be held by the Owner until satisfactory completion of the Warranty period.

B. Warranty period: one-year (365 days); except that deciduous plants in a dormant condition on the date the warranty commences will be warranted for an additional period, extending through to June 1 of the next following spring.

C. The Contractor shall replace any dead plant or any plant which is unhealthy, unsightly, or which for any cause no longer meets the Specifications, as directed by the Landscape Architect. Replacements will be made immediately as seasonal conditions permit. Replacements will be of the same variety and size specified in the plant list, with a new warranty commencing on the date of replacement.

D. The Contractor shall replace or reconstruct any damage caused to surrounding Work or to other improvements, by the plant replacement operations. Any such restoration Work shall conform to the applicable requirements of the Contract Documents.

1.12 INSPECTION AND ACCEPTANCE PROCEDURES

A. Submit Written Notice: requesting inspection by the Landscape Architect at least 10 days prior to the date of the requested inspection.

B. All plants that meet the warranty requirements when inspected will be accepted.

C. Should inspected Work not comply with the requirements of this Section, replace rejected Work and continue maintenance until reinspected and accepted; unless if in the opinion of the Landscape Architect, it is preferable to extend the plant warranty period for another full growing season. The Landscape Architect will make another inspection at the end of the extended plant warranty period, if any, to determine acceptance or rejection. Remove rejected material promptly from the site.

D. Preliminary Acceptance/ Start of Warranty Period:

1. The Contractor shall notify the Landscape Architect when all the Work of this Section is complete and ready for preliminary acceptance. The Landscape Architect will conduct an inspection to determine whether all plantings and related work have been completed and installed in accordance with the Contract Documents, and will prepare a list items to be completed or corrected. The Contractor will complete or correct the listed items, and will notify the Landscape Architect when all remaining work is ready for re-inspection.
2. When the Architect determines that the re-inspected work has been satisfactorily completed, the Landscape Architect will certify preliminary approval of the planting. The plant material warranty will commence on the date of preliminary approval.
3. Subject to the Landscape Architect's sole discretion; preliminary approval of the overall planting may be granted even if installation of a few particular plants is unavoidably delayed by seasonal or inventory circumstances that are documented in advance as being beyond the Contractor's control.

E. Final Acceptance/ End of Warranty Period

1. At the scheduled conclusion of the Warranty Period, the Contractor shall notify the Landscape Architect of the date when the site will be ready for inspection for final acceptance. The Landscape Architect will conduct an inspection to review the condition of the plantings, and whether all required maintenance has been satisfactorily performed.

2. After the inspection, the Contractor will be notified in writing of the plants requiring replacement and any deficiencies in the maintenance.

3. A final inspection of all plants will be held after the replacement planting has been completed and any maintenance deficiencies are corrected.

    a. Replacements shall be the same material, the same size, or larger, planted in the same manner as the original. The Landscape Architect shall have sole discretion to approve any Substitutions.
    b. Replacements will be subject to an additional one year warranty, but will be subject to only one additional replacement. After final acceptance, maintenance of replacement plants will be performed by the Owner.

4. The maintenance and warranty periods will end, and Final Acceptance to end of Warranty will be granted, provided the Contractor has complied with the following requirements:

    a. Dead, missing and defective plant material have all been replaced as directed by the Landscape Architect.
    b. Plant beds and plant materials have been properly mulched and are free of weeds.
    c. Stakes, guys, saucers, and tree wrapping have been removed at the end of the guarantee period.
    d. Remedial measures directed by the Landscape Architect to ensure plant survival have been carried out.

e. Any damage to lawn areas or site improvements has been corrected.

1.13 MAINTENANCE

A. Period Required: begins immediately after planting. Continue until the end of the warranty period.

B. Correct defective Work as soon as possible. Correct dangerous conditions immediately.

C. Replace dead, missing, unhealthy or unsightly plants immediately, as seasonal conditions permit.

1. Replace plants that are damaged or lose their natural form or become less than the originally specified size due to removal of the dead or damaged portions.
2. Replacements shall be of the same variety and size as specified in the plant list.
3. Repair damages to surrounding plantings and other improvements caused by removal and replacement of unacceptable plants. Replanted disturbed material will be subject to the same establishment period as the replacement plant.

D. Perform all cultural care necessary to properly maintain plant viability and keep planted areas in a neat and orderly condition, including but not limited to:

1. Watering
2. Weed removal
3. Spraying as necessary to keep plants free of disease and insects.
4. Applications of lime or sulphur to adjust soil pH to specific plant requirements.
5. Restoring or replacing mulch and edging, and reshaping earth saucers.
6. Adjusting tree supports, and resetting plants to proper grade and vertical position.
7. Pruning dead or broken branches.

E. Arrange inspections of all plant material with the Landscape Architect present. Two (2) inspections, one every six months, are required. Each inspection shall be provided when scheduled by the Landscape Architect.

PART 2 - PRODUCTS

2.01 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Perennial plants shall have been growing in the specified container for a minimum of one year (365 days) prior to installation. Root mass shall completely fill the container.

G. Substitutions will be permitted only by Change Order. If substitutions are proposed based on unavailability of the specified plant material, submit conclusive evidence of such unavailability, and proposals for equivalent material.

H. Provide container-grown plants with sufficient root growth to hold the earth intact when removed from containers. Root-bound plants will not be accepted.

I. The condition of plant material roots, shall be subject to a random pre-planting inspection and approval by the Landscape Architect.

J. Quantities as shown on the Drawings are given for the Contractor's convenience. Install every plant shown on the Drawings. Discrepancies will not entitle the Contractor to extra payment.

2.02 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.03 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Double-shredded softwood bark composed primarily of pine and spruce bark. Aged not less than 9 months. Clean and free of foreign matter and disease. Sample to be approved..
2. Color: Natural.

2.04 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.05 LANDSCAPE EDGINGS

A. Aluminum Edging: Standard-profile extruded-aluminum edging, ASTM B 221 Alloy 6063-T6, fabricated in standard lengths with interlocking sections with loops stamped from face of sections to receive stakes.

1. Manufacturers: Subject to compliance with requirements, provide products by the following :
   a. Permaloc Corporation.

2. Edging Size: 1/8 inch thick by 5-1/2 inches deep .
3. Stakes: Aluminum, ASTM B 221 Alloy 6061-T6, approximately 1-1/2 inches wide by 12 inches long.
4. Finish: Manufacturer's standard paint.
   a. Paint Color: Black.

2.06 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

B. Burlap: Non-synthetic, biodegradable.

C. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

D. Free-Draining Material: Sand, gravel, stone or mixtures thereof, with not more than 70 percent by weight passing the No. 40 mesh sieve and not more than 10 percent by weight passing the No. 200 mesh sieve.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Notify the Landscape Architect at least 2 days prior to conducting any planting operations, so the Architect may be present to observe the planting operations. Planting done without proper notification will not be accepted.

3.02 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

3.03 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 32 91 15 "Soil Preparation (Performance Specification)."

B. Placing Planting Soil: Place planting soil in-place over exposed subgrade.

C. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

D. Application of Mycorrhizal Fungi: Broadcast dry product uniformly over prepared soil at application rate according to manufacturer's written recommendations.

3.04 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further

disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate plant pits and beds to the dimensions as detailed on the Drawings.
3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
5. Maintain required angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
6. Maintain supervision of excavations during working hours.
7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.

B. Backfill Soil: Subsoil and topsoil removed from excavations may not be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

D. Drainage: Notify landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

3.05 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 3 inches adjacent finish grades.

1. Use Planting Mixture for backfill. .
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.

4. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Set container grown stock plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.

1. Use Planting Mixture for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Revise first subparagraph below to suit sizes and varieties of plants and planting tablets.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.06 TREE, SHRUB, AND VINE PRUNING

A. Prune, thin, and shape trees, shrubs, and vines as directed by Landscape Architect. Remove dead, injured, interfering, objectionable, obstructing and weak branches. Make clean cuts as close as possible to the trunk or parent branch without cutting into the branch collar or leaving a stub

B. Do not apply pruning paint to wounds.

3.07 GROUND COVER AND PLANT PLANTING

A. Protect Plants from sun. conduct planting operations in late afternoon or on cloudy days. Provide temporary shade until plants are acclimated to new location.

B. Soak roots of plants for several hours before planting, until roots are turgid.

C. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.

D. Use Planting Mixture for backfill.

E. Dig holes large enough to allow spreading of roots.

F. Gently break apart binding and winding roots of container material. Distribute roots through planting hole.

G. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

H. Set plants slightly above the soil level at which they were grown. Backfill and gently firm soil to eliminate air pockets or voids.

I. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

J. Water thoroughly after planting, taking care not to cover plant crowns with wet soil..

3.08 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Treelike Shrubs in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 36-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
2. Organic Mulch in Planting Areas: Apply 2-inch average thickness of organic mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.09 EDGING INSTALLATION

A. Aluminum Edging: Install aluminum edging where indicated on the Drawings according to manufacturer's written instructions. Anchor with aluminum stakes spaced approximately 36 inches apart, driven below top elevation of edging.

3.10 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.11 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.12 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Remove and replace trees that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size as those being replaced for each tree of 6 inches or smaller in caliper size.
2. Species of Replacement Trees: Same species being replaced .

3.13 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion , remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.14 MAINTENANCE SERVICE

A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance period begins immediately after planting and continues until the end of the warranty period.

B. Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance period begins immediately after planting and continues until the end of the warranty period.

END OF SECTION

SECTION 33 41 00

STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, latest edition.

1.02 SUMMARY

A. Section Includes:

1. Pipe and fittings.
2. Nonpressure transition couplings.
3. Cleanouts.
4. Drains.
5. Manholes.
6. Channel drainage systems.
7. Catch basins.
8. Stormwater detention structures.
9. Pipe outlets.
10. Stormwater disposal systems.
11. Warning tape.

1.03 DEFINITIONS

A. DI: Ductile-iron.

B. FRP: Fiberglass-reinforced plastic.

C. HDPE: High density polyethylene.

D. PVC: Polyvinyl chloride plastic.

E. RCP: Reinforced concrete piping.

1.04 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Non-pressure Drainage-Piping Pressure Rating: At least equal to test pressure. Pipe joints shall be at least silttight, unless otherwise indicated.

B. Precast concrete structures shall comply with ASTM C 890 Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

1.05 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Catch Basins and Manholes: Include plans, elevations, sections, details, frames, and covers. Include design calculations and concrete design-mix report.
2. Stormwater Detention Structures: Include plans, elevations, sections, details, frames, covers, design calculations, and concrete design-mix reports.
3. Channel Drainage Systems: Include plans, elevations, sections, details, and frames and covers, design calculations, and concrete design-mix report for system manufacturer.

1.06 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.

B. Field quality-control reports.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle all piping and structures according to manufacturer's written instructions.

1.08 PROJECT CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Do not proceed with interruption of service without Architect's and Owner's written permission.

PART 2 - PRODUCTS

2.01 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 74, Service class.

B. Gaskets: ASTM C 564, rubber.

C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.02 HDPE PIPE AND FITTINGS

A. Corrugated HDPE Drainage Pipe and Fittings NPS 12 to NPS 48: AASHTO M 294M, Type S, with smooth waterway for coupling joints.

1. Silttight Couplings: HDPE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.

2.03 PVC PIPE AND FITTINGS

A. PVC Gravity Sewer Piping, NPS 10 and Smaller:

1. Pipe and Fittings: ASTM D 3034 SDR 35, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.

2.04 CONCRETE PIPE AND FITTINGS

A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76.

1. Bell-and-spigot ends and gasketed joints with ASTM C 443, rubber gaskets.
2. Class IV, Wall B.

2.05 NONPRESSURE TRANSITION COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Concrete Pipes: ASTM C 443, rubber.
2. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
3. For Fiberglass Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
4. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
5. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

2.06 CLEANOUTS

A. Cast-Iron Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Josam Company.
   b. MIFAB, Inc.
   c. Smith, Jay R. Mfg. Co.
   d. Tyler Pipe.
   e. Watts Water Technologies, Inc.
   f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.

2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
3. Top-Loading Classification(s): Heavy Duty.
4. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

B. Plastic Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Canplas LLC.
   b. IPS Corporation.
   c. NDS Inc.
   d. Plastic Oddities; a division of Diverse Corporate Technologies, Inc.
   e. Sioux Chief Manufacturing Company, Inc.
   f. Zurn Light Commercial Products Operation; Zurn Plumbing Products Group.

2. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

2.07 MANHOLES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.

   a. Kor-n-Seal for smooth exterior walled pipe.
   b. Kor-n-Seal Plus Pipe Adapter by NPD for corrugated exterior walled pipe.

9. Steps: Individual FRP steps, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 36 inches.
10. Install frame over a minimum of three layers (8 inches) of concrete brick, continuous around frame, to allow vertical adjustment.
11. Mortar for Chimney, Frame and Cover Joints: Comply with ASTM C 270, Type M, except for quantities less than 2.3 cu. ft. where packaged mix complying with ASTM C387, Type M may be used.

B. Manhole Frames and Covers:

1. Description: Size as indicated on drawings. Include indented top design with lettering cast into cover, using wording equivalent to "STORM SEWER."
2. Material: ASTM A 48, Class 35 gray, designed for H20 structural loading.

2.08 CONCRETE

A. General: Cast-in-place concrete:

1. Normal weight concrete with a 3,000 psi, 28-day minimum compressive strength; water-cement ratio 0.50 maximum (water content shall include surface water in aggregates); minimum cement content of 5-1/2 sacks per cubic yard, maximum 3/4-inch aggregate, 4 plus or minus 1 inch slump; 6 percent air content by volume.
2. Cement: ASTM C 150, Type II.
3. Fine Aggregate: ASTM C 33, sand.
4. Coarse Aggregate: ASTM C 33, crushed gravel.
5. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

C. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

2.09 POLYMER-CONCRETE, CHANNEL DRAINAGE SYSTEMS

A. General Requirements for Polymer-Concrete, Channel Drainage Systems: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include quantity of units required to form total lengths indicated.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ABT, Inc.
2. ACO USA.
3. Innovative Plastic, Inc.; a subsidiary of T-H Marine Supplies, Inc.
4. Mea-Josam Div.; Josam Company.
5. Poly Drain.
6. Strungwell; Lenoir City Div.

C. Narrow-Width, Polymer-Concrete Systems:

1. Channel Sections:

a. Interlocking-joint, precast, modular units with end caps.
b. <insert size> inside width and <insert size> deep, rounded bottom, with level invert and with NPS 4 outlets in quantities, sizes, and locations indicated.

2. Grates:

a. Slots or perforations that fit recesses in channels.

b. Material: Gray iron capable of H20 loading.

3. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.

D. Wide-Width, Polymer-Concrete Systems:

1. Channel Sections:

a. Interlocking-joint, precast, modular units with end caps.
b. <**insert size**> inside width and <**insert size**> deep, rounded bottom, with level invert and with outlets in quantities, sizes, and locations indicated.

2. Grates:

a. Slots or other openings that fit recesses in channels.
b. Material: Gray iron capable of H20 loading.

3. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.
4. Small Catch Basins:

a. 19- to 24-inch by approximately 6-inch polymer-concrete body, with outlets in quantities and sizes indicated.
b. Gray-iron slotted grate.
c. Frame: Include gray-iron or steel frame for grate.

2.10 YARD DRAINS

A. Basins:

1. PVC body, conforming to ASTM D 3034 and ASTM D 679; inlets and outlets in number and sizes indicated on drawings, gasketed push-on joints.
2. RCP body, conforming to ASTM C 76, Class IV, Wall B; inlets and outlets in number and sizes indicated on drawings, grouted joints.

B. Frames and Grates:

1. PVC Body: Gray-iron, ASTM A 48, Class 35.

a. Top-Loading Classification(s): Pedestrian loading.

2. RCP Body: Gray-iron, ASTM A 48, Class 35.

a. Top-Loading Classification(s): Pedestrian loading.

C. PVC Body Manufacturers:

1. NDS.
2. ADS.

2.11 CATCH BASINS

A. Standard Precast Concrete Catch Basins:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
3. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
4. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
5. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
6. Install frame over a minimum of three layers (8 inches) of concrete brick, continuous around frame, to allow vertical adjustment.
7. Mortar for Chimney, Frame and Cover Joints: Comply with ASTM C 270, Type M, except for quantities less than 2.0 cu. ft. where packaged mix complying with ASTM C 387, Type M, may be used.
8. Catch Basin Trap with Backing Plate: Provide on outlet pipe of catch basins, where indicated. Provide aluminum or cast-iron trap with stainless steel fasteners. Size trap to accommodate pipe taking into account pipe orientation. Should field conditions preclude use of standard trap, Contractor to provide alternate solution for review and approval by Engineer.

B. Frames and Grates:

1. Standard steel CT DOT bar grate.

2.12 STORMWATER DETENTION STRUCTURES

A. Refer to drawings for information.

2.13 PIPE OUTLETS

A. Riprap Basins and Energy Dissipaters: Broken, irregularly sized and shaped, graded stone. Materials for this items hall consist of sound, tough, durable and angular rock, free from decomposed stones or other defects impairing its durability. The size of a stone as hereinafter specified shall be its least dimension. Broken concrete or rounded stones are not acceptable. The type of material to be sued shall be as noted on the plans, in the special provisions, or as may be ordered by the Engineer.

1. Standard Riprap: This material shall conform to the following requirements:

a. Not more than 15 percent of the riprap shall be scattered spalls and stones less than 5 inches in size.
b. No stone shall be larger than 30 inches in size, and at least 75 percent of the mass shall be stones at least 15 inches in size.

2. Intermediate Riprap: This material shall conform to the following gradation:

Stone Size	% of the Mass
18" or over	0
10" to 18"	30-50
6" to 10"	30-50
4" to 6"	20-30
2" to 4"	10-20
Less than 1"	0-10

3. Modify Riprap: This material shall conform to the following gradation:

Stone Size	% of the Mass
10" or over	0
6" to 10"	20-50
4" to 6"	30-60
2" to 4"	30-40
1" to 2"	10-20
Less than 1"	0-10

B. Reinforced Concrete Pipe Flared End Section: ASTM C 76, Class IV, Wall B, with bell-and-spigot end and gasketed joint with ASTM C 443, rubber gasket.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.02 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.

F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow at a minimum slope of 0.5 percent, unless otherwise indicated.
2. Install piping with cover as indicated on drawings.
3. Install hub-and-spigot, cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
4. Install HDPE corrugated sewer piping according to CPPA's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
5. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
6. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

3.03 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join hub-and-spigot, cast-iron soil piping with gasketed joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join corrugated HDPE piping according to CPPA 100 and the following:

   a. Use silttight couplings for Type 1, silttight joints.

3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasketed joints.
4. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
5. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.04 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use Heavy-Duty, top-loading classification cleanouts. Provide round 12-inch deep double flanged housing with secured scoriated cast-iron cover with lifting device, gasket seal, vandal-proof screws and bronze plug.

B. Refer to detail on Contract Drawings for cleanout installation.

3.05 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections with sealants according to ASTM C 891.

C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.

D. Set covers flush with finished surface for manholes that occur in pavements. Set covers flush with topsoil and provide a graded transition away from covers to surrounding grade.

3.06 YARD DRAIN INSTALLATION

A. Construct yard drain sizes and installation details as indicated.

B. Set top of frames and grates flush with surrounding surface to allow for stormwater interception.

3.07 CATCH BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates flush with surrounding surface to allow for stormwater interception.

3.08 STORMWATER OUTLET INSTALLATION

A. Construct riprap of broken stone, as indicated.

B. Install outlets that spill onto grade, with RCP flared end sections that match pipe, where indicated.

C. Construct energy dissipaters at outlets, as indicated.

3.09 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.10 CHANNEL DRAINAGE SYSTEM INSTALLATION

A. Install with top surfaces of components, except piping, flush with finished surface.

B. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.

C. Embed channel sections and drainage specialties per manufacturer's specifications.

D. Fasten grates to channel sections per manufacturer's specifications.

E. Assemble channel sections per manufacturer's specifications.

3.11 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Section 221413 "Facility Storm Drainage Piping."

B. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.

    a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

4. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

C. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.

    a. Unshielded flexible couplings for same or minor difference OD pipes.
    b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

3.12 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch- thick, brick masonry bulkheads.
2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:

1. Remove manhole or structure and close open ends of remaining piping.

C. Backfill to grade according to Section 312000 "Earth Moving."

3.13 IDENTIFICATION

A. Materials and their installation are specified in Section 312000 "Earth Moving." Arrange for installation of detectable warning tape 18 to 24 inches directly over piping and at outside edge of underground structures.

3.14 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:

   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.

5. Manhole Test: Visually inspect for damage.

C. Damage, leaks and loss in test pressure below limits stated above, constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.15 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

3.16 AS-BUILT DRAWINGS

A. The Contractor shall provide as-built drawings including as-built ties and markups on a monthly basis. As work progresses, all construction activities shall be documented. The record documents shall include:

1. All demolition and abandonment of underground utilities and structures.
2. Location, elevation, and type (size and quantity) of installed underground utilities and piping. Location, elevation, and type of existing exposed utilities during installation of new work, vaults, manholes, transformers, valves, above- and belowground conduits, walls, bridges, signs, fences, structural fill, and any other surface and subsurface elements as defined in the specifications.

3. The Contractor shall hire the services of a surveyor licensed in the state where the work is being performed to determine parameters stated above of completed work and record the results and update the electronic files. As-builts shall include lateral and vertical (depth) locations of all utilities at 50 foot increments.
4. Document installation with photographs in digital format, especially but not limited to, installation, joining of dissimilar materials, bedding material, and pipe connections to buildings and structures.
5. Final documents (drawings and electronic files in AutoCAD format, latest edition), shall be submitted to the designated Owner's Representative not later than 30 days after substantial completion of the project. All comments shall be incorporated to the final documents within 14 days after receiving them from the Owner's Representative. The final record set (hard copy and electronic files) shall be submitted to the Owner's Representative.

END OF SECTION
07/11/13

MATERIAL MANAGEMENT PLAN

488, 496, 506 & 516 Boston Post Road
4, 9, 14, 22 & 23 Daytona Street
14, 20-22, 24, 34, 38 & 46 Rockview Street
3, 6, 7, 13 & 20 Waban Street
West Haven, Connecticut

Prepared For:

Svigals + Partners
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Associate

14 June 2013
Revised 8 November 2013

140068601

LANGAN

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Appendix A – Laboratory Analytical Results

1.0 INTRODUCTION

This Materials Management Plan (MMP) has been prepared on behalf of Svigals + Partners (Svigals) and describes the procedures for documentation, excavation, management, and disposal of contaminated materials generated during the removal of urban fill containing metals, semi-volatile organic compounds (SVOCs), and extractable total petroleum hydrocarbons (ETPH); and potentially impacted groundwater during the proposed development activities at the "Subject Property", located at 488, 496, 506 and 516 Boston Post Road; 4, 9, 14, 22, and 23 Daytona Street; 14, 20-22, 24, 34, 38 & 46 Rockview Street; and 3, 6, 7, 13 & 20 Waban Street in the City of West Haven, New Haven County, Connecticut (see Figure 1).

Project activities associated with this MMP will include the following:

- Excavation and off-site disposal of contaminated soil in conjunction with proposed development activities (see Figures 2 and 3); and,
- Dewatering and discharge of groundwater from dewatering activities under an approved CTDEEP General Permit.

The preparation of this plan and proposed material handling stated herein is consistent with standard industry practices for preventing direct contact with lead, SVOC, and ETPH contaminated soils.

1.1 Background

According to the May 2012 Phase I Environmental Site Assessment (ESA) conducted by Langan, the Subject Property was primarily undeveloped until the 1960s, except for the residential buildings located at 506 Boston Post Road and 14 Rockview Street which were constructed in the early 1920s. The commercial property at 488 Boston Post Road was historically occupied by a general contractor. The building contains a concrete maintenance pit which was used for vehicle maintenance, and interior trench drains that reportedly collected ponded water which accumulated from truck storage. A heating oil underground storage tank (UST) which contained fuel oil used for heating the building is located north of the building. The Phase I ESA notes that a former occupant previously generated hazardous wastes on-site consisting of sulfuric acid, hydrochloric acid, and chloroform in quantities exceeding the 100 kilograms per month threshold, likely defining the property as an "Establishment" in accordance with the Connecticut Department of Energy and Environmental Protection (CTDEEP) Property Transfer Act. The property is currently vacant.

The commercial property at 496 Boston Post Road was historically occupied by an auto electric repair facility. During a Phase I site inspection performed by GZA in October 2011, interior operations consisted of a machining room, parts storage area, and office

space. A heating oil UST which contained fuel oil used for heating the building was observed directly south of the building during Langan's Phase I ESA site inspection.

According to previous reports reviewed by Langan, former site uses at the 4 and 14 Daytona Street parcel consisted of a construction company, and sheet metal and cement pipe manufacturer. A 275-gallon fuel oil aboveground storage tank (AST), 275-gallon waste oil AST, and fuel dispensing truck with a gasoline pump were located at the site. A Phase I ESA performed by Environmental Risk Limited (ERL) in July 2005 identified staining on the ground surface surrounding the waste oil AST and fuel truck. During site investigations performed in 2005 and 2006 by others, elevated concentrations of ETPH were identified in shallow soils (maximum 3 feet below grade) adjacent to the waste oil AST and fuel truck. In conjunction with the site owner vacating the property, approximately 35 to 40 tons of contaminated soils were excavated and disposed of off-site from the 2 areas of concern identified above. The property was subsequently redeveloped as a parking lot for the University of New Haven, and is improved with perimeter fencing, landscaped areas, and an underground stormwater detention system.

The remaining properties either remained undeveloped or were occupied by residential structures which were constructed between the 1950s and 1970s.

According to the May 2013 Phase II Environmental Site Investigation Report conducted by Langan, site specific subsurface conditions encountered during Langan's environmental and geotechnical investigations at the Subject Property generally consist of varying levels of fill underlain by silt, sand, glacial till, weathered rock and bedrock layers. Bedrock was encountered at depths ranging from approximately 1 to 24 feet below grade.

Copper was detected in groundwater at ELB-12(OW) above the applicable criteria and bromodichloromethane and chloroform were detected in groundwater at ELB-5(OW) below the applicable RSR criteria.

Lead was detected in the soil sample collected at HA-3, adjacent to the abandoned ASTs at 516 Boston Post Road. SVOC and ETPH were also detected in this soil sample at concentrations below applicable CTDEEP criteria. Lead was also detected above applicable criteria in the surficial soil samples collected from around 506 Boston Post Road, and 14, 34, and 38 Rockview Street where exterior lead-based paint had been identified. Lead was detected in one of these samples (HA-2 at 506 Boston Post Road) at a concentration of 17,100 mg/kg, above the industrial/commercial direct exposure criteria and the CTDEEP Significant Environmental Hazard (SEH) Reporting threshold.

The SEH detection was initially discovered on 3 April 2013, and in accordance with CGS Section 22a-6u, was reported to the CTDEEP on 1 July 2013. Following the May 2013 delineation, fencing was placed around the area where lead was detected exceeding the SEH Condition Notification Threshold Condition.

To delineate the extents of lead in subsurface soils, Langan provided oversight for the installation of an additional 33 soil borings on 30 and 31 May 2013. Four of the soil borings completed at 516 Boston Post Road (ELB-34 through ELB-37) were installed to complete investigation of potential releases at this property associated with abandoned aboveground storage tanks (ASTs) and 55-gallon drums. Elevated concentrations of ETPH and SVOCs were detected in two of these soil borings (ELB-34 and ELB-35) at concentrations exceeding CTDEEP criteria.

The removal of all soils exceeding CTDEEP criteria shall be addressed during the construction associated with this plan.

1.2 Purpose

The purpose of this MMP is to document the excavation and disposal of contaminated or potentially contaminated materials generated during the proposed development of the Subject Property. The most recent soil sampling data indicates residual ETPH, SVOC, and lead impacts in shallow soil. It is important to note that the Subject Property is not currently under order by the CTDEEP or subject to CTDEEP oversight for the implementation of these activities; however the Phase I ESA identified the historical generation of hazardous waste 488 Boston Post Road in quantities that meet the definition of an "Establishment" in accordance with the CTDEEP Property Transfer Act. The property owner has chosen to implement this MMP as a "best practice" measure.

2.0 PRE-EXCAVATION ACTIVITIES

2.1 Buried Utilities

Buried utilities in the public domain (e.g., electric, gas, water, sewers, telephone, etc.) will be located by the respective utilities. Connecticut Call-Before-You-Dig (CBYD) must be contacted prior to intrusive activities on the Subject Property.

2.2 Material Characterization

Contaminated material within the proposed construction envelope will be disposed of off-site and shall be characterized by waste characterization sampling to be completed by the Contractor. Results of this sampling will be provided to Langan and the proposed disposal facility. All sampling should be completed prior to selecting a disposal facility.

3.0 MATERIAL MANAGEMENT PLAN

3.1 Material Classifications

Material to be excavated for redevelopment of the Subject Property is expected to meet the definition of clean, polluted, or contaminated material, as defined below.

Clean Soils – Soils that meet background concentrations at the Subject Property and do not exceed CTDEEP RSR criteria.

Clean Fill – Approved fill brought onto the Subject Property that has been tested and found to have no non-naturally occurring compounds or no exceedances of any CTDEEP RSR Criteria for naturally occurring compounds. This material must be free of solid waste and organic matter (i.e. wood, glass, etc.), and shall also comply with the requirements for suitable backfill soils as specified in Section 31 00 00, Earthwork, dated May 1, 2013.

Polluted Soils – According to the CTDEEP RSRs, polluted soil is soil affected by a release of an non-naturally occurring substance at a concentration above the analytical detection limit for such substance but below the applicable CTDEEP RSR criteria in accordance with RCSA 22a-133k-1(a)(45).

Contaminated Materials – For the purposes of this MMP, contaminated materials are considered any concrete, soil, sediments, groundwater, or surface water that contains concentrations of contaminants exceeding the CTDEEP RSR criteria in accordance with RCSA 22a-133k. This material is not suitable for on-site reuse as backfill, and must be disposed of at an approved off-site disposal facility, in accordance with this MMP.

Hazardous Materials – Includes all soil/fill material that exceeds regulatory limits for hazardous substances as defined in 40 CFR, Part 261.20 Subpart C – Characteristics of Hazardous Waste. This material is not suitable for on-site reuse as backfill, and must be disposed of at an approved off-site disposal facility, in accordance with this MMP.

3.2 Erosion Control Measures

Stormwater pollution prevention and erosion control measures are shown on the design drawings prepared by BVH Integrated Services, Inc. dated April 19, 2013. Sediment and erosion control measures include the following:

- Inlet protection;
- Perimeter and excavation silt fencing;
- Disturbed area stabilization;
- Slope stabilization; and,
- Installation of a construction entrance.

3.3 Construction Entrance/Exit

A construction entrance shall be constructed at the Subject Property consisting of a minimum of 50 by 24 foot wide by 12-inch thick stabilized pad of ASTM C-33 No. 2 or 3 crushed stone. (see Soil Erosion and Sediment Control Details – C8.02 dated June 17, 2013) The construction entrance/exit shall be inspected daily for evidence of off-site sediment tracking and to maintain and clean the adjacent city streets as needed. The Contractor is responsible for personnel cleaning public roadways in front of the Subject Property as needed to prevent the off-site migration of contaminants.

3.4 Air Monitoring

Although impacts to air quality are not anticipated during the proposed redevelopment activities, a Community Air Monitoring Program (CAMP) will be implemented as a precautionary measure. Fixed air monitoring stations (AMS) will be placed at two locations (upwind and downwind) at the property boundaries to monitor for VOCs and particulates (dust) during excavation activities. The AMS will consist of a Dusttrak air monitor (or engineer approved equivalent) and a photo ionization detector (PID). Air quality shall be monitored in real time during the excavation of contaminated material and a remote alarm will be used to notify the Engineer of any exceedances of Occupational Safety and Health Administration (OSHA) thresholds. Preventative measures for dust suppression will include continuous misting of excavation activities, limiting vehicle speeds, and covering stockpiled material. Visible dust will be controlled by the Contractor using engineering controls as required (e.g., use of water trucks for misting).

Airborne particulates shall not exceed OSHA's permissible exposure limit (PEL) of 15 mg/m^3 averaged over an 8 hour work day. In the event that the particulate standard is exceeded, excavation operations will cease and the work area shall be sprayed with water to reduce airborne particulates. Site operations will continue once monitoring instruments indicate that the total airborne particulates are below the particulate standard of 15 ug/m^3 at the property boundary.

3.5 Excavation of Contaminated Materials

Excavation of contaminated material shall be performed using capable, well maintained equipment and methods acceptable to the Owner and Engineer. If necessary, the proposed excavation will be dewatered prior to excavation to avoid the handling of wet soil. Contaminated materials at the Subject Property will be disposed of off-site at a licensed disposal facility.

3.6 Stockpiling of Excavated Materials

Stockpiling of excavated materials is anticipated. All excavated materials will be temporarily placed onto two layers of 8-mil (minimum) polyethylene sheeting, covered with a layer of polyethylene sheeting and weighted down when not in use. If adverse weather conditions are expected, the stockpiles will be securely covered and bermed (with hay bales or "clean" soil) around the perimeter to prevent runoff and erosion. Stockpiles shall not exceed 1,000 cubic yards to avoid the need for a CTDEEP Contaminated Soil and/or Sediment Management (Staging and Transfer) General Permit. Wet or undraining soils are not permitted for stockpiling; however, should saturated soils be encountered during excavation activities, such soils will be placed in a double polyethylene lined and bermed stockpile area, not to exceed 1,000 cubic-yards (CY), and mixed with additives (i.e. cement or stone dust) to lower the moisture content and assist in drying of the soils prior to on-site reuse or off-site disposal.

3.7 On-site Reuse of Polluted Materials

Polluted excavated materials, which are deemed acceptable for reuse on-site, will be reused as fill material. Due to the designation of 488 Boston Post Road as an "Establishment", soil is not to be imported or exported from this parcel without notification and approval by the owner and engineer. Placement and compaction of this material will be conducted in accordance with the applicable Geotechnical specifications for the project.

3.8 Off-Site Disposal of Contaminated Materials

Contaminated materials are deemed un-acceptable for reuse on-site and will be disposed of at a pre-approved, stated licensed, off-site soil disposal facility capable of accepting such materials. With the exception of soils in the vicinity of HA-2, located at 506 Boston Post Road, it is believed that all excavated materials are not hazardous. Any hazardous materials shall be characterized prior to disposal at the chosen disposal facility.

The proposed disposal facilities will be determined by the Contractor and approved by the Engineer in accordance with applicable regulations prior to initiation of construction activities.

Waste characterization sampling results shall be submitted to the proposed disposal facility prior to initiation of construction activities. Should additional sampling be required to satisfy the disposal facility, the Contractor will collect and submit the appropriate samples to the proposed facilities for approval. An approval letter from the facility will be submitted to the Owner and Engineer at least 48 hours prior to removing the materials from the Subject Property.

3.9 Transportation of Contaminated Materials

All material to be disposed of off-site will be stockpiled as described in Section 3.6 or directly loaded into a container, dump truck, or trailer and immediately transported to the pre-approved stated licensed off-site soil disposal facility. The material will be handled and transported in accordance with applicable Connecticut Department of Transportation (ConnDOT) regulations and other applicable local, state, and federal regulations. All transport of materials will be performed by licensed haulers with valid permits in accordance with appropriate local, state, and federal regulations. Loaded vehicles leaving the Subject Property will be appropriately placarded, lined and securely covered in accordance with applicable federal, state, local, and ConnDOT requirements (or other applicable transportation requirements).

Material identified as non-hazardous contaminated material (i.e., non-hazardous, but exceeding CTDEEP Remediation Standard Regulations (RSRs)) based on the laboratory analytical results will be transported by a licensed hauler to be selected prior to initiation of construction activities.

3.10 Survey

Prior to initiating this MMP, the Contractor shall survey and stake the horizontal extents of the proposed development area. Upon completion of the excavation activities, the Contractor shall survey the horizontal and vertical limits of the excavation area. The surveyed information will be provided on a Site Plan to the Owner within 14 days of completion of the activities outlined in this MMP.

3.11 Employee/ Worker Health and Safety

3.11.1 Potential Exposure Pathways

As identified in Section 2.2, contaminated material is known to exist within the proposed development area. Potential exposure pathways associated with the activities outlined in this MMP include dermal absorption, inhalation, and ingestion.

Level D (or Modified Level D) Personal Protective Equipment (PPE) should be sufficient to prevent dermal absorption. Those workers whose activities involve direct contact with contaminated materials shall be provided Tyvek outerwear, gloves, and other appropriate PPE as deemed appropriate by the Contractor.

The inhalation risk shall be controlled by implementing continuous CAMP measures during the demolition and excavation activities.

Ingestion risk will be controlled by restricting eating within the work zones and by providing hand wash stations at break areas, entrances and exits.

3.11.2 Site Specific Health and Safety Plan

Prior to initiation of construction activities, the General Contractor/Subcontractors shall develop and implement a Site Specific Health and Safety Plan (HASP) in accordance with OSHA regulations 29 CFR 1910.120.

4.0 CONSTRUCTION DEWATERING

4.1 General

During Langan's 2013 subsurface investigations groundwater was observed at approximately 4 to 9 feet below grade. A wetland area is present in the southeastern portion of the Subject Property in the vicinity of 6 Waban Street. Based on the depth of the proposed excavations and the presence of wetlands on-site, dewatering is anticipated to facilitate foundation excavation, material handling, and utility installation. The Contractor shall dewater excavations in accordance with the dewatering specifications for the project (Section 31 08 02), dated May 1, 2013 and the requirements of the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

4.2 Conceptual Dewatering System

The Owner's Engineer will evaluate the discharge and, if at any time impacts are noted, will obtain a Groundwater Remediation Wastewater Discharge Permit (to the Sanitary Sewer), which the Contractor must comply with.

If impacts are identified, an effluent treatment system will be necessary to comply with the Groundwater Remediation Wastewater General Permit, and will likely consist of bag filters and two frac tanks for settling. Effluent water will be sampled in accordance with the CTDEEP General Permit for discharge.

5.0 RECORD KEEPING AND SITE VISITS

5.1 Record Keeping

All records regarding the approximate volumes of excavated material shall be monitored and maintained by the contractor and will be made readily available to the Owner and Environmental Engineer upon request. At a minimum, the contractor shall maintain the following documentation:

- Individual return truck load tickets for each load of material removed from the proposed development area and disposed off-site. Each facility scale ticket

should include the following information:

- Facility name, address, and telephone number
- Material source and surface location description
- Scale ticket number
- Associated manifest number (if applicable)
- Truck license plate number
- Trailer license plate number
- Container number
- Transporter's number
- Gross, net, and tare weight of the load (tons)

- OSHA certifications for on-site personnel conducting the activities.

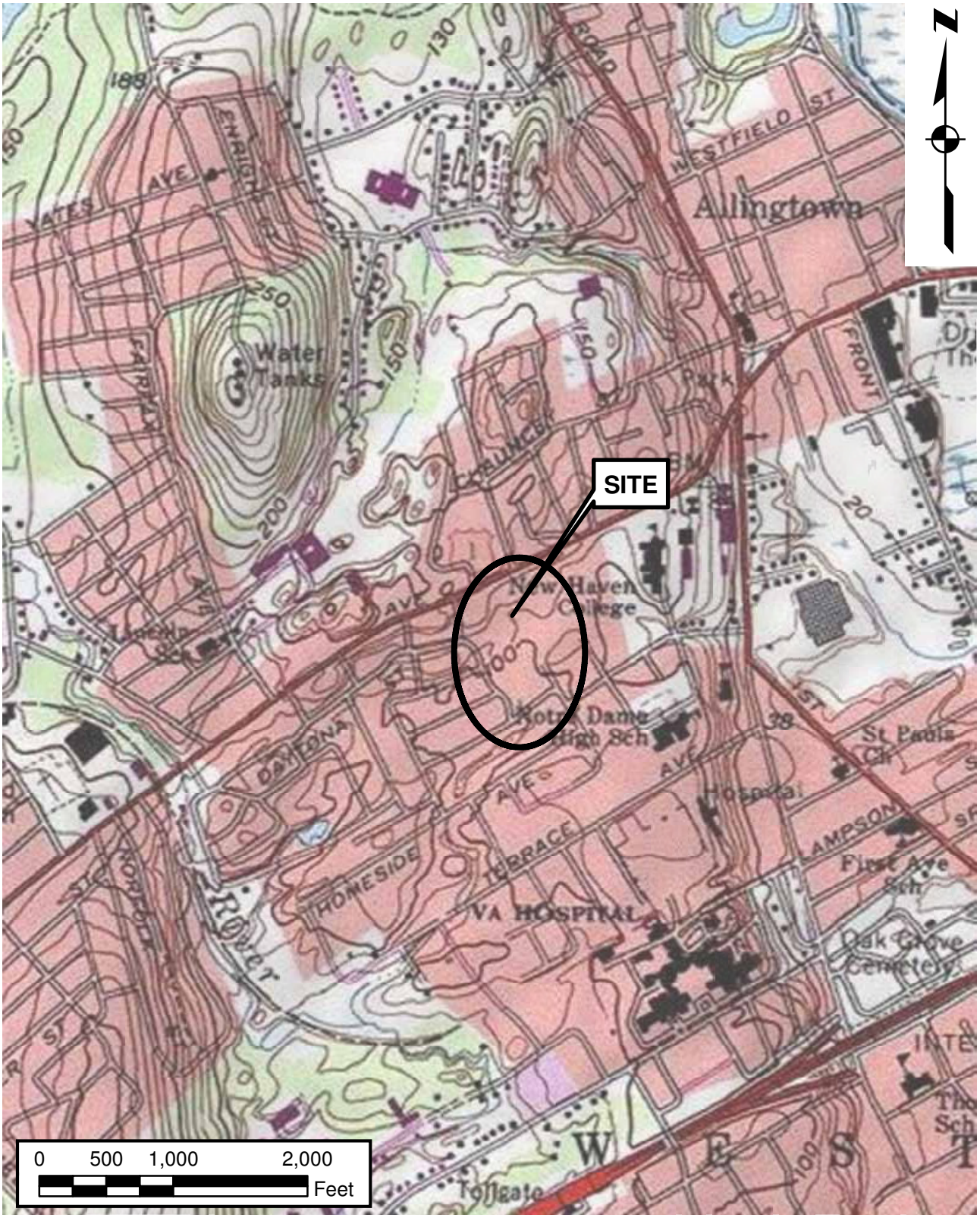
5.2 Site Visits

The Environmental Engineer will conduct oversight during the implementation of the MMP as necessary to document soil excavation, placement, and disposal, and dewatering activities, review appropriate records and verify Contractor compliance with the plan. Prior to initiating the MMP, a kickoff meeting will be held on-site to review the plan and address Contractor questions or concerns.

6.0 REPORTING

Upon completion of excavation and disposal activities, the Engineer will prepare a final report summarizing the activities completed in accordance with this MMP.

FIGURES



REFERENCES: USGS QUADRANGLE MAP FOR WEST HAVEN, CONNECTICUT

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Project

USGS MAP

ENGINEERING & SCIENCE UNIVERSITY
MAGNET SCHOOL - ROCKVIEW SITE

WEST HAVEN **CONNECTICUT**

Project No.	Date	Scale	Fig. No.
140068603	5/8/2013	1"=1,000'	1

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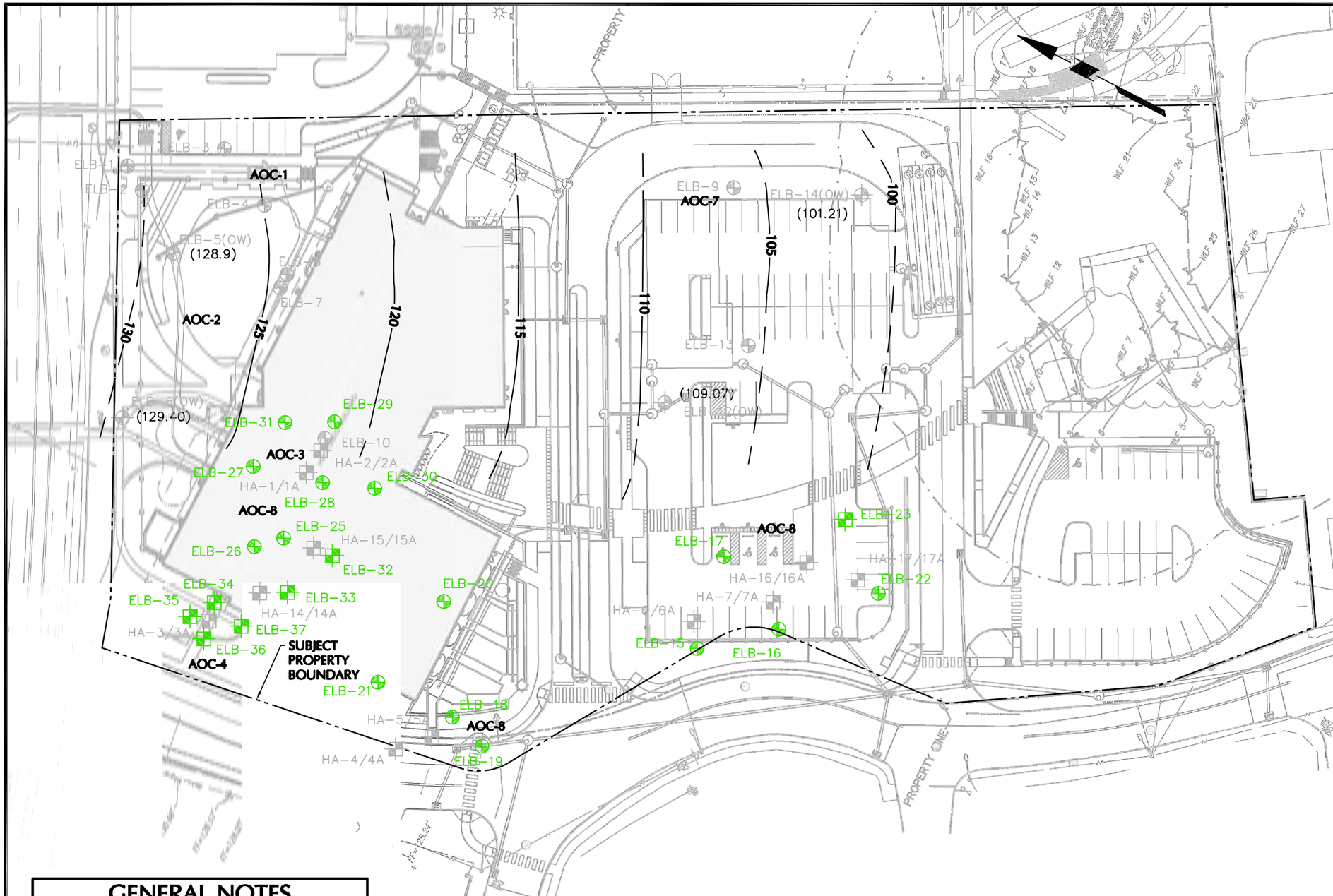

LEGEND

ELB-34	HAND AUGER SAMPLE LOCATION
ELB-15	GEOPROBE SOIL BORING
HA-15/15A	LANGAN PHASE II ESI HAND AUGER SAMPLE LOCATION
ELB-11	LANGAN PHASE II ESI GEOPROBE SOIL BORING
ELB-14(OW) (101.21)	LANGAN PHASE II ESI MONITORING WELL AND GROUNDWATER ELEVATION (FT)
103	LANGAN PHASE II ESI GROUNDWATER CONTOUR AND ELEVATION (FT)
	INFERRED GROUNDWATER CONTOURS
	SUBJECT PROPERTY BOUNDARY
	LEAD IMPACTED SOIL AREA (0 – 1 FT)
	LEAD IMPACTED SOIL AREA (1 – 2 FT)

AOC DESCRIPTIONS

AOC-1 – Former Site Uses/Activities at 488 Boston Post Road
AOC-2 – Former Site Use/Activities at 496 Boston Post Road
AOC-3 – Aboveground Storage Tank at 506 Boston Post Road
AOC-4 – Abandoned ASTs, drums and trash at 516 Boston Post Road
AOC-5 – Surrounding Properties
AOC-6 – Fill Material
AOC-7 – Historic Petroleum Impacted Soil Remediation at 4 and 14 Daytona Street
AOC-8 – Lead Impacted Soil at 506 Boston Post Road, 14, 34, and 38 Rockview Street

GENERAL NOTES

1. BASE MAP TAKEN FROM PLANNING AND ZONING SUBMISSION SET BY SVIGALS + PARTNERS ARCHITECTS DATED APRIL 19, 2013 – OVERALL SITE PLAN SHEET C0.02.
2. ALL BORING AND HAND AUGER LOCATIONS ARE APPROXIMATE. MONITORING WELL LOCATIONS WERE SURVEYED IN THE FIELD BY A LICENSED SURVEYOR.
3. ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM (NAVD) 88.

60 0 20 40 60
SCALE IN FEET

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Langan International LLC
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Project
ENGINEERING & SCIENCE UNIVERSITY MAGNET SCHOOL - ROCKVIEW SITE
WEST HAVEN CONNECTICUT

Drawing Title
Sampling Location Plan (Proposed Development)

Project No. 140068603	Drawing No. FIG 2
Date 6/13/13	
Scale 1"=60'	
Drawn By KTZ	
Submission Date 6/13/13	

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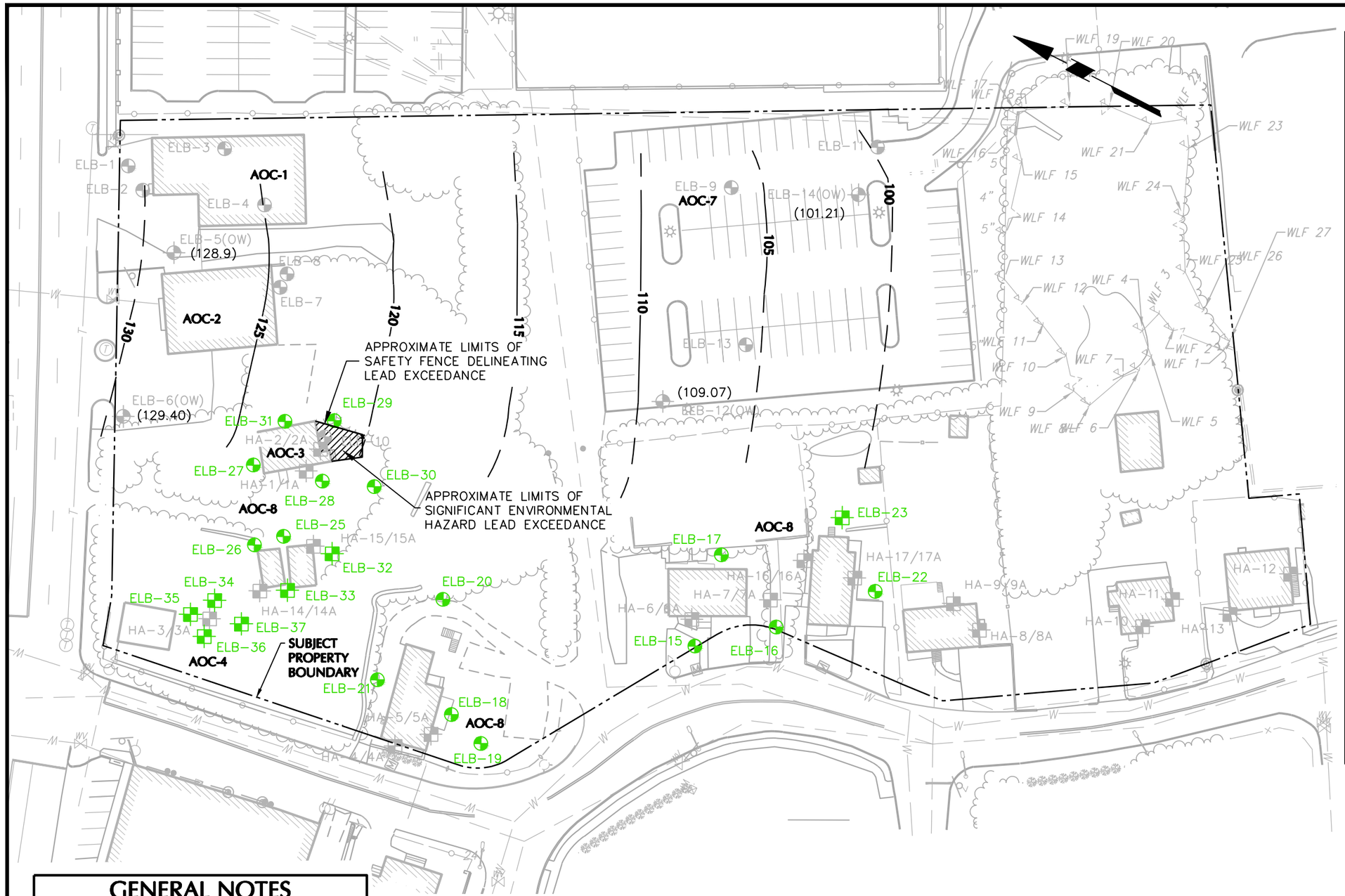
Filename: \\langan.com\data\NH\data6\140068601\Cadd Data - 140068601\SheetFiles\Environmental\140068601 SMP Development Plan.dwg Date: 6/13/2013 Time: 17:21 User: dgranucci Style Table: Langan.stb Layout: DEVELOPMENT FIGURE 2



LEGEND

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AOC DESCRIPTIONS

AOC-1 – Former Site Uses/Activities at 488 Boston Post Road
AOC-2 – Former Site Use/Activities at 496 Boston Post Road
AOC-3 – Aboveground Storage Tank at 506 Boston Post Road
AOC-4 – Abandoned ASTs, drums and trash at 516 Boston Post Road
AOC-5 – Surrounding Properties
AOC-6 – Fill Material
AOC-7 – Historic Petroleum Impacted Soil Remediation at 4 and 14 Daytona Street
AOC-8 – Lead Impacted Soil at 506 Boston Post Road, 14, 34, and 38 Rockview Street

GENERAL NOTES

1. BOUNDARY AND TOPOGRAPHIC INFORMATION WAS OBTAINED FROM A SURVEY COMPLETED BY LANGAN ENGINEERING & ENVIRONMENTAL SERVICES, DATED 4/4/13.
2. ALL BORING AND HAND AUGER LOCATIONS ARE APPROXIMATE. MONITORING WELL LOCATIONS WERE SURVEYED IN THE FIELD BY A LICENSED SURVEYOR.
3. ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM (NAVD) 88.

60 0 20 40 60
SCALE IN FEET

LANGAN
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Langan International LLC
Collectively known as Langan

Project
ENGINEERING & SCIENCE UNIVERSITY MAGNET SCHOOL
506 BOSTON POST ROAD
WEST HAVEN CONNECTICUT

Drawing Title
Sampling Location Plan (Existing Conditions)

Project No. 140068605	Drawing No. FIG 3
Date 6/13/13	
Scale 1"=60'	
Drawn By KTZ	
Submission Date 7/17/13	

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Filename: \\langan.com\data\NH\data6\140068601\Cadd Data - 140068601\SheetFiles\Environmental\140068601 Boring Location Plan_Phase III.dwg Date: 7/17/2013 Time: 15:15 User: asuarato Style Table: Langan.stb Layout: COPY FIGURE 3

TABLES

Table 1
Phase II Environmental Site Investigation Results
Engineering & Science University Magnet School
West Haven, Connecticut
Langan Project No.: 140068603

Parameters / Depth of Sample (ft) / Sample Date	Residential Direct Exposure Criteria (mg/kg)	Indus./Comm. Direct Exposure Criteria (mg/kg)	GA/GAA Pollutant Mobility Criteria (mg/kg)	ELB-1 10 - 11 3/13/13	ELB-2 9 - 11 3/13/13	ELB-3 5 - 7 3/13/13	ELB-4 4 - 5 3/13/13	ELB-7 5 - 7 3/13/13	ELB-8 3 - 4 3/13/13	ELB-9 3 - 4 3/13/13	ELB-10 1 - 2 3/13/13	ELB-13 4 - 5 3/13/13	HA-1 0.5 - 1.0 3/14/13	HA-2 0.5 - 1.0 3/14/13	HA-3 0.5 - 1.0 3/14/13	HA-4 0.5 - 1.0 3/14/13	HA-5 0.5 - 1.0 3/14/13	HA-6 0.5 - 1.0 3/14/13	HA-7 0.5 - 1.0 3/14/13	HA-14 0.5 - 1.0 3/14/13	HA-15 0.5 - 1.0 3/14/13	HA-16 0.5 - 1.0 3/28/13	HA-17 0.5 - 1.0 3/28/13
VOCs (mg/kg)																							
Acetone	500	1,000	14	NA	NA	ND<0.009	ND<0.0083	NA	NA	0.029	NA	ND<0.01	NA	NA	0.27	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (mg/kg)																							
Benzo(a)anthracene	1	7.8	1	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	ND<0.475	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1	1	1	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	ND<0.475	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1	7.8	1	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	ND<0.475	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	8.4	78	1	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	ND<0.475	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	84*	780*	1*	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	0.479	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1,000	2,500	5.6	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	1.03	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	2,500	4	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	0.51	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,000	2,500	4	ND<0.185	ND<0.182	ND<0.203	ND<0.186	ND<0.218	ND<0.183	ND<0.201	ND<0.211	ND<0.194	NA	NA	1.04	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (mg/kg)	1	10	--	NA	NA	ND<0.0304	ND<0.0279	NA	NA	ND<0.0301	NA	ND<0.0291	NA	NA	ND<0.0475	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																							
Arsenic	10	10	--	NA	NA	3.18	3.04	NA	NA	2.36	NA	2.78	NA	NA	5.23	NA	NA	NA	NA	NA	NA	NA	NA
Barium	4,700	140,000	--	NA	NA	31.9	30.4	NA	NA	30.6	NA	31.5	NA	NA	97.7	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	34	1,000	--	NA	NA	ND<0.609	ND<0.559	NA	NA	ND<0.602	NA	ND<0.583	NA	NA	ND<0.949	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NE	NE	--	NA	NA	31.4	29.8	NA	NA	8.48	NA	12.6	NA	NA	20.9	NA	NA	NA	NA	NA	NA	NA	NA
Copper	2,500	76,000	--	NA	NA	34.3	32.2	NA	NA	4.74	NA	11.1	NA	NA	40.7	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400(1)	1,000	--	NA	NA	4.32	4.20	NA	NA	15.2	NA	25.9	*713*	*17100*	*453*	36	*410*	92.9	149	*834*	*428*	56.4	140
Nickel	1,400	7,500	--	NA	NA	26.6	26.8	NA	NA	7.75	NA	11.5	NA	NA	24.8	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	340	10,000	--	NA	NA	3.16	3.05	NA	NA	0.941	NA	1.96	NA	NA	ND<0.949	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	470	14,000	--	NA	NA	35.8	35.0	NA	NA	17.5	NA	25.2	NA	NA	41.2	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	20,000	610,000	--	NA	NA	34.0	28.6	NA	NA	19.6	NA	36.4	NA	NA	200	NA	NA	NA	NA	NA	NA	NA	NA
SPLP Lead (mg/L)	--	--	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TCLP Lead (mg/L)	--	--	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.562**	**0.673**	NA	**0.174**	**0.290**	**0.0287**	**0.0342**	**2.88**	**0.0629**	**0.0392**	**0.0410**
CT ETPH (mg/kg)	500	2,500	500	ND<11.1	ND<10.9	ND<12.2	ND<11.2	ND<13.1	ND<11.0	ND<12.0	29.2	30.8	NA	NA	65.7	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
NE = Criteria not established
ND = Not detected
NA = Not analyzed
* = 1996 criteria not established, 2008 criteria used
(1) Codified criterion for lead RDEC is 500 ppm, but the recommended cleanup criterion is 400 ppm to be protective of human health
Trip Blank had detections of Acetone (2.4 ug/L) and Toluene (0.67 ug/L)
Bold indicates an exceedance of the GA Pollutant Mobility Criteria
Italics indicates an exceedance of the Residential Direct Exposure Criteria
Shading indicates an exceedance of the Indus./Comm. Direct Exposure Criteria

Table 1
Phase II Environmental Site Investigation Results
Engineering & Science University Magnet School
West Haven, Connecticut
Langan Project No.: 140068603

Parameters / Depth of Sample (ft) / Sample Date	Residential Direct Exposure Criteria (mg/kg)	Indus./Comm. Direct Exposure Criteria (mg/kg)	GA/GAA Pollutant Mobility Criteria (mg/kg)	HA-1A 1.5 - 2 5/30/13	DUP (HA-1A) 5/30/13	HA-2A 1.5 - 2 5/30/13	HA-4A 1.5 - 2 5/31/13	HA-5A 1.5 - 2 5/31/13	HA-6A 1.5 - 2 5/30/13	HA-7A 1.0 - 1.5 5/30/13	HA-15A 1.5 - 2 5/30/13	HA-16A 1.5 - 2 5/30/13	HA-17A 1.5 - 2 5/30/13	ELB-15 0.5 - 1 5/30/13	ELB-15 1.5 - 2 5/30/13	ELB-16 0.5 - 1 5/30/13	ELB-16 1.5 - 2 5/30/13	ELB-17 0.5 - 1 5/30/13	ELB-17 1.5 - 2 5/30/13	ELB-18 0.5 - 1 5/30/13	ELB-18 1.5 - 2 5/30/13	ELB-19 0.5 - 1 5/30/13	ELB-19 1.5 - 2 5/30/13	ELB-20 0.5 - 1 5/30/13	ELB-21 0.5 - 1 5/30/13	ELB-22 0.5 - 1 5/30/13	ELB-22 1.5 - 2 5/30/13	ELB-23 0.5 - 1 5/31/13	ELB-23 1.5 - 2 5/31/13	ELB-25 0.5 - 1 5/30/13	ELB-26 0.5-1 5/30/13	ELB-27 0.5 - 1 5/30/13	ELB-27 1.5 - 2 5/30/13
VOCs (mg/kg)																																		
Acetone	500	1,000	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (mg/kg)																																		
Benzo(a)anthracene	1	7.8	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1	7.8	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	8.4	78	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	84*	780*	1*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1,000	2,500	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	1,000	2,500	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,000	2,500	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (mg/kg)	1	10	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																																		
Arsenic	10	10	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	4,700	140,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	34	1,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NE	NE	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	2,500	76,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400(1)	1,000	--	106	55.4	20.2	50.9	131	84	123	8.3	259	34.7	23.8	11.9	131	9.93	142	56.1	170	15.8	81.2	25.9	242	64.8	95.3	13.6	36.5	17.4	67.7	*1640*	*835*	ND<0.301
Nickel	1,400	7,500	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	340	10,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	470	14,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	20,000	610,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SPLP Lead (mg/L)	--	--	0.015	**0.0364**	**0.0294**	0.0105	**0.0230**	**0.0775**	**0.0364**	**0.0164**	0.00579	0.0116	0.00782	0.0103	ND<0.003	**0.0548**	0.0141	**0.0339**	0.0136	**0.086**	ND<0.003	0.0107	0.00696	**0.0566**	0.00999	**0.0265**	0.00681	0.00959	ND<0.003	**0.0193**	**0.195**	**0.153**	ND<0.003
TCLP Lead (mg/L)	--	--	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CT ETPH (mg/kg)	500	2,500	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:
NE = Criteria not established
ND = Not detected
NA = Not analyzed
* = 1996 criteria not established, 2008 criteria used
(1) Codified criterion for lead RDEC is 500 ppm, but the recommended cleanup criterion is 400 ppm to be protective of human health
Trip Blank had detections of Acetone (2.4 ug/L) and Toluene (0.67 ug/L)
Bold indicates an exceedance of the GA Pollutant Mobility Criteria
Italics indicates an exceedance of the Residential Direct Exposure Criteria
Shading indicates an exceedance of the Indus./Comm. Direct Exposure Criteria

Table 1
Phase II Environmental Site Investigation Results
Engineering & Science University Magnet School
West Haven, Connecticut
Langan Project No.: 140068603

Parameters / Depth of Sample (ft) / Sample Date	Residential Direct Exposure Criteria (mg/kg)	Indus./Comm. Direct Exposure Criteria (mg/kg)	GA/GAA Pollutant Mobility Criteria (mg/kg)	ELB-28 0.5 - 1 5/30/13	ELB-28 1.5 - 2 5/30/13	ELB-29 0.5 - 1 5/30/13	ELB-29 1.5 - 2 5/30/13	ELB-30 0.5 - 1 5/30/13	ELB-31 0.5 - 1 5/30/13	ELB-31 1.5 - 2 5/30/13	ELB-32 0.5 - 1 5/31/13	ELB-32 1.5 - 2 5/31/13	ELB-33 0.5 - 1 5/31/13	ELB-34 0.25 - 0.5 5/31/13	DUP-2 (ELB-34) 5/31/13	ELB-35 0.25 - 0.5 5/31/13	ELB-36 0.25 - 0.5 5/31/13	ELB-37 0.25 - 0.5 5/31/13
VOCs (mg/kg)																		
Acetone	500	1,000	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<0.027	NA	0.240	0.024	0.021
SVOCs (mg/kg)																		
Benzo(a)anthracene	1	7.8	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<1.720	NA	***3.58***	ND<0.358	ND<0.389
Benzo(a)pyrene	1	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<1.720	NA	***3.54***	0.379	ND<0.389
Benzo(b)fluoranthene	1	7.8	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	***1.910***	NA	***6.42***	0.487	ND<0.389
Benzo(k)fluoranthene	8.4	78	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<1.720	NA	**3.98**	0.431	ND<0.389
Chrysene	84*	780*	1*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<1.720	NA	**4.12**	0.383	ND<0.389
Fluoranthene	1,000	2,500	5.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.170	NA	**9.79**	0.820	ND<0.389
Phenanthrene	1,000	2,500	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<1.720	NA	**6.40**	0.441	ND<0.389
Pyrene	1,000	2,500	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.240	NA	**10.20**	0.759	ND<0.389
PCBs (mg/kg)	1	10	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)																		
Arsenic	10	10	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.75	NA	5.50	5.36	5.90
Barium	4,700	140,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.4	NA	615	54.3	148
Cadmium	34	1,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND<0.686	NA	ND<0.878	2.22	ND<0.778
Chromium	NE	NE	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	34.2	NA	43.1	24.4	22.0
Copper	2,500	76,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400(1)	1,000	--	71.8	3.67	282	7.84	310	24.6	1.38	*528*	*677*	*497*	309	336	*1780*	*494*	*691*
Nickel	1,400	7,500	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	340	10,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.04	NA	2.11	2.71	1.68
Vanadium	470	14,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	20,000	610,000	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SPLP Lead (mg/L)	--	--	0.015	**0.0664**	ND<0.003	**0.0444**	ND<0.003	**0.0265**	ND<0.003	ND<0.003	**0.0960**	**0.110**	**0.124**	**0.0280**	**0.0205**	**0.111**	**0.131**	**0.0652**
TCLP Lead (mg/L)	--	--	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CT ETPH (mg/kg)	500	2,500	500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	204	NA	***592***	132	62.8

NOTES:
NE = Criteria not established
ND = Not detected
NA = Not analyzed
* = 1996 criteria not established, 2008 criteria used
(1) Codified criterion for lead RDEC is 500 ppm, but the recommended cleanup criterion is 400 ppm to be protective of human health
Trip Blank had detections of Acetone (2.4 ug/L) and Toluene (0.67 ug/L)
Bold indicates an exceedance of the GA Pollutant Mobility Criteria
Italics indicates an exceedance of the Residential Direct Exposure Criteria
Shading indicates an exceedance of the Indus./Comm. Direct Exposure Criteria

Table 2
Groundwater Analytical Results Summary
Engineering & Science University Magnet School
West Haven, Connecticut
Langan Project No.: 140068603

Well Location Sample Date Parameters	Surface Water Protection Criteria	Residential Volatilization Criteria	Industrial/Commercial Volatilization Criteria	ELB-5(OW) 3/19/13	ELB-6(OW) 3/19/13	ELB-12(OW) 3/19/13	DUP ELB-12(OW) 3/19/13	ELB-14(OW) 3/19/13
VOCs (µg/L)								
Bromodichloromethane	1,394*	2*	80*	0.98	ND<0.50	ND<0.50	ND<0.50	ND<0.50
Chloroform	14,100	287	710	12	ND<0.50	ND<0.50	ND<0.50	ND<0.50
2-Butanone (MEK)	10,000*	50,000	50,000	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
2-Hexanone (MBK)	NE	NE	NE	ND<0.50	0.51	0.67	ND<0.50	ND<0.50
1,2,4-Trimethylbenzene	160*	122*	1,485*	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.62
ETPH (µg/L)	250	250	250	ND<81.1	ND<81.1	ND<78.9	ND<78.9	ND<81.1
PCBs (µg/L)	0.5	0.5*	3,600*	ND<0.0541	ND<0.0541	ND<0.0526	ND<0.0526	ND<0.0541
SVOCs (PAHs) (µg/L)								
Bis(2-ethylhexyl)phthalate	59	NE	NE	3.69	17.1	1.05	**266**	0.627
Metals (µg/L)								
Antimony	86,000	NE	NE	ND<1.0	ND<1.0	1.0	ND<1.0	ND<1.0
Arsenic	4	NE	NE	ND<1.0	ND<1.0	1.0	1.0	1.0
Barium	2,200*	NE	NE	23	123	358	396	143
Cadmium	6	NE	NE	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.0
Chromium	NE	NE	NE	3.0	4.0	4.0	5.0	5.0
Copper	48	NE	NE	5.0	11	**89**	40	18
Lead	13	NE	NE	1.0	ND<1.0	ND<1.0	2.0	ND<1.0
Nickel	880	NE	NE	2.0	5.0	7.0	8.0	24
Selenium	50	NE	NE	ND<1.0	ND<1.0	3.0	3.0	3.0
Vanadium	440*	NE	NE	1.0	ND<1.0	1.0	1.0	2.0
Zinc	123	NE	NE	25	6.0	12	14	17

NOTES:
NE = Criteria not established
ND = Not detected
* = 1996 criteria not established, 2008 criteria used
Field Blank had detections of 2-Butanone (3.3 ug/L), ETPH (98.5 ug/L), Bis(2-ethylhexyl)phthalate (30.8 ug/L) and Zinc (15 ug/L)
Bold indicates an exceedance of the SWPC

APPENDIX A

Laboratory Analytical Results

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Report Date: 03/21/2013
Client Project ID: 140068601
York Project (SDG) No.: 13C0445

CT License No. PH-0723 New Jersey License No. CT-005 New York License No. 10854 PA License No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 03/21/2013
Client Project ID: 140068601
York Project (SDG) No.: 13C0445

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on March 14, 2013 and listed below. The project was identified as your project: **140068601**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13C0445-01	TRIP BLANK	Water	03/13/2013	03/14/2013
13C0445-02	ELB-8 3'-4'	Soil	03/13/2013	03/14/2013
13C0445-03	ELB-7 5'-7'	Soil	03/13/2013	03/14/2013
13C0445-04	ELB-1 10'-11'	Soil	03/13/2013	03/14/2013
13C0445-05	ELB-2 9'-11'	Soil	03/13/2013	03/14/2013
13C0445-06	ELB-10 1'-2'	Soil	03/13/2013	03/14/2013
13C0445-07	ELB-3 5'-7'	Soil	03/13/2013	03/14/2013
13C0445-08	ELB-4 4'-5'	Soil	03/13/2013	03/14/2013
13C0445-09	ELB-9 3'-4'	Soil	03/13/2013	03/14/2013
13C0445-10	ELB-13 4'-5'	Soil	03/13/2013	03/14/2013

General Notes for York Project (SDG) No.: 13C0445

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By: **Date:** 03/21/2013

Robert Q. Bradley
Laboratory Director

YORK

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **TRIP BLANK** **York Sample ID:** **13C0445-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Water	March 13, 2013 12:00 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.071	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.024	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.17	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/L	0.074	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.070	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.11	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	0.12	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.17	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	0.11	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.068	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	0.46	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.15	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.071	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.051	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.059	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.048	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.048	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.096	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
78-93-3	2-Butanone	ND		ug/L	1.0	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.084	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
591-78-6	2-Hexanone	ND		ug/L	0.24	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.072	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.17	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
67-64-1	Acetone	**2.4**		ug/L	0.90	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
107-13-1	Acrylonitrile	ND		ug/L	0.73	1.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
71-43-2	Benzene	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
108-86-1	Bromobenzene	ND		ug/L	0.081	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
74-97-5	Bromochloromethane	ND		ug/L	0.10	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.054	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: TRIP BLANK

York Sample ID: 13C0445-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Water	March 13, 2013 12:00 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-25-2	Bromoform	ND		ug/L	0.079	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
74-83-9	Bromomethane	ND		ug/L	0.20	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-15-0	Carbon disulfide	ND		ug/L	0.065	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.085	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
108-90-7	Chlorobenzene	ND		ug/L	0.063	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-00-3	Chloroethane	ND		ug/L	0.090	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
67-66-3	Chloroform	ND		ug/L	0.079	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
74-87-3	Chloromethane	ND		ug/L	0.076	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.069	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.067	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.053	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
74-95-3	Dibromomethane	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.092	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.057	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.056	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.22	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.48	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-09-2	Methylene chloride	ND		ug/L	0.26	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
91-20-3	Naphthalene	ND		ug/L	0.090	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.083	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.068	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
95-47-6	o-Xylene	ND		ug/L	0.050	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	0.090	1.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.050	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
100-42-5	Styrene	ND		ug/L	0.043	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.050	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.070	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
109-99-9	Tetrahydrofuran	ND		ug/L	1.0	2.0	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
108-88-3	Toluene	**0.67**		ug/L	0.042	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.085	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.060	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.092	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: TRIP BLANK | **York Sample ID:** 13C0445-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Water	March 13, 2013 12:00 am	03/14/2013

Volatile Organics, CT RCP List | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
79-01-6	Trichloroethylene	ND		ug/L	0.071	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.094	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.062	0.50	1	SW8260B	03/21/2013 08:00	03/21/2013 17:08	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*111 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*110 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*103 %*	*70-130*

Sample Information

Client Sample ID: ELB-8 3'-4' | **York Sample ID:** 13C0445-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 10:40 am	03/14/2013

Semi-Volatiles, CT RCP BNA List | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	100	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	55.9	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
62-53-3	Aniline	ND		ug/kg dry	44.6	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
120-12-7	Anthracene	ND		ug/kg dry	56.6	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	54.8	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	91.7	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	119	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	125	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	81.5	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	124	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	111	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	61.4	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	93.2	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	66.1	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	88.8	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	161	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	92.8	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	57.0	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	99.4	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-8 3'-4'** **York Sample ID:** **13C0445-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 10:40 am	03/14/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
218-01-9	Chrysene	ND		ug/kg dry	55.5	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	89.2	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	106	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	158	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	69.8	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	62.8	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	116	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	29.3	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	57.0	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	73.1	365	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	128	365	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	63.9	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	128	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	67.6	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	51.5	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
206-44-0	Fluoranthene	ND		ug/kg dry	183	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
86-73-7	Fluorene	ND		ug/kg dry	116	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	73.1	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	91.0	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	45.7	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	183	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	107	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
78-59-1	Isophorone	ND		ug/kg dry	74.9	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	48.9	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	57.4	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	183	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	183	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
91-20-3	Naphthalene	ND		ug/kg dry	55.9	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	46.8	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	122	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	130	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	50.4	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	55.5	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	157	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-8 3'-4'** **York Sample ID:** **13C0445-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 10:40 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	183	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	94.6	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	48.1	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	80.4	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
85-01-8	Phenanthrene	ND		ug/kg dry	48.6	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
108-95-2	Phenol	ND		ug/kg dry	49.3	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
129-00-0	Pyrene	ND		ug/kg dry	136	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
110-86-1	Pyridine	ND		ug/kg dry	96.5	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	66.4	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	28.6	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	37.6	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	60.7	183	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:05	SR

	Surrogate Recoveries	Result		Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*130 %*	*S-04*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*91.0 %*		*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*98.4 %*		*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*94.6 %*		*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*105 %*		*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*115 %*		*30-130*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	`PH (Extractable Total Petroleum Hydrocarbor	ND		mg/kg dry	2.33	11.0	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*108 %*	*40.5-152*

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**91.2**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: **ELB-7 5'-7'** **York Sample ID:** **13C0445-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 10:25 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-7 5'-7'** **York Sample ID:** **13C0445-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 10:25 am	03/14/2013

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	120	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	66.7	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
62-53-3	Aniline	ND		ug/kg dry	53.2	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
120-12-7	Anthracene	ND		ug/kg dry	67.6	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	65.4	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	109	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	142	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	149	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	97.3	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	148	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	133	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	73.3	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	111	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	79.0	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	106	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	192	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	111	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	68.1	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	119	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
218-01-9	Chrysene	ND		ug/kg dry	66.3	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	106	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	126	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	188	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	83.3	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	75.0	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	138	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	35.0	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	68.1	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	87.2	436	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	153	436	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	76.3	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	152	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	80.7	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	61.5	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
206-44-0	Fluoranthene	ND		ug/kg dry	218	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-7 5'-7'** **York Sample ID:** **13C0445-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 10:25 am	03/14/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
86-73-7	Fluorene	ND		ug/kg dry	139	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	87.2	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	109	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	54.5	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	218	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	128	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
78-59-1	Isophorone	ND		ug/kg dry	89.4	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	58.4	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	68.5	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	218	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	218	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
91-20-3	Naphthalene	ND		ug/kg dry	66.7	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	55.8	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	145	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	155	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	60.2	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	66.3	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	188	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	218	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	113	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	57.4	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	96.0	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
85-01-8	Phenanthrene	ND		ug/kg dry	58.0	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
108-95-2	Phenol	ND		ug/kg dry	58.9	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
129-00-0	Pyrene	ND		ug/kg dry	162	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
110-86-1	Pyridine	ND		ug/kg dry	115	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	79.3	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	34.2	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	44.9	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	72.4	218	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 10:36	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*89.2 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*63.8 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*69.1 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*62.5 %*	*30-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-7 5'-7'** **York Sample ID:** **13C0445-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 10:25 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
4165-62-2	*Surrogate: Phenol-d5*	*72.6 %*			*15-110*						
1718-51-0	*Surrogate: Terphenyl-d14*	*81.0 %*			*30-130*						

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	`PH (Extractable Total Petroleum Hydrocarbor	ND		mg/kg dry	2.79	13.1	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*120 %*	*40.5-152*

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**76.4**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: **ELB-1 10'-11'** **York Sample ID:** **13C0445-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 9:10 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	102	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	56.6	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
62-53-3	Aniline	ND		ug/kg dry	45.1	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
120-12-7	Anthracene	ND		ug/kg dry	57.3	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	55.5	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	92.8	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	121	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	126	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	82.5	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	126	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	113	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	62.1	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	94.3	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	66.9	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-1 10'-11'** **York Sample ID:** **13C0445-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 9:10 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	89.9	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	163	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	93.9	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	57.7	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	101	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
218-01-9	Chrysene	ND		ug/kg dry	56.2	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	90.2	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	107	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	160	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	70.6	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	63.6	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	117	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	29.7	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	57.7	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	74.0	370	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	129	370	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	64.7	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	129	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	68.4	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	52.1	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
206-44-0	Fluoranthene	ND		ug/kg dry	185	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
86-73-7	Fluorene	ND		ug/kg dry	118	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	74.0	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	92.1	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	46.2	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	185	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	109	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
78-59-1	Isophorone	ND		ug/kg dry	75.8	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	49.5	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	58.1	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	185	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	185	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
91-20-3	Naphthalene	ND		ug/kg dry	56.6	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	47.3	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-1 10'-11'** **York Sample ID:** **13C0445-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 9:10 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
100-01-6	4-Nitroaniline	ND		ug/kg dry	123	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	131	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	51.0	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	56.2	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	159	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	185	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	95.8	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	48.7	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	81.4	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
85-01-8	Phenanthrene	ND		ug/kg dry	49.2	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
108-95-2	Phenol	ND		ug/kg dry	49.9	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
129-00-0	Pyrene	ND		ug/kg dry	137	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
110-86-1	Pyridine	ND		ug/kg dry	97.6	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	67.2	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	29.0	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	38.1	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	61.4	185	1	EPA SW-846 8270C	03/16/2013 10:37	03/21/2013 11:07	SR

	Surrogate Recoveries	Result		Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*120 %*	*S-04*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*88.7 %*		*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*93.5 %*		*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*84.3 %*		*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*98.2 %*		*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*112 %*		*30-130*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	PH (Extractable Total Petroleum Hydrocarbor	ND		mg/kg dry	2.36	11.1	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*113 %*	*40.5-152*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-1 10'-11'** **York Sample ID:** **13C0445-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 9:10 am	03/14/2013

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**90.1**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: **ELB-2 9'-11'** **York Sample ID:** **13C0445-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 9:30 am	03/14/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	100	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	55.7	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
62-53-3	Aniline	ND		ug/kg dry	44.4	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
120-12-7	Anthracene	ND		ug/kg dry	56.5	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	54.6	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	91.4	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	119	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	125	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	81.2	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	124	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	111	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	61.2	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	92.9	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	65.9	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	88.5	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	160	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	92.5	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	56.8	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	99.1	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
218-01-9	Chrysene	ND		ug/kg dry	55.4	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	88.9	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	105	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	157	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	69.6	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-2 9'-11'

York Sample ID: 13C0445-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 9:30 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	62.6	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	115	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	29.2	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	56.8	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	72.8	364	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	127	364	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	63.7	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	127	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	67.4	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	51.4	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
206-44-0	Fluoranthene	ND		ug/kg dry	182	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
86-73-7	Fluorene	ND		ug/kg dry	116	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	72.8	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	90.7	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	45.5	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	182	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	107	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
78-59-1	Isophorone	ND		ug/kg dry	74.7	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	48.7	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	57.2	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	182	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	182	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
91-20-3	Naphthalene	ND		ug/kg dry	55.7	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	46.6	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	121	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	129	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	50.3	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	55.4	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	157	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	182	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	94.3	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	47.9	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	80.1	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
85-01-8	Phenanthrene	ND		ug/kg dry	48.4	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-2 9'-11'** **York Sample ID:** **13C0445-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 9:30 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
108-95-2	Phenol	ND		ug/kg dry	49.2	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
129-00-0	Pyrene	ND		ug/kg dry	135	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
110-86-1	Pyridine	ND		ug/kg dry	96.2	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	66.2	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	28.5	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	37.5	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	60.5	182	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:27	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*63.2 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*78.6 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*60.6 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*66.4 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*65.7 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*68.6 %*	*30-130*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	`PH (Extractable Total Petroleum Hydrocarbor	ND		mg/kg dry	2.33	10.9	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*114 %*	*40.5-152*

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**91.5**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: **ELB-10 1'-2'** **York Sample ID:** **13C0445-06**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:00 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	116	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	64.5	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
62-53-3	Aniline	ND		ug/kg dry	51.4	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-10 1'-2'** **York Sample ID:** **13C0445-06**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:00 am	03/14/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-12-7	Anthracene	ND		ug/kg dry	65.3	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	63.2	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	106	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	137	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	144	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	94.0	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	143	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	129	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	70.8	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	107	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	76.3	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	102	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	185	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	107	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	65.7	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	115	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
218-01-9	Chrysene	ND		ug/kg dry	64.1	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	103	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	122	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	182	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	80.5	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	72.5	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	134	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	33.8	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	65.7	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	84.3	421	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	147	421	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	73.7	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	147	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	78.0	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	59.4	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
206-44-0	Fluoranthene	ND		ug/kg dry	211	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
86-73-7	Fluorene	ND		ug/kg dry	134	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	84.3	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-10 1'-2'** **York Sample ID:** **13C0445-06**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:00 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	105	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	52.7	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	211	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	124	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
78-59-1	Isophorone	ND		ug/kg dry	86.4	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	56.4	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	66.2	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	211	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	211	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
91-20-3	Naphthalene	ND		ug/kg dry	64.5	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	53.9	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	140	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	150	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	58.2	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	64.1	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	182	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	211	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	109	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	55.5	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	92.7	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
85-01-8	Phenanthrene	ND		ug/kg dry	56.0	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
108-95-2	Phenol	ND		ug/kg dry	56.9	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
129-00-0	Pyrene	ND		ug/kg dry	156	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
110-86-1	Pyridine	ND		ug/kg dry	111	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	76.6	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	33.0	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	43.4	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	70.0	211	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 16:58	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*47.9 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*55.1 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*43.8 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*45.2 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*48.3 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*51.0 %*	*30-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-10 1'-2'** **York Sample ID:** **13C0445-06**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:00 am	03/14/2013

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	PH (Extractable Total Petroleum Hydrocarbo	**29.2**		mg/kg dry	2.69	12.6	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*119 %*	*40.5-152*

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**79.1**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: **ELB-3 5'-7'** **York Sample ID:** **13C0445-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:50 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	0.63	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.11	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	0.90	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.30	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	0.68	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	0.45	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	0.37	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	0.42	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.48	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	0.64	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	0.61	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	0.49	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	1.2	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.36	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	0.39	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	0.45	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.36	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.40	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-3 5'-7'** **York Sample ID:** **13C0445-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:50 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	0.52	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	0.58	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	0.65	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	0.42	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
78-93-3	2-Butanone	ND		ug/kg dry	0.79	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	0.36	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
591-78-6	2-Hexanone	ND		ug/kg dry	0.63	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	0.46	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	0.56	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
67-64-1	Acetone	ND		ug/kg dry	6.0	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
107-13-1	Acrylonitrile	ND		ug/kg dry	0.72	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
71-43-2	Benzene	ND		ug/kg dry	0.44	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
108-86-1	Bromobenzene	ND		ug/kg dry	0.59	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	0.35	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	0.67	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-25-2	Bromoform	ND		ug/kg dry	0.43	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
74-83-9	Bromomethane	ND		ug/kg dry	1.0	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-15-0	Carbon disulfide	ND		ug/kg dry	0.33	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	0.44	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.44	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-00-3	Chloroethane	ND		ug/kg dry	0.50	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
67-66-3	Chloroform	ND		ug/kg dry	0.45	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
74-87-3	Chloromethane	ND		ug/kg dry	0.50	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.26	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.41	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	0.52	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
74-95-3	Dibromomethane	ND		ug/kg dry	0.57	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	0.41	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.26	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	0.62	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.48	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
80-62-6	Methyl Methacrylate	ND		ug/kg dry	0.73	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.33	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-09-2	Methylene chloride	ND		ug/kg dry	0.81	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-3 5'-7'** **York Sample ID:** **13C0445-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:50 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
91-20-3	Naphthalene	ND		ug/kg dry	0.98	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.40	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	0.38	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
95-47-6	o-Xylene	ND		ug/kg dry	0.33	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	0.84	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.28	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	0.42	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
100-42-5	Styrene	ND		ug/kg dry	0.30	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	0.42	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	0.48	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
109-99-9	Tetrahydrofuran	ND		ug/kg dry	1.3	9.0	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
108-88-3	Toluene	ND		ug/kg dry	0.35	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	0.47	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	0.47	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	0.84	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	0.45	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.32	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.25	4.5	1	SW8260B	03/20/2013 09:00	03/20/2013 17:25	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*92.7 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*96.7 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*97.4 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	112	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	62.1	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
62-53-3	Aniline	ND		ug/kg dry	49.5	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
120-12-7	Anthracene	ND		ug/kg dry	62.9	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	60.9	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	102	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	132	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	139	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	90.5	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-3 5'-7'** **York Sample ID:** **13C0445-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:50 am	03/14/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	138	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	124	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	68.2	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	103	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	73.4	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	98.6	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	179	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	103	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	63.3	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	110	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
218-01-9	Chrysene	ND		ug/kg dry	61.7	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	99.0	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	117	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	175	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	77.5	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	69.8	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	129	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	32.5	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	63.3	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	81.1	406	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	142	406	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	71.0	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	142	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	75.1	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	57.2	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
206-44-0	Fluoranthene	ND		ug/kg dry	203	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
86-73-7	Fluorene	ND		ug/kg dry	129	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	81.1	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	101	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	50.7	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	203	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	119	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
78-59-1	Isophorone	ND		ug/kg dry	83.2	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	54.3	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-3 5'-7'** **York Sample ID:** **13C0445-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:50 am	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	63.7	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	203	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	203	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
91-20-3	Naphthalene	ND		ug/kg dry	62.1	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	51.9	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	135	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	144	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	56.0	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	61.7	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	175	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	203	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	105	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	53.4	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	89.3	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
85-01-8	Phenanthrene	ND		ug/kg dry	54.0	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
108-95-2	Phenol	ND		ug/kg dry	54.8	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
129-00-0	Pyrene	ND		ug/kg dry	151	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
110-86-1	Pyridine	ND		ug/kg dry	107	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	73.8	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	31.8	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	41.8	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	67.4	203	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 17:29	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*46.5 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*50.7 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*43.1 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*46.4 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*45.6 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*55.3 %*	*30-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-3 5'-7'** **York Sample ID:** **13C0445-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:50 am	03/14/2013

Polychlorinated Biphenyls(PCB RCP)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
11104-28-2	Aroclor 1221	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
11141-16-5	Aroclor 1232	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
53469-21-9	Aroclor 1242	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
12672-29-6	Aroclor 1248	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
11097-69-1	Aroclor 1254	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
11096-82-5	Aroclor 1260	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
37324-23-5	Aroclor 1262	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
11100-14-4	Aroclor 1268	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW
1336-36-3	Total PCBs	ND		mg/kg dry	0.0304	0.0304	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 13:58	JW

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*91.0 %*	*30-150*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*70.6 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	TPH (Extractable Total Petroleum Hydrocarbo	ND		mg/kg dry	2.59	12.2	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*112 %*	*40.5-152*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/kg dry	0.268	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-38-2	Arsenic	**3.18**		mg/kg dry	0.414	1.22	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-39-3	Barium	**31.9**		mg/kg dry	0.158	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.122	0.122	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.122	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-47-3	Chromium	**31.4**		mg/kg dry	0.146	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-50-8	Copper	**34.3**		mg/kg dry	0.146	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7439-92-1	Lead	**4.32**		mg/kg dry	0.207	0.365	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-02-0	Nickel	**26.6**		mg/kg dry	0.158	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7782-49-2	Selenium	**3.16**		mg/kg dry	0.609	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-22-4	Silver	ND		mg/kg dry	0.122	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-28-0	Thallium	ND		mg/kg dry	0.390	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW
7440-62-2	Vanadium	**35.8**		mg/kg dry	0.134	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-3 5'-7' **York Sample ID:** 13C0445-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:50 am	03/14/2013

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-66-6	Zinc	**34.0**		mg/kg dry	0.110	0.609	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:01	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.114	0.122	1	EPA SW846-7471	03/18/2013 10:22	03/19/2013 15:39	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**82.2**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: ELB-4 4'-5' **York Sample ID:** 13C0445-08

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:25 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	0.58	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.10	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	0.82	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.27	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	0.62	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	0.41	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	0.34	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	0.38	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.44	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	0.58	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	0.55	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	0.45	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	1.1	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.33	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	0.36	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	0.42	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-4 4'-5'** **York Sample ID:** **13C0445-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:25 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.33	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.37	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	0.48	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	0.53	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	0.59	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	0.39	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
78-93-3	2-Butanone	ND		ug/kg dry	0.73	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	0.33	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
591-78-6	2-Hexanone	ND		ug/kg dry	0.57	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	0.42	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	0.51	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
67-64-1	Acetone	ND		ug/kg dry	5.4	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
107-13-1	Acrylonitrile	ND		ug/kg dry	0.66	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
71-43-2	Benzene	ND		ug/kg dry	0.41	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
108-86-1	Bromobenzene	ND		ug/kg dry	0.54	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	0.32	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	0.61	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-25-2	Bromoform	ND		ug/kg dry	0.39	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
74-83-9	Bromomethane	ND		ug/kg dry	0.92	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-15-0	Carbon disulfide	ND		ug/kg dry	0.30	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	0.40	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.40	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-00-3	Chloroethane	ND		ug/kg dry	0.46	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
67-66-3	Chloroform	ND		ug/kg dry	0.42	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
74-87-3	Chloromethane	ND		ug/kg dry	0.45	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.24	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.38	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	0.48	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
74-95-3	Dibromomethane	ND		ug/kg dry	0.52	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	0.38	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.24	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	0.56	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.44	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
80-62-6	Methyl Methacrylate	ND		ug/kg dry	0.67	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-4 4'-5'** **York Sample ID:** **13C0445-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:25 am	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.30	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-09-2	Methylene chloride	ND		ug/kg dry	0.74	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
91-20-3	Naphthalene	ND		ug/kg dry	0.89	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.36	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	0.34	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
95-47-6	o-Xylene	ND		ug/kg dry	0.30	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	0.77	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.25	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	0.38	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
100-42-5	Styrene	ND		ug/kg dry	0.27	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	0.39	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	0.44	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
109-99-9	Tetrahydrofuran	ND		ug/kg dry	1.2	8.3	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
108-88-3	Toluene	ND		ug/kg dry	0.32	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	0.43	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	0.43	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	0.76	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	0.41	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.29	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.23	4.1	1	SW8260B	03/20/2013 18:00	03/20/2013 18:00	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*103 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*93.6 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*101 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	102	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	57.0	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
62-53-3	Aniline	ND		ug/kg dry	45.4	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
120-12-7	Anthracene	ND		ug/kg dry	57.7	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	55.9	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	93.5	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	121	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-4 4'-5'** **York Sample ID:** **13C0445-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:25 am	03/14/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	127	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	83.1	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	127	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	114	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	62.6	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	95.0	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	67.4	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	90.5	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	164	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	94.6	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	58.1	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	101	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
218-01-9	Chrysene	ND		ug/kg dry	56.6	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	90.9	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	108	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	161	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	71.1	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	64.1	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	118	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	29.9	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	58.1	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	74.5	372	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	130	372	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	65.2	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	130	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	68.9	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	52.5	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
206-44-0	Fluoranthene	ND		ug/kg dry	186	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
86-73-7	Fluorene	ND		ug/kg dry	118	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	74.5	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	92.7	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	46.6	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	186	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	109	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-4 4'-5'** **York Sample ID:** **13C0445-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:25 am	03/14/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
78-59-1	Isophorone	ND		ug/kg dry	76.4	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	49.8	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	58.5	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	186	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	186	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
91-20-3	Naphthalene	ND		ug/kg dry	57.0	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	47.7	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	124	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	132	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	51.4	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	56.6	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	161	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	186	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	96.5	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	49.0	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	81.9	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
85-01-8	Phenanthrene	ND		ug/kg dry	49.5	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
108-95-2	Phenol	ND		ug/kg dry	50.3	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
129-00-0	Pyrene	ND		ug/kg dry	138	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
110-86-1	Pyridine	ND		ug/kg dry	98.3	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	67.7	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	29.2	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	38.4	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	61.8	186	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:00	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*41.0 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*51.2 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*42.4 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*45.1 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*44.3 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*46.8 %*	*30-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-4 4'-5'** **York Sample ID:** **13C0445-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:25 am	03/14/2013

Polychlorinated Biphenyls(PCB RCP)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
11104-28-2	Aroclor 1221	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
11141-16-5	Aroclor 1232	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
53469-21-9	Aroclor 1242	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
12672-29-6	Aroclor 1248	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
11097-69-1	Aroclor 1254	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
11096-82-5	Aroclor 1260	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
37324-23-5	Aroclor 1262	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
11100-14-4	Aroclor 1268	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW
1336-36-3	Total PCBs	ND		mg/kg dry	0.0279	0.0279	1	EPA SW 846-8082	03/18/2013 07:18	03/21/2013 14:18	JW

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*106 %*	*30-150*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*77.1 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	TPH (Extractable Total Petroleum Hydrocarbo	ND		mg/kg dry	2.38	11.2	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*115 %*	*40.5-152*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/kg dry	0.246	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-38-2	Arsenic	**3.04**		mg/kg dry	0.380	1.12	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-39-3	Barium	**30.4**		mg/kg dry	0.145	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.112	0.112	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.112	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-47-3	Chromium	**29.8**		mg/kg dry	0.134	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-50-8	Copper	**32.2**		mg/kg dry	0.134	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7439-92-1	Lead	**4.20**		mg/kg dry	0.190	0.335	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-02-0	Nickel	**26.8**		mg/kg dry	0.145	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7782-49-2	Selenium	**3.05**		mg/kg dry	0.559	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-22-4	Silver	ND		mg/kg dry	0.112	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-28-0	Thallium	ND		mg/kg dry	0.358	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW
7440-62-2	Vanadium	**35.0**		mg/kg dry	0.123	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-4 4'-5'** **York Sample ID:** **13C0445-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 11:25 am	03/14/2013

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-66-6	Zinc	**28.6**		mg/kg dry	0.101	0.559	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:06	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.105	0.112	1	EPA SW846-7471	03/18/2013 10:22	03/19/2013 15:39	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**89.5**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: **ELB-9 3'-4'** **York Sample ID:** **13C0445-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 3:15 pm	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	0.71	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.13	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.0	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.33	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	0.77	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	0.51	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	0.42	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	0.47	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.55	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	0.72	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	0.69	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	0.56	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	1.4	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.40	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	0.44	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	0.51	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-9 3'-4'** **York Sample ID:** **13C0445-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 3:15 pm	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.41	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.46	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	0.59	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	0.66	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	0.74	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	0.48	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
78-93-3	2-Butanone	ND		ug/kg dry	0.90	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	0.41	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
591-78-6	2-Hexanone	ND		ug/kg dry	0.71	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	0.52	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	0.64	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
67-64-1	Acetone	**29**		ug/kg dry	6.7	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
107-13-1	Acrylonitrile	ND		ug/kg dry	0.82	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
71-43-2	Benzene	ND		ug/kg dry	0.50	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
108-86-1	Bromobenzene	ND		ug/kg dry	0.66	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	0.40	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	0.76	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-25-2	Bromoform	ND		ug/kg dry	0.48	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
74-83-9	Bromomethane	ND		ug/kg dry	1.1	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-15-0	Carbon disulfide	ND		ug/kg dry	0.37	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	0.50	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.50	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-00-3	Chloroethane	ND		ug/kg dry	0.57	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
67-66-3	Chloroform	ND		ug/kg dry	0.51	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
74-87-3	Chloromethane	ND		ug/kg dry	0.56	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.30	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.47	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	0.59	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
74-95-3	Dibromomethane	ND		ug/kg dry	0.65	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	0.47	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.30	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	0.70	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.54	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
80-62-6	Methyl Methacrylate	ND		ug/kg dry	0.82	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-9 3'-4'** **York Sample ID:** **13C0445-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 3:15 pm	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.38	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-09-2	Methylene chloride	ND		ug/kg dry	0.92	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
91-20-3	Naphthalene	ND		ug/kg dry	1.1	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.45	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	0.43	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
95-47-6	o-Xylene	ND		ug/kg dry	0.38	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	0.95	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.31	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	0.48	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
100-42-5	Styrene	ND		ug/kg dry	0.34	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	0.48	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	0.55	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
109-99-9	Tetrahydrofuran	ND		ug/kg dry	1.5	10	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
108-88-3	Toluene	ND		ug/kg dry	0.39	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	0.53	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	0.53	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	0.95	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	0.50	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.36	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.28	5.1	1	SW8260B	03/20/2013 09:00	03/20/2013 18:35	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*90.4 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*97.4 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*95.3 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	110	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	61.4	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
62-53-3	Aniline	ND		ug/kg dry	49.0	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
120-12-7	Anthracene	ND		ug/kg dry	62.2	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	60.2	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	101	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	131	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-9 3'-4'** **York Sample ID:** **13C0445-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 3:15 pm	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	137	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	89.5	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	137	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	122	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	67.5	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	102	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	72.7	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	97.6	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	177	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	102	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	62.6	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	109	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
218-01-9	Chrysene	ND		ug/kg dry	61.0	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	98.0	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	116	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	173	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	76.7	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	69.1	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	127	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	32.2	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	62.6	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	80.3	402	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	141	402	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	70.3	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	140	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	74.3	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	56.6	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
206-44-0	Fluoranthene	ND		ug/kg dry	201	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
86-73-7	Fluorene	ND		ug/kg dry	128	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	80.3	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	100	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	50.2	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	201	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	118	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-9 3'-4'** **York Sample ID:** **13C0445-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 3:15 pm	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
78-59-1	Isophorone	ND		ug/kg dry	82.3	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	53.7	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	63.0	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	201	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	201	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
91-20-3	Naphthalene	ND		ug/kg dry	61.4	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	51.4	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	134	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	143	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	55.4	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	61.0	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	173	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	201	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	104	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	52.9	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	88.3	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
85-01-8	Phenanthrene	ND		ug/kg dry	53.4	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
108-95-2	Phenol	ND		ug/kg dry	54.2	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
129-00-0	Pyrene	ND		ug/kg dry	149	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
110-86-1	Pyridine	ND		ug/kg dry	106	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	73.0	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	31.4	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	41.4	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	66.7	201	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 18:32	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*60.2 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*64.6 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*54.8 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*54.3 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*58.6 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*60.9 %*	*30-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-9 3'-4'** **York Sample ID:** **13C0445-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 3:15 pm	03/14/2013

Polychlorinated Biphenyls(PCB RCP)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
11104-28-2	Aroclor 1221	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
11141-16-5	Aroclor 1232	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
53469-21-9	Aroclor 1242	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
12672-29-6	Aroclor 1248	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
11097-69-1	Aroclor 1254	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
11096-82-5	Aroclor 1260	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
37324-23-5	Aroclor 1262	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
11100-14-4	Aroclor 1268	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW
1336-36-3	Total PCBs	ND		mg/kg dry	0.0301	0.0301	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 10:53	JW

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*78.0 %*	*30-150*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*54.7 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	PH (Extractable Total Petroleum Hydrocarbo	ND		mg/kg dry	2.57	12.0	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*103 %*	*40.5-152*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/kg dry	0.265	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-38-2	Arsenic	**2.36**		mg/kg dry	0.410	1.20	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-39-3	Barium	**30.6**		mg/kg dry	0.157	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.120	0.120	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.120	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-47-3	Chromium	**8.48**		mg/kg dry	0.145	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-50-8	Copper	**4.74**		mg/kg dry	0.145	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7439-92-1	Lead	**15.2**		mg/kg dry	0.205	0.361	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-02-0	Nickel	**7.75**		mg/kg dry	0.157	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7782-49-2	Selenium	**0.941**		mg/kg dry	0.602	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-22-4	Silver	ND		mg/kg dry	0.120	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-28-0	Thallium	ND		mg/kg dry	0.385	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW
7440-62-2	Vanadium	**17.5**		mg/kg dry	0.133	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-9 3'-4' **York Sample ID:** 13C0445-09

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 3:15 pm	03/14/2013

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-66-6	Zinc	**19.6**		mg/kg dry	0.108	0.602	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:22	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.113	0.120	1	EPA SW846-7471	03/18/2013 10:22	03/19/2013 15:39	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**83.0**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

Sample Information

Client Sample ID: ELB-13 4'-5' **York Sample ID:** 13C0445-10

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 2:20 pm	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	0.72	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.13	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.0	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.34	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	0.78	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	0.52	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	0.42	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	0.48	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.55	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	0.73	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	0.69	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	0.56	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	1.4	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.41	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	0.45	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	0.52	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS

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Sample Information

Client Sample ID: **ELB-13 4'-5'** **York Sample ID:** **13C0445-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 2:20 pm	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.42	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.46	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	0.60	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	0.66	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	0.75	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	0.48	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
78-93-3	2-Butanone	ND		ug/kg dry	0.91	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	0.42	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
591-78-6	2-Hexanone	ND		ug/kg dry	0.72	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	0.53	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	0.64	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
67-64-1	Acetone	ND		ug/kg dry	6.8	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
107-13-1	Acrylonitrile	ND		ug/kg dry	0.83	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
71-43-2	Benzene	ND		ug/kg dry	0.51	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
108-86-1	Bromobenzene	ND		ug/kg dry	0.67	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	0.41	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	0.77	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-25-2	Bromoform	ND		ug/kg dry	0.49	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
74-83-9	Bromomethane	ND		ug/kg dry	1.2	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-15-0	Carbon disulfide	ND		ug/kg dry	0.38	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	0.51	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.51	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-00-3	Chloroethane	ND		ug/kg dry	0.58	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
67-66-3	Chloroform	ND		ug/kg dry	0.52	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
74-87-3	Chloromethane	ND		ug/kg dry	0.57	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.30	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.47	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	0.60	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
74-95-3	Dibromomethane	ND		ug/kg dry	0.65	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	0.47	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.30	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	0.71	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.55	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
80-62-6	Methyl Methacrylate	ND		ug/kg dry	0.84	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-13 4'-5'** **York Sample ID:** **13C0445-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 2:20 pm	03/14/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.38	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-09-2	Methylene chloride	ND		ug/kg dry	0.93	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
91-20-3	Naphthalene	ND		ug/kg dry	1.1	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.45	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	0.43	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
95-47-6	o-Xylene	ND		ug/kg dry	0.38	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	0.96	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.32	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	0.48	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
100-42-5	Styrene	ND		ug/kg dry	0.34	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	0.49	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	0.55	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
109-99-9	Tetrahydrofuran	ND		ug/kg dry	1.5	10	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
108-88-3	Toluene	ND		ug/kg dry	0.40	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	0.54	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	0.54	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	0.96	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	0.51	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.37	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.28	5.2	1	SW8260B	03/20/2013 09:00	03/20/2013 19:10	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*97.4 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*96.9 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*97.7 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	107	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	59.4	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
62-53-3	Aniline	ND		ug/kg dry	47.4	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
120-12-7	Anthracene	ND		ug/kg dry	60.2	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	58.3	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	97.5	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	127	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-13 4'-5'

York Sample ID: 13C0445-10

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 2:20 pm	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	133	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	86.6	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	132	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	118	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	65.2	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	99.0	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	70.3	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	94.4	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	171	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	98.6	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	60.6	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	106	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
218-01-9	Chrysene	ND		ug/kg dry	59.0	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	94.8	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	112	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	168	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	74.2	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	66.8	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	123	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	31.1	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	60.6	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	77.7	388	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	136	388	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	68.0	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	136	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	71.8	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	54.8	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
206-44-0	Fluoranthene	ND		ug/kg dry	194	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
86-73-7	Fluorene	ND		ug/kg dry	124	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	77.7	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	96.7	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	48.5	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	194	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	114	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-13 4'-5'** **York Sample ID:** **13C0445-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 2:20 pm	03/14/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
78-59-1	Isophorone	ND		ug/kg dry	79.6	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	52.0	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	61.0	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	194	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	194	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
91-20-3	Naphthalene	ND		ug/kg dry	59.4	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	49.7	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	129	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	138	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	53.6	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	59.0	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	167	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	194	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	101	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	51.1	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	85.4	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
85-01-8	Phenanthrene	ND		ug/kg dry	51.7	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
108-95-2	Phenol	ND		ug/kg dry	52.4	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
129-00-0	Pyrene	ND		ug/kg dry	144	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
110-86-1	Pyridine	ND		ug/kg dry	103	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	70.6	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	30.4	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	40.0	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	64.5	194	1	EPA SW-846 8270C	03/16/2013 10:37	03/20/2013 19:02	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*54.3 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*57.8 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*49.7 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*49.8 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*53.9 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*56.1 %*	*30-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-13 4'-5'** **York Sample ID:** **13C0445-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 2:20 pm	03/14/2013

Polychlorinated Biphenyls(PCB RCP)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
11104-28-2	Aroclor 1221	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
11141-16-5	Aroclor 1232	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
53469-21-9	Aroclor 1242	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
12672-29-6	Aroclor 1248	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
11097-69-1	Aroclor 1254	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
11096-82-5	Aroclor 1260	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
37324-23-5	Aroclor 1262	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
11100-14-4	Aroclor 1268	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW
1336-36-3	Total PCBs	ND		mg/kg dry	0.0291	0.0291	1	EPA SW 846-8082	03/18/2013 07:18	03/19/2013 07:15	JW

	Surrogate Recoveries	Result	Acceptance Range
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*81.0 %*	*30-150*
2051-24-3	*Surrogate: Decachlorobiphenyl*	*61.7 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	PH (Extractable Total Petroleum Hydrocarbo	**30.8**		mg/kg dry	2.48	11.7	1	CT DEP ETPH	03/17/2013 10:56	03/21/2013 10:08	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*111 %*	*40.5-152*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/kg dry	0.256	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-38-2	Arsenic	**2.78**		mg/kg dry	0.396	1.17	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-39-3	Barium	**31.5**		mg/kg dry	0.151	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.117	0.117	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.117	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-47-3	Chromium	**12.6**		mg/kg dry	0.140	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-50-8	Copper	**11.1**		mg/kg dry	0.140	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7439-92-1	Lead	**25.9**		mg/kg dry	0.198	0.350	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-02-0	Nickel	**11.5**		mg/kg dry	0.151	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7782-49-2	Selenium	**1.96**		mg/kg dry	0.583	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-22-4	Silver	ND		mg/kg dry	0.117	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-28-0	Thallium	ND		mg/kg dry	0.373	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW
7440-62-2	Vanadium	**25.2**		mg/kg dry	0.128	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-13 4'-5'** **York Sample ID:** **13C0445-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0445	140068601	Soil	March 13, 2013 2:20 pm	03/14/2013

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-66-6	Zinc	**36.4**		mg/kg dry	0.105	0.583	1	EPA SW846-6010B	03/18/2013 16:05	03/18/2013 23:27	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.110	0.117	1	EPA SW846-7471	03/18/2013 10:22	03/19/2013 15:39	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**85.8**		%	0.100	0.100	1	SM 2540G	03/18/2013 11:50	03/18/2013 11:50	AMC

YORK
ANALYTICAL LABORATORIES, INC.

Analytical Batch Summary

Batch ID: BC30806 **Preparation Method:** EPA 3550B **Prepared By:** AY

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-02	ELB-8 3'-4'	03/16/13
13C0445-03	ELB-7 5'-7'	03/16/13
13C0445-04	ELB-1 10'-11'	03/16/13
13C0445-05	ELB-2 9'-11'	03/16/13
13C0445-06	ELB-10 1'-2'	03/16/13
13C0445-07	ELB-3 5'-7'	03/16/13
13C0445-08	ELB-4 4'-5'	03/16/13
13C0445-09	ELB-9 3'-4'	03/16/13
13C0445-10	ELB-13 4'-5'	03/16/13

Batch ID: BC30812 **Preparation Method:** EPA 3545A **Prepared By:** DB

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-02	ELB-8 3'-4'	03/17/13
13C0445-03	ELB-7 5'-7'	03/17/13
13C0445-04	ELB-1 10'-11'	03/17/13
13C0445-05	ELB-2 9'-11'	03/17/13
13C0445-06	ELB-10 1'-2'	03/17/13
13C0445-07	ELB-3 5'-7'	03/17/13
13C0445-08	ELB-4 4'-5'	03/17/13
13C0445-09	ELB-9 3'-4'	03/17/13
13C0445-10	ELB-13 4'-5'	03/17/13
BC30812-BLK1	Blank	03/17/13
BC30812-BS1	LCS	03/17/13

Batch ID: BC30852 **Preparation Method:** EPA 3550B **Prepared By:** CC

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-07	ELB-3 5'-7'	03/18/13
13C0445-08	ELB-4 4'-5'	03/18/13
13C0445-09	ELB-9 3'-4'	03/18/13
13C0445-10	ELB-13 4'-5'	03/18/13
BC30852-BLK1	Blank	03/18/13
BC30852-BS2	LCS	03/18/13
BC30852-BSD2	LCS Dup	03/18/13

Batch ID: BC30860 **Preparation Method:** % Solids Prep **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-02	ELB-8 3'-4'	03/18/13
13C0445-03	ELB-7 5'-7'	03/18/13
13C0445-04	ELB-1 10'-11'	03/18/13
13C0445-05	ELB-2 9'-11'	03/18/13
13C0445-06	ELB-10 1'-2'	03/18/13
13C0445-07	ELB-3 5'-7'	03/18/13
13C0445-08	ELB-4 4'-5'	03/18/13
13C0445-09	ELB-9 3'-4'	03/18/13

13C0445-10	ELB-13 4'-5'	03/18/13

Batch ID: BC30881 **Preparation Method:** EPA SW846-7471 **Prepared By:** AA

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-07	ELB-3 5'-7'	03/18/13
13C0445-08	ELB-4 4'-5'	03/18/13
13C0445-09	ELB-9 3'-4'	03/18/13
13C0445-10	ELB-13 4'-5'	03/18/13
BC30881-BLK1	Blank	03/18/13
BC30881-BS1	LCS	03/18/13

Batch ID: BC30908 **Preparation Method:** EPA 3050B **Prepared By:** MW

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-07	ELB-3 5'-7'	03/18/13
13C0445-08	ELB-4 4'-5'	03/18/13
13C0445-09	ELB-9 3'-4'	03/18/13
13C0445-10	ELB-13 4'-5'	03/18/13
BC30908-BLK1	Blank	03/18/13
BC30908-SRM1	Reference	03/18/13

Batch ID: BC31000 **Preparation Method:** EPA 5035A **Prepared By:** SS

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-07	ELB-3 5'-7'	03/20/13
13C0445-09	ELB-9 3'-4'	03/20/13
13C0445-10	ELB-13 4'-5'	03/20/13
BC31000-BLK1	Blank	03/20/13
BC31000-BS1	LCS	03/20/13
BC31000-BSD1	LCS Dup	03/20/13

Batch ID: BC31064 **Preparation Method:** EPA 5030B **Prepared By:** EKM

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-01	TRIP BLANK	03/21/13
BC31064-BLK1	Blank	03/21/13
BC31064-BS1	LCS	03/21/13
BC31064-BSD1	LCS Dup	03/21/13

Batch ID: BC31083 **Preparation Method:** EPA 5035A **Prepared By:** EKM

YORK Sample ID	Client Sample ID	Preparation Date
13C0445-08	ELB-4 4'-5'	03/20/13

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31000 - EPA 5035A											
Blank (BC31000-BLK1)								Prepared & Analyzed: 03/20/2013			
1,1,1,2-Tetrachloroethane	ND	5.0	ug/kg wet								
1,1,1-Trichloroethane	ND	5.0	"								
1,1,2,2-Tetrachloroethane	ND	5.0	"								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	5.0	"								
1,1,2-Trichloroethane	ND	5.0	"								
1,1-Dichloroethane	ND	5.0	"								
1,1-Dichloroethylene	ND	5.0	"								
1,1-Dichloropropylene	ND	5.0	"								
1,2,3-Trichlorobenzene	ND	10	"								
1,2,3-Trichloropropane	ND	5.0	"								
1,2,4-Trichlorobenzene	ND	10	"								
1,2,4-Trimethylbenzene	ND	5.0	"								
1,2-Dibromo-3-chloropropane	ND	10	"								
1,2-Dibromoethane	ND	5.0	"								
1,2-Dichlorobenzene	ND	5.0	"								
1,2-Dichloroethane	ND	5.0	"								
1,2-Dichloropropane	ND	5.0	"								
1,3,5-Trimethylbenzene	ND	5.0	"								
1,3-Dichlorobenzene	ND	5.0	"								
1,3-Dichloropropane	ND	5.0	"								
1,4-Dichlorobenzene	ND	5.0	"								
2,2-Dichloropropane	ND	5.0	"								
2-Butanone	ND	10	"								
2-Chlorotoluene	ND	5.0	"								
2-Hexanone	ND	5.0	"								
4-Chlorotoluene	ND	5.0	"								
4-Methyl-2-pentanone	ND	5.0	"								
Acetone	ND	10	"								
Acrylonitrile	ND	5.0	"								
Benzene	ND	5.0	"								
Bromobenzene	ND	5.0	"								
Bromochloromethane	ND	5.0	"								
Bromodichloromethane	ND	5.0	"								
Bromoform	ND	5.0	"								
Bromomethane	ND	5.0	"								
Carbon disulfide	ND	5.0	"								
Carbon tetrachloride	ND	5.0	"								
Chlorobenzene	ND	5.0	"								
Chloroethane	ND	5.0	"								
Chloroform	ND	5.0	"								
Chloromethane	ND	5.0	"								
cis-1,2-Dichloroethylene	ND	5.0	"								
cis-1,3-Dichloropropylene	ND	5.0	"								
Dibromochloromethane	ND	5.0	"								
Dibromomethane	ND	5.0	"								
Dichlorodifluoromethane	ND	5.0	"								
Ethyl Benzene	ND	5.0	"								
Hexachlorobutadiene	ND	5.0	"								
Isopropylbenzene	ND	5.0	"								
Methyl Methacrylate	ND	5.0	"								
Methyl tert-butyl ether (MTBE)	ND	5.0	"								
Methylene chloride	ND	10	"								
Naphthalene	ND	10	"								
n-Butylbenzene	ND	5.0	"								

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31000 - EPA 5035A											
Blank (BC31000-BLK1)								Prepared & Analyzed: 03/20/2013			
n-Propylbenzene	ND	5.0	ug/kg wet								
o-Xylene	ND	5.0	"								
p- & m- Xylenes	ND	10	"								
p-Isopropyltoluene	ND	5.0	"								
sec-Butylbenzene	ND	5.0	"								
Styrene	ND	5.0	"								
tert-Butylbenzene	ND	5.0	"								
Tetrachloroethylene	ND	5.0	"								
Tetrahydrofuran	ND	10	"								
Toluene	ND	5.0	"								
trans-1,2-Dichloroethylene	ND	5.0	"								
trans-1,3-Dichloropropylene	ND	5.0	"								
trans-1,4-dichloro-2-butene	ND	5.0	"								
Trichloroethylene	ND	5.0	"								
Trichlorofluoromethane	ND	5.0	"								
Vinyl Chloride	ND	5.0	"								
Surrogate: 1,2-Dichloroethane-d4	*47.4*		*ug/L*	*50.0*		*94.8*	*70-130*				
Surrogate: p-Bromofluorobenzene	*48.5*		*"*	*50.0*		*97.1*	*70-130*				
Surrogate: Toluene-d8	*49.8*		*"*	*50.0*		*99.6*	*70-130*				
LCS (BC31000-BS1)								Prepared & Analyzed: 03/20/2013			
1,1,1,2-Tetrachloroethane	47		ug/L	50.0		93.3	70-130				
1,1,1-Trichloroethane	47		"	50.0		94.0	70-130				
1,1,2,2-Tetrachloroethane	47		"	50.0		93.9	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	55		"	50.0		110	70-130				
1,1,2-Trichloroethane	49		"	50.0		97.8	70-130				
1,1-Dichloroethane	50		"	50.0		99.5	70-130				
1,1-Dichloroethylene	44		"	50.0		87.5	70-130				
1,1-Dichloropropylene	45		"	50.0		90.3	70-130				
1,2,3-Trichlorobenzene	49		"	50.0		98.4	70-130				
1,2,3-Trichloropropane	46		"	50.0		91.5	70-130				
1,2,4-Trichlorobenzene	51		"	50.0		102	70-130				
1,2,4-Trimethylbenzene	45		"	50.0		89.4	70-130				
1,2-Dibromo-3-chloropropane	41		"	50.0		81.9	70-130				
1,2-Dibromoethane	49		"	50.0		98.4	70-130				
1,2-Dichlorobenzene	46		"	50.0		92.7	70-130				
1,2-Dichloroethane	48		"	50.0		96.9	70-130				
1,2-Dichloropropane	47		"	50.0		94.6	70-130				
1,3,5-Trimethylbenzene	44		"	50.0		87.7	70-130				
1,3-Dichlorobenzene	47		"	50.0		94.8	70-130				
1,3-Dichloropropane	46		"	50.0		91.5	70-130				
1,4-Dichlorobenzene	46		"	50.0		92.6	70-130				
2,2-Dichloropropane	45		"	50.0		90.1	70-130				
2-Butanone	52		"	50.0		103	70-130				
2-Chlorotoluene	41		"	50.0		82.3	70-130				
2-Hexanone	48		"	50.0		95.2	70-130				
4-Chlorotoluene	43		"	50.0		86.9	70-130				
4-Methyl-2-pentanone	34		"	50.0		68.3	70-130	Low Bias			
Acetone	31		"	50.0		61.0	70-130	Low Bias			
Acrylonitrile	57		"	50.0		114	70-130				
Benzene	52		"	50.0		103	70-130				
Bromobenzene	42		"	50.0		84.5	70-130				
Bromochloromethane	50		"	50.0		101	70-130				
Bromodichloromethane	45		"	50.0		89.4	70-130				

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Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31000 - EPA 5035A											
LCS (BC31000-BS1)							Prepared & Analyzed: 03/20/2013				
Bromoform	48		ug/L	50.0		97.0	70-130				
Bromomethane	49		"	50.0		97.3	70-130				
Carbon disulfide	87		"	100		86.9	70-130				
Carbon tetrachloride	49		"	50.0		97.2	70-130				
Chlorobenzene	47		"	50.0		94.8	70-130				
Chloroethane	55		"	50.0		110	70-130				
Chloroform	48		"	50.0		96.5	70-130				
Chloromethane	56		"	50.0		112	70-130				
cis-1,2-Dichloroethylene	54		"	50.0		107	70-130				
cis-1,3-Dichloropropylene	49		"	50.0		98.0	70-130				
Dibromochloromethane	47		"	50.0		94.2	70-130				
Dibromomethane	49		"	50.0		98.7	70-130				
Dichlorodifluoromethane	57		"	50.0		113	70-130				
Ethyl Benzene	47		"	50.0		93.4	70-130				
Hexachlorobutadiene	49		"	50.0		97.8	70-130				
Isopropylbenzene	44		"	50.0		87.3	70-130				
Methyl Methacrylate	52		"	50.0		103	70-130				
Methyl tert-butyl ether (MTBE)	53		"	50.0		106	70-130				
Methylene chloride	45		"	50.0		91.0	70-130				
Naphthalene	52		"	50.0		104	70-130				
n-Butylbenzene	43		"	50.0		86.2	70-130				
n-Propylbenzene	42		"	50.0		84.2	70-130				
o-Xylene	45		"	50.0		89.2	70-130				
p- & m- Xylenes	88		"	100		87.9	70-130				
p-Isopropyltoluene	47		"	50.0		93.4	70-130				
sec-Butylbenzene	47		"	50.0		93.6	70-130				
Styrene	52		"	50.0		104	70-130				
tert-Butylbenzene	45		"	50.0		90.9	70-130				
Tetrachloroethylene	48		"	50.0		95.6	70-130				
Tetrahydrofuran	47		"	50.0		94.9	70-130				
Toluene	45		"	50.0		89.3	70-130				
trans-1,2-Dichloroethylene	48		"	50.0		95.2	70-130				
trans-1,3-Dichloropropylene	45		"	50.0		90.3	70-130				
trans-1,4-dichloro-2-butene	46		"	50.0		91.7	70-130				
Trichloroethylene	46		"	50.0		91.2	70-130				
Trichlorofluoromethane	50		"	50.0		99.8	70-130				
Vinyl Chloride	52		"	50.0		104	70-130				
Surrogate: 1,2-Dichloroethane-d4	*50.9*		*"*	*50.0*		*102*	*70-130*				
Surrogate: p-Bromofluorobenzene	*47.7*		*"*	*50.0*		*95.5*	*70-130*				
Surrogate: Toluene-d8	*48.8*		*"*	*50.0*		*97.5*	*70-130*				

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Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31000 - EPA 5035A											
LCS Dup (BC31000-BSD1)								Prepared & Analyzed: 03/20/2013			
1,1,1,2-Tetrachloroethane	46		ug/L	50.0		92.4	70-130		0.947	30	
1,1,1-Trichloroethane	47		"	50.0		94.3	70-130		0.319	30	
1,1,2,2-Tetrachloroethane	47		"	50.0		93.2	70-130		0.727	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	55		"	50.0		109	70-130		0.840	30	
1,1,2-Trichloroethane	48		"	50.0		95.3	70-130		2.59	30	
1,1-Dichloroethane	52		"	50.0		104	70-130		4.81	30	
1,1-Dichloroethylene	44		"	50.0		87.8	70-130		0.297	30	
1,1-Dichloropropylene	45		"	50.0		90.1	70-130		0.222	30	
1,2,3-Trichlorobenzene	49		"	50.0		97.1	70-130		1.37	30	
1,2,3-Trichloropropane	45		"	50.0		89.8	70-130		1.88	30	
1,2,4-Trichlorobenzene	48		"	50.0		95.2	70-130		6.58	30	
1,2,4-Trimethylbenzene	43		"	50.0		85.3	70-130		4.65	30	
1,2-Dibromo-3-chloropropane	38		"	50.0		75.8	70-130		7.71	30	
1,2-Dibromoethane	50		"	50.0		101	70-130		2.21	30	
1,2-Dichlorobenzene	45		"	50.0		90.4	70-130		2.58	30	
1,2-Dichloroethane	48		"	50.0		95.4	70-130		1.64	30	
1,2-Dichloropropane	47		"	50.0		94.8	70-130		0.190	30	
1,3,5-Trimethylbenzene	43		"	50.0		86.3	70-130		1.65	30	
1,3-Dichlorobenzene	45		"	50.0		89.9	70-130		5.33	30	
1,3-Dichloropropane	46		"	50.0		91.1	70-130		0.460	30	
1,4-Dichlorobenzene	44		"	50.0		87.1	70-130		6.12	30	
2,2-Dichloropropane	45		"	50.0		89.9	70-130		0.156	30	
2-Butanone	49		"	50.0		98.4	70-130		4.98	30	
2-Chlorotoluene	39		"	50.0		77.7	70-130		5.75	30	
2-Hexanone	44		"	50.0		88.2	70-130		7.61	30	
4-Chlorotoluene	42		"	50.0		84.9	70-130		2.28	30	
4-Methyl-2-pentanone	33		"	50.0		66.7	70-130	Low Bias	2.37	30	
Acetone	35		"	50.0		69.4	70-130	Low Bias	12.9	30	
Acrylonitrile	57		"	50.0		113	70-130		0.141	30	
Benzene	50		"	50.0		100	70-130		3.36	30	
Bromobenzene	42		"	50.0		83.1	70-130		1.72	30	
Bromochloromethane	48		"	50.0		95.7	70-130		5.03	30	
Bromodichloromethane	46		"	50.0		92.5	70-130		3.34	30	
Bromoform	46		"	50.0		92.2	70-130		5.01	30	
Bromomethane	49		"	50.0		97.0	70-130		0.329	30	
Carbon disulfide	88		"	100		87.5	70-130		0.699	30	
Carbon tetrachloride	48		"	50.0		96.8	70-130		0.412	30	
Chlorobenzene	47		"	50.0		93.2	70-130		1.66	30	
Chloroethane	54		"	50.0		107	70-130		2.07	30	
Chloroform	50		"	50.0		99.5	70-130		3.06	30	
Chloromethane	52		"	50.0		104	70-130		7.73	30	
cis-1,2-Dichloroethylene	54		"	50.0		108	70-130		0.669	30	
cis-1,3-Dichloropropylene	47		"	50.0		94.6	70-130		3.49	30	
Dibromochloromethane	47		"	50.0		94.4	70-130		0.191	30	
Dibromomethane	49		"	50.0		98.1	70-130		0.589	30	
Dichlorodifluoromethane	52		"	50.0		104	70-130		8.86	30	
Ethyl Benzene	45		"	50.0		90.1	70-130		3.51	30	
Hexachlorobutadiene	48		"	50.0		95.1	70-130		2.76	30	
Isopropylbenzene	42		"	50.0		83.8	70-130		4.09	30	
Methyl Methacrylate	51		"	50.0		101	70-130		2.04	30	
Methyl tert-butyl ether (MTBE)	52		"	50.0		104	70-130		1.84	30	
Methylene chloride	47		"	50.0		94.1	70-130		3.44	30	
Naphthalene	51		"	50.0		101	70-130		2.36	30	
n-Butylbenzene	41		"	50.0		82.9	70-130		3.90	30	

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Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31000 - EPA 5035A											
LCS Dup (BC31000-BSD1)								Prepared & Analyzed: 03/20/2013			
n-Propylbenzene	42		ug/L	50.0		83.3	70-130		1.07	30	
o-Xylene	44		"	50.0		87.2	70-130		2.20	30	
p- & m- Xylenes	87		"	100		86.7	70-130		1.37	30	
p-Isopropyltoluene	45		"	50.0		90.1	70-130		3.58	30	
sec-Butylbenzene	45		"	50.0		90.9	70-130		2.91	30	
Styrene	51		"	50.0		101	70-130		2.87	30	
tert-Butylbenzene	45		"	50.0		90.0	70-130		1.06	30	
Tetrachloroethylene	45		"	50.0		91.0	70-130		4.95	30	
Tetrahydrofuran	49		"	50.0		98.8	70-130		3.98	30	
Toluene	43		"	50.0		86.8	70-130		2.86	30	
trans-1,2-Dichloroethylene	47		"	50.0		94.4	70-130		0.907	30	
trans-1,3-Dichloropropylene	44		"	50.0		87.9	70-130		2.65	30	
trans-1,4-dichloro-2-butene	45		"	50.0		89.7	70-130		2.16	30	
Trichloroethylene	46		"	50.0		91.7	70-130		0.547	30	
Trichlorofluoromethane	50		"	50.0		100	70-130		0.599	30	
Vinyl Chloride	50		"	50.0		99.8	70-130		4.06	30	
Surrogate: 1,2-Dichloroethane-d4	*49.3*		*"*	*50.0*		*98.6*	*70-130*				
Surrogate: p-Bromofluorobenzene	*48.6*		*"*	*50.0*		*97.1*	*70-130*				
Surrogate: Toluene-d8	*47.5*		*"*	*50.0*		*94.9*	*70-130*				
Batch BC31064 - EPA 5030B											
Blank (BC31064-BLK1)								Prepared & Analyzed: 03/21/2013			
1,1,1,2-Tetrachloroethane	ND	0.50	ug/L								
1,1,1-Trichloroethane	ND	0.50	"								
1,1,2,2-Tetrachloroethane	ND	0.50	"								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"								
1,1,2-Trichloroethane	ND	0.50	"								
1,1-Dichloroethane	ND	0.50	"								
1,1-Dichloroethylene	ND	0.50	"								
1,1-Dichloropropylene	ND	0.50	"								
1,2,3-Trichlorobenzene	ND	2.0	"								
1,2,3-Trichloropropane	ND	0.50	"								
1,2,4-Trichlorobenzene	ND	2.0	"								
1,2,4-Trimethylbenzene	ND	0.50	"								
1,2-Dibromo-3-chloropropane	ND	2.0	"								
1,2-Dibromoethane	ND	0.50	"								
1,2-Dichlorobenzene	ND	0.50	"								
1,2-Dichloroethane	ND	0.50	"								
1,2-Dichloropropane	ND	0.50	"								
1,3,5-Trimethylbenzene	ND	0.50	"								
1,3-Dichlorobenzene	ND	0.50	"								
1,3-Dichloropropane	ND	0.50	"								
1,4-Dichlorobenzene	ND	0.50	"								
2,2-Dichloropropane	ND	0.50	"								
2-Butanone	ND	2.0	"								
2-Chlorotoluene	ND	0.50	"								
2-Hexanone	ND	0.50	"								
4-Chlorotoluene	ND	0.50	"								
4-Methyl-2-pentanone	ND	0.50	"								
Acetone	ND	2.0	"								
Acrylonitrile	ND	1.0	"								
Benzene	ND	0.50	"								
Bromobenzene	ND	0.50	"								

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Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31064 - EPA 5030B											
Blank (BC31064-BLK1)								Prepared & Analyzed: 03/21/2013			
Bromochloromethane	ND	0.50	ug/L								
Bromodichloromethane	ND	0.50	"								
Bromoform	ND	0.50	"								
Bromomethane	ND	0.50	"								
Carbon disulfide	ND	0.50	"								
Carbon tetrachloride	ND	0.50	"								
Chlorobenzene	ND	0.50	"								
Chloroethane	ND	0.50	"								
Chloroform	ND	0.50	"								
Chloromethane	ND	0.50	"								
cis-1,2-Dichloroethylene	ND	0.50	"								
cis-1,3-Dichloropropylene	ND	0.50	"								
Dibromochloromethane	ND	0.50	"								
Dibromomethane	ND	0.50	"								
Dichlorodifluoromethane	ND	0.50	"								
Ethyl Benzene	ND	0.50	"								
Hexachlorobutadiene	ND	0.50	"								
Isopropylbenzene	ND	0.50	"								
Methyl Methacrylate	ND	0.50	"								
Methyl tert-butyl ether (MTBE)	ND	0.50	"								
Methylene chloride	4.1	2.0	"								
Naphthalene	ND	2.0	"								
n-Butylbenzene	ND	0.50	"								
n-Propylbenzene	ND	0.50	"								
o-Xylene	ND	0.50	"								
p- & m- Xylenes	ND	1.0	"								
p-Isopropyltoluene	ND	0.50	"								
sec-Butylbenzene	ND	0.50	"								
Styrene	ND	0.50	"								
tert-Butylbenzene	ND	0.50	"								
Tetrachloroethylene	ND	0.50	"								
Tetrahydrofuran	ND	2.0	"								
Toluene	ND	0.50	"								
trans-1,2-Dichloroethylene	ND	0.50	"								
trans-1,3-Dichloropropylene	ND	0.50	"								
trans-1,4-dichloro-2-butene	ND	0.50	"								
Trichloroethylene	ND	0.50	"								
Trichlorofluoromethane	ND	0.50	"								
Vinyl Chloride	ND	0.50	"								
Surrogate: 1,2-Dichloroethane-d4	*10.2*		*"*	*10.0*		*102*	*70-130*				
Surrogate: p-Bromofluorobenzene	*11.3*		*"*	*10.0*		*113*	*70-130*				
Surrogate: Toluene-d8	*10.1*		*"*	*10.0*		*101*	*70-130*				

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Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31064 - EPA 5030B											
LCS (BC31064-BS1)							Prepared & Analyzed: 03/21/2013				
1,1,1,2-Tetrachloroethane	9.7		ug/L	10.0		97.0	70-130				
1,1,1-Trichloroethane	10		"	10.0		102	70-130				
1,1,2,2-Tetrachloroethane	11		"	10.0		105	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	9.2		"	10.0		91.7	70-130				
1,1,2-Trichloroethane	9.4		"	10.0		93.9	70-130				
1,1-Dichloroethane	9.8		"	10.0		98.5	70-130				
1,1-Dichloroethylene	9.5		"	10.0		94.8	70-130				
1,1-Dichloropropylene	9.2		"	10.0		91.8	70-130				
1,2,3-Trichlorobenzene	12		"	10.0		122	70-130				
1,2,3-Trichloropropane	9.4		"	10.0		94.5	70-130				
1,2,4-Trichlorobenzene	12		"	10.0		119	70-130				
1,2,4-Trimethylbenzene	16		"	10.0		158	70-130	High Bias			
1,2-Dibromo-3-chloropropane	7.6		"	10.0		76.4	70-130				
1,2-Dibromoethane	10		"	10.0		102	70-130				
1,2-Dichlorobenzene	10		"	10.0		99.7	70-130				
1,2-Dichloroethane	9.4		"	10.0		93.9	70-130				
1,2-Dichloropropane	9.5		"	10.0		95.2	70-130				
1,3,5-Trimethylbenzene	12		"	10.0		117	70-130				
1,3-Dichlorobenzene	9.9		"	10.0		98.8	70-130				
1,3-Dichloropropane	9.5		"	10.0		94.8	70-130				
1,4-Dichlorobenzene	10		"	10.0		99.7	70-130				
2,2-Dichloropropane	12		"	10.0		120	70-130				
2-Butanone	9.9		"	10.0		98.7	70-130				
2-Chlorotoluene	9.9		"	10.0		98.6	70-130				
2-Hexanone	10		"	10.0		101	70-130				
4-Chlorotoluene	10		"	10.0		102	70-130				
4-Methyl-2-pentanone	0.11		"	10.0		1.10	70-130	Low Bias			
Acetone	7.8		"	10.0		78.2	70-130				
Acrylonitrile	9.2		"	10.0		91.5	70-130				
Benzene	10		"	10.0		102	70-130				
Bromobenzene	9.7		"	10.0		97.0	70-130				
Bromochloromethane	10		"	10.0		99.6	70-130				
Bromodichloromethane	10		"	10.0		103	70-130				
Bromoform	11		"	10.0		109	70-130				
Bromomethane	5.1		"	10.0		50.9	70-130	Low Bias			
Carbon disulfide	19		"	20.0		94.2	70-130				
Carbon tetrachloride	10		"	10.0		101	70-130				
Chlorobenzene	9.6		"	10.0		95.6	70-130				
Chloroethane	10		"	10.0		101	70-130				
Chloroform	10		"	10.0		104	70-130				
Chloromethane	9.9		"	10.0		99.3	70-130				
cis-1,2-Dichloroethylene	10		"	10.0		103	70-130				
cis-1,3-Dichloropropylene	11		"	10.0		107	70-130				
Dibromochloromethane	11		"	10.0		106	70-130				
Dibromomethane	10		"	10.0		100	70-130				
Dichlorodifluoromethane	13		"	10.0		131	70-130	High Bias			
Ethyl Benzene	10		"	10.0		101	70-130				
Hexachlorobutadiene	10		"	10.0		105	70-130				
Isopropylbenzene	10		"	10.0		102	70-130				
Methyl Methacrylate	13		"	10.0		125	70-130				
Methyl tert-butyl ether (MTBE)	10		"	10.0		103	70-130				
Methylene chloride	9.4		"	10.0		94.0	70-130				
Naphthalene	15		"	10.0		149	70-130	High Bias			
n-Butylbenzene	10		"	10.0		104	70-130				

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31064 - EPA 5030B											
LCS (BC31064-BS1)							Prepared & Analyzed: 03/21/2013				
n-Propylbenzene	10		ug/L	10.0		102	70-130				
o-Xylene	10		"	10.0		99.9	70-130				
p- & m- Xylenes	22		"	20.0		109	70-130				
p-Isopropyltoluene	11		"	10.0		113	70-130				
sec-Butylbenzene	10		"	10.0		103	70-130				
Styrene	16		"	10.0		161	70-130	High Bias			
tert-Butylbenzene	9.9		"	10.0		98.7	70-130				
Tetrachloroethylene	9.3		"	10.0		92.7	70-130				
Tetrahydrofuran	10		"	10.0		101	70-130				
Toluene	9.7		"	10.0		97.1	70-130				
trans-1,2-Dichloroethylene	9.2		"	10.0		92.0	70-130				
trans-1,3-Dichloropropylene	10		"	10.0		105	70-130				
trans-1,4-dichloro-2-butene	9.7		"	10.0		97.0	70-130				
Trichloroethylene	9.6		"	10.0		96.3	70-130				
Trichlorofluoromethane	10		"	10.0		103	70-130				
Vinyl Chloride	9.8		"	10.0		98.0	70-130				
Surrogate: 1,2-Dichloroethane-d4	*10.2*		*"*	*10.0*		*102*	*70-130*				
Surrogate: p-Bromofluorobenzene	*10.2*		*"*	*10.0*		*102*	*70-130*				
Surrogate: Toluene-d8	*9.87*		*"*	*10.0*		*98.7*	*70-130*				
LCS Dup (BC31064-BSD1)							Prepared & Analyzed: 03/21/2013				
1,1,1,2-Tetrachloroethane	9.7		ug/L	10.0		97.2	70-130		0.206	30	
1,1,1-Trichloroethane	10		"	10.0		102	70-130		0.00	30	
1,1,2,2-Tetrachloroethane	10		"	10.0		104	70-130		0.858	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	9.4		"	10.0		93.9	70-130		2.37	30	
1,1,2-Trichloroethane	9.6		"	10.0		95.6	70-130		1.79	30	
1,1-Dichloroethane	9.9		"	10.0		98.7	70-130		0.203	30	
1,1-Dichloroethylene	9.5		"	10.0		95.3	70-130		0.526	30	
1,1-Dichloropropylene	9.2		"	10.0		91.5	70-130		0.327	30	
1,2,3-Trichlorobenzene	13		"	10.0		126	70-130		3.15	30	
1,2,3-Trichloropropane	9.7		"	10.0		96.7	70-130		2.30	30	
1,2,4-Trichlorobenzene	12		"	10.0		121	70-130		2.00	30	
1,2,4-Trimethylbenzene	16		"	10.0		156	70-130	High Bias	1.27	30	
1,2-Dibromo-3-chloropropane	8.0		"	10.0		80.4	70-130		5.10	30	
1,2-Dibromoethane	10		"	10.0		99.5	70-130		2.29	30	
1,2-Dichlorobenzene	9.7		"	10.0		97.4	70-130		2.33	30	
1,2-Dichloroethane	9.4		"	10.0		93.7	70-130		0.213	30	
1,2-Dichloropropane	9.4		"	10.0		93.6	70-130		1.69	30	
1,3,5-Trimethylbenzene	12		"	10.0		116	70-130		0.942	30	
1,3-Dichlorobenzene	9.7		"	10.0		97.2	70-130		1.63	30	
1,3-Dichloropropane	9.3		"	10.0		92.8	70-130		2.13	30	
1,4-Dichlorobenzene	9.7		"	10.0		97.4	70-130		2.33	30	
2,2-Dichloropropane	11		"	10.0		106	70-130		11.7	30	
2-Butanone	10		"	10.0		99.8	70-130		1.11	30	
2-Chlorotoluene	9.7		"	10.0		96.7	70-130		1.95	30	
2-Hexanone	10		"	10.0		102	70-130		0.891	30	
4-Chlorotoluene	9.9		"	10.0		98.6	70-130		3.19	30	
4-Methyl-2-pentanone	7.5		"	10.0		75.2	70-130		194	30	Non-dir.
Acetone	8.6		"	10.0		85.8	70-130		9.27	30	
Acrylonitrile	9.3		"	10.0		92.8	70-130		1.41	30	
Benzene	10		"	10.0		100	70-130		2.17	30	
Bromobenzene	9.5		"	10.0		94.6	70-130		2.51	30	
Bromochloromethane	9.7		"	10.0		97.1	70-130		2.54	30	
Bromodichloromethane	9.9		"	10.0		99.1	70-130		3.47	30	

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31064 - EPA 5030B											
LCS Dup (BC31064-BSD1)								Prepared & Analyzed: 03/21/2013			
Bromoform	11		ug/L	10.0		106	70-130		2.51	30	
Bromomethane	5.4		"	10.0		54.3	70-130	Low Bias	6.46	30	
Carbon disulfide	19		"	20.0		94.1	70-130		0.159	30	
Carbon tetrachloride	10		"	10.0		100	70-130		0.895	30	
Chlorobenzene	9.4		"	10.0		94.2	70-130		1.48	30	
Chloroethane	10		"	10.0		101	70-130		0.593	30	
Chloroform	10		"	10.0		100	70-130		3.14	30	
Chloromethane	9.9		"	10.0		98.9	70-130		0.404	30	
cis-1,2-Dichloroethylene	10		"	10.0		99.5	70-130		3.07	30	
cis-1,3-Dichloropropylene	10		"	10.0		102	70-130		4.78	30	
Dibromochloromethane	10		"	10.0		103	70-130		2.69	30	
Dibromomethane	9.8		"	10.0		97.5	70-130		3.03	30	
Dichlorodifluoromethane	13		"	10.0		129	70-130		1.38	30	
Ethyl Benzene	10		"	10.0		101	70-130		0.594	30	
Hexachlorobutadiene	11		"	10.0		107	70-130		2.64	30	
Isopropylbenzene	10		"	10.0		102	70-130		0.587	30	
Methyl Methacrylate	12		"	10.0		117	70-130		6.93	30	
Methyl tert-butyl ether (MTBE)	10		"	10.0		99.6	70-130		3.36	30	
Methylene chloride	11		"	10.0		107	70-130		12.9	30	
Naphthalene	16		"	10.0		158	70-130	High Bias	5.98	30	
n-Butylbenzene	10		"	10.0		101	70-130		2.83	30	
n-Propylbenzene	10		"	10.0		100	70-130		2.17	30	
o-Xylene	10		"	10.0		99.8	70-130		0.100	30	
p- & m- Xylenes	22		"	20.0		108	70-130		0.784	30	
p-Isopropyltoluene	11		"	10.0		111	70-130		1.78	30	
sec-Butylbenzene	10		"	10.0		104	70-130		0.290	30	
Styrene	16		"	10.0		158	70-130	High Bias	1.95	30	
tert-Butylbenzene	9.9		"	10.0		98.7	70-130		0.00	30	
Tetrachloroethylene	9.4		"	10.0		93.5	70-130		0.859	30	
Tetrahydrofuran	9.8		"	10.0		98.5	70-130		2.51	30	
Toluene	9.6		"	10.0		96.4	70-130		0.724	30	
trans-1,2-Dichloroethylene	9.0		"	10.0		89.9	70-130		2.31	30	
trans-1,3-Dichloropropylene	10		"	10.0		101	70-130		3.89	30	
trans-1,4-dichloro-2-butene	9.5		"	10.0		95.1	70-130		1.98	30	
Trichloroethylene	9.6		"	10.0		95.7	70-130		0.625	30	
Trichlorofluoromethane	10		"	10.0		104	70-130		0.484	30	
Vinyl Chloride	9.6		"	10.0		95.7	70-130		2.37	30	
Surrogate: 1,2-Dichloroethane-d4	*10.2*		*"*	*10.0*		*102*	*70-130*				
Surrogate: p-Bromofluorobenzene	*10.3*		*"*	*10.0*		*103*	*70-130*				
Surrogate: Toluene-d8	*9.76*		*"*	*10.0*		*97.6*	*70-130*				

YORK
ANALYTICAL LABORATORIES, INC.

Polychlorinated Biphenyls (PCB) by EPA SW 846-8082/EPA Compendium Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC30852 - EPA 3550B											
Blank (BC30852-BLK1)								Prepared: 03/18/2013 Analyzed: 03/19/2013			
Aroclor 1016	ND	0.0167	mg/kg wet								
Aroclor 1221	ND	0.0167	"								
Aroclor 1232	ND	0.0167	"								
Aroclor 1242	ND	0.0167	"								
Aroclor 1248	ND	0.0167	"								
Aroclor 1254	ND	0.0167	"								
Aroclor 1260	ND	0.0167	"								
Aroclor 1262	ND	0.0167	"								
Aroclor 1268	ND	0.0167	"								
Total PCBs	ND	0.0167	"								
Surrogate: Tetrachloro-m-xylene	*0.0647*		*"*	*0.0667*		*97.0*	*30-150*				
Surrogate: Decachlorobiphenyl	*0.0493*		*"*	*0.0670*		*73.6*	*30-150*				
LCS (BC30852-BS2)								Prepared: 03/18/2013 Analyzed: 03/19/2013			
Aroclor 1016	0.381	0.0167	mg/kg wet	0.333		114	40-140				
Aroclor 1260	0.363	0.0167	"	0.333		109	40-140				
Surrogate: Tetrachloro-m-xylene	*0.0833*		*"*	*0.0667*		*125*	*30-150*				
Surrogate: Decachlorobiphenyl	*0.0783*		*"*	*0.0670*		*117*	*30-150*				
LCS Dup (BC30852-BSD2)								Prepared: 03/18/2013 Analyzed: 03/19/2013			
Aroclor 1016	0.362	0.0167	mg/kg wet	0.333		109	40-140		4.96	25	
Aroclor 1260	0.333	0.0167	"	0.333		99.9	40-140		8.55	25	
Surrogate: Tetrachloro-m-xylene	*0.0817*		*"*	*0.0667*		*122*	*30-150*				
Surrogate: Decachlorobiphenyl	*0.0627*		*"*	*0.0670*		*93.5*	*30-150*				

YORK
ANALYTICAL LABORATORIES, INC.

Gas Chromatography/Flame Ionization Determination - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC30812 - EPA 3545A											
Blank (BC30812-BLK1)									Prepared: 03/17/2013 Analyzed: 03/21/2013		
ETPH (Extractable Total Petroleum Hydrocarbons)	ND	10.0	mg/kg wet								
Surrogate: 1-Chlorooctadecane	*11.0*		*"*	*10.0*		*110*	*40.5-152*				
LCS (BC30812-BS1)									Prepared: 03/17/2013 Analyzed: 03/21/2013		
ETPH (Extractable Total Petroleum Hydrocarbons)	62.0	10.0	mg/kg wet	75.0		82.7	60-120				
Surrogate: 1-Chlorooctadecane	*11.6*		*"*	*10.0*		*116*	*40.5-152*				

YORK
ANALYTICAL LABORATORIES, INC.

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC30908 - EPA 3050B											
Blank (BC30908-BLK1)								Prepared & Analyzed: 03/18/2013			
Antimony	ND	0.500	mg/kg wet								
Arsenic	ND	1.00	"								
Barium	ND	0.500	"								
Beryllium	ND	0.100	"								
Cadmium	ND	0.500	"								
Chromium	ND	0.500	"								
Copper	ND	0.500	"								
Lead	ND	0.300	"								
Nickel	ND	0.500	"								
Selenium	ND	0.500	"								
Silver	ND	0.500	"								
Thallium	ND	0.500	"								
Vanadium	ND	0.500	"								
Zinc	ND	0.500	"								
Reference (BC30908-SRM1)								Prepared & Analyzed: 03/18/2013			
Antimony	95.3	0.500	mg/kg wet	120		79.5	20.8-253				
Arsenic	154	1.00	"	168		91.4	70.8-130				
Barium	192	0.500	"	213		90.3	73.2-127				
Beryllium	95.9	0.100	"	110		87.2	75.1-125				
Cadmium	88.2	0.500	"	103		85.6	73-126				
Chromium	106	0.500	"	119		88.9	69.7-129				
Copper	110	0.500	"	118		93.5	74.6-125				
Lead	66.0	0.300	"	76.9		85.8	68.7-131				
Nickel	74.5	0.500	"	70.0		106	70.9-129				
Selenium	117	0.500	"	126		92.8	66.7-134				
Silver	36.1	0.500	"	42.3		85.3	66.2-134				
Thallium	182	0.500	"	208		87.5	69.2-121				
Vanadium	77.5	0.500	"	87.1		88.9	63.1-137				
Zinc	244	0.500	"	276		88.6	71.3-129				

YORK
ANALYTICAL LABORATORIES, INC.

Mercury by EPA 7000/200 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC30881 - EPA SW846-7471											
Blank (BC30881-BLK1)								Prepared: 03/18/2013 Analyzed: 03/19/2013			
Mercury	ND	0.100	mg/kg wet								
LCS (BC30881-BS1)								Prepared: 03/18/2013 Analyzed: 03/19/2013			
Mercury	3.03		mg/kg	3.73		81.2	67.6-131				

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Analysis Sample Containers

Lab ID	Client Sample ID	Volatile Sample Container
13C0445-01	TRIP BLANK	40mL Clear Vial (pre-pres.) HCl; Cool to 4° C
13C0445-07	ELB-3 5'-7'	40mL Vial with Stir Bar-Cool 4° C
13C0445-08	ELB-4 4'-5'	40mL Vial with Stir Bar-Cool 4° C
13C0445-09	ELB-9 3'-4'	40mL Vial with Stir Bar-Cool 4° C
13C0445-10	ELB-13 4'-5'	40mL Vial with Stir Bar-Cool 4° C

Notes and Definitions

S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

QL-02 This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

B Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants. Data users should consider anything <10x the blank value as artifact.

ND Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.

RL REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.

MDL METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.

NR Not reported

RPD Relative Percent Difference

Wet The data has been reported on an as-received (wet weight) basis

Low Bias Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

High Bias High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

Non-Dir. Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the MDL, with values between the MDL and the RL being "J" flagged as estimated results.

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13C0445

YOUR Information	Report To:	Invoice To:
Company: Langan Engineering	Company: Same	Company: Same
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:
Phone No. 203.562.5771	Phone No.	Phone No.
Contact Person: Kyle Zalaski	Attention:	Attention:
E-Mail Address: KZalaski@langan.com	E-Mail Address:	E-Mail Address:

YOUR Project ID: 140068601

Purchase Order No.: 140068601

Samples from: CT X NY ___ NJ ___

Turn-Around Time
- RUSH - Same Day ☐
- RUSH - Next Day ☐
- RUSH - Two Day ☐
- RUSH - Three Day ☐
- RUSH - Four Day ☐
- Standard(5-7 Days) X

Report Type
- Summary Report
- Summary w/ QA Summary
- CT RCP Package
- CTRCP DQA/DUE Pkg
- NY ASP A Package
- NY ASP B Package
- NJDEP Red. Deliv.

Electronic Data Deliverables (EDD)
- Simple Excel ✓
- NYSDEC EQuIS
- EQuIS (std)
- EZ-EDD (EQuIS)
- NJDEP SRP HazSite EDD
- GIS/KEY (std)
- Other pdf
- **York Regulatory Comparison Excel Spreadsheet**

Compare to the following Regs. (please fill in):

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Kyle Zalaski
Name (printed)

Matrix Codes
- S - soil
- Other - specify(oil, etc.)
- WW - wastewater
- GW - groundwater
- DW - drinking water
- Air-A - ambient air
- Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL Met/Cn	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360-Routine	Heterotrophs
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360-Baseline	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360-Extended	BTU/lb.
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360-Full List	Aquatic Tox.
Halog.only	NJDEP list	App. IX	Chlordane	Indls. Metals	Air TICs	NYCDEP Sewer	TOC
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
TRIP BLANK	3/13/13 00:00	AQ	VOCs(8260)	2 40ml VOAs
ELB-8 3'-4'	10:40	S	SVOCs(8270), CTETPH	1-8oz glass
ELB-7 5'-7'	10:25			
ELB-1 10'-11'	09:10			
ELB-2 9'-11'	09:30			
ELB-10 1'-2'	11:00			
ELB-3 5'-7'	11:50		SVOCs(8270), CTETPH, VOCs(8260), PCBs(8082), CT LISTED METALS	1-8oz glass, 3 ENCORES
ELB-4 4'-5'	11:25			
ELB-9 3'-4'	15:15			
ELB-13 4'-5'	14:20			

Comments

Preservation Check those Applicable: 4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Special Instructions
- Field Filtered ☐
- Lab to Filter ☐

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Joshua Hill	3.14.13 1030	[illegible]	3/14 10:30
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time
		[illegible]	3/14/13 -1700

Temperature on Receipt 3.8 °C

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Report Date: 03/22/2013
Client Project ID: 140068601
York Project (SDG) No.: 13C0478

CT License No. PH-0723 New Jersey License No. CT-005 New York License No. 10854 PA License No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 03/22/2013
Client Project ID: 140068601
York Project (SDG) No.: 13C0478

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on March 15, 2013 and listed below. The project was identified as your project: **140068601**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13C0478-01	TRIP BLANK	Water	03/14/2013	03/15/2013
13C0478-02	HA-3	Soil	03/14/2013	03/15/2013

General Notes for York Project (SDG) No.: 13C0478

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By: **Date:** 03/22/2013

Robert Q. Bradley
Laboratory Director

YORK

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **TRIP BLANK** **York Sample ID:** **13C0478-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Water	March 14, 2013 12:00 am	03/15/2013

Volatile Organics, CT RCP List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.071	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.024	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.17	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.074	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.070	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.11	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	0.12	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.17	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	0.11	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.068	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	0.46	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.15	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.071	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.051	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.059	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.048	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.048	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.096	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
78-93-3	2-Butanone	ND		ug/L	1.0	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.084	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
591-78-6	2-Hexanone	ND		ug/L	0.24	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.072	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.17	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
67-64-1	Acetone	ND		ug/L	0.90	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
107-13-1	Acrylonitrile	ND		ug/L	0.73	1.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
71-43-2	Benzene	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
108-86-1	Bromobenzene	ND		ug/L	0.081	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
74-97-5	Bromochloromethane	ND		ug/L	0.10	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.054	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-25-2	Bromoform	ND		ug/L	0.079	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: TRIP BLANK

York Sample ID: 13C0478-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Water	March 14, 2013 12:00 am	03/15/2013

Volatile Organics, CT RCP List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
74-83-9	Bromomethane	ND		ug/L	0.20	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-15-0	Carbon disulfide	ND		ug/L	0.065	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.085	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
108-90-7	Chlorobenzene	ND		ug/L	0.063	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-00-3	Chloroethane	ND		ug/L	0.090	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
67-66-3	Chloroform	ND		ug/L	0.079	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
74-87-3	Chloromethane	ND		ug/L	0.076	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.069	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.067	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.053	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
74-95-3	Dibromomethane	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.092	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.057	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.12	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.056	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.22	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.48	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-09-2	Methylene chloride	ND		ug/L	0.26	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
91-20-3	Naphthalene	ND		ug/L	0.090	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.083	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.068	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
95-47-6	o-Xylene	ND		ug/L	0.050	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	0.090	1.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.044	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.050	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
100-42-5	Styrene	ND		ug/L	0.043	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.050	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.070	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
109-99-9	Tetrahydrofuran	ND		ug/L	1.0	2.0	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
108-88-3	Toluene	ND		ug/L	0.042	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.085	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.060	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.092	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
79-01-6	Trichloroethylene	ND		ug/L	0.071	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.094	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: TRIP BLANK **York Sample ID:** 13C0478-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Water	March 14, 2013 12:00 am	03/15/2013

Volatile Organics, CT RCP List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-01-4	Vinyl Chloride	ND		ug/L	0.062	0.50	1	SW8260B	03/21/2013 08:21	03/21/2013 15:16	SS

Sample Information

Client Sample ID: HA-3 **York Sample ID:** 13C0478-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Soil	March 14, 2013 12:10 pm	03/15/2013

Volatile Organics, CT RCP List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.2	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.22	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.7	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/kg dry	0.57	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.3	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	0.86	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	0.71	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	0.80	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.92	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	1.2	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.2	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	0.94	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	2.3	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.68	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	0.75	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	0.87	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.69	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.77	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	1.0	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	1.1	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.2	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	0.81	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
78-93-3	2-Butanone	ND		ug/kg dry	1.5	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	0.70	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **HA-3** **York Sample ID:** **13C0478-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Soil	March 14, 2013 12:10 pm	03/15/2013

Volatile Organics, CT RCP List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
591-78-6	2-Hexanone	ND		ug/kg dry	1.2	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	0.88	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	1.1	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
67-64-1	**Acetone**	**270**		ug/kg dry	11	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
107-13-1	Acrylonitrile	ND		ug/kg dry	1.4	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
71-43-2	Benzene	ND		ug/kg dry	0.85	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
108-86-1	Bromobenzene	ND		ug/kg dry	1.1	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	0.68	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.3	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-25-2	Bromoform	ND		ug/kg dry	0.81	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
74-83-9	Bromomethane	ND		ug/kg dry	1.9	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-15-0	Carbon disulfide	ND		ug/kg dry	0.63	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	0.84	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.85	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-00-3	Chloroethane	ND		ug/kg dry	0.96	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
67-66-3	Chloroform	ND		ug/kg dry	0.87	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
74-87-3	Chloromethane	ND		ug/kg dry	0.95	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.50	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.79	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	1.0	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
74-95-3	Dibromomethane	ND		ug/kg dry	1.1	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	0.79	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.50	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.2	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.91	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
80-62-6	Methyl Methacrylate	ND		ug/kg dry	1.4	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.64	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-09-2	Methylene chloride	ND		ug/kg dry	1.6	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
91-20-3	Naphthalene	ND		ug/kg dry	1.9	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.76	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	0.72	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
95-47-6	o-Xylene	ND		ug/kg dry	0.63	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/kg dry	1.6	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.53	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	0.81	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-3 **York Sample ID:** 13C0478-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Soil	March 14, 2013 12:10 pm	03/15/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
100-42-5	Styrene	ND		ug/kg dry	0.57	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	0.81	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	0.93	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
109-99-9	Tetrahydrofuran	ND		ug/kg dry	2.5	17	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
108-88-3	Toluene	ND		ug/kg dry	0.67	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	0.90	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	0.89	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	1.6	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	0.85	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.61	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.47	8.6	1	SW8260B	03/20/2013 09:00	03/20/2013 15:40	SS

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	173	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	74.3	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	127	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	158	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	97.8	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	163	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	76.1	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	332	949	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	331	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	166	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	241	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	148	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	149	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	475	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	337	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	144	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	475	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	181	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	122	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	190	949	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-3 **York Sample ID:** 13C0478-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Soil	March 14, 2013 12:10 pm	03/15/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	290	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	159	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	242	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	258	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	316	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	409	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
83-32-9	Acenaphthene	ND		ug/kg dry	261	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	145	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
62-53-3	Aniline	ND		ug/kg dry	116	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
120-12-7	Anthracene	ND		ug/kg dry	147	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	142	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	238	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	309	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	325	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	212	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	323	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	172	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	231	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	418	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	134	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
218-01-9	**Chrysene**	**479**		ug/kg dry	144	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	232	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	274	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	301	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	148	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	410	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	176	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
206-44-0	**Fluoranthene**	**1030**		ug/kg dry	475	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
86-73-7	Fluorene	ND		ug/kg dry	302	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	190	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	236	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	119	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	475	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	279	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
78-59-1	Isophorone	ND		ug/kg dry	195	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-3 **York Sample ID:** 13C0478-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Soil	March 14, 2013 12:10 pm	03/15/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
91-20-3	Naphthalene	ND		ug/kg dry	145	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	131	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	475	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	246	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	125	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	209	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
85-01-8	**Phenanthrene**	**510**		ug/kg dry	126	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
108-95-2	Phenol	ND		ug/kg dry	128	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
129-00-0	**Pyrene**	**1040**		ug/kg dry	352	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR
110-86-1	Pyridine	ND		ug/kg dry	251	475	1	EPA SW-846 8270C	03/19/2013 07:47	03/22/2013 11:11	SR

Polychlorinated Biphenyls(PCB RCP)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3550B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
11104-28-2	Aroclor 1221	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
11141-16-5	Aroclor 1232	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
53469-21-9	Aroclor 1242	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
12672-29-6	Aroclor 1248	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
11097-69-1	Aroclor 1254	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
11096-82-5	Aroclor 1260	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
37324-23-5	Aroclor 1262	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
11100-14-4	Aroclor 1268	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW
1336-36-3	Total PCBs	ND		mg/kg dry	0.0475	0.0475	1	EPA SW 846-8082	03/19/2013 07:43	03/20/2013 14:52	JW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-3 **York Sample ID:** 13C0478-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0478	140068601	Soil	March 14, 2013 12:10 pm	03/15/2013

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	**ETPH (Extractable Total Petroleum Hydrocarbons)**	**65.7**		mg/kg dry	4.04	19.0	1	CT DEP ETPH	03/19/2013 15:01	03/22/2013 12:46	SR

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/kg dry	0.418	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-38-2	**Arsenic**	**5.23**		mg/kg dry	0.645	1.90	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-39-3	**Barium**	**97.7**		mg/kg dry	0.247	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-41-7	Beryllium	ND		mg/kg dry	0.190	0.190	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-43-9	Cadmium	ND		mg/kg dry	0.190	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-47-3	**Chromium**	**20.9**		mg/kg dry	0.228	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-50-8	**Copper**	**40.7**		mg/kg dry	0.228	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7439-92-1	**Lead**	**453**		mg/kg dry	0.323	0.570	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-02-0	**Nickel**	**24.8**		mg/kg dry	0.247	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7782-49-2	Selenium	ND		mg/kg dry	0.949	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-22-4	Silver	ND		mg/kg dry	0.190	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-28-0	Thallium	ND		mg/kg dry	0.608	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-62-2	**Vanadium**	**41.2**		mg/kg dry	0.209	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW
7440-66-6	**Zinc**	**200**		mg/kg dry	0.171	0.949	1	EPA SW846-6010B	03/19/2013 08:51	03/19/2013 12:05	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.178	0.190	1	EPA SW846-7471	03/19/2013 08:37	03/20/2013 10:19	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**52.7**		%	0.100	0.100	1	SM 2540G	03/19/2013 13:16	03/19/2013 13:16	AMC

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Volatile Analysis Sample Containers

Lab ID	Client Sample ID	Volatile Sample Container
13C0478-01	TRIP BLANK	40mL 01_Clear Vial Cool to 4° C
13C0478-02	HA-3	Encore Sampler

Notes and Definitions

S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

QL-02 This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

B Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants. Data users should consider anything <10x the blank value as artifact.

ND Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.

RL REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.

MDL METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.

NR Not reported

RPD Relative Percent Difference

Wet The data has been reported on an as-received (wet weight) basis

Low Bias Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

High Bias High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

Non-Dir. Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the MDL, with values between the MDL and the RL being "J" flagged as estimated results.

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120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13C0478

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering	Company: same	Company: same	140068601	RUSH - Same Day ☐	Summary Report ___
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:	Purchase Order No. 140068601	RUSH - Next Day ☐	Summary w/ QA Summary ___
Phone No. 203.562.5771	Phone No.	Phone No.		RUSH - Two Day ☐	CT RCP Package ___
Contact Person: Kyle Zalaski	Attention:	Attention:		RUSH - Three Day ☐	NY ASP A Package ___
E-Mail Address: kzalaski@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY ___ NJ ___	RUSH - Four Day ☐	NY ASP B Package ___
				Standard(5-7 Days) X	*Electronic Deliverables:* EDD (Specify Type) ___ Excel pdf & excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 full	TICs	8270 / 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MeCN	Ignitability	TKN	Cyanide-T
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot.Nitrogen	Cyanide-A
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.	Ammonia-N	BOD5
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360 Marine	Heterotrophs	Chloride	CBOD5
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360 Marine	TOX	Phosphate	BOD28
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360	BTU/lb.	Tot. Phos.	COD
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360	Aquatic Tox.	Oil&Grease	TSS
Halog.only	NJDEP list	App. IX	Chlordane	Info. Metals	Air TICs	NYCDEP Sewer	TOC	F.O.G.	Total Solids
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos	pH	TDS
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664

Matrix Codes
S - soil
Other - specify (oil, etc.)
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Special Instructions
Field Filtered ☐
Lab to Filter ☐

Kyle Zalaski
Samples Collected/Authorized By (Signature)
Kyle Zalaski
Name (printed)

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
TRIP BLANK	3/14/13 00:00	AQ	VOCs (8260)	2 VOAs
HA-3	12:10	SO	VOCs (8260), SVOCs (8270), PCBs (8082), CTETPH, CT LISTED Metals	1 8oz glass, 3 ENCORES
HA-1	11:35		Lead (total), PCBs (8082) *HOLD*	1 2oz glass
HA-2	11:45			
HA-4	12:30			
HA-5	12:48			
HA-6	13:00			
HA-7	13:12			
HA-8	13:23			
HA-9	13:30			

Comments

Reporting limits must meet CTDEEP RSRs

Preservation
Check those Applicable
4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___
ZnAc ___ Ascorbic Acid ___ Other ___

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
[signature]	3/15/13 2:05	[signature]	3-15-13 14:05
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time
		[signature]	3/15/13 - 1600

Temperature on Receipt 3.8 °C

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13C0478

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Eng.	Company: Same	Company: Same	14006860 1	RUSH - Same Day	Summary Report
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day	Summary w/ QA Summary
Phone No. 203. 567. 5771	Phone No.	Phone No.		RUSH - Two Day	CT RCP Package
Contact Person: Kyle Zalaski	Attention:	Attention:		RUSH - Three Day	NY ASP A Package
E-Mail Address: kzalaski@langancon	E-Mail Address:	E-Mail Address:	Samples from: CT X NY___ NJ___	RUSH - Four Day	NY ASP B Package
				Standard(5-7 Days) X	*Electronic Deliverables:* EDD (Specify Type)
					Excel pdf & excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Kyle Zalaski
Name (printed)

Matrix Codes
S - soil
Other - specify(oil, etc.)
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters			Special Instructions
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color	Field Filtered ☐
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols	Lab to Filter ☐
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MetCN	Ignitability	TKN	Cyanide-T	
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot.Nitrogen	Cyanide-A	
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.	Ammonia-N	BOD5	
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part360 Routine	Heterotrophs	Chloride	CBOD5	
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part360 Baseline	TOX	Phosphate	BOD28	
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part360+	BTU/lb	Tot. Phos.	COD	
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part360+	Aquatic Tox.	Oil&Grease	TSS	
Halog.only	NJDEP list	App. IX	Chlordane	Indp. Metals	Air TICs	NYCDEP Sewer	TOC	F.O.G.	Total Solids	
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos	pH	TDS	
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664	

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HA-10	3/14/13 13:37	SO	Lead (total), PCBs (8082) * HOLD #	1 2oz glass
HA-11	13:45			
HA-12	13:52			
HA-13	13:58			
HA-14	14:18			
HA-15	14:30			

Comments

Reporting Limits must meet CTDEEP RSRs

Preservation Check those Applicable: 4°C___ Frozen___ HCl___ MeOH___ HNO_3___ H_2SO_4___ NaOH___ ZnAc___ Ascorbic Acid___ Other___

Samples Relinquished By	Date/Time 3.14.13 2:05	Samples Received By	Date/Time 3-15-13 14:05
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time 3/15/13-1600

Temperature on Receipt 3.8 °C

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ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Report Date: 04/03/2013
Client Project ID: 140068601
York Project (SDG) No.: 13D0073

CT License No. PH-0723 New Jersey License No. CT-005 New York License No. 10854 PA License No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 04/03/2013
Client Project ID: 140068601
York Project (SDG) No.: 13D0073

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on March 15, 2013 and listed below. The project was identified as your project: **140068601**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13D0073-01	HA-1	Soil	03/14/2013	03/15/2013
13D0073-02	HA-2	Soil	03/14/2013	03/15/2013
13D0073-03	HA-4	Soil	03/14/2013	03/15/2013
13D0073-04	HA-5	Soil	03/14/2013	03/15/2013
13D0073-05	HA-14	Soil	03/14/2013	03/15/2013
13D0073-06	HA-15	Soil	03/14/2013	03/15/2013
13D0073-07	HA-16	Soil	03/28/2013	03/15/2013
13D0073-08	HA-17	Soil	03/28/2013	03/15/2013

General Notes for York Project (SDG) No.: 13D0073

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By: **Date:** 04/03/2013

Robert Q. Bradley
Laboratory Director

YORK

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Sample Information

Client Sample ID: HA-1 **York Sample ID:** 13D0073-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 14, 2013 11:35 am	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**713**		mg/kg dry	0.213	0.377	1	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 02:43	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**79.7**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

Sample Information

Client Sample ID: HA-2 **York Sample ID:** 13D0073-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 14, 2013 11:45 am	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**17100**		mg/kg dry	22.7	40.1	100	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 03:11	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**74.9**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

Sample Information

Client Sample ID: HA-4 **York Sample ID:** 13D0073-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 14, 2013 12:30 pm	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**36.0**		mg/kg dry	0.185	0.327	1	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 03:18	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**91.8**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

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Sample Information

Client Sample ID: HA-5 **York Sample ID:** 13D0073-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 14, 2013 12:48 pm	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**410**		mg/kg dry	0.216	0.381	1	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 03:22	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**78.7**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

Sample Information

Client Sample ID: HA-14 **York Sample ID:** 13D0073-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 14, 2013 2:18 pm	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**834**		mg/kg dry	0.214	0.377	1	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 03:27	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**79.5**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

Sample Information

Client Sample ID: HA-15 **York Sample ID:** 13D0073-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 14, 2013 2:30 pm	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**428**		mg/kg dry	0.230	0.406	1	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 03:31	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**73.9**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

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ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-16 **York Sample ID:** 13D0073-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 28, 2013 11:00 am	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**56.4**		mg/kg dry	0.182	0.321	1	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 03:36	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**93.5**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

Sample Information

Client Sample ID: HA-17 **York Sample ID:** 13D0073-08

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0073	140068601	Soil	March 28, 2013 11:10 am	03/15/2013

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**140**		mg/kg dry	0.194	0.343	1	EPA SW846-6010B	04/02/2013 15:16	04/03/2013 03:40	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**87.5**		%	0.100	0.100	1	SM 2540G	04/03/2013 11:59	04/03/2013 11:59	AMC

Notes and Definitions

ND	Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
MDL	METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the MDL, with values between the MDL and the RL being "J" flagged as estimated results.

YORK
ANALYTICAL LABORATORIES, INC.

120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 337-0164

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

Page 1 of 1
13D0073

York Project No. 13D0033

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type
Company: Langan Engineering Address: 555 Longwharf Dr New Haven, CT 06511 Phone No: 203 567.5771 Contact Person: Kyle Zalaski E-Mail Address: KZalaski@langan.com	Company: Same Address: Phone No: Attention: E-Mail Address:	Company: Same Address: Phone No: Attention: E-Mail Address:	14006B603 Purchase Order No. 14006B603 Samples from: CT X NY NJ	RUSH - Same Day RUSH - Next Day RUSH - Two Day RUSH - Three Day RUSH - Four Day Standard(5-7 Days) X	Summary Report Summary w/ QA Summary X CT RCP Package CT RCP DQA/DUE Pkg NY ASP A Package NY ASP B Package NJDEP Red. Deliv. *Electronic Data Deliverables (EDD)* Sample Excel NYSDEC EQuIS EQuIS (std) EZ-EDD (EQuIS) NJDEP SRP HazSite EDD GIS/KEY (std) Other **York Regulatory Comparison Excel Spreadsheet** Compare to the following (pick 10 max)

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri Poll.	Corrosivity
624	Site Spec	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TCL MetOH	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT 15 list	NY 310.13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec	NJDEP list	Air TO14A	Part 360 Inorg	Electroplate
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360 Inorg	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360 Organics	BTU/lb
Aroms. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360 Organics	Aquatic Tox.
Halog. only	NJDEP list	App. IX	Chlordane	Info. Metals	Air TICs	NYCDEP Metals	TOC
App. IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Metals	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes	
S -	soil
Other -	specify(oil, etc.)
WW -	wastewater
GW -	groundwater
DW -	drinking water
Air-A -	ambient air
Air-SV -	soil vapor

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HA-16	3/28/13 11:00	SO	Lead *Hold analysis until authorized by Langan*	1 2oz glass
HA-17	3/28/13 11:10	SO	Lead *Hold analysis until authorized by Langan*	1 2oz glass

Comments

Preservation (Check those Applicable): 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO$_3$ ____ H$_2$SO$_4$ ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Special Instructions: Field Filtered ☐ Lab to Filter ☐

Samples Relinquished By: Kyle Zalaski — Date/Time: 3/28/13 14:50

Samples Relinquished By: ____ Date/Time: ____

Samples Received By: TC Field — Date/Time: 3/28/13 1450

Samples Received in LAB by: [illegible] — Date/Time: 3-28-13 1530

Temperature on Receipt: 3.1 °C

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ANALYTICAL LABORATORIES, INC.

120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are printed on the back side of this document. Use this document as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

Page 1 of 2
13D0073

York Project No. 13C0478

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering Address: 555 Long Wharf Dr. New Haven, CT Phone No.: 203.562.5771 Contact Person: Kyle Zalaski E-Mail Address: Kzalaski@langan.com	Company: same Address: Phone No.: Attention: E-Mail Address:	Company: same Address: Phone No.: Attention: E-Mail Address:	14C0068601 **Purchase Order No.** 14C0068601 Samples from: CT X NY NJ	RUSH - Same Day RUSH - Next Day RUSH - Two Day RUSH - Three Day RUSH - Four Day Standard(5-7 Days) X	Summary Report Summary w/ QA CT RCP Package NY ASP A Package NY ASP B Package *Electronic Deliverables:* EDD (Specify Type) Excel pdf & excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Kyle Zalaski
Name (printed)

Matrix Codes
S - soil
Other - specify
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles: 624 (CT) | TICs | 624 | Air Spec | STARS list | BN Only | Acids Only | BAH list | TAGM list | CT RCP list | TCL list | NJDEP list | App IX | SPLP or TCLP

Semi-Vols.: 625 (CT) | 8270 (CT) | STARS list | 8270 Pest | RTI Herb | CT RCP | App IX | Sim Spec | SPLP or TCLP | TCLP Pest | TCLP Herb | Chlorobenz | 608 Pest | 608 PCB

Pesticides: 8081 (CT) | 8082 (CT)

Metals: RCRA | PPL list | EAL | CT RCP | TAGM list | NJDEP list | Lead | Dissolved | SPLP or TCLP | App IX | 6010 Pest | 8151 Herb | 1357 Sulfur

Misc. Org.: TPH GRO | TPH DRO | CT ETPH | NY 310.13 | TPH 1664 | Air TO14A | Air TO15 | Air STARS | Air VPH | Air TRS | Methane | Helium

Full Lists: Pr Poll | TCL Organics | Reactivity | Ignitability | Flash Point | Sieve Anal | Hydrocarbons | TCN | Phenols | Cyanide-T | Cyanide-A | Chloride | Phosphate | Tot. Phos | Aquatic Tox | FOG | Sulfide | Sulfate | Sulfite

Common Miscellaneous Parameters: Corrosivity | Reactivity | Ignitability | Flash Point | Sieve Anal | Hydrocarbons | TCN | Phenols | Cyanide-T | Cyanide-A | Chloride | Phosphate | Tot. Phos | Aquatic Tox | FOG | Sulfide | Sulfate | Sulfite | Nitrate | Nitrite | TKN | Tot Nitrogen | AmmoniaN | BOD5 | CBOD5 | BOD20 | COD | TSS | Total Solids | TDS | TPH 1664

Special Instructions
Field Filtered
Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
TRIP BLANK	3/14/13 00:00	AQ	VOCs (8260)	2 VOAs
HA-3	12:10	SO	VOCs (8260), SVOCs (8270), PCBs (8082), CTETPH, CT LISTED Metals	1 8oz glass, 3 ENCORES
HA-1	11:35		Lead (total), PCBs (8082) *HOLD*	1 2oz glass
HA-2	11:45			
HA-4	12:30			
HA-5	12:48			
HA-6	13:00			
HA-7	13:12			
HA-8	13:23			
HA-9	13:30			

Comments
Reporting limits must meet CTDEEP RSRs

Preservation (Check those Applicable): FC | Filtered | HCl | Zn Ac | MeOH | Ascorbic Acid | HNO | H2SO | NaOH | Other

Samples Relinquished By: [signature] Date/Time: 3/15/13 2:05
Samples Received By: [signature] Date/Time: 3-15-13 14.05
Samples Relinquished By: Date/Time:
Samples Received in LAB by: [signature] Date/Time: 3/15/13 - 1600

Temperature on Receipt: 3.8 °C

1300073

YORK
ANALYTICAL LABORATORIES, INC.

120 Research Dr. Stratford, CT 06615
(203) 325-1371 Fax (203) 337-0166

Field Chain-of-Custody Record

NOTE: York's Sale Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Sale Terms & Conditions unless superseded by a mutually signed contract.

York Project No. 13C0478

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Eng.	Company: Same	Company: Same	14006860 1	RUSH - Same Day	Summary Report
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day	Summary w/ QA
Phone No: 203 567 5771	Phone No:	Phone No:		RUSH - Two Day	CT RCP Package
Contact Person: Kyle Zelaski	Attention:	Attention:		RUSH - Three Day	NY ASP A Package
E-Mail Address: kzelaski@langancon	E-Mail Address:	E-Mail Address:	Samples from: CT X NY NJ	RUSH - Four Day	NY ASP B Package
				Standard(5-7 Days) X	Electronic Deliverables: EDD (Specify Type) Excel pdf & excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zelaski
Samples Collected/Authorized By (Signature)

Kyle Zelaski
Name (printed)

Matrix Codes
S - soil
Other - specify
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pesticides	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 full	TRV	8270 or 625	Cl-Pest	RCRA8	TPH GRO	Pri Poll.	Corrosivity	Nitrite	Color
624	Sec Solvt.	STARS list	608 Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrate	Phenols
STARS list	Nonaro Co	BN Only	615 Herb	TAL	CT ETPH	TAL Metals	Ignitability	TKN	Cyanide-T
BTEX	Suffolk Co	Acids Only	CT RCP	CT 15 list	NY 310-13	Full TCLP	Flash Point	NO3/Nitrogen	Cyanide-A
MTBE	Kennedy	PAH list	App IX	TAGM list	TPH 1664	Full App. IX	Sulfide	AmmoniaN	BOD5
TCL list	Oxygenates	TAGM list	Sec Spec	NJDEP list	Air TO-14A	Pet 8040/Sulfur	Heterotrophs	Chloride	CBOD5
TAGM list	TCLP 8	CT RCP list	SPLP or TCLP	Total	Air TO15	Pet 9056/Sulfate	TOC	Phosphate	BOD20
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Pet 300/	HTOC	Tot Phos	COD
Arom. only	HCL	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Pet 300/	Aquatic Tox	O&G/Grease	TSS
Halogen only	NJDEP list	App IX	Chlorinated	Info. Metals	Air TICs	NYCDEP	TOC	E.Coli	Total Solids
App IX list	SPLP or TCLP	TCLP BNA	Herb Pest	CT 15 Metals	Methane	NYSDEC	Asbestos	pH	TDS
8021B list		SPLP or TCLP	Sulfur PCB		Helium	TAGM	Silica	SHAS	TPH 1664

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HA-10	3/14/13 13:37	SO	Lead (total), PCBs (8082) * HOLD #	1 2oz glass
HA-11	13:45			
HA-12	13:52			
HA-13	13:58			
HA-14	14:18			
HA-15	14:30			

Comments

Reporting Limits must meet CTDEEP RSRs

Preservation (Check those Applicable): 4°C ___ Freezer ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
	3.14.13 2:05	Chris C	3-15-13 1405
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time
		J. H.	3/15/13-1600

Temperature on Receipt: 3.8 °C

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Report Date: 04/04/2013
Client Project ID: 140068601
York Project (SDG) No.: 13D0164

CT License No. PH-0723 New Jersey License No. CT-005 New York License No. 10854 PA License No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 04/04/2013
Client Project ID: 140068601
York Project (SDG) No.: 13D0164

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on March 15, 2013 and listed below. The project was identified as your project: **140068601**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13D0164-01	HA-1	Soil	03/14/2013	03/15/2013
13D0164-02	HA-2	Soil	03/14/2013	03/15/2013
13D0164-03	HA-4	Soil	03/14/2013	03/15/2013
13D0164-04	HA-5	Soil	03/14/2013	03/15/2013
13D0164-05	HA-14	Soil	03/14/2013	03/15/2013
13D0164-06	HA-15	Soil	03/14/2013	03/15/2013
13D0164-07	HA-16	Soil	03/28/2013	03/15/2013
13D0164-08	HA-17	Soil	03/28/2013	03/15/2013

General Notes for York Project (SDG) No.: 13D0164

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By:

Date: 04/04/2013

Robert Q. Bradley
Laboratory Director

YORK

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-1 **York Sample ID:** 13D0164-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 14, 2013 11:35 am	03/15/2013

TCLP Extraction for METALS EPA 1311

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.562**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 12:23	MW

Sample Information

Client Sample ID: HA-2 **York Sample ID:** 13D0164-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 14, 2013 11:45 am	03/15/2013

TCLP Extraction for METALS EPA 1311

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.673**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 12:40	MW

Sample Information

Client Sample ID: HA-4 **York Sample ID:** 13D0164-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 14, 2013 12:30 pm	03/15/2013

TCLP Extraction for METALS EPA 1311

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.174**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 12:48	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-5 **York Sample ID:** 13D0164-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 14, 2013 12:48 pm	03/15/2013

TCLP Extraction for METALS EPA 1311 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.290**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 12:53	MW

Sample Information

Client Sample ID: HA-14 **York Sample ID:** 13D0164-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 14, 2013 2:18 pm	03/15/2013

TCLP Extraction for METALS EPA 1311 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**2.88**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 12:58	MW

Sample Information

Client Sample ID: HA-15 **York Sample ID:** 13D0164-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 14, 2013 2:30 pm	03/15/2013

TCLP Extraction for METALS EPA 1311 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0629**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 13:03	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: HA-16 **York Sample ID:** 13D0164-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 28, 2013 11:00 am	03/15/2013

TCLP Extraction for METALS EPA 1311 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0392**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 13:08	MW

Sample Information

Client Sample ID: HA-17 **York Sample ID:** 13D0164-08

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13D0164	140068601	Soil	March 28, 2013 11:10 am	03/15/2013

TCLP Extraction for METALS EPA 1311 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1311	04/03/2013 17:00	04/04/2013 10:22	KK

Lead TCLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0410**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	04/04/2013 10:43	04/04/2013 13:13	MW

YORK
ANALYTICAL LABORATORIES, INC.

Analytical Batch Summary

Batch ID: BD30169 **Preparation Method:** EPA SW 846-1311 TCLP ext. for meta **Prepared By:** KK

YORK Sample ID	Client Sample ID	Preparation Date
13D0164-01	HA-1	04/03/13
13D0164-02	HA-2	04/03/13
13D0164-03	HA-4	04/03/13
13D0164-04	HA-5	04/03/13
13D0164-05	HA-14	04/03/13
13D0164-06	HA-15	04/03/13
13D0164-07	HA-16	04/03/13
13D0164-08	HA-17	04/03/13
BD30169-BLK1	Blank	04/03/13

Batch ID: BD30194 **Preparation Method:** EPA 3010A **Prepared By:** MW

YORK Sample ID	Client Sample ID	Preparation Date
13D0164-01	HA-1	04/04/13
13D0164-02	HA-2	04/04/13
13D0164-03	HA-4	04/04/13
13D0164-04	HA-5	04/04/13
13D0164-05	HA-14	04/04/13
13D0164-06	HA-15	04/04/13
13D0164-07	HA-16	04/04/13
13D0164-08	HA-17	04/04/13
BD30194-BLK1	Blank	04/04/13
BD30194-BLK2	Blank	04/04/13
BD30194-SRM1	Reference	04/04/13

YORK
ANALYTICAL LABORATORIES, INC.

TCLP Extraction by EPA SW-846 1311 - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag

Batch BD30169 - EPA SW 846-1311 TCLP ext. for metals

Blank (BD30169-BLK1) Prepared: 04/03/2013 Analyzed: 04/04/2013

TCLP Extraction	Completed	1.00	N/A								

YORK
ANALYTICAL LABORATORIES, INC.

TCLP Metals by EPA SW846-1311/6010B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BD30194 - EPA 3010A											
Blank (BD30194-BLK1)								Prepared & Analyzed: 04/04/2013			
Lead	ND	0.00300	mg/L								
Blank (BD30194-BLK2)								Prepared & Analyzed: 04/04/2013			
Lead	ND	0.00300	mg/L								
Reference (BD30194-SRM1)								Prepared & Analyzed: 04/04/2013			
Lead	0.268	0.00300	mg/L	0.259		103	85.7-114				

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Notes and Definitions

EXT-COMP Completed

ND	Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
MDL	METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the MDL, with values between the MDL and the RL being "J" flagged as estimated results.

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13D0164

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering Address: 555 Long Wharf Dr New Haven, CT Phone No. 203.562.5771 Contact Person: Kyle Zalaski E-Mail Address: kzalaski@langan.com	Same	Same	140068601 Purchase Order No. 140068601 Samples from: CT X NY NJ	RUSH - Same Day RUSH - Next Day 24 hr X RUSH - Two Day RUSH - Three Day RUSH - Four Day Standard (5-7 Days) X	Summary Report Summary w/ QA Summary CT RCP Package NY ASP A Package NY ASP B Package Electronic Deliverables: EDD (Specify Type) Excel PDF & excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Name (printed)

Matrix Codes: S - soil; Other - specify; WW - wastewater; GW - groundwater; DW - drinking water; Air-A - ambient air; Air-SV - soil vapor

Volatiles: 8260 full, TICs, 624, Site Spec, STARS list, Aqueous Liq, BTEX, Sulfide Liq, MTBE, Ketones, TCL list, Oxygenates, TAGM list, TCLP list, CT RCP list, 5242, Acrylonitrile, 8022, Halog only, NJDEP list, App. IX, App.IX list, SPLP or TCLP, 8270 list

Semi-Vols.: 8270, 625, STARS list, BN Only, Acids Only, PAH list, TAGM list, Site Spec, CT RCP list, TCL list, NJDEP list, App. IX, TCLP BNA, SPLP or TCLP

Pest/PCB/Herb: 8081/PCB, 8151/Herb, TAL, CT RCP, Site Spec, NJDEP list, SPLP or TCLP, Total, TCLP Pest, TCLP Herb, Chlordane, pesticide Prep, 1251/Herb

Metals: RCRA 8, 8010/Pest, TAL, CT RCP, Site Spec, NJDEP list, SPLP or TCLP, Total, Dissolved, SPLP or TCLP, Info. Metals, 1251/Herb

Misc. Org.: TPH GRO, TPH DRO, CT ETPH, NY 310-13, 418.1/TCLP, Diesel, App. IX, Air TO14A, Air TO15, Air STARS, Air VPH, Air TICs, Methane, Hexane

Full Lists: Pest/PCB, TCL Organics, Reactivity, Ignitability, Flash Point, Dil App. IX, Surface Area, Dioxin/Furan, BTX, Flashpoint, RTU/lb, Aquatic Inv., TOC, Asbestos, TAGM

Common Miscellaneous Parameters: Cations, Nitrate, Nitrite, TKN, Cyanide T, Cyanide R, Total Nitrogen, BOD5, CBOD5, BOD20, Phosphate, Tot. Phos, COD, Alkalinity, TSS, Aqueous Inv., TDS, FOG, Total Solids, Hardness, pH, TDS, Sulfate, MBAS, TPH-IR64

Special Instructions: Field Filtered, Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
TRIP BLANK	3/14/13 00:00	AQ	VOCs (8260)	2 VOAs
HA-3	12:10	SO	VOCs (8260), SVOCs (8270), PCBs (8082), CT ETPH, CT Listed Metals	1 8oz glass, 3 EnCores
HA-1	11:35		Lead (total), TCLP Lead ~~(HOLD until authorized)~~	2 8oz glass
HA-2	11:45			
HA-4	12:30			
HA-5	12:48			
HA-6	13:00		Lead (total) - "HOLD until authorized"	
HA-7	13:12			
HA-8	13:23			
HA-9	13:30			

Comments

Reporting limits must meet CT DEEP RSRs
Please run TCLP Lead for samples HA-1, HA-2, HA-4 and HA-5 on a 24 hour TAT

Preservation (Check those Applicable): 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO3 ____ H2SO4 ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ____ °C

YORK
ANALYTICAL LABORATORIES, INC.

120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as a valid authorization to proceed to perform work for the analyses requested and your signature implies you agree to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13D0164

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Eng.	Company: Same	Company: Same	14008601	RUSH - Same Day	Summary Report ___
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:		RUSH - Next Day X 24 hr	Summary w/ QA Summary ___
Phone No: 203.567.5771	Phone No:	Phone No:	Purchase Order No.	RUSH - Two Day	CT RCP Package ___
Contact Person: Kyle Zalaski	Attention:	Attention:		RUSH - Three Day	NY ASP A Package ___
E-Mail Address: kzalaski@langan.com	E-Mail Address:	E-Mail Address:		RUSH - Four Day	NY ASP B Package ___
			Samples from: CT X NY ___ NJ ___	Standard(5-7 Days) X	Electronic Deliverables: EDD (Specify Type) ___ Excel pdf & excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes: S - soil; Other - specify; WW - wastewater; GW - groundwater; DW - drinking water; Air S - ambient air; Air SV - soil vapor

Volatiles: 8260/624 | TICs | 8270/625 | STARS List | Site Spec. | BTEX | Surrogate Ck | MTBE | Known | TCL list | Compounds | TAGM list | TCLP list | CT RCP List | 524.2 | NJDEP list | Halogens | NJDEP list | Arp. IX list | SW Par TCLP | 8260 list | SPLP/RCLP | 8270 list | TCLP DNA | SPLP/RCLP

Semi-Vols.: 8082/PCB | STARS List | BN Only | Acids Only | PAH list | TAGM list | TCLP list | NJDEP list | Arp. IX | TCLP DNA | SPLP/RCLP | Arp. PCB

Metals: RCRA8 | PP 13 list | TAL | CT RCP | Arp. IX | Site Spec. | NJDEP list | Total | TCLP Pest. | SPLP/RCLP | Chlorides | Info. Metals | List Below

Misc. Org: TPH GRO | TPH DRO | CT TPH | NY TPH | Air TO-14A | Air TO-15 | Air STARS | Air VOC | Air TICs | Methane | Hexane | Full Lists: Pesticide | Herbicide | Cyanide | Sulfide | Flash Point | Full TCLP | Full Arp IX | Semi Arp. | Acetone | Benzene/phe | Ethanol | TDS | Phenolics | STORE | Tot. Phos. | Aquatic Tox. | Oil/Grease | TOC | TCLP | NYSDEC | Arsenic | Mercury | TAGM | Common Miscellaneous Parameters: Chlorine | Nitrate | Color | Reactivity | Nitrite | Phenol | Ignitability | DIN | Cyanide T | Flash Point | Sp. Weight | Cyanide A | Sulfide | Ammonia N | BOD5 | Chloride | Chlorine | CBOD5 | Phosphate | BOD52 | Sulfate | COD | Aquatic Tox. | TSS | TCLP | Total S-Sulf. | pH | TDS | MBAS | TPH/Oil

Special Instructions: Field Filtered ☐ Lab to Filter ☐

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HA-10	3/4/13 13:37	SO	Lead (total) - Hold Until Authorized | TCLP Lead (HOLD Until authorized)	1 2oz glass
HA-11	13:45			
HA-12	13:52			
HA-13	13:58			
HA-14	14:18		Lead (total)	
HA-15	14:30			

Comments: Please run TCLP Lead for samples HA-14 and HA-15 on a 24 hour TAT

Preservation (Check those Applicable): 4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ___ °C

YORK
ANALYTICAL LABORATORIES, INC.
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Field Chain-of-Custody Record

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York Project No. 13D0164

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type
Company: [illegible]	Company:	Company:	[illegible]	RUSH - Same Day	Summary Report
Address: [illegible]	Address:	Address:	Purchase Order No. [illegible]	RUSH - Next Day 24 hr	Summary w/ QA
Phone No: [illegible]	Phone No:	Phone No:		RUSH - Two Day	CT RCP Package
Contact Person: [illegible]	Attention:	Attention:		RUSH - Three Day	CTRCP DQA/DUE Pkg
E-Mail Address: [illegible]	E-Mail Address:	E-Mail Address:	Samples from: CT ___ NY ___ NJ ___	RUSH - Four Day	NY ASP A Package
				Standard(5-7 Days) X	NY ASP B Package
					NJDEP Red. Deliv.
					Electronic Data Deliverables (EDD)
					Simple Excel
					NYSDEC EQuIS
					EQuIS (std)
					EZ-EDD (EQuIS)
					NJDEP SRP HazSite EDD
					GIS/KEY (std)
					Other
					York Regulatory Comparison
					Excel Spreadsheet
					Compare to the following Regs. (please fill in)

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

[illegible]
Samples Collected/Authorized By (Signature)

K. F. Zolaski
Name (printed)

Matrix Codes
S - soil
Other - specify (oil, etc.)
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL Met/CN	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360-Basic	Fluorotophs
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360-Basic	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360-	BTU/lb.
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360-	Aquatic Tox.
Halog. only	NJDEP list	App. IX	Chlordane	Info. Metals	Air TICs	NYCDEP	TOC
App IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HA-16	3/6/13 1100	SO	Lead (total) ‖ TCLP Lead ~~(Hold until authorized)~~	1 2oz glass
HA-17	3/6/13 1100	SO		1 2oz glass

Comments
Please run TCLP Lead for samples HA-16 and HA-17 on a 24 hour TAT

Preservation
Check those Applicable
4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___
ZnAc ___ Ascorbic Acid ___ Other ___

Special Instructions
Field Filtered ☐
Lab to Filter ☐

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ___ °C

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Report Date: 05/02/2013
Client Project ID: 140068601
York Project (SDG) No.: 13E0026

CT Cert. No. PH-0723 New Jersey Cert. No. CT-005 New York Cert. No. 10854 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 05/02/2013
Client Project ID: 140068601
York Project (SDG) No.: 13E0026

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on March 15, 2013 and listed below. The project was identified as your project: **140068601**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13E0026-01	HA-6	Soil	03/14/2013	03/15/2013
13E0026-02	HA-7	Soil	03/14/2013	03/15/2013

General Notes for York Project (SDG) No.: 13E0026

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By: **Date:** 05/02/2013

Benjamin Gulizia
Laboratory Director

YORK

Sample Information

Client Sample ID: HA-6 **York Sample ID:** 13E0026-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13E0026	140068601	Soil	March 14, 2013 1:00 pm	03/15/2013

TCLP Extraction for METALS EPA 1311

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed	HT-01R	N/A	1.00	1.00	1	EPA SW846-1311	05/01/2013 17:25	05/02/2013 10:00	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**92.9**		mg/kg dry	0.209	0.368	1	EPA SW846-6010B	05/02/2013 08:59	05/02/2013 13:37	MW

Lead TCLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0287**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	05/02/2013 09:49	05/02/2013 15:29	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**81.5**		%	0.100	0.100	1	SM 2540G	05/02/2013 10:39	05/02/2013 10:39	AMC

Sample Information

Client Sample ID: HA-7 **York Sample ID:** 13E0026-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13E0026	140068601	Soil	March 14, 2013 1:12 pm	03/15/2013

TCLP Extraction for METALS EPA 1311

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1311 TCLP ext. for metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	TCLP Extraction	Completed	HT-01R	N/A	1.00	1.00	1	EPA SW846-1311	05/01/2013 17:25	05/02/2013 10:00	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**149**		mg/kg dry	0.208	0.368	1	EPA SW846-6010B	05/02/2013 08:59	05/02/2013 13:42	MW

Lead TCLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0342**		mg/L	0.00220	0.00300	1	EPA SW846-6010B/1311	05/02/2013 09:49	05/02/2013 15:34	MW

Sample Information

Client Sample ID: **HA-7** **York Sample ID:** **13E0026-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13E0026	140068601	Soil	March 14, 2013 1:12 pm	03/15/2013

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**81.6**		%	0.100	0.100	1	SM 2540G	05/02/2013 10:39	05/02/2013 10:39	AMC

Analytical Batch Summary

Batch ID: BE30046 **Preparation Method:** EPA SW 846-1311 TCLP ext. for meta **Prepared By:** KK

YORK Sample ID	Client Sample ID	Preparation Date
13E0026-01	HA-6	05/01/13
13E0026-02	HA-7	05/01/13
BE30046-BLK1	Blank	05/01/13

Batch ID: BE30071 **Preparation Method:** % Solids Prep **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13E0026-01	HA-6	05/02/13
13E0026-02	HA-7	05/02/13

Batch ID: BE30077 **Preparation Method:** EPA 3050B **Prepared By:** MW

YORK Sample ID	Client Sample ID	Preparation Date
13E0026-01	HA-6	05/02/13
13E0026-02	HA-7	05/02/13
BE30077-BLK1	Blank	05/02/13
BE30077-SRM1	Reference	05/02/13

Batch ID: BE30078 **Preparation Method:** EPA 3010A **Prepared By:** MW

YORK Sample ID	Client Sample ID	Preparation Date
13E0026-01	HA-6	05/02/13
13E0026-02	HA-7	05/02/13
BE30078-BLK1	Blank	05/02/13
BE30078-BLK2	Blank	05/02/13
BE30078-SRM1	Reference	05/02/13

TCLP Extraction by EPA SW-846 1311 - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BE30046 - EPA SW 846-1311 TCLP ext. for metals											
Blank (BE30046-BLK1)									Prepared: 05/01/2013 Analyzed: 05/02/2013		
TCLP Extraction	Completed	1.00	N/A								

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BE30077 - EPA 3050B											
Blank (BE30077-BLK1)								Prepared & Analyzed: 05/02/2013			
Lead	ND	0.300	mg/kg wet								
Reference (BE30077-SRM1)								Prepared & Analyzed: 05/02/2013			
Lead	85.9	0.300	mg/kg wet	91.7		93.7	70.2-130				

TCLP Metals by EPA SW846-1311/6010B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BE30078 - EPA 3010A											
Blank (BE30078-BLK1)								Prepared & Analyzed: 05/02/2013			
Lead	ND	0.00300	mg/L								
Blank (BE30078-BLK2)								Prepared & Analyzed: 05/02/2013			
Lead	ND	0.00300	mg/L								
Reference (BE30078-SRM1)								Prepared & Analyzed: 05/02/2013			
Lead	0.246	0.00300	mg/L	0.259		94.9	85.7-114				

Notes and Definitions

HT-01R This flag indicates that the sample was initially analyzed within recommended hold time and that a re-run was performed outside of the hold time.

EXT-COMP Completed

ND Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.

RL REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.

MDL METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.

NR Not reported

RPD Relative Percent Difference

Wet The data has been reported on an as-received (wet weight) basis

Low Bias Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

High Bias High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

Non-Dir. Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the MDL, with values between the MDL and the RL being "J" flagged as estimated results.

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13E0026

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: [illegible] Engineering	Company: Same	Company: Same	H00686601	RUSH - Same Day	Summary Report ____
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day	Summary w/ QA Summary ____
Phone No. 203.562.5771	Phone No.	Phone No.	14006860 1	RUSH - Two Day	CT RCP Package ____
Contact Person: Kyle Zalaski	Attention:	Attention:		RUSH - Three Day	NY ASP A Package ____
E-Mail Address: kzalaski@[illegible].com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY NJ ___	RUSH - Four Day	NY ASP B Package ____
				Standard(5-7 Days) X	*Electronic Deliverables:* EDD (Specify Type) ____ Excel pdf & excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Kyle Zalaski
Name (printed)

Matrix Codes
S - soil
Other - specify
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols		Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters			
8260 full	TICs	8270 or 625		8082 PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color	
624	Site Spec.	STARS list		8081 Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols	
STARS list	Nassau Co.	BN Only		8151 Herb	TAL	CT ETPH	TAL MeCN	Ignitability	TKN	Cyanide-T	
BTEX	Suffolk Co.	Acids Only		CT RCP	CT 13 list	NY 310-13	Full TCLP	Flash Point	Tot. Nitrogen	Cyanide-A	
MTBE	Ketones	PAH list		App. IX	TAGM list	TPH 1664	Full App IX	Sieve Anal.	Ammonia-N	BOD5	
TCL list	Oxygenates	TAGM list		Site Spec.	NJDEP list	Air TO14A	Part 360 Metals	Hexavalent Cr	Chloride	CBOD5	
TAGM list	TCLP list	CT RCP list		SPLP or TCLP	Total	Air TO15	Part 360 Inorganics	HOX	Phosphate	BOD28	
CT RCP list	524.2	TCL list		TCLP Pest	Dissolved	Air STARS	Part 360 Organics	BTU/lb.	Tot. Phos	COD	
Arom. only	502.2	NJDEP list		TCLP Herb	SPLP or TCLP	Air VPH	Part 360 Pesticides	Aquatic Tox.	Ortho Phos	TSS	
Halog. only	NJDEP list	App. IX		Chlordane	Info. Metals	Air TICs	NYCDEP Metals	TOX	FOG	Total Solids	
App.IX list	SPLP or TCLP	TCLP BNA		608 Pest	LIST Below	Methane	NYSDEC Metals	Asbestos	pH	TDS	
8021B list		SPLP or TCLP		MIX PCB		Helium	TAGM	Silica	MBAS	TPH-1664	

Special Instructions
Field Filtered
Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
TRIP BLANK	3/14/13 00:00	AQ	VOCs (8260)	2 VOAs
HA-3	12:10	SO	VOCs (8260), SVOCs (8270), PCBs (8082), CT ETPH, CT 13 Metals	1 8oz glass, 3 encores
HA-1	11:35		Lead (total), PCBs (8082) *HOLD*	1 2oz glass
HA-2	11:45			
HA-4	12:30			
HA-5	12:48			
HA-6	13:00		Lead (total), TCLP Lead } 3-DAY TAT	
HA-7	13:12		Lead (total), TCLP Lead }	
HA-8	13:23			
HA-9	13:30			

Comments

Reporting limits must meet CT DEEP RSPs
Please run analyses for HA-6 and HA-7 on a 3-day TAT (Authorized by K. Zalaski 3/1/13)

Preservation Check those Applicable: 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO3 ____ H2SO4 ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ____ °C

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kathleen Blessing

Report Date: 06/05/2013
Client Project ID: 140068605
York Project (SDG) No.: 13F0003

CT Cert. No. PH-0723 New Jersey Cert. No. CT-005 New York Cert. No. 10854 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 06/05/2013
Client Project ID: 140068605
York Project (SDG) No.: 13F0003

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kathleen Blessing

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on May 31, 2013 and listed below. The project was identified as your project: **140068605**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13F0003-01	HA-6 1.5-2	Soil	05/30/2013	05/31/2013
13F0003-02	ELB-15 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-04	ELB-16 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-06	HA-7A 1.0-1.5	Soil	05/30/2013	05/31/2013
13F0003-07	ELB-17 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-09	ELB-18 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-11	ELB-19 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-13	ELB-20 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-14	ELB-21 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-15	ELB-22 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-17	HA-17A 1.5-2	Soil	05/30/2013	05/31/2013
13F0003-18	HA-16A 1.5-2	Soil	05/30/2013	05/31/2013
13F0003-19	HA-15A 1.5-2	Soil	05/30/2013	05/31/2013
13F0003-20	ELB-25A 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-21	ELB-26 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-22	ELB-27 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-24	ELB-28 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-25	ELB-29 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-27	ELB-30 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-28	HA-1A 1.5-2	Soil	05/30/2013	05/31/2013
13F0003-30	HA-2A 1.5-2	Soil	05/30/2013	05/31/2013
13F0003-31	ELB-31 0.5-1	Soil	05/30/2013	05/31/2013
13F0003-33	DUP	Soil	05/30/2013	05/31/2013

General Notes for York Project (SDG) No.: 13F0003

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results ples submitted on the attached chain-of-custody form(s) received by York.

Approved By: **Date:** 06/05/2013

Benjamin Gulizia
Laboratory Director

YORK

Sample Information

Client Sample ID: **HA-6 1.5-2** **York Sample ID:** **13F0003-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 9:15 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**84.0**		mg/kg dry	0.196	0.345	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 17:49	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0364**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/04/2013 23:42	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**86.9**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: **ELB-15 0.5-1** **York Sample ID:** **13F0003-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 9:25 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**23.8**		mg/kg dry	0.198	0.349	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:06	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0103**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:00	MW

Sample Information

Client Sample ID: ELB-15 0.5-1 **York Sample ID:** 13F0003-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 9:25 am	05/31/2013

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**85.9**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: ELB-16 0.5-1 **York Sample ID:** 13F0003-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 9:34 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**131**		mg/kg dry	0.182	0.321	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:11	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0548**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:05	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**93.5**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: HA-7A 1.0-1.5 **York Sample ID:** 13F0003-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 9:44 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Sample Information

Client Sample ID: HA-7A 1.0-1.5 **York Sample ID:** 13F0003-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 9:44 am	05/31/2013

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**123**		mg/kg dry	0.202	0.356	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:16	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0164**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:10	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**84.2**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: ELB-17 0.5-1 **York Sample ID:** 13F0003-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 9:50 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**142**		mg/kg dry	0.204	0.360	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:20	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0339**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:15	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**83.4**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: ELB-18 0.5-1 **York Sample ID:** 13F0003-09

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 10:17 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**170**		mg/kg dry	0.203	0.359	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:25	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0860**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:32	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**83.6**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: ELB-19 0.5-1 **York Sample ID:** 13F0003-11

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 10:27 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**81.2**		mg/kg dry	0.199	0.350	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:42	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0107**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:37	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Information

Client Sample ID: **ELB-19 0.5-1** **York Sample ID:** **13F0003-11**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 10:27 am	05/31/2013

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**85.6**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: **ELB-20 0.5-1** **York Sample ID:** **13F0003-13**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 10:35 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**242**		mg/kg dry	0.201	0.354	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:47	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0566**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:42	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**84.8**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: **ELB-21 0.5-1** **York Sample ID:** **13F0003-14**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 10:38 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Information

Client Sample ID: **ELB-21 0.5-1** **York Sample ID:** **13F0003-14**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 10:38 am	05/31/2013

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**64.8**		mg/kg dry	0.206	0.363	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:52	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.00999**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:47	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**82.6**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:54	06/04/2013 12:29	AMC

Sample Information

Client Sample ID: **ELB-22 0.5-1** **York Sample ID:** **13F0003-15**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 11:04 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**95.3**		mg/kg dry	0.201	0.354	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 18:57	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0265**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:52	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**84.8**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **HA-17A 1.5-2** **York Sample ID:** **13F0003-17**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 11:10 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**34.7**		mg/kg dry	0.214	0.378	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:02	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.00782**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 00:57	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**79.4**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **HA-16A 1.5-2** **York Sample ID:** **13F0003-18**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 11:20 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**259**		mg/kg dry	0.207	0.365	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:07	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0116**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:02	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Information

Client Sample ID: **HA-16A 1.5-2** **York Sample ID:** **13F0003-18**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 11:20 am	05/31/2013

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**82.2**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **HA-15A 1.5-2** **York Sample ID:** **13F0003-19**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 12:28 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**8.30**		mg/kg dry	0.174	0.307	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:12	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.00579**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:07	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**97.7**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **ELB-25A 0.5-1** **York Sample ID:** **13F0003-20**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 12:35 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Information

Client Sample ID: **ELB-25A 0.5-1** **York Sample ID:** **13F0003-20**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 12:35 pm	05/31/2013

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**67.7**		mg/kg dry	0.180	0.318	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:17	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0193**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:12	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**94.5**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **ELB-26 0.5-1** **York Sample ID:** **13F0003-21**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 12:40 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**1640**		mg/kg dry	0.224	0.395	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:22	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.195**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:17	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**75.9**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: ELB-27 0.5-1 **York Sample ID:** 13F0003-22

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 12:50 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**835**		mg/kg dry	0.200	0.353	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:29	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.153**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:34	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**85.1**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: ELB-28 0.5-1 **York Sample ID:** 13F0003-24

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 12:55 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**71.8**		mg/kg dry	0.203	0.359	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:46	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0664**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:39	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Information

Client Sample ID: ELB-28 0.5-1 **York Sample ID:** 13F0003-24

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 12:55 pm	05/31/2013

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**83.6**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: ELB-29 0.5-1 **York Sample ID:** 13F0003-25

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 1:13 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**282**		mg/kg dry	0.208	0.367	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:51	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0444**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:44	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**81.7**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: ELB-30 0.5-1 **York Sample ID:** 13F0003-27

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 1:30 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Information

Client Sample ID: **ELB-30 0.5-1** **York Sample ID:** **13F0003-27**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 1:30 pm	05/31/2013

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**310**		mg/kg dry	0.199	0.351	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 19:56	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0265**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:49	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**85.5**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **HA-1A 1.5-2** **York Sample ID:** **13F0003-28**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 1:45 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:02	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**106**		mg/kg dry	0.203	0.359	1	EPA SW846-6010B	06/03/2013 13:05	06/03/2013 20:00	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0364**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:45	06/05/2013 01:54	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**83.6**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **HA-2A 1.5-2** **York Sample ID:** **13F0003-30**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 2:22 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**20.2**		mg/kg dry	0.183	0.324	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 20:22	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0105**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 02:19	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**92.7**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **ELB-31 0.5-1** **York Sample ID:** **13F0003-31**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 2:15 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**24.6**		mg/kg dry	0.179	0.317	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 20:27	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 02:36	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Information

Client Sample ID: **ELB-31 0.5-1** **York Sample ID:** **13F0003-31**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 2:15 pm	05/31/2013

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**94.7**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Sample Information

Client Sample ID: **DUP** **York Sample ID:** **13F0003-33**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0003	140068605	Soil	May 30, 2013 3:00 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**55.4**		mg/kg dry	0.204	0.361	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 20:32	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0294**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 02:41	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**83.2**		%	0.100	0.100	1	SM 2540G	06/03/2013 10:55	06/04/2013 12:33	AMC

Analytical Batch Summary

Batch ID: BF30036 **Preparation Method:** % Solids Prep **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-01	HA-6 1.5-2	06/03/13
13F0003-02	ELB-15 0.5-1	06/03/13
13F0003-04	ELB-16 0.5-1	06/03/13
13F0003-06	HA-7A 1.0-1.5	06/03/13
13F0003-07	ELB-17 0.5-1	06/03/13
13F0003-09	ELB-18 0.5-1	06/03/13
13F0003-11	ELB-19 0.5-1	06/03/13
13F0003-13	ELB-20 0.5-1	06/03/13
13F0003-14	ELB-21 0.5-1	06/03/13

Batch ID: BF30037 **Preparation Method:** % Solids Prep **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-15	ELB-22 0.5-1	06/03/13
13F0003-17	HA-17A 1.5-2	06/03/13
13F0003-18	HA-16A 1.5-2	06/03/13
13F0003-19	HA-15A 1.5-2	06/03/13
13F0003-20	ELB-25A 0.5-1	06/03/13
13F0003-21	ELB-26 0.5-1	06/03/13
13F0003-22	ELB-27 0.5-1	06/03/13
13F0003-24	ELB-28 0.5-1	06/03/13
13F0003-25	ELB-29 0.5-1	06/03/13
13F0003-27	ELB-30 0.5-1	06/03/13
13F0003-28	HA-1A 1.5-2	06/03/13
13F0003-30	HA-2A 1.5-2	06/03/13
13F0003-31	ELB-31 0.5-1	06/03/13
13F0003-33	DUP	06/03/13

Batch ID: BF30038 **Preparation Method:** EPA SW 846-1312 SPLP for Extr. for **Prepared By:** KK

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-01	HA-6 1.5-2	06/03/13
13F0003-02	ELB-15 0.5-1	06/03/13
13F0003-04	ELB-16 0.5-1	06/03/13
13F0003-06	HA-7A 1.0-1.5	06/03/13
13F0003-07	ELB-17 0.5-1	06/03/13
13F0003-09	ELB-18 0.5-1	06/03/13
13F0003-11	ELB-19 0.5-1	06/03/13
13F0003-13	ELB-20 0.5-1	06/03/13
13F0003-14	ELB-21 0.5-1	06/03/13
13F0003-15	ELB-22 0.5-1	06/03/13
13F0003-17	HA-17A 1.5-2	06/03/13
13F0003-18	HA-16A 1.5-2	06/03/13
13F0003-19	HA-15A 1.5-2	06/03/13
13F0003-20	ELB-25A 0.5-1	06/03/13
13F0003-21	ELB-26 0.5-1	06/03/13

13F0003-22	ELB-27 0.5-1	06/03/13
13F0003-24	ELB-28 0.5-1	06/03/13
13F0003-25	ELB-29 0.5-1	06/03/13
13F0003-27	ELB-30 0.5-1	06/03/13
13F0003-28	HA-1A 1.5-2	06/03/13
BF30038-BLK2	Blank	06/03/13

Batch ID: BF30039 **Preparation Method:** EPA SW 846-1312 SPLP for Extr. for **Prepared By:** KK

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-30	HA-2A 1.5-2	06/03/13
13F0003-31	ELB-31 0.5-1	06/03/13
13F0003-33	DUP	06/03/13
BF30039-BLK1	Blank	06/03/13

Batch ID: BF30050 **Preparation Method:** EPA 3050B **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-01	HA-6 1.5-2	06/03/13
13F0003-02	ELB-15 0.5-1	06/03/13
13F0003-04	ELB-16 0.5-1	06/03/13
13F0003-06	HA-7A 1.0-1.5	06/03/13
13F0003-07	ELB-17 0.5-1	06/03/13
13F0003-09	ELB-18 0.5-1	06/03/13
13F0003-11	ELB-19 0.5-1	06/03/13
13F0003-13	ELB-20 0.5-1	06/03/13
13F0003-14	ELB-21 0.5-1	06/03/13
13F0003-15	ELB-22 0.5-1	06/03/13
13F0003-17	HA-17A 1.5-2	06/03/13
13F0003-18	HA-16A 1.5-2	06/03/13
13F0003-19	HA-15A 1.5-2	06/03/13
13F0003-20	ELB-25A 0.5-1	06/03/13
13F0003-21	ELB-26 0.5-1	06/03/13
13F0003-22	ELB-27 0.5-1	06/03/13
13F0003-24	ELB-28 0.5-1	06/03/13
13F0003-25	ELB-29 0.5-1	06/03/13
13F0003-27	ELB-30 0.5-1	06/03/13
13F0003-28	HA-1A 1.5-2	06/03/13
BF30050-BLK1	Blank	06/03/13
BF30050-DUP1	Duplicate	06/03/13
BF30050-MS1	Matrix Spike	06/03/13
BF30050-SRM1	Reference	06/03/13

Batch ID: BF30051 **Preparation Method:** EPA 3050B **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-30	HA-2A 1.5-2	06/03/13
13F0003-31	ELB-31 0.5-1	06/03/13
13F0003-33	DUP	06/03/13
BF30051-BLK1	Blank	06/03/13
BF30051-SRM1	Reference	06/03/13

Batch ID: BF30150 **Preparation Method:** EPA 3010A **Prepared By:** MW

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-01	HA-6 1.5-2	06/04/13
13F0003-02	ELB-15 0.5-1	06/04/13
13F0003-04	ELB-16 0.5-1	06/04/13
13F0003-06	HA-7A 1.0-1.5	06/04/13
13F0003-07	ELB-17 0.5-1	06/04/13
13F0003-09	ELB-18 0.5-1	06/04/13
13F0003-11	ELB-19 0.5-1	06/04/13
13F0003-13	ELB-20 0.5-1	06/04/13
13F0003-14	ELB-21 0.5-1	06/04/13
13F0003-15	ELB-22 0.5-1	06/04/13
13F0003-17	HA-17A 1.5-2	06/04/13
13F0003-18	HA-16A 1.5-2	06/04/13
13F0003-19	HA-15A 1.5-2	06/04/13
13F0003-20	ELB-25A 0.5-1	06/04/13
13F0003-21	ELB-26 0.5-1	06/04/13
13F0003-22	ELB-27 0.5-1	06/04/13
13F0003-24	ELB-28 0.5-1	06/04/13
13F0003-25	ELB-29 0.5-1	06/04/13
13F0003-27	ELB-30 0.5-1	06/04/13
13F0003-28	HA-1A 1.5-2	06/04/13
BF30150-BLK1	Blank	06/04/13
BF30150-BLK2	Blank	06/04/13
BF30150-DUP1	Duplicate	06/04/13
BF30150-MS1	Matrix Spike	06/04/13
BF30150-SRM1	Reference	06/04/13

Batch ID: BF30151 **Preparation Method:** EPA 3010A **Prepared By:** MW

YORK Sample ID	Client Sample ID	Preparation Date
13F0003-30	HA-2A 1.5-2	06/04/13
13F0003-31	ELB-31 0.5-1	06/04/13
13F0003-33	DUP	06/04/13
BF30151-BLK1	Blank	06/04/13
BF30151-BLK2	Blank	06/04/13
BF30151-SRM1	Reference	06/04/13

SPLP Extraction by EPA SW-846 1312 - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30038 - EPA SW 846-1312 SPLP for Extr. for Metals											
Blank (BF30038-BLK2)									Prepared: 06/03/2013 Analyzed: 06/04/2013		
SPLP Extraction	Completed	1.00	N/A								
Batch BF30039 - EPA SW 846-1312 SPLP for Extr. for Metals											
Blank (BF30039-BLK1)									Prepared: 06/03/2013 Analyzed: 06/04/2013		
SPLP Extraction	Completed	1.00	N/A								

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30050 - EPA 3050B											
Blank (BF30050-BLK1)								Prepared & Analyzed: 06/03/2013			
Lead	ND	0.300	mg/kg wet								
Duplicate (BF30050-DUP1)	*Source sample: 13F0003-01 (HA-6 1.5-2)							Prepared & Analyzed: 06/03/2013			
Lead	84.2	0.345	mg/kg dry		84.0				0.203	35	
Matrix Spike (BF30050-MS1)	*Source sample: 13F0003-01 (HA-6 1.5-2)							Prepared & Analyzed: 06/03/2013			
Lead	140	0.345	mg/kg dry	57.5	84.0	97.4	75-125				
Reference (BF30050-SRM1)								Prepared & Analyzed: 06/03/2013			
Lead	83.0	0.300	mg/kg wet	91.7		90.5	70.2-130				
Batch BF30051 - EPA 3050B											
Blank (BF30051-BLK1)								Prepared & Analyzed: 06/03/2013			
Lead	ND	0.300	mg/kg wet								
Reference (BF30051-SRM1)								Prepared & Analyzed: 06/03/2013			
Lead	82.6	0.300	mg/kg wet	91.7		90.0	70.2-130				

SPLP Metals by EPA SW846-1312/6010B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30150 - EPA 3010A											
Blank (BF30150-BLK1)								Prepared & Analyzed: 06/04/2013			
Lead	ND	0.00300	mg/L								
Blank (BF30150-BLK2)								Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	ND	0.00300	mg/L								
Duplicate (BF30150-DUP1)	*Source sample: 13F0003-01 (HA-6 1.5-2)							Prepared & Analyzed: 06/04/2013			
Lead	0.0359	0.00300	mg/L		0.0364				1.34	20	
Matrix Spike (BF30150-MS1)	*Source sample: 13F0003-01 (HA-6 1.5-2)							Prepared & Analyzed: 06/04/2013			
Lead	0.571	0.00300	mg/L	0.500	0.0364	107	75-125				
Reference (BF30150-SRM1)								Prepared & Analyzed: 06/04/2013			
Lead	1.49	0.00300	mg/L	1.48		100	87.8-111				
Batch BF30151 - EPA 3010A											
Blank (BF30151-BLK1)								Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	ND	0.00300	mg/L								
Blank (BF30151-BLK2)								Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	ND	0.00300	mg/L								
Reference (BF30151-SRM1)								Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	1.48	0.00300	mg/L	1.48		100	87.8-111				

Notes and Definitions

EXT-COMP Completed

ND	Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
MDL	METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the MDL, with values between the MDL and the RL being "J" flagged as estimated results.

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13F0003

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering	Company: same	Company: same	100686605	RUSH - Same Day	Summary Report
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day	Summary w QA Summary
Phone No: 203-562-5771	Phone No:	Phone No:		RUSH - Two Day	CT RCP Package ✓
Contact Person: Kathleen Biessing	Attention:	Attention:		RUSH - Three Day ✓	NY ASP A Package
E-Mail Address: kbiessing@langan.com	E-Mail Address:	E-Mail Address:		RUSH - Four Day	NY ASP B Package
					Electronic Deliverables: PDF ✓ Excel
			Samples from: CT ✓ NY NJ	Standard(5-7 Days)	EDD (Specify Type)
					Excel DOH Spreadsheet

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes
S - soil
Other - specify
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 Full	EDB	8270 or 625	8082 PCB	RCRA 8	TPH GRO	Pri Poll.	Corrosivity	Nitrate	Color
624	Site spec	STARS list	8081 Pest	PP13 list	TPH DRO	TCL	Reactivity	Nitrite	Phenols
STARS list	Nassau Co	BN Only	8152 Herb	TAL	CT ETPH	TAL Metals	Ignitability	TKN	Cyanide T
BTEX	Suffolk Co	Acids Only	CT RCP	CT 13 list	NY 310-13	Full TCLP	Flash Point	Total Nitrogen	Cyanide A
MTBE	Ketones	PAH list	App IX	TAGM list	TPH 1664	Full App IX	Specific Grav.	Ammonia-N	BOD5
TCL list	Oxygenates	TAGM list	Site Spec.	NYDEP list	Air TO-14A	Part 360 Grav	Heterotrophs	Chloride	CBOD5
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO-15	Part 360 Inorg	DOX	Phosphate	BOD28
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360	BTU	Total Phos	COD
Aromatics only	502.2	NYDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360	Acetate Ion	Oil&Grease	TSS
Halogenated only	NYDEP list	App IX	Chlordane	Indoor Metals	Air TICs	NYSDEC	NYSDEC	TOC	Total Solids
App IX list	SPLP or TCLP	TCLP BNA	608 Pest	TST Metals	Methane	NYSDEC	Asbestos	pH	TDS
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664

Special Instructions
Field Filtered
Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HA-6 1.5-2	5/30/13 09:15	S	Total Lead, SPLP Lead	1 4oz glass
ELB-15 0.5-1	09:25			
ELB-15 1.5-2	09:27		*	
ELB-16 0.5-1	09:34			
ELB-16 1.5-2	09:36		*	
HA-7A 1.0-1.5	09:44			
ELB-17 0.5-1	09:50			
ELB-17 1.5-2	09:52		*	
ELB-18 0.5-1	10:17			
ELB-18 1.5-2	10:19		*	

Comments
→ must meet CTDEEP RSRs
* = HOLD Analyses until authorized by Langan

Preservation (Check those Applicable): 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO3 ____ H2SO4 ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
[signature]	5/31 6a	[signature]	5-31-13 1800
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt 4.0 °C

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13F0003

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering	Company: same	Company: same	140068605	RUSH - Same Day	Summary Report ___
Address: 555 Long Wharf Dr New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day	Summary w/ QA Summary ___
Phone No. 203-562-5771	Phone No.	Phone No.		RUSH - Two Day	CT RCP Package X
Contact Person: Kathleen Blessing	Attention:	Attention:		RUSH - Three Day X	NY ASP A Package ___
E-Mail Address: kblessing@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY___ NJ___	RUSH - Four Day	NY ASP B Package ___
				Standard(5-7 Days)	*Electronic Deliverables:* EDD (Specify Type) PDF HCKL Excel DGA spreadsheet

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)
Kyle Zalaski
Name (printed)

Matrix Codes	
S -	soil
Other -	specify(oil, etc.)
WW -	wastewater
GW -	groundwater
DW -	drinking water
Air-A -	ambient air
Air-SV -	soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 full	HCs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MetCN	Ignitability	TKN	Cyanide-T
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot.Nitrogen	Cyanide-A
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.	Ammonia-N	BOD5
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360-Routine	Heterotrophs	Chloride	CBOD5
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360-Baseline	TOX	Phosphate	BOD28
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360-[illegible]	BTU lb.	Tot. Phos.	COD
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360-[illegible]	Aquatic Tox.	Oil&Grease	TSS
Halog.only	NJDEP list	App. IX	Chlordane	Indv. Metals	Air HCs	NYCDEP Sewer	TOC	F.O.G.	Total Solids
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	(LIST Below)	Methane	NYSDEC Sewer	Asbestos	pH	TDS
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664

Special Instructions
Field Filtered
Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-19 0.5-1	5/30/13 10:27	S	Total Lead, SPLP Lead	1-4oz glass
ELB-19 1.5-2	10:29		*	
ELB-20 0.5-1	10:35			
ELB-21 0.5-1	10:38			
ELB-22 0.5-1	11:04			
ELB-22 1.5-2	11:06		*	
HA-17A 1.5-2	11:10			
HA-16A 1.5-2	11:20			
HA-15A 1.5-2	12:28			
ELB-25 0.5-1	12:35			

Comments
RLs must meet CT DEEP RSRs
* = HOLD Analyses until authorized by Langan

Preservation Check those Applicable: 4°C____ Frozen____ HCl____ MeOH____ HNO3____ H2SO4____ NaOH____ ZnAc____ Ascorbic Acid____ Other____

Samples Relinquished By: [signature] Date/Time: 5/31 6:00
Samples Relinquished By: ___ Date/Time: ___
Samples Received By: [signature] Date/Time: 5-31-13 1800
Samples Received in LAB by: ___ Date/Time: ___

Temperature on Receipt 4.0 °C

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13F0003

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverbles
Company: Langan Engineering	Company: Same	Company: Same	140068605	RUSH - Same Day	Summary Report ___
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:	**Purchase Order No.**	RUSH - Next Day	Summary w/ QA Summary ___
Phone No. 203-562-5771	Phone No.	Phone No.		RUSH - Two Day	CT RCP Package X
Contact Person: Kathleen Blessing	Attention:	Attention:		RUSH - Three Day X	NY ASP A Package ___
E-Mail Address: kblessing@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY NJ	RUSH - Four Day	NY ASP B Package ___
				Standard(5-7 Days)	*Electronic Deliverables:* EDD (Specify Type) pdf-excel; Excel DQA spreadsheet

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Kyle Zalaski
Name (printed)

Matrix Codes
S - soil
Other - specify (oil, etc.)
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MetCN	Ignitability	TKN	Cyanide-T
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot.Nitrogen	Cyanide-A
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.	Ammonia-N	BOD5
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360-Routine	Heterotrophs	Chloride	CBOD5
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360-Baseline	TOX	Phosphate	BOD28
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360 Organics	BTU lb.	Tot. Phos.	COD
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360 Inorganics	Aquatic Tox.	Oil&Grease	TSS
Halog.only	NJDEP list	App. IX	Chlordane	India Metals	Air TICs	NYCDEP Sewer	TOC	E.O.G.	Total Solids
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LST Below	Methane	NYSDEC Sewer	Asbestos	pH	TDS
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664

Special Instructions
Field Filtered
Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-26 0.5-1	5/30/13 12:40	S	Total Lead, SPLP Lead	1-4oz glass
ELB-27 0.5-1	12:50			
ELB-27 1.5-2	12:52		X	
ELB-28 0.5-1	12:55			
ELB-29 0.5-1	13:13			
ELB-29 1.5-2	13:15		X	
ELB-30 0.5-1	13:30			
HA-1A 1.5-2	13:45			
ELB-28 1.5-2	13:50		X	
HA-2A 1.5-2	14:22			

Comments
TCLs must meet CTDEEP RSRs
X = HOLD Analyses until authorized by Langan

Preservation Check those Applicable: 4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Samples Relinquished By: [signature] Date/Time: 5/31 600
Samples Relinquished By: ___ Date/Time: ___
Samples Received By: [signature] Date/Time: 5-31-13 1800
Samples Received in LAB by: ___ Date/Time: ___

Temperature on Receipt: 4.0 °C

YORK
ANALYTICAL LABORATORIES, INC.
120 RESEARCH DR. STRATFORD, CT 06615
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13F0003

YOUR Information
Company: Langan Engineering
Address: 555 Long Wharf Dr. New Haven, CT
Phone No.: 203-562-5771
Contact Person: Kathleen Bressing
E-Mail Address: kbressing@langan.com

Report To:
Company: Same
Address:
Phone No.:
Attention:
E-Mail Address:

Invoice To:
Company: Same
Address:
Phone No.:
Attention:
E-Mail Address:

YOUR Project ID
14006960S

Purchase Order No.

Samples from: CT X NY NJ

Turn-Around Time
RUSH - Same Day
RUSH - Next Day
RUSH - Two Day
RUSH - Three Day X
RUSH - Four Day
Standard(5-7 Days)

Report Type/Deliverables
Summary Report
Summary w/ QA Summary
CT RCP Package X
NY ASP A Package
NY ASP B Package
Electronic Deliverables:
EDD (Specify Type) pdf-text
Excel DQA Spreadsheet

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)
Kyle Zalaski
Name (printed)

Matrix Codes
S - soil
Other - specify (oil, etc.)
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT EPH	TAL Met/CN	Ignitability	TKN	Cyanide-T
BTEX	Suffolk Co.	Acids Only	CT RCP	CT 5 list	NY 310-13	Full TCLP	Flash Point	Tot. Nitrogen	Cyanide-A
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.	Ammonia-N	BOD5
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360 Routine	Heterotrophs	Chloride	CBOD5
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360 Baseline	TOX	Phosphate	BOD28
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360 [illegible]	BTU/lb	Tot. Phos.	COD
Aromatic only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360 [illegible]	Aquatic Tox.	Oil&Grease	TSS
Halogen only	NJDLP list	App. IX	Chlordane	Indn. Metals	Air TICs	NYCDEP Sewer	TOC	E.O.G.	Total Solids
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos	pH	TDS
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664

Special Instructions
Field Filtered
Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-31 0.5-1	5/30/13 14:15	S	Total Lead, SPLP Lead	1 4oz glass
ELB-31 1.5-2	14:18		X	
DUP	00:00			

Page 28 of 28

Comments
RLs must meet CTDEEP RSRs
X = HOLD analyses until authorized by Langan

Preservation (Check those Applicable): 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO3 ____ H2SO4 ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Samples Relinquished By: [signature] Date/Time: 5/31 6:00
Samples Relinquished By: Date/Time:
Samples Received By: [signature] Date/Time: 5-31-13 1800
Samples Received in LAB by: Date/Time:

Temperature on Receipt: 4.0 °C

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kathleen Blessing

Report Date: 06/06/2013
Client Project ID: 140068605
York Project (SDG) No.: 13F0008

CT Cert. No. PH-0723 New Jersey Cert. No. CT-005 New York Cert. No. 10854 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 06/06/2013
Client Project ID: 140068605
York Project (SDG) No.: 13F0008

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kathleen Blessing

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on May 31, 2013 and listed below. The project was identified as your project: **140068605**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13F0008-01	ELB-23 0.5-1	Soil	05/31/2013	05/31/2013
13F0008-03	HA-4A 1.5-2	Soil	05/31/2013	05/31/2013
13F0008-04	HA-5A 1.5-2	Soil	05/31/2013	05/31/2013
13F0008-05	ELB-32 0.5-1	Soil	05/31/2013	05/31/2013
13F0008-07	ELB-33 0.5-1	Soil	05/31/2013	05/31/2013
13F0008-08	ELB-34 0.25-0.5	Soil	05/31/2013	05/31/2013
13F0008-09	ELB-35 0.25-0.5	Soil	05/31/2013	05/31/2013
13F0008-10	ELB-36 0.25-0.5	Soil	05/31/2013	05/31/2013
13F0008-11	ELB-37 0.25-0.5	Soil	05/31/2013	05/31/2013
13F0008-12	DUP-2	Soil	05/31/2013	05/31/2013
13F0008-13	Trip Blank	Water	05/30/2013	05/31/2013

General Notes for York Project (SDG) No.: 13F0008

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By:

Date: 06/06/2013

Benjamin Gulizia
Laboratory Director

YORK

Sample Information

Client Sample ID: **ELB-23 0.5-1** **York Sample ID:** **13F0008-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 7:30 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**36.5**		mg/kg dry	0.197	0.348	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:01	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.00959**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 02:46	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**86.2**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: **HA-4A 1.5-2** **York Sample ID:** **13F0008-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 8:00 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**50.9**		mg/kg dry	0.197	0.348	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:06	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0230**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 02:51	MW

Sample Information

Client Sample ID: HA-4A 1.5-2 **York Sample ID:** 13F0008-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 8:00 am	05/31/2013

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**86.3**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: HA-5A 1.5-2 **York Sample ID:** 13F0008-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 8:05 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**131**		mg/kg dry	0.209	0.369	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:11	AMC

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0775**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 02:56	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**81.3**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: ELB-32 0.5-1 **York Sample ID:** 13F0008-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 8:20 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Sample Information

Client Sample ID: ELB-32 0.5-1 **York Sample ID:** 13F0008-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 8:20 am	05/31/2013

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**528**		mg/kg dry	0.197	0.348	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:16	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0960**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 03:01	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**86.3**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: ELB-33 0.5-1 **York Sample ID:** 13F0008-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 8:35 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**497**		mg/kg dry	0.202	0.356	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:20	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.124**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 03:06	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**84.3**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: **ELB-34 0.25-0.5** **York Sample ID:** **13F0008-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 10:00 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.9	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.35	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	2.7	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.90	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	2.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	1.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	1.5	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	1.9	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.8	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	1.5	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	3.7	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	1.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	1.2	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	1.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	1.2	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	1.6	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	1.8	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	2.0	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
78-93-3	2-Butanone	ND		ug/kg dry	2.4	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
95-49-8	2-Chlorotoluene	ND		ug/kg dry	1.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
591-78-6	2-Hexanone	ND		ug/kg dry	1.9	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
106-43-4	4-Chlorotoluene	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	1.7	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
67-64-1	Acetone	ND		ug/kg dry	18	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
107-13-1	Acrylonitrile	ND		ug/kg dry	2.2	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
71-43-2	Benzene	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
108-86-1	Bromobenzene	ND		ug/kg dry	1.8	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
74-97-5	Bromochloromethane	ND		ug/kg dry	1.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK

Sample Information

Client Sample ID: **ELB-34 0.25-0.5** **York Sample ID:** **13F0008-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 10:00 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-27-4	Bromodichloromethane	ND		ug/kg dry	2.0	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-25-2	Bromoform	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
74-83-9	Bromomethane	ND		ug/kg dry	3.0	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-15-0	Carbon disulfide	ND		ug/kg dry	0.99	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
56-23-5	Carbon tetrachloride	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
108-90-7	Chlorobenzene	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-00-3	Chloroethane	ND		ug/kg dry	1.5	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
67-66-3	Chloroform	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
74-87-3	Chloromethane	ND		ug/kg dry	1.5	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.80	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
124-48-1	Dibromochloromethane	ND		ug/kg dry	1.6	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
74-95-3	Dibromomethane	ND		ug/kg dry	1.7	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.80	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.9	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
98-82-8	Isopropylbenzene	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
80-62-6	Methyl Methacrylate	ND		ug/kg dry	2.2	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	1.0	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-09-2	Methylene chloride	ND		ug/kg dry	2.5	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
91-20-3	Naphthalene	ND		ug/kg dry	3.0	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
104-51-8	n-Butylbenzene	ND		ug/kg dry	1.2	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
103-65-1	n-Propylbenzene	ND		ug/kg dry	1.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
95-47-6	o-Xylene	ND		ug/kg dry	1.0	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
179601-23-1	p- & m- Xylenes	ND		ug/kg dry	2.6	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.84	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
135-98-8	sec-Butylbenzene	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
100-42-5	Styrene	ND		ug/kg dry	0.91	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
98-06-6	tert-Butylbenzene	ND		ug/kg dry	1.3	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
127-18-4	Tetrachloroethylene	ND		ug/kg dry	1.5	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
109-99-9	Tetrahydrofuran	ND		ug/kg dry	4.0	27	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
108-88-3	Toluene	ND		ug/kg dry	1.1	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK

Sample Information

Client Sample ID: **ELB-34 0.25-0.5** **York Sample ID:** **13F0008-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 10:00 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	2.5	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
79-01-6	Trichloroethylene	ND		ug/kg dry	1.4	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.97	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.75	14	1	SW8260B	06/04/2013 10:19	06/04/2013 11:43	BK

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*104 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*100 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*103 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
62-53-3	Aniline	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
120-12-7	Anthracene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
205-99-2	Benzo(b)fluoranthene	**1910**		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
218-01-9	Chrysene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR

Sample Information

Client Sample ID: **ELB-34 0.25-0.5** **York Sample ID:** **13F0008-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 10:00 am	05/31/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	3430	3430	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	3430	3430	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
206-44-0	Fluoranthene	**2170**		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
86-73-7	Fluorene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
78-59-1	Isophorone	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
91-20-3	Naphthalene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR

Sample Information

Client Sample ID: **ELB-34 0.25-0.5** **York Sample ID:** **13F0008-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 10:00 am	05/31/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
100-02-7	4-Nitrophenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
85-01-8	Phenanthrene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
108-95-2	Phenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
129-00-0	Pyrene	**2240**		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
110-86-1	Pyridine	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	1720	1720	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:35	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*78.2 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*72.1 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*55.5 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*59.6 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*57.3 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*96.6 %*	*30-130*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	TPH (Extractable Total Petroleum Hydrocarbo	**204**		mg/kg dry	2.92	13.7	1	CT DEP ETPH	06/03/2013 11:53	06/04/2013 12:55	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*94.7 %*	*40.5-152*

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Sample Information

Client Sample ID: **ELB-34 0.25-0.5** **York Sample ID:** **13F0008-08**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 10:00 am	05/31/2013

Metals, RCRA

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-38-2	Arsenic	**2.75**		mg/kg dry	0.467	1.37	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:25	AMC
7440-39-3	Barium	**99.4**		mg/kg dry	0.178	0.686	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:25	AMC
7440-43-9	Cadmium	ND		mg/kg dry	0.137	0.686	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:25	AMC
7440-47-3	Chromium	**34.2**		mg/kg dry	0.165	0.686	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:25	AMC
7439-92-1	Lead	**309**		mg/kg dry	0.233	0.412	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:25	AMC
7782-49-2	Selenium	**1.04**		mg/kg dry	0.686	0.686	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:25	AMC
7440-22-4	Silver	ND		mg/kg dry	0.137	0.686	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:25	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0280**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 03:11	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.0453	0.0453	1	EPA SW846-7471	06/03/2013 08:52	06/03/2013 17:43	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**72.8**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: **ELB-35 0.25-0.5** **York Sample ID:** **13F0008-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:20 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.7	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.32	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	2.5	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.82	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.9	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK

Sample Information

Client Sample ID: **ELB-35 0.25-0.5** **York Sample ID:** **13F0008-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:20 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	1.0	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	1.3	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	1.8	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.7	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	1.4	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	3.4	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.99	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	1.1	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	1.0	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	1.1	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	1.4	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	1.6	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.8	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
78-93-3	2-Butanone	ND		ug/kg dry	2.2	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
95-49-8	2-Chlorotoluene	ND		ug/kg dry	1.0	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
591-78-6	2-Hexanone	ND		ug/kg dry	1.7	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
106-43-4	4-Chlorotoluene	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	1.6	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
67-64-1	Acetone	**240**		ug/kg dry	17	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
107-13-1	Acrylonitrile	ND		ug/kg dry	2.0	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
71-43-2	Benzene	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
108-86-1	Bromobenzene	ND		ug/kg dry	1.6	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
74-97-5	Bromochloromethane	ND		ug/kg dry	0.98	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.9	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-25-2	Bromoform	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
74-83-9	Bromomethane	ND		ug/kg dry	2.8	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-15-0	Carbon disulfide	ND		ug/kg dry	0.91	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
56-23-5	Carbon tetrachloride	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK

Sample Information

Client Sample ID: **ELB-35 0.25-0.5** **York Sample ID:** **13F0008-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:20 am	05/31/2013

Volatile Organics, CT RCP List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
108-90-7	Chlorobenzene	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-00-3	Chloroethane	ND		ug/kg dry	1.4	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
67-66-3	Chloroform	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
74-87-3	Chloromethane	ND		ug/kg dry	1.4	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.73	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	1.1	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
124-48-1	Dibromochloromethane	ND		ug/kg dry	1.4	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
74-95-3	Dibromomethane	ND		ug/kg dry	1.6	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	1.1	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.73	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.7	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
98-82-8	Isopropylbenzene	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
80-62-6	Methyl Methacrylate	ND		ug/kg dry	2.0	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.92	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-09-2	Methylene chloride	ND		ug/kg dry	2.3	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
91-20-3	Naphthalene	ND		ug/kg dry	2.7	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
104-51-8	n-Butylbenzene	ND		ug/kg dry	1.1	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
103-65-1	n-Propylbenzene	ND		ug/kg dry	1.0	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
95-47-6	o-Xylene	ND		ug/kg dry	0.92	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
179601-23-1	p- & m- Xylenes	ND		ug/kg dry	2.3	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.77	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
135-98-8	sec-Butylbenzene	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
100-42-5	Styrene	ND		ug/kg dry	0.83	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
98-06-6	tert-Butylbenzene	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
127-18-4	Tetrachloroethylene	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
109-99-9	Tetrahydrofuran	ND		ug/kg dry	3.6	25	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
108-88-3	Toluene	ND		ug/kg dry	0.97	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	1.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	2.3	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
79-01-6	Trichloroethylene	ND		ug/kg dry	1.2	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.89	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK

Sample Information

Client Sample ID: **ELB-35 0.25-0.5** **York Sample ID:** **13F0008-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:20 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.68	13	1	SW8260B	06/04/2013 10:19	06/04/2013 12:19	BK

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*109 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*99.5 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*101 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
62-53-3	Aniline	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
120-12-7	Anthracene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
56-55-3	Benzo(a)anthracene	**3580**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
50-32-8	Benzo(a)pyrene	**3540**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
205-99-2	Benzo(b)fluoranthene	**6420**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
207-08-9	Benzo(k)fluoranthene	**3980**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
218-01-9	Chrysene	**4120**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR

Sample Information

Client Sample ID: **ELB-35 0.25-0.5** **York Sample ID:** **13F0008-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:20 am	05/31/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
84-66-2	Diethyl phthalate	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	4390	4390	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	4390	4390	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
206-44-0	Fluoranthene	**9790**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
86-73-7	Fluorene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
78-59-1	Isophorone	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
91-20-3	Naphthalene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR

Sample Information

Client Sample ID: **ELB-35 0.25-0.5** **York Sample ID:** **13F0008-09**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:20 am	05/31/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
85-01-8	Phenanthrene	**6400**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
108-95-2	Phenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
129-00-0	Pyrene	**10200**		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
110-86-1	Pyridine	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	2190	2190	5	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:02	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*74.7 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*65.9 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*54.1 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*50.9 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*48.9 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*92.4 %*	*30-130*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	PH (Extractable Total Petroleum Hydrocarbo	**592**		mg/kg dry	3.74	17.6	1	CT DEP ETPH	06/03/2013 11:53	06/04/2013 12:55	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*90.7 %*	*40.5-152*

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Metals, RCRA

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-38-2	Arsenic	**5.50**		mg/kg dry	0.597	1.76	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:30	AMC
7440-39-3	Barium	**615**		mg/kg dry	0.228	0.878	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:30	AMC
7440-43-9	Cadmium	ND		mg/kg dry	0.176	0.878	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:30	AMC
7440-47-3	Chromium	**43.1**		mg/kg dry	0.211	0.878	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:30	AMC
7439-92-1	Lead	**1780**		mg/kg dry	0.298	0.527	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:30	AMC
7782-49-2	Selenium	**2.11**		mg/kg dry	0.878	0.878	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:30	AMC

Sample Information

Client Sample ID: ELB-35 0.25-0.5 **York Sample ID:** 13F0008-09

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:20 am	05/31/2013

Metals, RCRA

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-22-4	Silver	ND		mg/kg dry	0.176	0.878	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:30	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.111**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 03:16	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.0579	0.0579	1	EPA SW846-7471	06/03/2013 08:52	06/03/2013 17:43	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**57.0**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: ELB-36 0.25-0.5 **York Sample ID:** 13F0008-10

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:40 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	0.97	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.18	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.4	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.46	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.1	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	0.70	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	0.57	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	0.64	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.74	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	0.99	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS

Sample Information

Client Sample ID: **ELB-36 0.25-0.5** **York Sample ID:** **13F0008-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:40 am	05/31/2013

Volatile Organics, CT RCP List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	0.94	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	0.76	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	1.9	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.55	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	0.60	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	0.70	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.56	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.62	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	0.81	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	0.90	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.0	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	0.65	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
78-93-3	2-Butanone	ND		ug/kg dry	1.2	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
95-49-8	2-Chlorotoluene	ND		ug/kg dry	0.56	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
591-78-6	2-Hexanone	ND		ug/kg dry	0.97	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
106-43-4	4-Chlorotoluene	ND		ug/kg dry	0.71	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	0.87	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
67-64-1	Acetone	**24**		ug/kg dry	9.2	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
107-13-1	Acrylonitrile	ND		ug/kg dry	1.1	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
71-43-2	Benzene	ND		ug/kg dry	0.69	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
108-86-1	Bromobenzene	ND		ug/kg dry	0.91	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
74-97-5	Bromochloromethane	ND		ug/kg dry	0.55	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.0	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-25-2	Bromoform	ND		ug/kg dry	0.66	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
74-83-9	Bromomethane	ND		ug/kg dry	1.6	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-15-0	Carbon disulfide	ND		ug/kg dry	0.51	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
56-23-5	Carbon tetrachloride	ND		ug/kg dry	0.68	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
108-90-7	Chlorobenzene	ND		ug/kg dry	0.68	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-00-3	Chloroethane	ND		ug/kg dry	0.78	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
67-66-3	Chloroform	ND		ug/kg dry	0.70	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
74-87-3	Chloromethane	ND		ug/kg dry	0.77	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.41	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS

Sample Information

Client Sample ID: **ELB-36 0.25-0.5** **York Sample ID:** **13F0008-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:40 am	05/31/2013

Volatile Organics, CT RCP List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.64	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
124-48-1	Dibromochloromethane	ND		ug/kg dry	0.81	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
74-95-3	Dibromomethane	ND		ug/kg dry	0.88	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	0.64	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.41	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	0.95	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.74	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
80-62-6	Methyl Methacrylate	ND		ug/kg dry	1.1	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.51	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-09-2	Methylene chloride	ND		ug/kg dry	1.3	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
91-20-3	Naphthalene	ND		ug/kg dry	1.5	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.61	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
103-65-1	n-Propylbenzene	ND		ug/kg dry	0.58	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
95-47-6	o-Xylene	ND		ug/kg dry	0.51	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
179601-23-1	p- & m- Xylenes	ND		ug/kg dry	1.3	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.43	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
135-98-8	sec-Butylbenzene	ND		ug/kg dry	0.65	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
100-42-5	Styrene	ND		ug/kg dry	0.46	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
98-06-6	tert-Butylbenzene	ND		ug/kg dry	0.65	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
127-18-4	Tetrachloroethylene	ND		ug/kg dry	0.75	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
109-99-9	Tetrahydrofuran	ND		ug/kg dry	2.0	14	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
108-88-3	Toluene	ND		ug/kg dry	0.54	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	0.73	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	0.72	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	1.3	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
79-01-6	Trichloroethylene	ND		ug/kg dry	0.69	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.49	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.38	7.0	1	SW8260B	06/03/2013 11:22	06/04/2013 02:31	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*98.9 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*104 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*107 %*	*70-130*

Sample Information

Client Sample ID: **ELB-36 0.25-0.5** **York Sample ID:** **13F0008-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:40 am	05/31/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
62-53-3	Aniline	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
120-12-7	Anthracene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
50-32-8	Benzo(a)pyrene	**379**		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
205-99-2	Benzo(b)fluoranthene	**487**		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
207-08-9	Benzo(k)fluoranthene	**431**		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
218-01-9	Chrysene	**383**		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	716	716	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	716	716	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR

Sample Information

Client Sample ID: **ELB-36 0.25-0.5** **York Sample ID:** **13F0008-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:40 am	05/31/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
206-44-0	Fluoranthene	**820**		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
86-73-7	Fluorene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
78-59-1	Isophorone	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
91-20-3	Naphthalene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
85-01-8	Phenanthrene	**441**		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
108-95-2	Phenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
129-00-0	Pyrene	**759**		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
110-86-1	Pyridine	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR

Sample Information

Client Sample ID: **ELB-36 0.25-0.5** **York Sample ID:** **13F0008-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:40 am	05/31/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	358	358	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 17:33	SR

Surrogate Recoveries		Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*62.8 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*48.5 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*50.6 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*45.5 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*51.4 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*70.5 %*	*30-130*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	PH (Extractable Total Petroleum Hydrocarbo	**132**		mg/kg dry	3.05	14.3	1	CT DEP ETPH	06/03/2013 11:53	06/04/2013 12:55	JW

Surrogate Recoveries		Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*100 %*	*40.5-152*

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Metals, RCRA

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-38-2	Arsenic	**5.36**		mg/kg dry	0.487	1.43	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:38	AMC
7440-39-3	Barium	**54.3**		mg/kg dry	0.186	0.716	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:38	AMC
7440-43-9	Cadmium	**2.22**		mg/kg dry	0.143	0.716	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:38	AMC
7440-47-3	Chromium	**24.4**		mg/kg dry	0.172	0.716	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:38	AMC
7439-92-1	Lead	**494**		mg/kg dry	0.243	0.429	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:38	AMC
7782-49-2	Selenium	**2.71**		mg/kg dry	0.716	0.716	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:38	AMC
7440-22-4	Silver	ND		mg/kg dry	0.143	0.716	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:38	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.131**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 03:21	MW

Sample Information

Client Sample ID: **ELB-36 0.25-0.5** **York Sample ID:** **13F0008-10**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:40 am	05/31/2013

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.0472	0.0472	1	EPA SW846-7471	06/03/2013 08:52	06/03/2013 17:43	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**69.9**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: **ELB-37 0.25-0.5** **York Sample ID:** **13F0008-11**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:35 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/kg dry	1.0	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
71-55-6	1,1,1-Trichloroethane	ND		ug/kg dry	0.19	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/kg dry	1.5	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/kg dry	0.49	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
79-00-5	1,1,2-Trichloroethane	ND		ug/kg dry	1.1	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-34-3	1,1-Dichloroethane	ND		ug/kg dry	0.74	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-35-4	1,1-Dichloroethylene	ND		ug/kg dry	0.61	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
563-58-6	1,1-Dichloropropylene	ND		ug/kg dry	0.69	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
87-61-6	1,2,3-Trichlorobenzene	ND		ug/kg dry	0.79	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
96-18-4	1,2,3-Trichloropropane	ND		ug/kg dry	1.1	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	1.0	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
95-63-6	1,2,4-Trimethylbenzene	ND		ug/kg dry	0.81	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/kg dry	2.0	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
106-93-4	1,2-Dibromoethane	ND		ug/kg dry	0.59	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
95-50-1	1,2-Dichlorobenzene	ND		ug/kg dry	0.64	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
107-06-2	1,2-Dichloroethane	ND		ug/kg dry	0.75	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
78-87-5	1,2-Dichloropropane	ND		ug/kg dry	0.60	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
108-67-8	1,3,5-Trimethylbenzene	ND		ug/kg dry	0.66	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK

Sample Information

Client Sample ID: **ELB-37 0.25-0.5** **York Sample ID:** **13F0008-11**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:35 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
541-73-1	1,3-Dichlorobenzene	ND		ug/kg dry	0.86	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
142-28-9	1,3-Dichloropropane	ND		ug/kg dry	0.95	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
106-46-7	1,4-Dichlorobenzene	ND		ug/kg dry	1.1	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
594-20-7	2,2-Dichloropropane	ND		ug/kg dry	0.70	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
78-93-3	2-Butanone	ND		ug/kg dry	1.3	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
95-49-8	2-Chlorotoluene	ND		ug/kg dry	0.60	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
591-78-6	2-Hexanone	ND		ug/kg dry	1.0	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
106-43-4	4-Chlorotoluene	ND		ug/kg dry	0.76	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
108-10-1	4-Methyl-2-pentanone	ND		ug/kg dry	0.92	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
67-64-1	Acetone	**21**		ug/kg dry	9.8	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
107-13-1	Acrylonitrile	ND		ug/kg dry	1.2	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
71-43-2	Benzene	ND		ug/kg dry	0.73	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
108-86-1	Bromobenzene	ND		ug/kg dry	0.97	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
74-97-5	Bromochloromethane	ND		ug/kg dry	0.58	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-27-4	Bromodichloromethane	ND		ug/kg dry	1.1	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-25-2	Bromoform	ND		ug/kg dry	0.70	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
74-83-9	Bromomethane	ND		ug/kg dry	1.7	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-15-0	Carbon disulfide	ND		ug/kg dry	0.54	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
56-23-5	Carbon tetrachloride	ND		ug/kg dry	0.73	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
108-90-7	Chlorobenzene	ND		ug/kg dry	0.73	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-00-3	Chloroethane	ND		ug/kg dry	0.83	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
67-66-3	Chloroform	ND		ug/kg dry	0.75	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
74-87-3	Chloromethane	ND		ug/kg dry	0.82	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
156-59-2	cis-1,2-Dichloroethylene	ND		ug/kg dry	0.43	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/kg dry	0.68	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
124-48-1	Dibromochloromethane	ND		ug/kg dry	0.86	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
74-95-3	Dibromomethane	ND		ug/kg dry	0.94	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-71-8	Dichlorodifluoromethane	ND		ug/kg dry	0.68	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
100-41-4	Ethyl Benzene	ND		ug/kg dry	0.43	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	1.0	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
98-82-8	Isopropylbenzene	ND		ug/kg dry	0.79	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
80-62-6	Methyl Methacrylate	ND		ug/kg dry	1.2	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK

Sample Information

Client Sample ID: **ELB-37 0.25-0.5** **York Sample ID:** **13F0008-11**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:35 am	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5035A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/kg dry	0.55	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-09-2	Methylene chloride	ND		ug/kg dry	1.3	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
91-20-3	Naphthalene	ND		ug/kg dry	1.6	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
104-51-8	n-Butylbenzene	ND		ug/kg dry	0.65	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
103-65-1	n-Propylbenzene	ND		ug/kg dry	0.62	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
95-47-6	o-Xylene	ND		ug/kg dry	0.55	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
179601-23-1	p- & m- Xylenes	ND		ug/kg dry	1.4	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
99-87-6	p-Isopropyltoluene	ND		ug/kg dry	0.45	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
135-98-8	sec-Butylbenzene	ND		ug/kg dry	0.69	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
100-42-5	Styrene	ND		ug/kg dry	0.49	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
98-06-6	tert-Butylbenzene	ND		ug/kg dry	0.70	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
127-18-4	Tetrachloroethylene	ND		ug/kg dry	0.80	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
109-99-9	Tetrahydrofuran	ND		ug/kg dry	2.1	15	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
108-88-3	Toluene	ND		ug/kg dry	0.57	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
156-60-5	trans-1,2-Dichloroethylene	ND		ug/kg dry	0.77	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/kg dry	0.77	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/kg dry	1.4	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
79-01-6	Trichloroethylene	ND		ug/kg dry	0.73	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-69-4	Trichlorofluoromethane	ND		ug/kg dry	0.53	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK
75-01-4	Vinyl Chloride	ND		ug/kg dry	0.41	7.4	1	SW8260B	06/04/2013 10:19	06/04/2013 11:08	BK

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*100 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*94.7 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*97.8 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
83-32-9	Acenaphthene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
208-96-8	Acenaphthylene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
62-53-3	Aniline	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
120-12-7	Anthracene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
56-55-3	Benzo(a)anthracene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
50-32-8	Benzo(a)pyrene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR

Sample Information

Client Sample ID: **ELB-37 0.25-0.5** **York Sample ID:** **13F0008-11**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:35 am	05/31/2013

Semi-Volatiles, CT RCP BNA List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
205-99-2	Benzo(b)fluoranthene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
85-68-7	Benzyl butyl phthalate	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
106-47-8	4-Chloroaniline	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
91-58-7	2-Chloronaphthalene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
95-57-8	2-Chlorophenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
218-01-9	Chrysene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
132-64-9	Dibenzofuran	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
84-74-2	Di-n-butyl phthalate	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
120-83-2	2,4-Dichlorophenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
84-66-2	Diethyl phthalate	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
105-67-9	2,4-Dimethylphenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
131-11-3	Dimethyl phthalate	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/kg dry	778	778	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
51-28-5	2,4-Dinitrophenol	ND		ug/kg dry	778	778	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
117-84-0	Di-n-octyl phthalate	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
117-81-7	Bis(2-ethylhexyl)phthalate	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
206-44-0	Fluoranthene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
86-73-7	Fluorene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
118-74-1	Hexachlorobenzene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
87-68-3	Hexachlorobutadiene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR

Sample Information

Client Sample ID: **ELB-37 0.25-0.5** **York Sample ID:** **13F0008-11**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:35 am	05/31/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
77-47-4	Hexachlorocyclopentadiene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
67-72-1	Hexachloroethane	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
78-59-1	Isophorone	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
90-12-0	1-Methylnaphthalene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
91-57-6	2-Methylnaphthalene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
95-48-7	2-Methylphenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
91-20-3	Naphthalene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
99-09-2	3-Nitroaniline	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
100-01-6	4-Nitroaniline	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
88-74-4	2-Nitroaniline	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
98-95-3	Nitrobenzene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
88-75-5	2-Nitrophenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
100-02-7	4-Nitrophenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
82-68-8	Pentachloronitrobenzene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
87-86-5	Pentachlorophenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
85-01-8	Phenanthrene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
108-95-2	Phenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
129-00-0	Pyrene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
110-86-1	Pyridine	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/kg dry	389	389	1	EPA SW-846 8270C	06/03/2013 15:25	06/04/2013 18:04	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*51.5 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*39.0 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*39.9 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*42.8 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*51.8 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*73.9 %*	*30-130*

Sample Information

Client Sample ID: **ELB-37 0.25-0.5** **York Sample ID:** **13F0008-11**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 9:35 am	05/31/2013

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3545A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	PH (Extractable Total Petroleum Hydrocarbo	**62.8**		mg/kg dry	3.32	15.6	1	CT DEP ETPH	06/03/2013 11:53	06/04/2013 12:55	JW

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*96.8 %*	*40.5-152*

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Metals, RCRA

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-38-2	Arsenic	**5.90**		mg/kg dry	0.529	1.56	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:55	AMC
7440-39-3	Barium	**148**		mg/kg dry	0.202	0.778	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:55	AMC
7440-43-9	Cadmium	ND		mg/kg dry	0.156	0.778	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:55	AMC
7440-47-3	Chromium	**22.0**		mg/kg dry	0.187	0.778	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:55	AMC
7439-92-1	Lead	**691**		mg/kg dry	0.265	0.467	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:55	AMC
7782-49-2	Selenium	**1.68**		mg/kg dry	0.778	0.778	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:55	AMC
7440-22-4	Silver	ND		mg/kg dry	0.156	0.778	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 21:55	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0652**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 03:39	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7471

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/kg dry	0.0514	0.0514	1	EPA SW846-7471	06/03/2013 08:52	06/03/2013 17:43	AA

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**64.2**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: DUP-2 **York Sample ID:** 13F0008-12

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Soil	May 31, 2013 3:00 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1.00	1	EPA SW846-1312	06/03/2013 16:30	06/04/2013 15:07	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**336**		mg/kg dry	0.235	0.414	1	EPA SW846-6010B	06/03/2013 13:07	06/03/2013 22:13	AMC

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	**0.0205**		mg/L	0.00220	0.00300	1	EPA SW846-6010B	06/04/2013 15:47	06/05/2013 03:56	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	% Solids	**72.5**		%	0.100	0.100	1	SM 2540G	06/03/2013 11:29	06/04/2013 12:37	AMC

Sample Information

Client Sample ID: Trip Blank **York Sample ID:** 13F0008-13

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Water	May 30, 2013 3:00 pm	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.071	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.024	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.17	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
76-13-1	,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND		ug/L	0.074	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.070	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.044	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.044	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.11	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	0.12	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.17	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS

Sample Information

Client Sample ID: **Trip Blank** **York Sample ID:** **13F0008-13**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Water	May 30, 2013 3:00 pm	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	0.11	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.068	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	0.46	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.15	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.071	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.12	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.051	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.059	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.048	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.12	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.048	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.096	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
78-93-3	2-Butanone	ND		ug/L	1.0	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.084	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
591-78-6	2-Hexanone	ND		ug/L	0.24	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.072	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.17	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
67-64-1	Acetone	ND		ug/L	0.90	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
107-13-1	Acrylonitrile	ND		ug/L	0.73	1.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
71-43-2	Benzene	ND		ug/L	0.044	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
108-86-1	Bromobenzene	ND		ug/L	0.081	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
74-97-5	Bromochloromethane	ND		ug/L	0.10	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.054	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-25-2	Bromoform	ND		ug/L	0.079	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
74-83-9	Bromomethane	ND		ug/L	0.20	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-15-0	Carbon disulfide	ND		ug/L	0.065	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.085	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
108-90-7	Chlorobenzene	ND		ug/L	0.063	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-00-3	Chloroethane	ND		ug/L	0.090	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
67-66-3	Chloroform	ND		ug/L	0.079	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
74-87-3	Chloromethane	ND		ug/L	0.076	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.069	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS

Sample Information

Client Sample ID: **Trip Blank** **York Sample ID:** **13F0008-13**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0008	140068605	Water	May 30, 2013 3:00 pm	05/31/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	MDL	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.067	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.053	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
74-95-3	Dibromomethane	ND		ug/L	0.12	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.092	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.057	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.12	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.056	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.22	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.48	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-09-2	Methylene chloride	ND		ug/L	0.26	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
91-20-3	Naphthalene	ND		ug/L	0.090	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.083	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.068	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
95-47-6	o-Xylene	ND		ug/L	0.050	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
179601-23-1	p- & m- Xylenes	ND		ug/L	0.090	1.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.044	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.050	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
100-42-5	Styrene	ND		ug/L	0.043	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.050	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.070	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
109-99-9	Tetrahydrofuran	ND		ug/L	1.0	2.0	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
108-88-3	Toluene	ND		ug/L	0.042	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.085	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.060	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.092	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
79-01-6	Trichloroethylene	ND		ug/L	0.071	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.094	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.062	0.50	1	SW8260B	06/04/2013 08:45	06/05/2013 00:26	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*100 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*108 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*101 %*	*70-130*

Analytical Batch Summary

Batch ID: BF30019 **Preparation Method:** EPA SW846-7471 **Prepared By:** AA

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-08	ELB-34 0.25-0.5	06/03/13
13F0008-09	ELB-35 0.25-0.5	06/03/13
13F0008-10	ELB-36 0.25-0.5	06/03/13
13F0008-11	ELB-37 0.25-0.5	06/03/13
BF30019-BLK1	Blank	06/03/13
BF30019-BS1	LCS	06/03/13
BF30019-DUP2	Duplicate	06/03/13
BF30019-MS2	Matrix Spike	06/03/13

Batch ID: BF30039 **Preparation Method:** EPA SW 846-1312 SPLP for Extr. for **Prepared By:** KK

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-01	ELB-23 0.5-1	06/03/13
13F0008-03	HA-4A 1.5-2	06/03/13
13F0008-04	HA-5A 1.5-2	06/03/13
13F0008-05	ELB-32 0.5-1	06/03/13
13F0008-07	ELB-33 0.5-1	06/03/13
13F0008-08	ELB-34 0.25-0.5	06/03/13
13F0008-09	ELB-35 0.25-0.5	06/03/13
13F0008-10	ELB-36 0.25-0.5	06/03/13
13F0008-11	ELB-37 0.25-0.5	06/03/13
13F0008-12	DUP-2	06/03/13
BF30039-BLK1	Blank	06/03/13

Batch ID: BF30043 **Preparation Method:** % Solids Prep **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-01	ELB-23 0.5-1	06/03/13
13F0008-03	HA-4A 1.5-2	06/03/13
13F0008-04	HA-5A 1.5-2	06/03/13
13F0008-05	ELB-32 0.5-1	06/03/13
13F0008-07	ELB-33 0.5-1	06/03/13
13F0008-08	ELB-34 0.25-0.5	06/03/13
13F0008-09	ELB-35 0.25-0.5	06/03/13
13F0008-10	ELB-36 0.25-0.5	06/03/13
13F0008-11	ELB-37 0.25-0.5	06/03/13
13F0008-12	DUP-2	06/03/13

Batch ID: BF30048 **Preparation Method:** EPA 3545A **Prepared By:** DB

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-08	ELB-34 0.25-0.5	06/03/13
13F0008-09	ELB-35 0.25-0.5	06/03/13
13F0008-10	ELB-36 0.25-0.5	06/03/13
13F0008-11	ELB-37 0.25-0.5	06/03/13

BF30048-BLK1	Blank	06/03/13
BF30048-BS1	LCS	06/03/13
BF30048-BSD1	LCS Dup	06/03/13
BF30048-MS1	Matrix Spike	06/03/13

Batch ID: BF30051 **Preparation Method:** EPA 3050B **Prepared By:** AMC

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-01	ELB-23 0.5-1	06/03/13
13F0008-03	HA-4A 1.5-2	06/03/13
13F0008-04	HA-5A 1.5-2	06/03/13
13F0008-05	ELB-32 0.5-1	06/03/13
13F0008-07	ELB-33 0.5-1	06/03/13
13F0008-08	ELB-34 0.25-0.5	06/03/13
13F0008-09	ELB-35 0.25-0.5	06/03/13
13F0008-10	ELB-36 0.25-0.5	06/03/13
13F0008-11	ELB-37 0.25-0.5	06/03/13
13F0008-12	DUP-2	06/03/13
BF30051-BLK1	Blank	06/03/13
BF30051-DUP1	Duplicate	06/03/13
BF30051-MS1	Matrix Spike	06/03/13
BF30051-SRM1	Reference	06/03/13

Batch ID: BF30054 **Preparation Method:** EPA 3545A **Prepared By:** SA

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-08	ELB-34 0.25-0.5	06/03/13
13F0008-09	ELB-35 0.25-0.5	06/03/13
13F0008-10	ELB-36 0.25-0.5	06/03/13
13F0008-11	ELB-37 0.25-0.5	06/03/13
BF30054-BLK1	Blank	06/03/13
BF30054-BS1	LCS	06/03/13
BF30054-BSD1	LCS Dup	06/03/13
BF30054-MS1	Matrix Spike	06/03/13

Batch ID: BF30068 **Preparation Method:** EPA 5035A **Prepared By:** KH

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-10	ELB-36 0.25-0.5	06/03/13
BF30068-BLK1	Blank	06/03/13
BF30068-BS1	LCS	06/03/13
BF30068-BSD1	LCS Dup	06/03/13

Batch ID: BF30092 **Preparation Method:** EPA 5035A **Prepared By:** EKM

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-08	ELB-34 0.25-0.5	06/04/13
13F0008-09	ELB-35 0.25-0.5	06/04/13
13F0008-11	ELB-37 0.25-0.5	06/04/13

BF30092-BLK1	Blank	06/04/13
BF30092-BS1	LCS	06/04/13
BF30092-BSD1	LCS Dup	06/04/13
BF30092-MS1	Matrix Spike	06/04/13
BF30092-MSD1	Matrix Spike Dup	06/04/13

Batch ID: BF30096 **Preparation Method:** EPA 5030B **Prepared By:** KH

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-13	Trip Blank	06/04/13
BF30096-BLK1	Blank	06/04/13
BF30096-BS1	LCS	06/04/13
BF30096-BSD1	LCS Dup	06/04/13

Batch ID: BF30151 **Preparation Method:** EPA 3010A **Prepared By:** MW

YORK Sample ID	Client Sample ID	Preparation Date
13F0008-01	ELB-23 0.5-1	06/04/13
13F0008-03	HA-4A 1.5-2	06/04/13
13F0008-04	HA-5A 1.5-2	06/04/13
13F0008-05	ELB-32 0.5-1	06/04/13
13F0008-07	ELB-33 0.5-1	06/04/13
13F0008-08	ELB-34 0.25-0.5	06/04/13
13F0008-09	ELB-35 0.25-0.5	06/04/13
13F0008-10	ELB-36 0.25-0.5	06/04/13
13F0008-11	ELB-37 0.25-0.5	06/04/13
13F0008-12	DUP-2	06/04/13
BF30151-BLK1	Blank	06/04/13
BF30151-BLK2	Blank	06/04/13
BF30151-DUP1	Duplicate	06/04/13
BF30151-SRM1	Reference	06/04/13

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30068 - EPA 5035A											
Blank (BF30068-BLK1)									Prepared: 06/03/2013 Analyzed: 06/04/2013		
1,1,1,2-Tetrachloroethane	ND	5.0	ug/kg wet								
1,1,1-Trichloroethane	ND	5.0	"								
1,1,2,2-Tetrachloroethane	ND	5.0	"								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	5.0	"								
1,1,2-Trichloroethane	ND	5.0	"								
1,1-Dichloroethane	ND	5.0	"								
1,1-Dichloroethylene	ND	5.0	"								
1,1-Dichloropropylene	ND	5.0	"								
1,2,3-Trichlorobenzene	ND	10	"								
1,2,3-Trichloropropane	ND	5.0	"								
1,2,4-Trichlorobenzene	ND	10	"								
1,2,4-Trimethylbenzene	ND	5.0	"								
1,2-Dibromo-3-chloropropane	ND	10	"								
1,2-Dibromoethane	ND	5.0	"								
1,2-Dichlorobenzene	ND	5.0	"								
1,2-Dichloroethane	ND	5.0	"								
1,2-Dichloropropane	ND	5.0	"								
1,3,5-Trimethylbenzene	ND	5.0	"								
1,3-Dichlorobenzene	ND	5.0	"								
1,3-Dichloropropane	ND	5.0	"								
1,4-Dichlorobenzene	ND	5.0	"								
2,2-Dichloropropane	ND	5.0	"								
2-Butanone	ND	10	"								
2-Chlorotoluene	ND	5.0	"								
2-Hexanone	ND	5.0	"								
4-Chlorotoluene	ND	5.0	"								
4-Methyl-2-pentanone	ND	5.0	"								
Acetone	ND	10	"								
Acrylonitrile	ND	5.0	"								
Benzene	ND	5.0	"								
Bromobenzene	ND	5.0	"								
Bromochloromethane	ND	5.0	"								
Bromodichloromethane	ND	5.0	"								
Bromoform	ND	5.0	"								
Bromomethane	ND	5.0	"								
Carbon disulfide	ND	5.0	"								
Carbon tetrachloride	ND	5.0	"								
Chlorobenzene	ND	5.0	"								
Chloroethane	ND	5.0	"								
Chloroform	ND	5.0	"								
Chloromethane	ND	5.0	"								
cis-1,2-Dichloroethylene	ND	5.0	"								
cis-1,3-Dichloropropylene	ND	5.0	"								
Dibromochloromethane	ND	5.0	"								
Dibromomethane	ND	5.0	"								
Dichlorodifluoromethane	ND	5.0	"								
Ethyl Benzene	ND	5.0	"								
Hexachlorobutadiene	ND	5.0	"								
Isopropylbenzene	ND	5.0	"								
Methyl Methacrylate	ND	5.0	"								
Methyl tert-butyl ether (MTBE)	ND	5.0	"								

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30068 - EPA 5035A											
Blank (BF30068-BLK1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
Methylene chloride	ND	10	ug/kg wet								
Naphthalene	ND	10	"								
n-Butylbenzene	ND	5.0	"								
n-Propylbenzene	ND	5.0	"								
o-Xylene	ND	5.0	"								
p- & m- Xylenes	ND	10	"								
p-Isopropyltoluene	ND	5.0	"								
sec-Butylbenzene	ND	5.0	"								
Styrene	ND	5.0	"								
tert-Butylbenzene	ND	5.0	"								
Tetrachloroethylene	ND	5.0	"								
Tetrahydrofuran	ND	10	"								
Toluene	ND	5.0	"								
trans-1,2-Dichloroethylene	ND	5.0	"								
trans-1,3-Dichloropropylene	ND	5.0	"								
trans-1,4-dichloro-2-butene	ND	5.0	"								
Trichloroethylene	ND	5.0	"								
Trichlorofluoromethane	ND	5.0	"								
Vinyl Chloride	ND	5.0	"								
Surrogate: 1,2-Dichloroethane-d4	*48.5*		*ug/L*	*50.0*		*97.0*	*70-130*				
Surrogate: p-Bromofluorobenzene	*48.7*		*"*	*50.0*		*97.5*	*70-130*				
Surrogate: Toluene-d8	*52.1*		*"*	*50.0*		*104*	*70-130*				
LCS (BF30068-BS1)								Prepared & Analyzed: 06/03/2013			
1,1,1,2-Tetrachloroethane	48		ug/L	50.0		95.6	70-130				
1,1,1-Trichloroethane	45		"	50.0		90.8	70-130				
1,1,2,2-Tetrachloroethane	53		"	50.0		107	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	44		"	50.0		88.6	70-130				
1,1,2-Trichloroethane	53		"	50.0		107	70-130				
1,1-Dichloroethane	43		"	50.0		86.3	70-130				
1,1-Dichloroethylene	42		"	50.0		84.7	70-130				
1,1-Dichloropropylene	45		"	50.0		90.6	70-130				
1,2,3-Trichlorobenzene	47		"	50.0		94.1	70-130				
1,2,3-Trichloropropane	49		"	50.0		97.5	70-130				
1,2,4-Trichlorobenzene	44		"	50.0		88.4	70-130				
1,2,4-Trimethylbenzene	45		"	50.0		89.7	70-130				
1,2-Dibromo-3-chloropropane	62		"	50.0		124	70-130				
1,2-Dibromoethane	51		"	50.0		101	70-130				
1,2-Dichlorobenzene	46		"	50.0		92.4	70-130				
1,2-Dichloroethane	46		"	50.0		92.8	70-130				
1,2-Dichloropropane	52		"	50.0		105	70-130				
1,3,5-Trimethylbenzene	45		"	50.0		90.2	70-130				
1,3-Dichlorobenzene	45		"	50.0		89.9	70-130				
1,3-Dichloropropane	52		"	50.0		104	70-130				
1,4-Dichlorobenzene	44		"	50.0		88.9	70-130				
2,2-Dichloropropane	49		"	50.0		98.5	70-130				
2-Butanone	71		"	50.0		141	70-130	High Bias			
2-Chlorotoluene	44		"	50.0		87.5	70-130				
2-Hexanone	57		"	50.0		113	70-130				
4-Chlorotoluene	46		"	50.0		92.0	70-130				
4-Methyl-2-pentanone	42		"	50.0		84.4	70-130				
Acetone	37		"	50.0		74.9	70-130				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30068 - EPA 5035A											
LCS (BF30068-BS1)							Prepared & Analyzed: 06/03/2013				
Acrylonitrile	52		ug/L	50.0		103	70-130				
Benzene	49		"	50.0		99.0	70-130				
Bromobenzene	48		"	50.0		96.2	70-130				
Bromochloromethane	60		"	50.0		120	70-130				
Bromodichloromethane	50		"	50.0		99.8	70-130				
Bromoform	50		"	50.0		101	70-130				
Bromomethane	43		"	50.0		85.2	70-130				
Carbon disulfide	89		"	100		88.8	70-130				
Carbon tetrachloride	45		"	50.0		89.6	70-130				
Chlorobenzene	48		"	50.0		96.7	70-130				
Chloroethane	45		"	50.0		89.3	70-130				
Chloroform	51		"	50.0		102	70-130				
Chloromethane	46		"	50.0		92.9	70-130				
cis-1,2-Dichloroethylene	54		"	50.0		107	70-130				
cis-1,3-Dichloropropylene	52		"	50.0		105	70-130				
Dibromochloromethane	50		"	50.0		101	70-130				
Dibromomethane	52		"	50.0		104	70-130				
Dichlorodifluoromethane	36		"	50.0		71.5	70-130				
Ethyl Benzene	49		"	50.0		98.9	70-130				
Hexachlorobutadiene	44		"	50.0		87.5	70-130				
Isopropylbenzene	46		"	50.0		91.3	70-130				
Methyl Methacrylate	58		"	50.0		115	70-130				
Methyl tert-butyl ether (MTBE)	45		"	50.0		90.9	70-130				
Methylene chloride	45		"	50.0		90.6	70-130				
Naphthalene	54		"	50.0		108	70-130				
n-Butylbenzene	44		"	50.0		87.7	70-130				
n-Propylbenzene	46		"	50.0		91.9	70-130				
o-Xylene	48		"	50.0		95.8	70-130				
p- & m- Xylenes	96		"	100		95.7	70-130				
p-Isopropyltoluene	45		"	50.0		90.2	70-130				
sec-Butylbenzene	47		"	50.0		94.0	70-130				
Styrene	51		"	50.0		101	70-130				
tert-Butylbenzene	46		"	50.0		92.6	70-130				
Tetrachloroethylene	47		"	50.0		94.1	70-130				
Tetrahydrofuran	69		"	50.0		138	70-130	High Bias			
Toluene	49		"	50.0		98.4	70-130				
trans-1,2-Dichloroethylene	41		"	50.0		82.7	70-130				
trans-1,3-Dichloropropylene	50		"	50.0		99.2	70-130				
trans-1,4-dichloro-2-butene	50		"	50.0		99.3	70-130				
Trichloroethylene	48		"	50.0		96.9	70-130				
Trichlorofluoromethane	38		"	50.0		76.8	70-130				
Vinyl Chloride	43		"	50.0		85.1	70-130				
Surrogate: 1,2-Dichloroethane-d4	*48.0*		*"*	*50.0*		*95.9*	*70-130*				
Surrogate: p-Bromofluorobenzene	*48.4*		*"*	*50.0*		*96.7*	*70-130*				
Surrogate: Toluene-d8	*51.8*		*"*	*50.0*		*104*	*70-130*				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30068 - EPA 5035A											
LCS Dup (BF30068-BSD1)								Prepared & Analyzed: 06/03/2013			
1,1,1,2-Tetrachloroethane	47		ug/L	50.0		94.9	70-130		0.714	30	
1,1,1-Trichloroethane	46		"	50.0		91.2	70-130		0.462	30	
1,1,2,2-Tetrachloroethane	54		"	50.0		108	70-130		0.933	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	45		"	50.0		90.7	70-130		2.34	30	
1,1,2-Trichloroethane	53		"	50.0		106	70-130		0.659	30	
1,1-Dichloroethane	45		"	50.0		89.2	70-130		3.31	30	
1,1-Dichloroethylene	41		"	50.0		82.7	70-130		2.49	30	
1,1-Dichloropropylene	45		"	50.0		89.8	70-130		0.843	30	
1,2,3-Trichlorobenzene	46		"	50.0		93.0	70-130		1.13	30	
1,2,3-Trichloropropane	51		"	50.0		101	70-130		3.67	30	
1,2,4-Trichlorobenzene	43		"	50.0		85.2	70-130		3.68	30	
1,2,4-Trimethylbenzene	46		"	50.0		91.9	70-130		2.40	30	
1,2-Dibromo-3-chloropropane	64		"	50.0		128	70-130		2.71	30	
1,2-Dibromoethane	51		"	50.0		101	70-130		0.237	30	
1,2-Dichlorobenzene	46		"	50.0		92.2	70-130		0.173	30	
1,2-Dichloroethane	46		"	50.0		92.5	70-130		0.281	30	
1,2-Dichloropropane	53		"	50.0		106	70-130		0.702	30	
1,3,5-Trimethylbenzene	47		"	50.0		93.8	70-130		3.93	30	
1,3-Dichlorobenzene	45		"	50.0		89.5	70-130		0.446	30	
1,3-Dichloropropane	52		"	50.0		104	70-130		0.750	30	
1,4-Dichlorobenzene	44		"	50.0		88.5	70-130		0.451	30	
2,2-Dichloropropane	48		"	50.0		97.0	70-130		1.53	30	
2-Butanone	68		"	50.0		136	70-130	High Bias	4.02	30	
2-Chlorotoluene	45		"	50.0		89.1	70-130		1.81	30	
2-Hexanone	56		"	50.0		112	70-130		0.621	30	
4-Chlorotoluene	46		"	50.0		91.7	70-130		0.370	30	
4-Methyl-2-pentanone	43		"	50.0		85.2	70-130		0.873	30	
Acetone	47		"	50.0		94.0	70-130		22.7	30	
Acrylonitrile	49		"	50.0		98.9	70-130		4.37	30	
Benzene	49		"	50.0		97.3	70-130		1.71	30	
Bromobenzene	49		"	50.0		97.9	70-130		1.81	30	
Bromochloromethane	59		"	50.0		118	70-130		1.88	30	
Bromodichloromethane	51		"	50.0		102	70-130		1.69	30	
Bromoform	51		"	50.0		103	70-130		1.79	30	
Bromomethane	42		"	50.0		83.4	70-130		2.16	30	
Carbon disulfide	89		"	100		88.8	70-130		0.0788	30	
Carbon tetrachloride	45		"	50.0		90.0	70-130		0.446	30	
Chlorobenzene	48		"	50.0		95.4	70-130		1.40	30	
Chloroethane	45		"	50.0		89.2	70-130		0.112	30	
Chloroform	51		"	50.0		103	70-130		0.821	30	
Chloromethane	44		"	50.0		87.4	70-130		6.10	30	
cis-1,2-Dichloroethylene	53		"	50.0		105	70-130		1.49	30	
cis-1,3-Dichloropropylene	52		"	50.0		104	70-130		0.518	30	
Dibromochloromethane	51		"	50.0		102	70-130		1.05	30	
Dibromomethane	54		"	50.0		108	70-130		4.10	30	
Dichlorodifluoromethane	36		"	50.0		71.8	70-130		0.475	30	
Ethyl Benzene	49		"	50.0		97.8	70-130		1.16	30	
Hexachlorobutadiene	44		"	50.0		88.7	70-130		1.34	30	
Isopropylbenzene	46		"	50.0		92.6	70-130		1.41	30	
Methyl Methacrylate	57		"	50.0		114	70-130		1.05	30	
Methyl tert-butyl ether (MTBE)	46		"	50.0		92.9	70-130		2.13	30	

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30068 - EPA 5035A											
LCS Dup (BF30068-BSD1)								Prepared & Analyzed: 06/03/2013			
Methylene chloride	45		ug/L	50.0		89.1	70-130		1.74	30	
Naphthalene	54		"	50.0		108	70-130		0.352	30	
n-Butylbenzene	44		"	50.0		87.1	70-130		0.755	30	
n-Propylbenzene	47		"	50.0		93.9	70-130		2.13	30	
o-Xylene	48		"	50.0		95.1	70-130		0.754	30	
p- & m- Xylenes	96		"	100		96.1	70-130		0.459	30	
p-Isopropyltoluene	46		"	50.0		92.0	70-130		1.98	30	
sec-Butylbenzene	48		"	50.0		95.8	70-130		1.92	30	
Styrene	50		"	50.0		100	70-130		0.874	30	
tert-Butylbenzene	47		"	50.0		93.5	70-130		0.903	30	
Tetrachloroethylene	48		"	50.0		95.8	70-130		1.83	30	
Tetrahydrofuran	71		"	50.0		141	70-130	High Bias	2.44	30	
Toluene	50		"	50.0		99.9	70-130		1.51	30	
trans-1,2-Dichloroethylene	42		"	50.0		83.2	70-130		0.651	30	
trans-1,3-Dichloropropylene	51		"	50.0		102	70-130		2.65	30	
trans-1,4-dichloro-2-butene	52		"	50.0		103	70-130		3.74	30	
Trichloroethylene	48		"	50.0		96.5	70-130		0.455	30	
Trichlorofluoromethane	39		"	50.0		78.4	70-130		2.11	30	
Vinyl Chloride	43		"	50.0		85.6	70-130		0.539	30	
Surrogate: 1,2-Dichloroethane-d4	*50.3*		*"*	*50.0*		*101*	*70-130*				
Surrogate: p-Bromofluorobenzene	*50.2*		*"*	*50.0*		*100*	*70-130*				
Surrogate: Toluene-d8	*52.1*		*"*	*50.0*		*104*	*70-130*				
Batch BF30092 - EPA 5035A											
Blank (BF30092-BLK1)								Prepared & Analyzed: 06/04/2013			
1,1,1,2-Tetrachloroethane	ND	5.0	ug/kg wet								
1,1,1-Trichloroethane	ND	5.0	"								
1,1,2,2-Tetrachloroethane	ND	5.0	"								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	5.0	"								
1,1,2-Trichloroethane	ND	5.0	"								
1,1-Dichloroethane	ND	5.0	"								
1,1-Dichloroethylene	ND	5.0	"								
1,1-Dichloropropylene	ND	5.0	"								
1,2,3-Trichlorobenzene	ND	10	"								
1,2,3-Trichloropropane	ND	5.0	"								
1,2,4-Trichlorobenzene	ND	10	"								
1,2,4-Trimethylbenzene	ND	5.0	"								
1,2-Dibromo-3-chloropropane	ND	10	"								
1,2-Dibromoethane	ND	5.0	"								
1,2-Dichlorobenzene	ND	5.0	"								
1,2-Dichloroethane	ND	5.0	"								
1,2-Dichloropropane	ND	5.0	"								
1,3,5-Trimethylbenzene	ND	5.0	"								
1,3-Dichlorobenzene	ND	5.0	"								
1,3-Dichloropropane	ND	5.0	"								
1,4-Dichlorobenzene	ND	5.0	"								
2,2-Dichloropropane	ND	5.0	"								
2-Butanone	ND	10	"								
2-Chlorotoluene	ND	5.0	"								
2-Hexanone	ND	5.0	"								
4-Chlorotoluene	ND	5.0	"								

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30092 - EPA 5035A											
Blank (BF30092-BLK1)								Prepared & Analyzed: 06/04/2013			
4-Methyl-2-pentanone	ND	5.0	ug/kg wet								
Acetone	ND	10	"								
Acrylonitrile	ND	5.0	"								
Benzene	ND	5.0	"								
Bromobenzene	ND	5.0	"								
Bromochloromethane	ND	5.0	"								
Bromodichloromethane	ND	5.0	"								
Bromoform	ND	5.0	"								
Bromomethane	ND	5.0	"								
Carbon disulfide	ND	5.0	"								
Carbon tetrachloride	ND	5.0	"								
Chlorobenzene	ND	5.0	"								
Chloroethane	ND	5.0	"								
Chloroform	ND	5.0	"								
Chloromethane	ND	5.0	"								
cis-1,2-Dichloroethylene	ND	5.0	"								
cis-1,3-Dichloropropylene	ND	5.0	"								
Dibromochloromethane	ND	5.0	"								
Dibromomethane	ND	5.0	"								
Dichlorodifluoromethane	ND	5.0	"								
Ethyl Benzene	ND	5.0	"								
Hexachlorobutadiene	ND	5.0	"								
Isopropylbenzene	ND	5.0	"								
Methyl Methacrylate	ND	5.0	"								
Methyl tert-butyl ether (MTBE)	ND	5.0	"								
Methylene chloride	ND	10	"								
Naphthalene	ND	10	"								
n-Butylbenzene	ND	5.0	"								
n-Propylbenzene	ND	5.0	"								
o-Xylene	ND	5.0	"								
p- & m- Xylenes	ND	10	"								
p-Isopropyltoluene	ND	5.0	"								
sec-Butylbenzene	ND	5.0	"								
Styrene	ND	5.0	"								
tert-Butylbenzene	ND	5.0	"								
Tetrachloroethylene	ND	5.0	"								
Tetrahydrofuran	ND	10	"								
Toluene	ND	5.0	"								
trans-1,2-Dichloroethylene	ND	5.0	"								
trans-1,3-Dichloropropylene	ND	5.0	"								
trans-1,4-dichloro-2-butene	ND	5.0	"								
Trichloroethylene	ND	5.0	"								
Trichlorofluoromethane	ND	5.0	"								
Vinyl Chloride	ND	5.0	"								
Surrogate: 1,2-Dichloroethane-d4	*49.3*		*ug/L*	*50.0*		*98.7*	*70-130*				
Surrogate: p-Bromofluorobenzene	*47.8*		*"*	*50.0*		*95.7*	*70-130*				
Surrogate: Toluene-d8	*48.5*		*"*	*50.0*		*97.0*	*70-130*				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30092 - EPA 5035A											
LCS (BF30092-BS1)							Prepared & Analyzed: 06/04/2013				
1,1,1,2-Tetrachloroethane	48		ug/L	50.0		96.9	70-130				
1,1,1-Trichloroethane	46		"	50.0		92.1	70-130				
1,1,2,2-Tetrachloroethane	51		"	50.0		101	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	53		"	50.0		106	70-130				
1,1,2-Trichloroethane	48		"	50.0		95.6	70-130				
1,1-Dichloroethane	32		"	50.0		64.5	70-130	Low Bias			
1,1-Dichloroethylene	47		"	50.0		94.8	70-130				
1,1-Dichloropropylene	43		"	50.0		86.6	70-130				
1,2,3-Trichlorobenzene	50		"	50.0		99.1	70-130				
1,2,3-Trichloropropane	51		"	50.0		102	70-130				
1,2,4-Trichlorobenzene	51		"	50.0		102	70-130				
1,2,4-Trimethylbenzene	47		"	50.0		94.8	70-130				
1,2-Dibromo-3-chloropropane	54		"	50.0		107	70-130				
1,2-Dibromoethane	49		"	50.0		97.6	70-130				
1,2-Dichlorobenzene	49		"	50.0		97.7	70-130				
1,2-Dichloroethane	48		"	50.0		95.9	70-130				
1,2-Dichloropropane	47		"	50.0		94.4	70-130				
1,3,5-Trimethylbenzene	48		"	50.0		96.3	70-130				
1,3-Dichlorobenzene	49		"	50.0		98.4	70-130				
1,3-Dichloropropane	49		"	50.0		97.5	70-130				
1,4-Dichlorobenzene	48		"	50.0		96.5	70-130				
2,2-Dichloropropane	27		"	50.0		54.2	70-130	Low Bias			
2-Butanone	30		"	50.0		60.5	70-130	Low Bias			
2-Chlorotoluene	49		"	50.0		97.4	70-130				
2-Hexanone	51		"	50.0		102	70-130				
4-Chlorotoluene	49		"	50.0		97.2	70-130				
4-Methyl-2-pentanone	53		"	50.0		106	70-130				
Acetone	35		"	50.0		70.6	70-130				
Acrylonitrile	41		"	50.0		81.1	70-130				
Benzene	47		"	50.0		94.8	70-130				
Bromobenzene	47		"	50.0		94.6	70-130				
Bromochloromethane	40		"	50.0		79.7	70-130				
Bromodichloromethane	47		"	50.0		94.9	70-130				
Bromoform	50		"	50.0		99.0	70-130				
Bromomethane	40		"	50.0		80.2	70-130				
Carbon disulfide	87		"	100		86.5	70-130				
Carbon tetrachloride	46		"	50.0		91.1	70-130				
Chlorobenzene	48		"	50.0		95.8	70-130				
Chloroethane	48		"	50.0		96.0	70-130				
Chloroform	44		"	50.0		88.1	70-130				
Chloromethane	43		"	50.0		85.9	70-130				
cis-1,2-Dichloroethylene	17		"	50.0		33.9	70-130	Low Bias			
cis-1,3-Dichloropropylene	49		"	50.0		97.6	70-130				
Dibromochloromethane	49		"	50.0		98.3	70-130				
Dibromomethane	48		"	50.0		95.6	70-130				
Dichlorodifluoromethane	34		"	50.0		67.4	70-130	Low Bias			
Ethyl Benzene	49		"	50.0		97.4	70-130				
Hexachlorobutadiene	48		"	50.0		96.3	70-130				
Isopropylbenzene	47		"	50.0		94.2	70-130				
Methyl Methacrylate	49		"	50.0		98.1	70-130				
Methyl tert-butyl ether (MTBE)	44		"	50.0		87.1	70-130				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30092 - EPA 5035A											
LCS (BF30092-BS1)							Prepared & Analyzed: 06/04/2013				
Methylene chloride	42		ug/L	50.0		83.2	70-130				
Naphthalene	54		"	50.0		108	70-130				
n-Butylbenzene	48		"	50.0		96.1	70-130				
n-Propylbenzene	48		"	50.0		96.5	70-130				
o-Xylene	47		"	50.0		93.9	70-130				
p- & m- Xylenes	97		"	100		96.5	70-130				
p-Isopropyltoluene	50		"	50.0		99.7	70-130				
sec-Butylbenzene	49		"	50.0		98.0	70-130				
Styrene	51		"	50.0		101	70-130				
tert-Butylbenzene	49		"	50.0		97.4	70-130				
Tetrachloroethylene	47		"	50.0		93.8	70-130				
Tetrahydrofuran	49		"	50.0		97.7	70-130				
Toluene	47		"	50.0		93.7	70-130				
trans-1,2-Dichloroethylene	38		"	50.0		75.8	70-130				
trans-1,3-Dichloropropylene	50		"	50.0		99.1	70-130				
trans-1,4-dichloro-2-butene	51		"	50.0		102	70-130				
Trichloroethylene	45		"	50.0		89.3	70-130				
Trichlorofluoromethane	48		"	50.0		96.9	70-130				
Vinyl Chloride	42		"	50.0		84.6	70-130				
Surrogate: 1,2-Dichloroethane-d4	*51.9*		*"*	*50.0*		*104*	*70-130*				
Surrogate: p-Bromofluorobenzene	*49.5*		*"*	*50.0*		*99.1*	*70-130*				
Surrogate: Toluene-d8	*48.7*		*"*	*50.0*		*97.5*	*70-130*				
LCS Dup (BF30092-BSD1)							Prepared & Analyzed: 06/04/2013				
1,1,1,2-Tetrachloroethane	47		ug/L	50.0		93.8	70-130		3.23	30	
1,1,1-Trichloroethane	50		"	50.0		101	70-130		8.78	30	
1,1,2,2-Tetrachloroethane	46		"	50.0		92.8	70-130		8.52	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	51		"	50.0		102	70-130		4.46	30	
1,1,2-Trichloroethane	47		"	50.0		94.5	70-130		1.18	30	
1,1-Dichloroethane	69		"	50.0		139	70-130	High Bias	72.9	30	Non-dir.
1,1-Dichloroethylene	46		"	50.0		91.9	70-130		3.11	30	
1,1-Dichloropropylene	48		"	50.0		95.5	70-130		9.80	30	
1,2,3-Trichlorobenzene	49		"	50.0		97.8	70-130		1.34	30	
1,2,3-Trichloropropane	45		"	50.0		90.9	70-130		11.6	30	
1,2,4-Trichlorobenzene	50		"	50.0		100	70-130		1.29	30	
1,2,4-Trimethylbenzene	48		"	50.0		95.4	70-130		0.547	30	
1,2-Dibromo-3-chloropropane	48		"	50.0		96.0	70-130		11.1	30	
1,2-Dibromoethane	47		"	50.0		94.6	70-130		3.14	30	
1,2-Dichlorobenzene	48		"	50.0		95.6	70-130		2.17	30	
1,2-Dichloroethane	49		"	50.0		98.8	70-130		3.04	30	
1,2-Dichloropropane	47		"	50.0		94.3	70-130		0.0424	30	
1,3,5-Trimethylbenzene	48		"	50.0		95.5	70-130		0.813	30	
1,3-Dichlorobenzene	48		"	50.0		95.9	70-130		2.55	30	
1,3-Dichloropropane	47		"	50.0		93.3	70-130		4.34	30	
1,4-Dichlorobenzene	48		"	50.0		95.4	70-130		1.23	30	
2,2-Dichloropropane	51		"	50.0		102	70-130		60.8	30	Non-dir.
2-Butanone	57		"	50.0		114	70-130		61.7	30	Non-dir.
2-Chlorotoluene	47		"	50.0		94.6	70-130		2.92	30	
2-Hexanone	46		"	50.0		92.1	70-130		10.7	30	
4-Chlorotoluene	49		"	50.0		97.6	70-130		0.390	30	
4-Methyl-2-pentanone	49		"	50.0		97.4	70-130		8.28	30	
Acetone	37		"	50.0		73.6	70-130		4.05	30	

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30092 - EPA 5035A											
LCS Dup (BF30092-BSD1)								Prepared & Analyzed: 06/04/2013			
Acrylonitrile	34		ug/L	50.0		68.6	70-130	Low Bias	16.8	30	
Benzene	50		"	50.0		99.7	70-130		5.04	30	
Bromobenzene	47		"	50.0		93.9	70-130		0.806	30	
Bromochloromethane	47		"	50.0		93.5	70-130		15.9	30	
Bromodichloromethane	48		"	50.0		96.1	70-130		1.28	30	
Bromoform	47		"	50.0		93.6	70-130		5.65	30	
Bromomethane	39		"	50.0		77.3	70-130		3.76	30	
Carbon disulfide	83		"	100		82.8	70-130		4.43	30	
Carbon tetrachloride	50		"	50.0		101	70-130		10.2	30	
Chlorobenzene	48		"	50.0		95.3	70-130		0.607	30	
Chloroethane	46		"	50.0		92.3	70-130		3.97	30	
Chloroform	50		"	50.0		100	70-130		12.7	30	
Chloromethane	42		"	50.0		84.2	70-130		2.05	30	
cis-1,2-Dichloroethylene	51		"	50.0		102	70-130		100	30	Non-dir.
cis-1,3-Dichloropropylene	50		"	50.0		99.2	70-130		1.61	30	
Dibromochloromethane	48		"	50.0		96.9	70-130		1.35	30	
Dibromomethane	48		"	50.0		95.1	70-130		0.545	30	
Dichlorodifluoromethane	31		"	50.0		61.9	70-130	Low Bias	8.54	30	
Ethyl Benzene	49		"	50.0		97.7	70-130		0.328	30	
Hexachlorobutadiene	50		"	50.0		99.8	70-130		3.59	30	
Isopropylbenzene	48		"	50.0		95.8	70-130		1.71	30	
Methyl Methacrylate	49		"	50.0		97.3	70-130		0.840	30	
Methyl tert-butyl ether (MTBE)	39		"	50.0		78.8	70-130		10.1	30	
Methylene chloride	39		"	50.0		78.8	70-130		5.41	30	
Naphthalene	52		"	50.0		104	70-130		3.73	30	
n-Butylbenzene	49		"	50.0		98.3	70-130		2.22	30	
n-Propylbenzene	48		"	50.0		95.4	70-130		1.17	30	
o-Xylene	47		"	50.0		94.2	70-130		0.362	30	
p- & m- Xylenes	97		"	100		97.4	70-130		0.836	30	
p-Isopropyltoluene	49		"	50.0		97.2	70-130		2.58	30	
sec-Butylbenzene	49		"	50.0		98.6	70-130		0.570	30	
Styrene	50		"	50.0		100	70-130		0.974	30	
tert-Butylbenzene	49		"	50.0		97.9	70-130		0.532	30	
Tetrachloroethylene	47		"	50.0		93.0	70-130		0.814	30	
Tetrahydrofuran	52		"	50.0		104	70-130		6.05	30	
Toluene	47		"	50.0		93.6	70-130		0.128	30	
trans-1,2-Dichloroethylene	36		"	50.0		72.8	70-130		4.04	30	
trans-1,3-Dichloropropylene	47		"	50.0		93.6	70-130		5.71	30	
trans-1,4-dichloro-2-butene	47		"	50.0		94.8	70-130		7.43	30	
Trichloroethylene	46		"	50.0		92.6	70-130		3.69	30	
Trichlorofluoromethane	46		"	50.0		92.5	70-130		4.71	30	
Vinyl Chloride	39		"	50.0		78.0	70-130		8.07	30	
Surrogate: 1,2-Dichloroethane-d4	*52.7*		*"*	*50.0*		*105*	*70-130*				
Surrogate: p-Bromofluorobenzene	*49.4*		*"*	*50.0*		*98.7*	*70-130*				
Surrogate: Toluene-d8	*48.6*		*"*	*50.0*		*97.2*	*70-130*				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30092 - EPA 5035A											
Matrix Spike (BF30092-MS1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)						Prepared & Analyzed: 06/04/2013				
1,1,1,2-Tetrachloroethane	40		ug/L	50.0	ND	79.9	70-130				
1,1,1-Trichloroethane	43		"	50.0	ND	85.7	70-130				
1,1,2,2-Tetrachloroethane	42		"	50.0	ND	84.1	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	50		"	50.0	ND	99.1	70-130				
1,1,2-Trichloroethane	43		"	50.0	ND	85.5	70-130				
1,1-Dichloroethane	31		"	50.0	ND	61.1	70-130	Low Bias			
1,1-Dichloroethylene	46		"	50.0	ND	92.8	70-130				
1,1-Dichloropropylene	41		"	50.0	ND	82.3	70-130				
1,2,3-Trichlorobenzene	20		"	50.0	ND	39.2	70-130	Low Bias			
1,2,3-Trichloropropane	47		"	50.0	ND	93.7	70-130				
1,2,4-Trichlorobenzene	20		"	50.0	ND	39.5	70-130	Low Bias			
1,2,4-Trimethylbenzene	34		"	50.0	ND	67.6	70-130	Low Bias			
1,2-Dibromo-3-chloropropane	37		"	50.0	ND	73.3	70-130				
1,2-Dibromoethane	40		"	50.0	ND	80.4	70-130				
1,2-Dichlorobenzene	30		"	50.0	ND	59.2	70-130	Low Bias			
1,2-Dichloroethane	42		"	50.0	ND	84.9	70-130				
1,2-Dichloropropane	44		"	50.0	ND	88.0	70-130				
1,3,5-Trimethylbenzene	36		"	50.0	ND	71.8	70-130				
1,3-Dichlorobenzene	30		"	50.0	ND	59.9	70-130	Low Bias			
1,3-Dichloropropane	43		"	50.0	ND	85.1	70-130				
1,4-Dichlorobenzene	29		"	50.0	ND	57.8	70-130	Low Bias			
2,2-Dichloropropane	22		"	50.0	ND	44.7	70-130	Low Bias			
2-Butanone	15		"	50.0	ND	30.1	70-130	Low Bias			
2-Chlorotoluene	35		"	50.0	ND	70.2	70-130				
2-Hexanone	32		"	50.0	ND	64.8	70-130	Low Bias			
4-Chlorotoluene	36		"	50.0	ND	72.0	70-130				
4-Methyl-2-pentanone	41		"	50.0	ND	82.1	70-130				
Acetone	34		"	50.0	15	38.4	70-130	Low Bias			
Acrylonitrile	30		"	50.0	ND	60.1	70-130	Low Bias			
Benzene	44		"	50.0	ND	87.8	70-130				
Bromobenzene	36		"	50.0	ND	71.0	70-130				
Bromochloromethane	35		"	50.0	ND	70.8	70-130				
Bromodichloromethane	41		"	50.0	ND	81.4	70-130				
Bromoform	35		"	50.0	ND	70.2	70-130				
Bromomethane	38		"	50.0	ND	75.2	70-130				
Carbon disulfide	74		"	100	ND	73.9	70-130				
Carbon tetrachloride	44		"	50.0	ND	88.3	70-130				
Chlorobenzene	38		"	50.0	ND	76.6	70-130				
Chloroethane	47		"	50.0	ND	94.8	70-130				
Chloroform	41		"	50.0	ND	82.7	70-130				
Chloromethane	44		"	50.0	ND	87.4	70-130				
cis-1,2-Dichloroethylene	15		"	50.0	ND	31.0	70-130	Low Bias			
cis-1,3-Dichloropropylene	37		"	50.0	ND	73.7	70-130				
Dibromochloromethane	38		"	50.0	ND	76.1	70-130				
Dibromomethane	44		"	50.0	ND	88.1	70-130				
Dichlorodifluoromethane	34		"	50.0	ND	67.5	70-130	Low Bias			
Ethyl Benzene	42		"	50.0	ND	84.3	70-130				
Hexachlorobutadiene	26		"	50.0	ND	51.4	70-130	Low Bias			
Isopropylbenzene	41		"	50.0	ND	81.3	70-130				
Methyl Methacrylate	54		"	50.0	ND	108	70-130				
Methyl tert-butyl ether (MTBE)	39		"	50.0	ND	78.5	70-130				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30092 - EPA 5035A											
Matrix Spike (BF30092-MS1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)						Prepared & Analyzed: 06/04/2013				
Methylene chloride	42		ug/L	50.0	3.1	78.7	70-130				
Naphthalene	26		"	50.0	0.88	49.5	70-130	Low Bias			
n-Butylbenzene	31		"	50.0	ND	61.8	70-130	Low Bias			
n-Propylbenzene	36		"	50.0	ND	73.0	70-130				
o-Xylene	39		"	50.0	ND	78.6	70-130				
p- & m- Xylenes	79		"	100	ND	79.0	70-130				
p-Isopropyltoluene	35		"	50.0	ND	70.4	70-130				
sec-Butylbenzene	38		"	50.0	ND	75.9	70-130				
Styrene	31		"	50.0	ND	62.7	70-130	Low Bias			
tert-Butylbenzene	40		"	50.0	ND	79.1	70-130				
Tetrachloroethylene	39		"	50.0	ND	78.0	70-130				
Tetrahydrofuran	42		"	50.0	ND	84.3	70-130				
Toluene	42		"	50.0	ND	83.8	70-130				
trans-1,2-Dichloroethylene	37		"	50.0	ND	74.0	70-130				
trans-1,3-Dichloropropylene	34		"	50.0	ND	68.3	70-130	Low Bias			
trans-1,4-dichloro-2-butene	31		"	50.0	ND	61.1	70-130	Low Bias			
Trichloroethylene	41		"	50.0	ND	82.5	70-130				
Trichlorofluoromethane	49		"	50.0	ND	97.1	70-130				
Vinyl Chloride	43		"	50.0	ND	86.0	70-130				
Surrogate: 1,2-Dichloroethane-d4	*51.2*		*"*	*50.0*		*102*	*70-130*				
Surrogate: p-Bromofluorobenzene	*49.3*		*"*	*50.0*		*98.6*	*70-130*				
Surrogate: Toluene-d8	*49.1*		*"*	*50.0*		*98.2*	*70-130*				
Matrix Spike Dup (BF30092-MSD1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)						Prepared & Analyzed: 06/04/2013				
1,1,1,2-Tetrachloroethane	35		ug/L	50.0	ND	70.8	70-130		12.1	30	
1,1,1-Trichloroethane	45		"	50.0	ND	89.3	70-130		4.05	30	
1,1,2,2-Tetrachloroethane	36		"	50.0	ND	72.7	70-130		14.5	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	50		"	50.0	ND	99.9	70-130		0.824	30	
1,1,2-Trichloroethane	39		"	50.0	ND	77.2	70-130		10.2	30	
1,1-Dichloroethane	29		"	50.0	ND	58.0	70-130	Low Bias	5.27	30	
1,1-Dichloroethylene	48		"	50.0	ND	95.5	70-130		2.91	30	
1,1-Dichloropropylene	39		"	50.0	ND	78.3	70-130		4.96	30	
1,2,3-Trichlorobenzene	11		"	50.0	ND	22.0	70-130	Low Bias	56.1	30	Non-dir.
1,2,3-Trichloropropane	38		"	50.0	ND	76.9	70-130		19.7	30	
1,2,4-Trichlorobenzene	12		"	50.0	ND	24.2	70-130	Low Bias	48.0	30	Non-dir.
1,2,4-Trimethylbenzene	31		"	50.0	ND	61.1	70-130	Low Bias	10.2	30	
1,2-Dibromo-3-chloropropane	31		"	50.0	ND	61.1	70-130	Low Bias	18.2	30	
1,2-Dibromoethane	35		"	50.0	ND	69.8	70-130	Low Bias	14.2	30	
1,2-Dichlorobenzene	22		"	50.0	ND	43.7	70-130	Low Bias	30.1	30	Non-dir.
1,2-Dichloroethane	43		"	50.0	ND	86.3	70-130		1.63	30	
1,2-Dichloropropane	42		"	50.0	ND	84.0	70-130		4.63	30	
1,3,5-Trimethylbenzene	33		"	50.0	ND	66.3	70-130	Low Bias	7.96	30	
1,3-Dichlorobenzene	22		"	50.0	ND	44.7	70-130	Low Bias	29.1	30	
1,3-Dichloropropane	38		"	50.0	ND	75.6	70-130		11.9	30	
1,4-Dichlorobenzene	22		"	50.0	ND	43.1	70-130	Low Bias	29.2	30	
2,2-Dichloropropane	36		"	50.0	ND	71.2	70-130		45.7	30	Non-dir.
2-Butanone	44		"	50.0	ND	87.6	70-130		97.6	30	Non-dir.
2-Chlorotoluene	32		"	50.0	ND	63.9	70-130	Low Bias	9.36	30	
2-Hexanone	28		"	50.0	ND	56.9	70-130	Low Bias	13.0	30	
4-Chlorotoluene	28		"	50.0	ND	56.4	70-130	Low Bias	24.3	30	
4-Methyl-2-pentanone	38		"	50.0	ND	75.5	70-130		8.38	30	
Acetone	47		"	50.0	15	65.6	70-130	Low Bias	52.2	30	Non-dir.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30092 - EPA 5035A											
Matrix Spike Dup (BF30092-MSD1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared & Analyzed: 06/04/2013			
Acrylonitrile	25		ug/L	50.0	ND	49.1	70-130	Low Bias	20.1	30	
Benzene	43		"	50.0	ND	85.4	70-130		2.75	30	
Bromobenzene	28		"	50.0	ND	55.9	70-130	Low Bias	23.8	30	
Bromochloromethane	46		"	50.0	ND	92.9	70-130		27.0	30	
Bromodichloromethane	38		"	50.0	ND	76.5	70-130		6.18	30	
Bromoform	32		"	50.0	ND	64.7	70-130	Low Bias	8.07	30	
Bromomethane	34		"	50.0	ND	67.4	70-130	Low Bias	11.0	30	
Carbon disulfide	70		"	100	ND	69.6	70-130	Low Bias	6.02	30	
Carbon tetrachloride	43		"	50.0	ND	86.3	70-130		2.34	30	
Chlorobenzene	32		"	50.0	ND	63.0	70-130	Low Bias	19.5	30	
Chloroethane	48		"	50.0	ND	96.6	70-130		1.92	30	
Chloroform	43		"	50.0	ND	86.5	70-130		4.59	30	
Chloromethane	40		"	50.0	ND	80.7	70-130		8.04	30	
cis-1,2-Dichloroethylene	41		"	50.0	ND	81.1	70-130		89.4	30	Non-dir.
cis-1,3-Dichloropropylene	30		"	50.0	ND	60.4	70-130	Low Bias	19.8	30	
Dibromochloromethane	34		"	50.0	ND	68.5	70-130	Low Bias	10.6	30	
Dibromomethane	42		"	50.0	ND	84.3	70-130		4.36	30	
Dichlorodifluoromethane	33		"	50.0	ND	65.9	70-130	Low Bias	2.43	30	
Ethyl Benzene	37		"	50.0	ND	73.6	70-130		13.6	30	
Hexachlorobutadiene	19		"	50.0	ND	37.9	70-130	Low Bias	30.2	30	Non-dir.
Isopropylbenzene	38		"	50.0	ND	76.5	70-130		6.03	30	
Methyl Methacrylate	34		"	50.0	ND	68.4	70-130	Low Bias	44.7	30	Non-dir.
Methyl tert-butyl ether (MTBE)	40		"	50.0	ND	79.1	70-130		0.787	30	
Methylene chloride	40		"	50.0	3.1	74.8	70-130		4.95	30	
Naphthalene	14		"	50.0	0.87	26.3	70-130	Low Bias	61.2	30	Non-dir.
n-Butylbenzene	27		"	50.0	ND	54.7	70-130	Low Bias	12.1	30	
n-Propylbenzene	35		"	50.0	ND	69.0	70-130	Low Bias	5.55	30	
o-Xylene	33		"	50.0	ND	65.4	70-130	Low Bias	18.3	30	
p- & m- Xylenes	68		"	100	ND	67.7	70-130	Low Bias	15.3	30	
p-Isopropyltoluene	33		"	50.0	ND	65.4	70-130	Low Bias	7.45	30	
sec-Butylbenzene	34		"	50.0	ND	67.6	70-130	Low Bias	11.6	30	
Styrene	16		"	50.0	ND	31.4	70-130	Low Bias	66.6	30	Non-dir.
tert-Butylbenzene	36		"	50.0	ND	72.4	70-130		8.90	30	
Tetrachloroethylene	36		"	50.0	ND	72.0	70-130		8.08	30	
Tetrahydrofuran	49		"	50.0	ND	98.8	70-130		15.9	30	
Toluene	38		"	50.0	ND	76.5	70-130		9.16	30	
trans-1,2-Dichloroethylene	32		"	50.0	ND	64.6	70-130	Low Bias	13.5	30	
trans-1,3-Dichloropropylene	28		"	50.0	ND	56.2	70-130	Low Bias	19.4	30	
trans-1,4-dichloro-2-butene	32		"	50.0	ND	63.1	70-130	Low Bias	3.16	30	
Trichloroethylene	38		"	50.0	ND	76.0	70-130		8.20	30	
Trichlorofluoromethane	48		"	50.0	ND	95.9	70-130		1.29	30	
Vinyl Chloride	42		"	50.0	ND	84.4	70-130		1.90	30	
Surrogate: 1,2-Dichloroethane-d4	*53.5*		*"*	*50.0*		*107*	*70-130*				
Surrogate: p-Bromofluorobenzene	*51.4*		*"*	*50.0*		*103*	*70-130*				
Surrogate: Toluene-d8	*50.2*		*"*	*50.0*		*100*	*70-130*				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30096 - EPA 5030B											
Blank (BF30096-BLK1)								Prepared & Analyzed: 06/04/2013			
1,1,1,2-Tetrachloroethane	ND	0.50	ug/L								
1,1,1-Trichloroethane	ND	0.50	"								
1,1,2,2-Tetrachloroethane	ND	0.50	"								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.50	"								
1,1,2-Trichloroethane	ND	0.50	"								
1,1-Dichloroethane	ND	0.50	"								
1,1-Dichloroethylene	ND	0.50	"								
1,1-Dichloropropylene	ND	0.50	"								
1,2,3-Trichlorobenzene	ND	2.0	"								
1,2,3-Trichloropropane	ND	0.50	"								
1,2,4-Trichlorobenzene	ND	2.0	"								
1,2,4-Trimethylbenzene	ND	0.50	"								
1,2-Dibromo-3-chloropropane	ND	2.0	"								
1,2-Dibromoethane	ND	0.50	"								
1,2-Dichlorobenzene	ND	0.50	"								
1,2-Dichloroethane	ND	0.50	"								
1,2-Dichloropropane	ND	0.50	"								
1,3,5-Trimethylbenzene	ND	0.50	"								
1,3-Dichlorobenzene	ND	0.50	"								
1,3-Dichloropropane	ND	0.50	"								
1,4-Dichlorobenzene	ND	0.50	"								
2,2-Dichloropropane	ND	0.50	"								
2-Butanone	ND	2.0	"								
2-Chlorotoluene	ND	0.50	"								
2-Hexanone	ND	0.50	"								
4-Chlorotoluene	ND	0.50	"								
4-Methyl-2-pentanone	ND	0.50	"								
Acetone	ND	2.0	"								
Acrylonitrile	ND	1.0	"								
Benzene	ND	0.50	"								
Bromobenzene	ND	0.50	"								
Bromochloromethane	ND	0.50	"								
Bromodichloromethane	ND	0.50	"								
Bromoform	ND	0.50	"								
Bromomethane	ND	0.50	"								
Carbon disulfide	ND	0.50	"								
Carbon tetrachloride	ND	0.50	"								
Chlorobenzene	ND	0.50	"								
Chloroethane	ND	0.50	"								
Chloroform	ND	0.50	"								
Chloromethane	ND	0.50	"								
cis-1,2-Dichloroethylene	ND	0.50	"								
cis-1,3-Dichloropropylene	ND	0.50	"								
Dibromochloromethane	ND	0.50	"								
Dibromomethane	ND	0.50	"								
Dichlorodifluoromethane	ND	0.50	"								
Ethyl Benzene	ND	0.50	"								
Hexachlorobutadiene	ND	0.50	"								
Isopropylbenzene	ND	0.50	"								
Methyl Methacrylate	ND	0.50	"								
Methyl tert-butyl ether (MTBE)	ND	0.50	"								

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30096 - EPA 5030B											
Blank (BF30096-BLK1)							Prepared & Analyzed: 06/04/2013				
Methylene chloride	ND	2.0	ug/L								
Naphthalene	ND	2.0	"								
n-Butylbenzene	ND	0.50	"								
n-Propylbenzene	ND	0.50	"								
o-Xylene	ND	0.50	"								
p- & m- Xylenes	ND	1.0	"								
p-Isopropyltoluene	ND	0.50	"								
sec-Butylbenzene	ND	0.50	"								
Styrene	ND	0.50	"								
tert-Butylbenzene	ND	0.50	"								
Tetrachloroethylene	ND	0.50	"								
Tetrahydrofuran	ND	2.0	"								
Toluene	ND	0.50	"								
trans-1,2-Dichloroethylene	ND	0.50	"								
trans-1,3-Dichloropropylene	ND	0.50	"								
trans-1,4-dichloro-2-butene	ND	0.50	"								
Trichloroethylene	ND	0.50	"								
Trichlorofluoromethane	ND	0.50	"								
Vinyl Chloride	ND	0.50	"								
Surrogate: 1,2-Dichloroethane-d4	*10.4*		*"*	*10.0*		*104*	*70-130*				
Surrogate: p-Bromofluorobenzene	*11.0*		*"*	*10.0*		*110*	*70-130*				
Surrogate: Toluene-d8	*10.3*		*"*	*10.0*		*103*	*70-130*				
LCS (BF30096-BS1)							Prepared & Analyzed: 06/04/2013				
1,1,1,2-Tetrachloroethane	9.6		ug/L	10.0		96.0	70-130				
1,1,1-Trichloroethane	9.1		"	10.0		91.1	70-130				
1,1,2,2-Tetrachloroethane	10		"	10.0		104	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	8.0		"	10.0		80.4	70-130				
1,1,2-Trichloroethane	9.7		"	10.0		97.0	70-130				
1,1-Dichloroethane	10		"	10.0		104	70-130				
1,1-Dichloroethylene	8.1		"	10.0		80.7	70-130				
1,1-Dichloropropylene	8.4		"	10.0		84.5	70-130				
1,2,3-Trichlorobenzene	9.2		"	10.0		92.0	70-130				
1,2,3-Trichloropropane	10		"	10.0		103	70-130				
1,2,4-Trichlorobenzene	9.7		"	10.0		96.6	70-130				
1,2,4-Trimethylbenzene	9.2		"	10.0		91.9	70-130				
1,2-Dibromo-3-chloropropane	8.1		"	10.0		80.8	70-130				
1,2-Dibromoethane	9.9		"	10.0		99.3	70-130				
1,2-Dichlorobenzene	9.0		"	10.0		89.9	70-130				
1,2-Dichloroethane	9.4		"	10.0		94.4	70-130				
1,2-Dichloropropane	9.6		"	10.0		95.8	70-130				
1,3,5-Trimethylbenzene	9.5		"	10.0		94.8	70-130				
1,3-Dichlorobenzene	9.0		"	10.0		89.9	70-130				
1,3-Dichloropropane	9.7		"	10.0		96.9	70-130				
1,4-Dichlorobenzene	8.8		"	10.0		88.5	70-130				
2,2-Dichloropropane	10		"	10.0		103	70-130				
2-Butanone	10		"	10.0		101	70-130				
2-Chlorotoluene	9.2		"	10.0		92.5	70-130				
2-Hexanone	8.2		"	10.0		82.5	70-130				
4-Chlorotoluene	9.5		"	10.0		95.0	70-130				
4-Methyl-2-pentanone	8.5		"	10.0		85.4	70-130				
Acetone	8.3		"	10.0		82.9	70-130				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30096 - EPA 5030B											
LCS (BF30096-BS1)							Prepared & Analyzed: 06/04/2013				
Acrylonitrile	10		ug/L	10.0		104	70-130				
Benzene	9.2		"	10.0		92.3	70-130				
Bromobenzene	9.5		"	10.0		94.6	70-130				
Bromochloromethane	10		"	10.0		103	70-130				
Bromodichloromethane	10		"	10.0		103	70-130				
Bromoform	11		"	10.0		108	70-130				
Bromomethane	7.4		"	10.0		73.5	70-130				
Carbon disulfide	17		"	20.0		83.4	70-130				
Carbon tetrachloride	9.0		"	10.0		89.8	70-130				
Chlorobenzene	9.1		"	10.0		90.8	70-130				
Chloroethane	7.8		"	10.0		77.6	70-130				
Chloroform	9.2		"	10.0		91.9	70-130				
Chloromethane	6.7		"	10.0		66.8	70-130	Low Bias			
cis-1,2-Dichloroethylene	8.7		"	10.0		87.2	70-130				
cis-1,3-Dichloropropylene	11		"	10.0		108	70-130				
Dibromochloromethane	11		"	10.0		105	70-130				
Dibromomethane	9.9		"	10.0		99.3	70-130				
Dichlorodifluoromethane	4.8		"	10.0		48.4	70-130	Low Bias			
Ethyl Benzene	9.8		"	10.0		97.8	70-130				
Hexachlorobutadiene	9.3		"	10.0		93.1	70-130				
Isopropylbenzene	9.4		"	10.0		93.6	70-130				
Methyl Methacrylate	10		"	10.0		100	70-130				
Methyl tert-butyl ether (MTBE)	10		"	10.0		99.8	70-130				
Methylene chloride	7.3		"	10.0		72.7	70-130				
Naphthalene	10		"	10.0		99.6	70-130				
n-Butylbenzene	9.8		"	10.0		97.8	70-130				
n-Propylbenzene	9.6		"	10.0		96.1	70-130				
o-Xylene	9.5		"	10.0		94.9	70-130				
p- & m- Xylenes	20		"	20.0		102	70-130				
p-Isopropyltoluene	9.6		"	10.0		95.6	70-130				
sec-Butylbenzene	9.6		"	10.0		96.5	70-130				
Styrene	9.8		"	10.0		98.5	70-130				
tert-Butylbenzene	9.3		"	10.0		92.8	70-130				
Tetrachloroethylene	8.9		"	10.0		89.2	70-130				
Tetrahydrofuran	9.7		"	10.0		96.6	70-130				
Toluene	9.4		"	10.0		93.8	70-130				
trans-1,2-Dichloroethylene	8.8		"	10.0		88.3	70-130				
trans-1,3-Dichloropropylene	11		"	10.0		109	70-130				
trans-1,4-dichloro-2-butene	10		"	10.0		101	70-130				
Trichloroethylene	8.8		"	10.0		87.8	70-130				
Trichlorofluoromethane	7.6		"	10.0		75.7	70-130				
Vinyl Chloride	6.7		"	10.0		66.8	70-130	Low Bias			
Surrogate: 1,2-Dichloroethane-d4	*10.3*		*"*	*10.0*		*103*	*70-130*				
Surrogate: p-Bromofluorobenzene	*9.74*		*"*	*10.0*		*97.4*	*70-130*				
Surrogate: Toluene-d8	*9.92*		*"*	*10.0*		*99.2*	*70-130*				

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30096 - EPA 5030B											
LCS Dup (BF30096-BSD1)								Prepared & Analyzed: 06/04/2013			
1,1,1,2-Tetrachloroethane	9.9		ug/L	10.0		99.1	70-130		3.18	30	
1,1,1-Trichloroethane	9.5		"	10.0		95.3	70-130		4.51	30	
1,1,2,2-Tetrachloroethane	11		"	10.0		114	70-130		8.93	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	9.6		"	10.0		95.9	70-130		17.6	30	
1,1,2-Trichloroethane	10		"	10.0		101	70-130		4.14	30	
1,1-Dichloroethane	9.1		"	10.0		90.6	70-130		13.9	30	
1,1-Dichloroethylene	9.0		"	10.0		90.0	70-130		10.9	30	
1,1-Dichloropropylene	8.6		"	10.0		85.7	70-130		1.41	30	
1,2,3-Trichlorobenzene	9.6		"	10.0		96.0	70-130		4.26	30	
1,2,3-Trichloropropane	11		"	10.0		107	70-130		4.09	30	
1,2,4-Trichlorobenzene	10		"	10.0		99.6	70-130		3.06	30	
1,2,4-Trimethylbenzene	9.3		"	10.0		92.8	70-130		0.975	30	
1,2-Dibromo-3-chloropropane	7.9		"	10.0		79.1	70-130		2.13	30	
1,2-Dibromoethane	10		"	10.0		103	70-130		3.66	30	
1,2-Dichlorobenzene	9.3		"	10.0		93.4	70-130		3.82	30	
1,2-Dichloroethane	9.6		"	10.0		95.5	70-130		1.16	30	
1,2-Dichloropropane	9.9		"	10.0		99.4	70-130		3.69	30	
1,3,5-Trimethylbenzene	9.5		"	10.0		95.2	70-130		0.421	30	
1,3-Dichlorobenzene	9.2		"	10.0		91.8	70-130		2.09	30	
1,3-Dichloropropane	10		"	10.0		101	70-130		4.34	30	
1,4-Dichlorobenzene	9.0		"	10.0		90.3	70-130		2.01	30	
2,2-Dichloropropane	9.0		"	10.0		90.3	70-130		13.5	30	
2-Butanone	11		"	10.0		112	70-130		9.88	30	
2-Chlorotoluene	9.4		"	10.0		93.5	70-130		1.08	30	
2-Hexanone	8.9		"	10.0		88.9	70-130		7.47	30	
4-Chlorotoluene	9.6		"	10.0		96.1	70-130		1.15	30	
4-Methyl-2-pentanone	9.4		"	10.0		94.5	70-130		10.1	30	
Acetone	9.3		"	10.0		92.8	70-130		11.3	30	
Acrylonitrile	8.8		"	10.0		87.8	70-130		17.0	30	
Benzene	9.6		"	10.0		96.5	70-130		4.45	30	
Bromobenzene	9.8		"	10.0		98.1	70-130		3.63	30	
Bromochloromethane	11		"	10.0		109	70-130		5.10	30	
Bromodichloromethane	11		"	10.0		109	70-130		5.00	30	
Bromoform	12		"	10.0		116	70-130		7.35	30	
Bromomethane	9.0		"	10.0		90.2	70-130		20.4	30	
Carbon disulfide	19		"	20.0		96.2	70-130		14.3	30	
Carbon tetrachloride	9.2		"	10.0		92.4	70-130		2.85	30	
Chlorobenzene	9.4		"	10.0		93.6	70-130		3.04	30	
Chloroethane	8.9		"	10.0		88.6	70-130		13.2	30	
Chloroform	9.6		"	10.0		95.9	70-130		4.26	30	
Chloromethane	7.5		"	10.0		75.2	70-130		11.8	30	
cis-1,2-Dichloroethylene	9.3		"	10.0		92.9	70-130		6.33	30	
cis-1,3-Dichloropropylene	11		"	10.0		109	70-130		0.826	30	
Dibromochloromethane	11		"	10.0		110	70-130		4.00	30	
Dibromomethane	10		"	10.0		102	70-130		2.88	30	
Dichlorodifluoromethane	5.0		"	10.0		49.5	70-130	Low Bias	2.25	30	
Ethyl Benzene	10		"	10.0		99.6	70-130		1.82	30	
Hexachlorobutadiene	9.2		"	10.0		92.3	70-130		0.863	30	
Isopropylbenzene	9.4		"	10.0		94.1	70-130		0.533	30	
Methyl Methacrylate	11		"	10.0		109	70-130		8.04	30	
Methyl tert-butyl ether (MTBE)	8.8		"	10.0		87.9	70-130		12.7	30	

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30096 - EPA 5030B											
LCS Dup (BF30096-BSD1)							Prepared & Analyzed: 06/04/2013				
Methylene chloride	8.3		ug/L	10.0		83.4	70-130		13.7	30	
Naphthalene	11		"	10.0		110	70-130		9.65	30	
n-Butylbenzene	9.4		"	10.0		93.9	70-130		4.07	30	
n-Propylbenzene	9.5		"	10.0		95.3	70-130		0.836	30	
o-Xylene	9.7		"	10.0		97.2	70-130		2.39	30	
p- & m- Xylenes	20		"	20.0		102	70-130		0.245	30	
p-Isopropyltoluene	9.4		"	10.0		94.0	70-130		1.69	30	
sec-Butylbenzene	9.7		"	10.0		96.6	70-130		0.104	30	
Styrene	10		"	10.0		101	70-130		2.31	30	
tert-Butylbenzene	9.4		"	10.0		94.3	70-130		1.60	30	
Tetrachloroethylene	9.0		"	10.0		89.7	70-130		0.559	30	
Tetrahydrofuran	12		"	10.0		121	70-130		22.4	30	
Toluene	9.5		"	10.0		95.0	70-130		1.27	30	
trans-1,2-Dichloroethylene	7.1		"	10.0		71.1	70-130		21.6	30	
trans-1,3-Dichloropropylene	11		"	10.0		110	70-130		0.912	30	
trans-1,4-dichloro-2-butene	10		"	10.0		105	70-130		3.99	30	
Trichloroethylene	9.3		"	10.0		93.1	70-130		5.86	30	
Trichlorofluoromethane	8.7		"	10.0		87.3	70-130		14.2	30	
Vinyl Chloride	7.7		"	10.0		77.2	70-130		14.4	30	
Surrogate: 1,2-Dichloroethane-d4	*10.4*		*"*	*10.0*		*104*	*70-130*				
Surrogate: p-Bromofluorobenzene	*9.80*		*"*	*10.0*		*98.0*	*70-130*				
Surrogate: Toluene-d8	*10.0*		*"*	*10.0*		*100*	*70-130*				

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30054 - EPA 3545A											
Blank (BF30054-BLK1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
Acenaphthene	ND	250	ug/kg wet								
Acenaphthylene	ND	250	"								
Aniline	ND	250	"								
Anthracene	ND	250	"								
Benzo(a)anthracene	ND	250	"								
Benzo(a)pyrene	ND	250	"								
Benzo(b)fluoranthene	ND	250	"								
Benzo(g,h,i)perylene	ND	250	"								
Benzo(k)fluoranthene	ND	250	"								
Benzyl butyl phthalate	ND	250	"								
4-Bromophenyl phenyl ether	ND	250	"								
4-Chloro-3-methylphenol	ND	250	"								
4-Chloroaniline	ND	250	"								
Bis(2-chloroethoxy)methane	ND	250	"								
Bis(2-chloroethyl)ether	ND	250	"								
Bis(2-chloroisopropyl)ether	ND	250	"								
2-Chloronaphthalene	ND	250	"								
2-Chlorophenol	ND	250	"								
4-Chlorophenyl phenyl ether	ND	250	"								
Chrysene	ND	250	"								
Dibenzo(a,h)anthracene	ND	250	"								
Dibenzofuran	ND	250	"								
Di-n-butyl phthalate	ND	250	"								
3,3'-Dichlorobenzidine	ND	250	"								
2,4-Dichlorophenol	ND	250	"								
Diethyl phthalate	ND	250	"								
2,4-Dimethylphenol	ND	250	"								
Dimethyl phthalate	ND	250	"								
4,6-Dinitro-2-methylphenol	ND	500	"								
2,4-Dinitrophenol	ND	500	"								
2,6-Dinitrotoluene	ND	250	"								
2,4-Dinitrotoluene	ND	250	"								
Di-n-octyl phthalate	ND	250	"								
Bis(2-ethylhexyl)phthalate	ND	250	"								
Fluoranthene	ND	250	"								
Fluorene	ND	250	"								
Hexachlorobenzene	ND	250	"								
Hexachlorobutadiene	ND	250	"								
Hexachlorocyclopentadiene	ND	250	"								
Hexachloroethane	ND	250	"								
Indeno(1,2,3-cd)pyrene	ND	250	"								
Isophorone	ND	250	"								
1-Methylnaphthalene	ND	250	"								
2-Methylnaphthalene	ND	250	"								
2-Methylphenol	ND	250	"								
3- & 4-Methylphenols	ND	250	"								
Naphthalene	ND	250	"								
3-Nitroaniline	ND	250	"								
4-Nitroaniline	ND	250	"								
2-Nitroaniline	ND	250	"								
Nitrobenzene	ND	250	"								

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30054 - EPA 3545A											
Blank (BF30054-BLK1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
2-Nitrophenol	ND	250	ug/kg wet								
4-Nitrophenol	ND	250	"								
N-nitroso-di-n-propylamine	ND	250	"								
N-Nitrosodiphenylamine	ND	250	"								
Pentachloronitrobenzene	ND	250	"								
Pentachlorophenol	ND	250	"								
Phenanthrene	ND	250	"								
Phenol	ND	250	"								
Pyrene	ND	250	"								
Pyridine	ND	250	"								
1,2,4,5-tetrachlorobenzene	ND	250	"								
1,2,4-Trichlorobenzene	ND	250	"								
2,4,6-Trichlorophenol	ND	250	"								
2,4,5-Trichlorophenol	ND	250	"								
Surrogate: 2,4,6-Tribromophenol	*2930*		*"*	*3760*		*78.0*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*1790*		*"*	*2510*		*71.3*	*30-130*				
Surrogate: 2-Fluorophenol	*3040*		*"*	*3740*		*81.4*	*15-110*				
Surrogate: Nitrobenzene-d5	*1760*		*"*	*2500*		*70.7*	*30-130*				
Surrogate: Phenol-d5	*2910*		*"*	*3740*		*77.8*	*15-110*				
Surrogate: Terphenyl-d14	*1860*		*"*	*2500*		*74.6*	*30-130*				
LCS (BF30054-BS1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
Acenaphthene	2190	250	ug/kg wet	2500		87.7	40-140				
Acenaphthylene	2090	250	"	2500		83.6	40-140				
Aniline	1860	250	"	2500		74.4	40-140				
Anthracene	2170	250	"	2500		86.6	40-140				
Benzo(a)anthracene	2360	250	"	2500		94.6	40-140				
Benzo(a)pyrene	2610	250	"	2500		104	40-140				
Benzo(b)fluoranthene	2780	250	"	2500		111	40-140				
Benzo(g,h,i)perylene	908	250	"	2500		36.3	40-140	Low Bias			
Benzo(k)fluoranthene	2560	250	"	2500		102	40-140				
Benzyl butyl phthalate	2540	250	"	2500		102	40-140				
4-Bromophenyl phenyl ether	2240	250	"	2500		89.8	40-140				
4-Chloro-3-methylphenol	2080	250	"	2500		83.0	30-130				
4-Chloroaniline	2340	250	"	2500		93.6	40-140				
Bis(2-chloroethoxy)methane	2090	250	"	2500		83.6	40-140				
Bis(2-chloroethyl)ether	2200	250	"	2500		88.1	40-140				
Bis(2-chloroisopropyl)ether	3730	250	"	2500		149	40-140	High Bias			
2-Chloronaphthalene	2010	250	"	2500		80.4	40-140				
2-Chlorophenol	2370	250	"	2500		94.9	30-130				
4-Chlorophenyl phenyl ether	2050	250	"	2500		82.1	40-140				
Chrysene	2340	250	"	2500		93.5	40-140				
Dibenzo(a,h)anthracene	1320	250	"	2500		52.6	40-140				
Dibenzofuran	2200	250	"	2500		88.0	40-140				
Di-n-butyl phthalate	2300	250	"	2500		91.9	40-140				
3,3'-Dichlorobenzidine	2630	250	"	2500		105	40-140				
2,4-Dichlorophenol	2420	250	"	2500		96.8	30-130				
Diethyl phthalate	2340	250	"	2500		93.4	40-140				
2,4-Dimethylphenol	2100	250	"	2500		84.0	30-130				
Dimethyl phthalate	2290	250	"	2500		91.6	40-140				
4,6-Dinitro-2-methylphenol	2370	500	"	2500		94.9	30-130				

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30054 - EPA 3545A											
LCS (BF30054-BS1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
2,4-Dinitrophenol	3240	500	ug/kg wet	2500		130	30-130				
2,6-Dinitrotoluene	2420	250	"	2500		96.7	40-140				
2,4-Dinitrotoluene	2390	250	"	2500		95.5	40-140				
Di-n-octyl phthalate	2970	250	"	2500		119	40-140				
Bis(2-ethylhexyl)phthalate	2430	250	"	2500		97.3	40-140				
Fluoranthene	2390	250	"	2500		95.8	40-140				
Fluorene	2130	250	"	2500		85.3	40-140				
Hexachlorobenzene	2430	250	"	2500		97.3	40-140				
Hexachlorobutadiene	2460	250	"	2500		98.4	40-140				
Hexachlorocyclopentadiene	2180	250	"	2500		87.4	40-140				
Hexachloroethane	2040	250	"	2500		81.4	40-140				
Indeno(1,2,3-cd)pyrene	1220	250	"	2500		48.7	40-140				
Isophorone	2300	250	"	2500		92.0	40-140				
1-Methylnaphthalene	ND	250	"	2500			40-140	Low Bias			
2-Methylnaphthalene	2160	250	"	2500		86.6	40-140				
2-Methylphenol	ND	250	"	2500			30-130	Low Bias			
3- & 4-Methylphenols	1940	250	"	2500		77.7	30-130				
Naphthalene	2180	250	"	2500		87.3	40-140				
3-Nitroaniline	2300	250	"	2500		92.0	40-140				
4-Nitroaniline	1910	250	"	2500		76.6	40-140				
2-Nitroaniline	2350	250	"	2500		94.1	40-140				
Nitrobenzene	2170	250	"	2500		86.9	40-140				
2-Nitrophenol	2290	250	"	2500		91.7	30-130				
4-Nitrophenol	1940	250	"	2500		77.7	30-130				
N-nitroso-di-n-propylamine	ND	250	"	2500			40-140	Low Bias			
N-Nitrosodiphenylamine	2550	250	"	2500		102	40-140				
Pentachloronitrobenzene	2680	250	"	2500		107	40-140				
Pentachlorophenol	3770	250	"	2500		151	30-130	High Bias			
Phenanthrene	2250	250	"	2500		90.2	40-140				
Phenol	2030	250	"	2500		81.3	30-130				
Pyrene	2470	250	"	2500		99.0	40-140				
Pyridine	1670	250	"	2500		66.7	40-140				
1,2,4,5-tetrachlorobenzene	2420	250	"	2500		96.9	40-140				
1,2,4-Trichlorobenzene	2390	250	"	2500		95.6	40-140				
2,4,6-Trichlorophenol	2370	250	"	2500		95.0	30-130				
2,4,5-Trichlorophenol	2220	250	"	2500		88.6	30-130				
Surrogate: 2,4,6-Tribromophenol	*3710*		*"*	*3760*		*98.8*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*2060*		*"*	*2510*		*82.0*	*30-130*				
Surrogate: 2-Fluorophenol	*3480*		*"*	*3740*		*93.1*	*15-110*				
Surrogate: Nitrobenzene-d5	*2090*		*"*	*2500*		*83.8*	*30-130*				
Surrogate: Phenol-d5	*3320*		*"*	*3740*		*88.6*	*15-110*				
Surrogate: Terphenyl-d14	*2460*		*"*	*2500*		*98.2*	*30-130*				

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30054 - EPA 3545A											
LCS Dup (BF30054-BSD1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
Acenaphthene	1960	250	ug/kg wet	2500		78.2	40-140		11.4	30	
Acenaphthylene	1850	250	"	2500		73.9	40-140		12.3	30	
Aniline	1700	250	"	2500		68.0	40-140		8.93	30	
Anthracene	1890	250	"	2500		75.5	40-140		13.8	30	
Benzo(a)anthracene	2060	250	"	2500		82.6	40-140		13.5	30	
Benzo(a)pyrene	2310	250	"	2500		92.4	40-140		12.2	30	
Benzo(b)fluoranthene	2390	250	"	2500		95.5	40-140		15.0	30	
Benzo(g,h,i)perylene	792	250	"	2500		31.7	40-140	Low Bias	13.7	30	
Benzo(k)fluoranthene	2270	250	"	2500		90.8	40-140		12.0	30	
Benzyl butyl phthalate	2180	250	"	2500		87.2	40-140		15.3	30	
4-Bromophenyl phenyl ether	2000	250	"	2500		80.1	40-140		11.4	30	
4-Chloro-3-methylphenol	1890	250	"	2500		75.8	30-130		9.12	30	
4-Chloroaniline	2320	250	"	2500		92.6	40-140		1.07	30	
Bis(2-chloroethoxy)methane	1890	250	"	2500		75.8	40-140		9.79	30	
Bis(2-chloroethyl)ether	1990	250	"	2500		79.7	40-140		10.1	30	
Bis(2-chloroisopropyl)ether	3400	250	"	2500		136	40-140		9.20	30	
2-Chloronaphthalene	1810	250	"	2500		72.4	40-140		10.5	30	
2-Chlorophenol	2170	250	"	2500		86.6	30-130		9.10	30	
4-Chlorophenyl phenyl ether	1870	250	"	2500		74.6	40-140		9.57	30	
Chrysene	2050	250	"	2500		81.8	40-140		13.3	30	
Dibenzo(a,h)anthracene	1160	250	"	2500		46.5	40-140		12.3	30	
Dibenzofuran	1950	250	"	2500		77.9	40-140		12.2	30	
Di-n-butyl phthalate	2000	250	"	2500		79.8	40-140		14.1	30	
3,3'-Dichlorobenzidine	2380	250	"	2500		95.2	40-140		10.0	30	
2,4-Dichlorophenol	2210	250	"	2500		88.3	30-130		9.25	30	
Diethyl phthalate	2050	250	"	2500		81.9	40-140		13.1	30	
2,4-Dimethylphenol	1930	250	"	2500		77.3	30-130		8.34	30	
Dimethyl phthalate	2020	250	"	2500		80.9	40-140		12.4	30	
4,6-Dinitro-2-methylphenol	2130	500	"	2500		85.1	30-130		10.9	30	
2,4-Dinitrophenol	2770	500	"	2500		111	30-130		15.8	30	
2,6-Dinitrotoluene	2140	250	"	2500		85.5	40-140		12.3	30	
2,4-Dinitrotoluene	2060	250	"	2500		82.4	40-140		14.8	30	
Di-n-octyl phthalate	2610	250	"	2500		104	40-140		13.1	30	
Bis(2-ethylhexyl)phthalate	2090	250	"	2500		83.6	40-140		15.2	30	
Fluoranthene	2060	250	"	2500		82.4	40-140		14.9	30	
Fluorene	1920	250	"	2500		76.7	40-140		10.7	30	
Hexachlorobenzene	2110	250	"	2500		84.5	40-140		14.1	30	
Hexachlorobutadiene	2260	250	"	2500		90.4	40-140		8.50	30	
Hexachlorocyclopentadiene	1890	250	"	2500		75.7	40-140		14.3	30	
Hexachloroethane	1840	250	"	2500		73.4	40-140		10.4	30	
Indeno(1,2,3-cd)pyrene	1060	250	"	2500		42.5	40-140		13.5	30	
Isophorone	2070	250	"	2500		82.6	40-140		10.7	30	
1-Methylnaphthalene	ND	250	"	2500			40-140	Low Bias		30	
2-Methylnaphthalene	1980	250	"	2500		79.2	40-140		8.86	30	
2-Methylphenol	1900	250	"	2500		76.0	30-130			30	
3- & 4-Methylphenols	1630	250	"	2500		65.0	30-130		17.8	30	
Naphthalene	1980	250	"	2500		79.2	40-140		9.78	30	
3-Nitroaniline	2080	250	"	2500		83.2	40-140		10.0	30	
4-Nitroaniline	1610	250	"	2500		64.3	40-140		17.4	30	
2-Nitroaniline	2070	250	"	2500		82.8	40-140		12.8	30	
Nitrobenzene	1950	250	"	2500		78.1	40-140		10.7	30	

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30054 - EPA 3545A											
LCS Dup (BF30054-BSD1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
2-Nitrophenol	2130	250	ug/kg wet	2500		85.3	30-130		7.21	30	
4-Nitrophenol	2200	250	"	2500		88.2	30-130		12.7	30	
N-nitroso-di-n-propylamine	1900	250	"	2500		76.0	40-140			30	
N-Nitrosodiphenylamine	2280	250	"	2500		91.1	40-140		11.2	30	
Pentachloronitrobenzene	2350	250	"	2500		94.0	40-140		13.1	30	
Pentachlorophenol	3180	250	"	2500		127	30-130		17.1	30	
Phenanthrene	1960	250	"	2500		78.5	40-140		13.8	30	
Phenol	1870	250	"	2500		74.9	30-130		8.17	30	
Pyrene	2140	250	"	2500		85.7	40-140		14.4	30	
Pyridine	1760	250	"	2500		70.2	40-140		5.20	30	
1,2,4,5-tetrachlorobenzene	2160	250	"	2500		86.3	40-140		11.5	30	
1,2,4-Trichlorobenzene	2180	250	"	2500		87.3	40-140		9.06	30	
2,4,6-Trichlorophenol	2140	250	"	2500		85.4	30-130		10.6	30	
2,4,5-Trichlorophenol	1960	250	"	2500		78.4	30-130		12.2	30	
Surrogate: 2,4,6-Tribromophenol	*3660*		*"*	*3760*		*97.4*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*2000*		*"*	*2510*		*79.6*	*30-130*				
Surrogate: 2-Fluorophenol	*3540*		*"*	*3740*		*94.6*	*15-110*				
Surrogate: Nitrobenzene-d5	*2090*		*"*	*2500*		*83.9*	*30-130*				
Surrogate: Phenol-d5	*3290*		*"*	*3740*		*87.8*	*15-110*				
Surrogate: Terphenyl-d14	*2310*		*"*	*2500*		*92.4*	*30-130*				
Matrix Spike (BF30054-MS1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared: 06/03/2013 Analyzed: 06/04/2013			
Acenaphthene	2780	389	ug/kg dry	3890	ND	71.4	40-140				
Acenaphthylene	2640	389	"	3890	ND	67.8	40-140				
Aniline	1510	389	"	3890	ND	38.8	40-140	Low Bias			
Anthracene	2620	389	"	3890	ND	67.4	40-140				
Benzo(a)anthracene	3210	389	"	3890	ND	82.5	40-140				
Benzo(a)pyrene	3520	389	"	3890	ND	90.5	40-140				
Benzo(b)fluoranthene	3900	389	"	3890	ND	100	40-140				
Benzo(g,h,i)perylene	671	389	"	3890	ND	17.2	40-140	Low Bias			
Benzo(k)fluoranthene	3470	389	"	3890	ND	89.2	40-140				
Benzyl butyl phthalate	3230	389	"	3890	ND	83.1	40-140				
4-Bromophenyl phenyl ether	2700	389	"	3890	ND	69.4	40-140				
4-Chloro-3-methylphenol	2590	389	"	3890	ND	66.6	30-130				
4-Chloroaniline	2580	389	"	3890	ND	66.4	40-140				
Bis(2-chloroethoxy)methane	2380	389	"	3890	ND	61.2	40-140				
Bis(2-chloroethyl)ether	2430	389	"	3890	ND	62.4	40-140				
Bis(2-chloroisopropyl)ether	3970	389	"	3890	ND	102	40-140				
2-Chloronaphthalene	2550	389	"	3890	ND	65.5	40-140				
2-Chlorophenol	2660	389	"	3890	ND	68.5	30-130				
4-Chlorophenyl phenyl ether	2800	389	"	3890	ND	71.9	40-140				
Chrysene	3110	389	"	3890	ND	79.8	40-140				
Dibenzo(a,h)anthracene	1170	389	"	3890	ND	30.0	40-140	Low Bias			
Dibenzofuran	2790	389	"	3890	ND	71.8	40-140				
Di-n-butyl phthalate	3010	389	"	3890	ND	77.5	40-140				
3,3'-Dichlorobenzidine	ND	389	"	3890	ND		40-140	Low Bias			
2,4-Dichlorophenol	2860	389	"	3890	ND	73.5	30-130				
Diethyl phthalate	2760	389	"	3890	ND	70.9	40-140				
2,4-Dimethylphenol	2490	389	"	3890	ND	64.0	30-130				
Dimethyl phthalate	2780	389	"	3890	ND	71.3	40-140				
4,6-Dinitro-2-methylphenol	2660	778	"	3890	ND	68.4	30-130				

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30054 - EPA 3545A											
Matrix Spike (BF30054-MS1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared: 06/03/2013 Analyzed: 06/04/2013			
2,4-Dinitrophenol	3460	778	ug/kg dry	3890	ND	88.8	30-130				
2,6-Dinitrotoluene	2970	389	"	3890	ND	76.2	40-140				
2,4-Dinitrotoluene	2890	389	"	3890	ND	74.4	40-140				
Di-n-octyl phthalate	4350	389	"	3890	ND	112	40-140				
Bis(2-ethylhexyl)phthalate	3340	389	"	3890	ND	85.8	40-140				
Fluoranthene	3520	389	"	3890	ND	90.3	40-140				
Fluorene	2860	389	"	3890	ND	73.5	40-140				
Hexachlorobenzene	3110	389	"	3890	ND	79.9	40-140				
Hexachlorobutadiene	2650	389	"	3890	ND	68.1	40-140				
Hexachlorocyclopentadiene	771	389	"	3890	ND	19.8	40-140	Low Bias			
Hexachloroethane	1960	389	"	3890	ND	50.3	40-140				
Indeno(1,2,3-cd)pyrene	1050	389	"	3890	ND	26.9	40-140	Low Bias			
Isophorone	2600	389	"	3890	ND	66.9	40-140				
1-Methylnaphthalene	ND	389	"	3890	ND		40-140	Low Bias			
2-Methylnaphthalene	2580	389	"	3890	ND	66.3	40-140				
2-Methylphenol	2420	389	"	3890	ND	62.2	30-130				
3- & 4-Methylphenols	2250	389	"	3890	ND	57.7	30-130				
Naphthalene	2520	389	"	3890	ND	64.7	40-140				
3-Nitroaniline	2670	389	"	3890	ND	68.5	40-140				
4-Nitroaniline	2240	389	"	3890	ND	57.6	40-140				
2-Nitroaniline	3070	389	"	3890	ND	78.8	40-140				
Nitrobenzene	2450	389	"	3890	ND	63.1	40-140				
2-Nitrophenol	2550	389	"	3890	ND	65.5	30-130				
4-Nitrophenol	3610	389	"	3890	ND	92.8	30-130				
N-nitroso-di-n-propylamine	2670	389	"	3890	ND	68.7	40-140				
N-Nitrosodiphenylamine	3020	389	"	3890	ND	77.6	40-140				
Pentachloronitrobenzene	3370	389	"	3890	ND	86.6	40-140				
Pentachlorophenol	4680	389	"	3890	ND	120	30-130				
Phenanthrene	3020	389	"	3890	ND	77.6	40-140				
Phenol	2530	389	"	3890	ND	65.0	30-130				
Pyrene	3610	389	"	3890	ND	92.9	40-140				
Pyridine	2090	389	"	3890	ND	53.7	40-140				
1,2,4,5-tetrachlorobenzene	2920	389	"	3890	ND	75.1	40-140				
1,2,4-Trichlorobenzene	2590	389	"	3890	ND	66.4	40-140				
2,4,6-Trichlorophenol	2980	389	"	3890	ND	76.5	30-130				
2,4,5-Trichlorophenol	2880	389	"	3890	ND	74.1	30-130				
Surrogate: 2,4,6-Tribromophenol	*3820*		*"*	*5850*		*65.3*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*2280*		*"*	*3910*		*58.4*	*30-130*				
Surrogate: 2-Fluorophenol	*3730*		*"*	*5820*		*64.0*	*15-110*				
Surrogate: Nitrobenzene-d5	*2190*		*"*	*3880*		*56.4*	*30-130*				
Surrogate: Phenol-d5	*3900*		*"*	*5830*		*66.9*	*15-110*				
Surrogate: Terphenyl-d14	*3040*		*"*	*3890*		*78.1*	*30-130*				

Gas Chromatography/Flame Ionization Determination - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30048 - EPA 3545A											
Blank (BF30048-BLK1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
ETPH (Extractable Total Petroleum Hydrocarbons)	ND	10.0	mg/kg wet								
Surrogate: 1-Chlorooctadecane	*9.58*		*"*	*10.0*		*95.8*	*40.5-152*				
LCS (BF30048-BS1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
ETPH (Extractable Total Petroleum Hydrocarbons)	75.3	10.0	mg/kg wet	75.0		100	60-120				
Surrogate: 1-Chlorooctadecane	*10.0*		*"*	*10.0*		*100*	*40.5-152*				
LCS Dup (BF30048-BSD1)								Prepared: 06/03/2013 Analyzed: 06/04/2013			
ETPH (Extractable Total Petroleum Hydrocarbons)	75.0	10.0	mg/kg wet	75.0		100	60-120		0.399	30	
Surrogate: 1-Chlorooctadecane	*10.2*		*"*	*10.0*		*102*	*40.5-152*				
Matrix Spike (BF30048-MS1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared: 06/03/2013 Analyzed: 06/04/2013			
ETPH (Extractable Total Petroleum Hydrocarbons)	376	15.6	mg/kg dry	117	62.8	268	50-150	High Bias			
Surrogate: 1-Chlorooctadecane	*15.0*		*"*	*15.6*		*96.6*	*40.5-152*				

SPLP Extraction by EPA SW-846 1312 - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30039 - EPA SW 846-1312 SPLP for Extr. for Metals											
Blank (BF30039-BLK1)									Prepared: 06/03/2013 Analyzed: 06/04/2013		
SPLP Extraction	Completed	1.00	N/A								

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30051 - EPA 3050B											
Blank (BF30051-BLK1)								Prepared & Analyzed: 06/03/2013			
Arsenic	ND	1.00	mg/kg wet								
Barium	ND	0.500	"								
Cadmium	ND	0.500	"								
Chromium	ND	0.500	"								
Lead	ND	0.300	"								
Lead	ND	0.300	"								
Selenium	ND	0.500	"								
Silver	ND	0.500	"								
Duplicate (BF30051-DUP1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared & Analyzed: 06/03/2013			
Arsenic	5.96	1.56	mg/kg dry		5.90				0.975	35	
Barium	149	0.778	"		148				0.292	35	
Cadmium	ND	0.778	"		ND					35	
Chromium	22.2	0.778	"		22.0				0.743	35	
Lead	694	0.467	"		691				0.337	35	
Lead	694	0.467	"		691				0.337	35	
Selenium	1.58	0.778	"		1.68				5.85	35	
Silver	ND	0.778	"		ND					35	
Matrix Spike (BF30051-MS1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared & Analyzed: 06/03/2013			
Arsenic	321	1.56	mg/kg dry	311	5.90	101	75-125				
Barium	473	0.778	"	311	148	104	75-125				
Cadmium	7.44	0.778	"	7.78	ND	95.6	75-125				
Chromium	52.7	0.778	"	31.1	22.0	98.6	75-125				
Lead	787	0.467	"	77.8	691	123	75-125				
Lead	787	0.467	"	77.8	691	123	75-125				
Silver	2.55	0.778	"	7.78	ND	32.7	75-125	Low Bias			

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30051 - EPA 3050B											
Reference (BF30051-SRM1)								Prepared & Analyzed: 06/03/2013			
Arsenic	88.6	1.00	mg/kg wet	94.5		93.7	69.2-131				
Barium	155	0.500	"	166		93.1	72.9-127				
Cadmium	52.8	0.500	"	59.9		88.1	73.1-127				
Chromium	60.6	0.500	"	69.3		87.4	68.4-132				
Lead	82.6	0.300	"	91.7		90.0	70.2-130				
Lead	82.6	0.300	"	91.7		90.0	70.2-130				
Selenium	151	0.500	"	159		94.8	67.9-133				
Silver	29.1	0.500	"	33.9		85.9	65.5-135				

SPLP Metals by EPA SW846-1312/6010B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30151 - EPA 3010A											
Blank (BF30151-BLK1)								Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	ND	0.00300	mg/L								
Blank (BF30151-BLK2)								Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	ND	0.00300	mg/L								
Duplicate (BF30151-DUP1)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	0.0651	0.00300	mg/L		0.0652				0.111	20	
Reference (BF30151-SRM1)								Prepared: 06/04/2013 Analyzed: 06/05/2013			
Lead	1.48	0.00300	mg/L	1.48		100	87.8-111				

Mercury by EPA 7000/200 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30019 - EPA SW846-7471											
Blank (BF30019-BLK1)								Prepared & Analyzed: 06/03/2013			
Mercury	ND	0.0330	mg/kg wet								
LCS (BF30019-BS1)								Prepared & Analyzed: 06/03/2013			
Mercury	3.08		mg/kg	3.73		82.6	67.6-131				
Duplicate (BF30019-DUP2)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared & Analyzed: 06/03/2013			
Mercury	ND	0.0514	mg/kg dry		ND					35	
Matrix Spike (BF30019-MS2)	*Source sample: 13F0008-11 (ELB-37 0.25-0.5)							Prepared & Analyzed: 06/03/2013			
Mercury	0.320		mg/kg	0.333	ND	96.1	75-125				

Volatile Analysis Sample Containers

Lab ID	Client Sample ID	Volatile Sample Container
13F0008-08	ELB-34 0.25-0.5	4 oz. WM Clear Glass Cool to 4° C
13F0008-09	ELB-35 0.25-0.5	Encore Sampler
13F0008-10	ELB-36 0.25-0.5	Encore Sampler
13F0008-11	ELB-37 0.25-0.5	Encore Sampler
13F0008-13	Trip Blank	40mL Clear Vial (pre-pres.) HCl; Cool to 4° C

Notes and Definitions

VOA-CONTNON-COMPLIANT- the container(s) provided by the client for soil volatiles do not meet the requirements of EPA SW846-5035A or NYSDOH ELAP. Results reported below 200 ug/kg may be biased low due to samples not being collected according to EPA SW846 5035A.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.

QM-01 The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

QL-02 This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

EXT-COMP Completed

ND Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.

RL REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.

MDL METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.

NR Not reported

RPD Relative Percent Difference

Wet The data has been reported on an as-received (wet weight) basis

Low Bias Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

High Bias High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.

Non-Dir. Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the MDL, with values between the MDL and the RL being "J" flagged as estimated results.

YORK ANALYTICAL LABORATORIES
120 RESEARCH DR.
STRATFORD, CT 06615
(203) 325-1371
FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions.

York Project No. 13F0008

YOUR Information

Company: Langan Engineering
Address: 555 Long Wharf Dr
New Haven, CT
Phone No. 203-562-5771
Contact Person: Kathleen Blessing
E-Mail Address: kblessing@langan.com

Report To:

Company: same
Address:
Phone No.
Attention:
E-Mail Address:

Invoice To:

Company: same
Address:
Phone No.
Attention:
E-Mail Address:

YOUR Project ID

140068605

Purchase Order No.

Samples from: CT X NY ___ NJ ___

Turn-Around Time

- RUSH - Same Day
- RUSH - Next Day
- RUSH - Two Day
- RUSH - Three Day X
- RUSH - Four Day
- Standard(5-7 Days)

Report Type

- Summary Report
- Summary w/ QA Summary
- CT RCP Package
- CTRCP DQA/DUE Pkg X
- NY ASP A Package
- NY ASP B Package
- NJDEP Red. Deliv.

Electronic Data Deliverables (EDD)

- Simple Excel X and PDF
- NYSDEC EQuIS
- EQuIS (std)
- EZ-EDD (EQuIS)
- NJDEP SRP HazSite EDD
- GIS/KEY (std)
- Other
- **York Regulatory Comparison Excel Spreadsheet**

Compare to the following Regs. (please fill in):

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes

- S - soil
- Other - specify(oil, etc.)
- WW - wastewater
- GW - groundwater
- DW - drinking water
- Air-A - ambient air
- Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL Met/CN	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360-Routine	Heterotrophs
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360-Baseline	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360-Expanded No Volatiles Scan	BTU/lb.
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360-Expanded Full List	Aquatic Tox.
Halog only	NJDEP list	App. IX	Chlordane	Indis. Metals	Air TICs	NYCDEP Sewer	TOC
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Sample Identification	Date/Time Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-37 0.25-0.5 MS/MSD	5/31/13 09:35	S	~~Total Lead~~, SPLP lead, VOC (8260), SVOC (8270), CT ETPH, RCRA 8 Metals	1 4oz glass, 3 8oz glass, 9 EnCores
DUP-2	↓ 00:00	S	Total Lead, SPLP lead	1 4oz glass
TRIP BLANK	5/30/13 00:00	AQ	VOCs (8260)	2 VOAs

Comments

PLs must meet CTDEEP RSRs

Please provide DQA spreadsheet

Preservation Check those Applicable: 4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Special Instructions: Field Filtered ___ Lab to Filter ___

Samples Relinquished By: [signature] Date/Time: 5/31 6:00

Samples Relinquished By: Date/Time:

Samples Received By: Date/Time:

Samples Received in LAB by: [signature] Date/Time: 5-31-13 1800

Temperature on Receipt 4.1 °C

YORK ANALYTICAL LABORATORIES
120 RESEARCH DR.
STRATFORD, CT 06615
(203) 325-1371
FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions.

York Project No. 13F0008

YOUR Information

Company: Langan Engineering
Address: 555 Long Wharf Dr. New Haven, CT 06511
Phone No. 203-562-5771
Contact Person: Kathleen Blessing
E-Mail Address: kblessing@langan.com

Report To:

Company: same
Address:
Phone No.
Attention:
E-Mail Address:

Invoice To:

Company: same
Address:
Phone No.
Attention:
E-Mail Address:

YOUR Project ID

140068605

Purchase Order No.

Samples from: CT X NY ___ NJ ___

Turn-Around Time

- RUSH - Same Day ☐
- RUSH - Next Day ☐
- RUSH - Two Day ☐
- RUSH - Three Day ☒
- RUSH - Four Day ☐
- Standard(5-7 Days) ☐

Report Type

- Summary Report
- Summary w/ QA Summary
- CT RCP Package
- CTRCP DQA/DUE Pkg X
- NY ASP A Package
- NY ASP B Package
- NJDEP Red. Deliv.

Electronic Data Deliverables (EDD)

- Simple Excel X and PDF
- NYSDEC EQuIS
- EQuIS (std)
- EZ-EDD (EQuIS)
- NJDEP SRP HazSite EDD
- GIS/KEY (std)
- Other
- **York Regulatory Comparison Excel Spreadsheet**

Compare to the following Regs. (please fill in):

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Kyle Zalaski
Name (printed)

Matrix Codes

- S - soil
- Other - specify(oil, etc.)
- WW - wastewater
- GW - groundwater
- DW - drinking water
- Air-A - ambient air
- Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
(8260 full)	TICs	(8270) or 625	8082PCB	(RCRA8)	TPH GRO	Pri.Poll.	Corrosivity
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	(CT ETPH)	TAL Met/CN	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360-Routine	Heterotrophs
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360-Baseline	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360-Expanded No Dioxins/Furans	BTU/lb.
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360-Expanded Full List	Aquatic Tox.
Halog.only	NJDEP list	App. IX	Chlordane	Indiv. Metals	Air TICs	NYCDEP Sewer	TOC
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	(LIST Below)	Methane	NYSDEC Sewer	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Sample Identification	Date/Time Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-23 0.5-1	5/31/13 07:30	S	Total Lead, SPLP Lead	1-4oz glass
ELB-23 1.5-2	07:30		*	
HA-4A 1.5-2	08:00			
HA-5A 1.5-2	08:05			
ELB-32 0.5-1	08:20			
ELB-32 1.5-2	08:30		*	
ELB-33 0.5-1	08:35			1-4oz glass
ELB-34 0.25-0.5	10:00		~~Total Lead~~ (KZ), SPLP Lead, VOCs(8260), SVOC(8270), CTETPH, RCRA 8 Metals	1-4oz glass
ELB-35 0.25-0.5	09:20			1-4oz glass, 1-8oz glass, 3 ENCORES
ELB-36 0.25-0.5	09:40			

Preservation Check those Applicable: 4°C ___ Frozen ___ HCl ___ MeOH ___ HNO_3 ___ H_2SO_4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Special Instructions
Field Filtered ☐
Lab to Filter ☐

Comments
s must meet CTDEEP RSRs
ease provide DQA spreadsheet
* = HOLD Analyses until authorized by Langan

Samples Relinquished By: [signature] Date/Time: 5/31 6:00
Samples Relinquished By: ___ Date/Time: ___
Samples Received By: Brace Date/Time: 5-31-13 1800
Samples Received in LAB by: ___ Date/Time: ___

Temperature on Receipt 4.1 °C

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kathleen Blessing

Report Date: 06/11/2013
Client Project ID: 140068605
York Project (SDG) No.: 13F0185

CT Cert. No. PH-0723 New Jersey Cert. No. CT-005 New York Cert. No. 10854 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 06/11/2013
Client Project ID: 140068605
York Project (SDG) No.: 13F0185

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kathleen Blessing

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on May 31, 2013 and listed below. The project was identified as your project: **140068605**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13F0185-01	ELB-15 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-02	ELB-16 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-03	ELB-17 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-04	ELB-18 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-05	ELB-19 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-06	ELB-22 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-07	ELB-27 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-08	ELB-29 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-09	ELB-28 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-10	ELB-31 1.5-2	Soil	05/30/2013	05/31/2013
13F0185-11	ELB-23 1.5-2	Soil	05/31/2013	05/31/2013
13F0185-12	ELB-32 1.5-2	Soil	05/31/2013	05/31/2013

General Notes for York Project (SDG) No.: 13F0185

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By:

Date: 06/11/2013

Benjamin Gulizia
Laboratory Director

YORK

Sample Information

Client Sample ID: **ELB-15 1.5-2** **York Sample ID:** **13F0185-01**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 9:27 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**11.9**		mg/kg dry	0.362	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 11:32	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 13:42	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**82.9**		%	0.100	1	SM 2540G	06/07/2013 08:16	06/10/2013 14:20	ALD

Sample Information

Client Sample ID: **ELB-16 1.5-2** **York Sample ID:** **13F0185-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 9:36 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**9.93**		mg/kg dry	0.347	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 11:37	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**0.0141**		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 13:47	MW

Sample Information

Client Sample ID: ELB-16 1.5-2 **York Sample ID:** 13F0185-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 9:36 am	05/31/2013

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**86.6**		%	0.100	1	SM 2540G	06/07/2013 08:16	06/10/2013 14:20	ALD

Sample Information

Client Sample ID: ELB-17 1.5-2 **York Sample ID:** 13F0185-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 9:52 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**56.1**		mg/kg dry	0.364	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 11:42	MW

Lead, SPLP by EPA 6010 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**0.0136**		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 13:52	MW

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**82.3**		%	0.100	1	SM 2540G	06/07/2013 08:16	06/10/2013 14:20	ALD

Sample Information

Client Sample ID: ELB-18 1.5-2 **York Sample ID:** 13F0185-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 10:19 am	05/31/2013

SPLP Extraction for METALS EPA 1312 **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Sample Information

Client Sample ID: ELB-18 1.5-2 **York Sample ID:** 13F0185-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 10:19 am	05/31/2013

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**15.8**		mg/kg dry	0.355	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 11:47	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 13:56	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**84.5**		%	0.100	1	SM 2540G	06/07/2013 08:16	06/10/2013 14:20	ALD

Sample Information

Client Sample ID: ELB-19 1.5-2 **York Sample ID:** 13F0185-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 10:29 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**25.9**		mg/kg dry	0.363	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 11:51	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**0.00696**		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 14:01	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**82.7**		%	0.100	1	SM 2540G	06/07/2013 08:16	06/10/2013 14:20	ALD

Sample Information

Client Sample ID: ELB-22 1.5-2 **York Sample ID:** 13F0185-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 11:06 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**13.6**		mg/kg dry	0.362	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 11:56	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**0.00681**		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 14:31	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**82.9**		%	0.100	1	SM 2540G	06/07/2013 08:16	06/10/2013 14:20	ALD

Sample Information

Client Sample ID: ELB-27 1.5-2 **York Sample ID:** 13F0185-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 12:52 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/kg dry	0.301	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 12:01	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 14:36	MW

Sample Information

Client Sample ID: ELB-27 1.5-2 | **York Sample ID:** 13F0185-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 12:52 pm	05/31/2013

Total Solids | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**99.6**		%	0.100	1	SM 2540G	06/10/2013 08:07	06/10/2013 14:27	ALD

Sample Information

Client Sample ID: ELB-29 1.5-2 | **York Sample ID:** 13F0185-08

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 1:15 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010 | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**7.84**		mg/kg dry	0.324	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 12:18	MW

Lead, SPLP by EPA 6010 | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 14:41	MW

Total Solids | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**92.6**		%	0.100	1	SM 2540G	06/10/2013 08:07	06/10/2013 14:27	ALD

Sample Information

Client Sample ID: ELB-28 1.5-2 | **York Sample ID:** 13F0185-09

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 1:50 pm	05/31/2013

SPLP Extraction for METALS EPA 1312 | **Log-in Notes:** | **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Sample Information

Client Sample ID: ELB-28 1.5-2 **York Sample ID:** 13F0185-09

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 1:50 pm	05/31/2013

Lead by EPA 6010

Log-in Notes: Sample Notes:

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**3.67**		mg/kg dry	0.317	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 12:23	MW

Lead, SPLP by EPA 6010

Log-in Notes: Sample Notes:

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 14:45	MW

Total Solids

Log-in Notes: Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**94.8**		%	0.100	1	SM 2540G	06/10/2013 08:07	06/10/2013 14:27	ALD

Sample Information

Client Sample ID: ELB-31 1.5-2 **York Sample ID:** 13F0185-10

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 30, 2013 2:18 pm	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: Sample Notes:

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: Sample Notes:

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**1.38**		mg/kg dry	0.316	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 12:27	MW

Lead, SPLP by EPA 6010

Log-in Notes: Sample Notes:

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 14:50	MW

Total Solids

Log-in Notes: Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**95.1**		%	0.100	1	SM 2540G	06/10/2013 08:07	06/10/2013 14:27	ALD

Sample Information

Client Sample ID: ELB-23 1.5-2 **York Sample ID:** 13F0185-11

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 31, 2013 7:30 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**17.4**		mg/kg dry	0.346	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 12:44	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	Lead	ND		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 14:55	MW

Total Solids

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**86.7**		%	0.100	1	SM 2540G	06/10/2013 08:07	06/10/2013 14:27	ALD

Sample Information

Client Sample ID: ELB-32 1.5-2 **York Sample ID:** 13F0185-12

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 31, 2013 8:30 am	05/31/2013

SPLP Extraction for METALS EPA 1312

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW 846-1312 SPLP for Extr. for Metals

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed		N/A	1.00	1	EPA SW846-1312	06/06/2013 17:19	06/07/2013 12:22	KK

Lead by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3050B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**677**		mg/kg dry	0.354	1	EPA SW846-6010B	06/07/2013 10:01	06/07/2013 12:49	MW

Lead, SPLP by EPA 6010

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-92-1	**Lead**	**0.110**		mg/L	0.00300	1	EPA SW846-6010B	06/07/2013 11:10	06/07/2013 15:00	MW

Sample Information

Client Sample ID: **ELB-32 1.5-2** **York Sample ID:** **13F0185-12**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13F0185	140068605	Soil	May 31, 2013 8:30 am	05/31/2013

Total Solids **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	**% Solids**	**84.7**		%	0.100	1	SM 2540G	06/10/2013 08:07	06/10/2013 14:27	ALD

REASONABLE CONFIDENCE PROTOCOL

LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068605	*Lab Project No.:*	**13F0185**
Laboratory Sample ID(s):	13F0185-01 - 13F0185-12	*Sampling Date(s):*	05/30/2013 - 05/31/2013

RCP Methods Used: See Narrative and Method Reference Section of this Technical Report

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed (including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP RCPs)?	YES
1A	Were the method specified preservation and holding time requirements met?	YES
1B	VPH and EPH Methods only: Was the VPH or EPH method conducted without significant modifications (see Section 11.3 of respective RCP methods)?	NR
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	YES
3	Were samples received at an appropriate temperature (<6°C)?	YES
4	Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?	NO
5A	Were reporting limits specified or referenced on the chain-of-custody?	YES
5B	Were these reporting limits met?	YES
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	NO
7	Are project-specific matrix spikes and laboratory duplicates included in this data set?	YES

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to questions #1, #1A, or #1B is "No", the data package does not meet the requirements for "Reasonable Confidence".
This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature:

Position: Laboratory Director

Printed Name: Benjamin Gulizia

Date: 06/11/2013

YORK

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Case Narrative

Client: Langan Engineering & Environmental Services (CT)
Client Project ID: 140068605
Prepared for: Kathleen Blessing

Introduction

This Case Narrative applies to the following samples submitted to our laboratory on **5/31/2013 6:00:00 PM** :

ELB-15 1.5-2	**Soil**
ELB-16 1.5-2	**Soil**
ELB-17 1.5-2	**Soil**
ELB-18 1.5-2	**Soil**
ELB-19 1.5-2	**Soil**
ELB-22 1.5-2	**Soil**
ELB-23 1.5-2	**Soil**
ELB-27 1.5-2	**Soil**
ELB-28 1.5-2	**Soil**
ELB-29 1.5-2	**Soil**
ELB-31 1.5-2	**Soil**
ELB-32 1.5-2	**Soil**

The 12 sample(s) were received intact in a custody-sealed cooler unless otherwise noted. Upon receipt, the temperature of the cooler was determined. The cooler temperature was acceptable (2-6oC) and measured cooler 1 @ 4 C at time of receipt as measured by a NIST traceable digital infrared thermometer. Chain-of-custody was maintained from receipt through analysis in the laboratory.

Methodology

Preparation and analysis were conducted according to the SW-846 methods, as detailed in the sample information table, and the requirements of the State of Connecticut Reasonable Confidence Protocols (RCP).

Metals – Total (Lead)

No problems were encountered during analysis of the sample.

Batch QC

A Standard Reference Material and site-specific Matrix Spike/Dup set on sample "ELB-31 1.5-2" was as QC for this project. Please refer to the Quality Control Data attached to this report for bias information.

Method Blank

No analyte was detected at or above the RL in the method blank or leach blank.

Dilutions

No sample dilutions were required. All analyte reporting limits were met.

Metals – SPLP (Lead)

No problems were encountered during analysis of the sample.

Batch QC

A Standard Reference Material and site-specific Matrix Spike/Dup set on sample "ELB-19 1.5-2" was as QC for this project. Please refer to the Quality Control Data attached to this report for bias information.

Method Blank

No analyte was detected at or above the RL in the method blank or leach blank.

Dilutions

No sample dilutions were required. All analyte reporting limits were met.

Analytical Batch Summary

Batch ID: BF30287 **General Method:** SPLP Extraction by EPA SW-846 1312
Prep Method: EPA SW 846-1312 SPLP for Extr. for Metals

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13F0185-01	ELB-15 1.5-2	06/06/13	KK
13F0185-02	ELB-16 1.5-2	06/06/13	KK
13F0185-03	ELB-17 1.5-2	06/06/13	KK
13F0185-04	ELB-18 1.5-2	06/06/13	KK
13F0185-05	ELB-19 1.5-2	06/06/13	KK
13F0185-06	ELB-22 1.5-2	06/06/13	KK
13F0185-07	ELB-27 1.5-2	06/06/13	KK
13F0185-08	ELB-29 1.5-2	06/06/13	KK
13F0185-09	ELB-28 1.5-2	06/06/13	KK
13F0185-10	ELB-31 1.5-2	06/06/13	KK
13F0185-11	ELB-23 1.5-2	06/06/13	KK
13F0185-12	ELB-32 1.5-2	06/06/13	KK
BF30287-BLK1	Blank	06/06/13	KK

Batch ID: BF30299 **General Method:** Miscellaneous Physical/Conventional Chemistry Parameters
Prep Method: % Solids Prep

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13F0185-01	ELB-15 1.5-2	06/07/13	AMC
13F0185-02	ELB-16 1.5-2	06/07/13	AMC
13F0185-03	ELB-17 1.5-2	06/07/13	AMC
13F0185-04	ELB-18 1.5-2	06/07/13	AMC
13F0185-05	ELB-19 1.5-2	06/07/13	AMC
13F0185-06	ELB-22 1.5-2	06/07/13	AMC

Batch ID: BF30317 **General Method:** Metals by EPA 6000 Series Methods
Prep Method: EPA 3050B

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13F0185-01	ELB-15 1.5-2	06/07/13	MW
13F0185-02	ELB-16 1.5-2	06/07/13	MW
13F0185-03	ELB-17 1.5-2	06/07/13	MW
13F0185-04	ELB-18 1.5-2	06/07/13	MW
13F0185-05	ELB-19 1.5-2	06/07/13	MW
13F0185-06	ELB-22 1.5-2	06/07/13	MW
13F0185-07	ELB-27 1.5-2	06/07/13	MW
13F0185-08	ELB-29 1.5-2	06/07/13	MW
13F0185-09	ELB-28 1.5-2	06/07/13	MW
13F0185-10	ELB-31 1.5-2	06/07/13	MW
13F0185-11	ELB-23 1.5-2	06/07/13	MW
13F0185-12	ELB-32 1.5-2	06/07/13	MW
BF30317-BLK1	Blank	06/07/13	MW
BF30317-DUP1	Duplicate	06/07/13	MW
BF30317-MS1	Matrix Spike	06/07/13	MW
BF30317-SRM1	Reference	06/07/13	MW

Batch ID: BF30318 **General Method:** SPLP Metals by EPA SW846-1312/6010B
Prep Method: EPA 3010A

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13F0185-01	ELB-15 1.5-2	06/07/13	MW
13F0185-02	ELB-16 1.5-2	06/07/13	MW
13F0185-03	ELB-17 1.5-2	06/07/13	MW
13F0185-04	ELB-18 1.5-2	06/07/13	MW
13F0185-05	ELB-19 1.5-2	06/07/13	MW
13F0185-06	ELB-22 1.5-2	06/07/13	MW
13F0185-07	ELB-27 1.5-2	06/07/13	MW
13F0185-08	ELB-29 1.5-2	06/07/13	MW
13F0185-09	ELB-28 1.5-2	06/07/13	MW
13F0185-10	ELB-31 1.5-2	06/07/13	MW
13F0185-11	ELB-23 1.5-2	06/07/13	MW
13F0185-12	ELB-32 1.5-2	06/07/13	MW
BF30318-BLK1	Blank	06/07/13	MW
BF30318-BLK2	Blank	06/07/13	MW
BF30318-BLK3	Blank	06/07/13	MW
BF30318-DUP1	Duplicate	06/07/13	MW
BF30318-MS1	Matrix Spike	06/07/13	MW
BF30318-SRM1	Reference	06/07/13	MW

Batch ID: BF30388 **General Method:** Miscellaneous Physical/Conventional Chemistry Parameters

Prep Method: % Solids Prep

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13F0185-07	ELB-27 1.5-2	06/10/13	AMC
13F0185-08	ELB-29 1.5-2	06/10/13	AMC
13F0185-09	ELB-28 1.5-2	06/10/13	AMC
13F0185-10	ELB-31 1.5-2	06/10/13	AMC
13F0185-11	ELB-23 1.5-2	06/10/13	AMC
13F0185-12	ELB-32 1.5-2	06/10/13	AMC

SPLP Extraction by EPA SW-846 1312 - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30287 - EPA SW 846-1312 SPLP for Extr. for Metals											
Blank (BF30287-BLK1)									Prepared: 06/06/2013 Analyzed: 06/07/2013		
SPLP Extraction	Completed	1.00	N/A								

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30317 - EPA 3050B											
Blank (BF30317-BLK1)							Prepared & Analyzed: 06/07/2013				
Lead	ND	0.300	mg/kg wet								
Duplicate (BF30317-DUP1)	*Source sample: 13F0185-10 (ELB-31 1.5-2)						Prepared & Analyzed: 06/07/2013				
Lead	1.36	0.316	mg/kg dry		1.38				1.54	35	
Matrix Spike (BF30317-MS1)	*Source sample: 13F0185-10 (ELB-31 1.5-2)						Prepared & Analyzed: 06/07/2013				
Lead	55.2	0.316	mg/kg dry	52.6	1.38	102	75-125				
Reference (BF30317-SRM1)							Prepared & Analyzed: 06/07/2013				
Lead	84.5	0.300	mg/kg wet	91.7		92.1	70.2-130				

SPLP Metals by EPA SW846-1312/6010B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BF30318 - EPA 3010A											
Blank (BF30318-BLK1)								Prepared & Analyzed: 06/07/2013			
Lead	ND	0.00300	mg/L								
Blank (BF30318-BLK2)								Prepared & Analyzed: 06/07/2013			
Lead	ND	0.00300	mg/L								
Blank (BF30318-BLK3)								Prepared & Analyzed: 06/07/2013			
Lead	ND	0.00300	mg/L								
Duplicate (BF30318-DUP1)	*Source sample: 13F0185-05 (ELB-19 1.5-2)							Prepared & Analyzed: 06/07/2013			
Lead	0.00668	0.00300	mg/L		0.00696				4.10	20	
Matrix Spike (BF30318-MS1)	*Source sample: 13F0185-05 (ELB-19 1.5-2)							Prepared & Analyzed: 06/07/2013			
Lead	0.526	0.00300	mg/L	0.500	0.00696	104	75-125				
Reference (BF30318-SRM1)								Prepared & Analyzed: 06/07/2013			
Lead	1.51	0.00300	mg/L	1.48		102	87.8-111				

DATA QUALITY ASSESSMENT WORKSHEET - METALS

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068605	*Lab Project No.:*	**13F0185**
Laboratory Sample ID(s):	13F0185-01 - 13F0185-12	*Sampling Date(s):*	05/30/2013 - 05/31/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
STANDARD RCP DELIVERABLES	NONE
Data Package Inspection	NONE
Reasonable Confidence Evaluation	NONE
Chain of Custody Evaluation	NONE
Sample Result Evaluation	NONE
Sample Preservation and Holding Time Evaluation	NONE
Method Blank Evaluation	NONE
Laboratory Control Samples Recovery Evaluation	NOT APPLICABLE
Laboratory Control Samples Precision Evaluation	NOT APPLICABLE
Standard Reference Material Recovery Evaluation	NONE
Site Specific Matrix Spike Recovery Evaluation	NONE
Site Specific Matrix Spike Precision Evaluation	NOT APPLICABLE
Duplicate Precision Evaluation	NONE

DATA QUALITY ASSESSMENT SUMMARY

No QC Nonconformances Found

No Sample Nonconformances Found

Notes: Other RCP nonconformances, if any, are detailed in the Data Quality Assessment worksheets.

For multiple surrogate analyses such as semi-volatiles, volatiles, etc, single surrogate excursions do not necessarily indicate a bias in the sample. Samples with multiple surrogate excursions may exhibit a bias in the results.

Definitions:
LCS - Laboratory Control Sample
LCS dup - Laboratory Control Sample Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
BS - Blank Spike also called LCS
BSD - Blank Spike Duplicate also called LCS dup
SRM - Standard Reference Material
DUP - Duplicate

Notes and Definitions

EXT-COMP Completed

ND	Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
MDL	METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

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Field Chain-of-Custody Record

Page ___ of ___

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York Project No. 13F0185

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering	Company: Same	Company: Same	140068605	RUSH - Same Day	Summary Report
Address: 565 Lowland Dr. New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day	Summary w/ QA Summary
Phone No. 203 562 5771	Phone No.	Phone No.		RUSH - Two Day	CT RCP Package X
Contact Person: Kathleen Dessing	Attention:	Attention:		RUSH - Three Day X	NY ASP A Package
E-Mail Address: kdessing@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY ___ NJ ___	RUSH - Four Day	NY ASP B Package
				Standard(5-7 Days)	*Electronic Deliverables:* EDD (Specify Type) X
					Excel

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): [signature]

Name (printed): Kyle Zolasko

Matrix Codes
S - soil
Other - specify
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll	Corrosivity	Nitrate	Color
624	Site Spec.	STARS list	8081Pest	PPI3 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MetCN	Ignitability	TKN	Cyanide-T
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot.Nitrogen	Cyanide-A
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App.IX	Sieve Anal.	Ammonia-N	BOD5
1CL list	Oxygenates	TAGM list	Site Spec	NJDEP list	Air TO14A	Part.360Reactive	Hetero-aphs	Chloride	CBOD5
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part.360Ignitable	TOX	Phosphate	BOD28
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	AirSTARS	Part.360Corrosive	BTU/lb.	Tot. Phos.	COD
Atom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part.360Reactive	Aquatic Tox.	Oil&Grease	TSS
Halog.only	NJDEP list	App. IX	Chlordane	Indic.Metals	Air TICs	NYCRP Sem	TOC	F.O.G.	Total Solids
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sem	Asbestos	pH	TDS
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664

Special Instructions
Field Filtered
Lab to Filter

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HP-6 1.5-2	5/31/13 09:15	S	Total Lead, SPLP Lead	1 4oz glass
FLB-15 0.5-1	09:25			
FLB-15 1.5-2	09:27		* Please run on 3 day TAT	
FLB-16 0.5-1	09:34			
FLB-16 1.5-2	09:36		* Please run on 3 day TAT	
HP-6A 10-15	09:44			
FLB-17 0.5-1	09:50			
FLB-17 1.5-2	09:52		* Please run on 3 day TAT	
FLB-18 0.5-1	10:17			
FLB-18 1.5-2	10:19		* Please run on 3 day TAT	

Comments
Must meet CT DEP RSRs
[illegible]

Preservation (Check those Applicable): 4°C ___ Frozen ___ HCl ___ MeOH ___ HNO_3 ___ H_2SO_4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
[signature]	[illegible]		
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ___ °C

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Field Chain-of-Custody Record

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York Project No. 13F0185

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverbles
Company: Langan Engineering	Company: Same	Company: Same	140068605	RUSH - Same Day ☐	Summary Report ____
Address: 55 E. Longwharf Dr. New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day ☐	Summary w/ QA Summary ____
Phone No. 203-562-2771	Phone No.	Phone No.		RUSH - Two Day ☐	CT RCP Package X
Contact Person: Kathleen Blessing	Attention:	Attention:		RUSH - Three Day ☒	NY ASP A Package ____
E-Mail Address: kblessing@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY ___ NJ ___	RUSH - Four Day ☐	NY ASP B Package ____
				Standard(5-7 Days) ☐	*Electronic Deliverables:* EDD (Specify Type) ____ Excel ____

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes	
S -	soil
Other -	specify(oil, etc.)
WW -	wastewater
GW -	groundwater
DW -	drinking water
Air-A -	ambient air
Air-SV -	soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters		
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color
624	Site Spec.	STARS list	8081 Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MetCN	Ignitability	TKN	Cyanide-T
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot. Nitrogen	Cyanide-A
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.	Ammonia-N	BOD5
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part360 Routine	Heterotrophs	Chloride	CBOD5
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part360 Baseline	TOX	Phosphate	BOD28
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part360 Hazardous Discharge Offshore	BTU/lb.	Tot. Phos.	COD
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part360 Hazardous Full List	Aquatic Tox.	Oil&Grease	TSS
Halog.only	NJDEP list	App. IX	Chlordane	Indiv. Metals	Air TICs	NYCDEP Sewer	TOC	F.O.G.	Total Solids
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos	pH	TDS
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664

Special Instructions: Field Filtered ☐ Lab to Filter ☐

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-19 0.5-1	5/30/13 10:27	S	Total Lead, SPLP Lead	1-4oz glass
ELB-19 1.5-2	10:29		* Please run on 3day TAT	
ELB-20 0.5-1	10:35			
ELB-21 0.5-1	10:38			
ELB-22 0.5-1	11:04			
ELB-22 1.5-2	11:06		* Please run on 3day TAT	
HA-17A 1.5-2	11:10			
HA-16A 1.5-2	11:20			
HA-15A 1.5-2	12:28			
ELB-25 0.5-1	12:35			

Preservation (Check those Applicable): 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO3 ____ H2SO4 ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Comments: RL's must meet CT DEEP RSPC. Total Analyses not authorized by Langan.

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
[signature]	5/31 6:20		
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ____ °C

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York Project No. 13F0185

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering	Company: Same	Company: Same	140063605	RUSH - Same Day ☐	Summary Report ____
Address: 555 Long Wharf Dr. New Haven CT	Address:	Address:	Purchase Order No.	RUSH - Next Day ☐	Summary w/ QA Summary ____
Phone No. 203-562-5771	Phone No.	Phone No.		RUSH - Two Day ☐	CT RCP Package ☒
Contact Person: Kathleen Blessing	Attention:	Attention:		RUSH - Three Day ☒	NY ASP A Package ____
E Mail Address: kblessing@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT ☒ NY ___ NJ ___	RUSH - Four Day ☐	NY ASP B Package ____
				Standard(5-7 Days) ☐	*Electronic Deliverables:* EDD (Specify Type) DEP-EKO
					Excel DOA Screening

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes	
S -	soil
Other -	specify(oil, etc.)
WW -	wastewater
GW -	groundwater
DW -	drinking water
Air-A -	ambient air
Air-SV -	soil vapor

Volatiles		Semi-Vols	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters			
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color	
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols	
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MetCN	Ignitability	TKN	Cyanide-T	
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot.Nitrogen	Cyanide-A	
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App.IX	Sieve Anal.	Ammonia-N	BOD5	
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part360-Routine	Heterotrophs	Chloride	CBOD5	
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part360-Baseline	TOX	Phosphate	BOD28	
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part360-Expanded	BTU/lb.	Tot. Phos.	COD	
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part360-Expanded Full List	Aquatic Tox.	Oil&Grease	TSS	
Halog.only	NJDEP list	App. IX	Chlordane	Indic.Metals	Air TICs	NYCDEPSewer	TOC	F.O.G.	Total Solids	
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST BS	Methane	NYSDECSewer	Asbestos	pH	TDS	
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	MBAS	TPH-1664	

Special Instructions: Field Filtered ☐ Lab to Filter ☐

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
HLB-26 0.5-1	5/30/13 12:40	S	Total Lead, SPLP Lead	1-4oz glass
HLB-27 0.5-1	12:50			
HLB-27 1.5-2	12:52		* Please run on 3 day TAT	
HLB-28 0.5-1	12:55			
HLB-29 0.5-1	13:13			
HLB-29 1.5-2	13:15		* Please run on 3 day TAT	
HLB-30 0.5-1	13:30			
HA-1A 1.5-2	13:45			
HLB-28 1.5-2	13:50		* Please run on 3 day TAT	
HA-2A 1.5-2	14:22			

Preservation (Check those Applicable): 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO_3 ____ H_2SO_4 ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Comments

Plan must meet CT DEEP RSRs

* = HOLD Analysis until authorized by Langan

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
[signature]	5/31 6:00	[signature]	5/31/13 12:00
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ____ °C

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York Project No. 13F0185

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type/Deliverables
Company: Langan Engineering	Company: Same	Company: Same	14006 9605	RUSH - Same Day ☐	Summary Report ____
Address: 555 Long Wharf Dr. New Haven, CT	Address:	Address:	Purchase Order No.	RUSH - Next Day ☐	Summary w/ QA Summary ____
Phone No. 203-562-5771	Phone No.	Phone No.		RUSH - Two Day ☐	CT RCP Package X
Contact Person: Kathleen Hassing	Attention:	Attention:		RUSH - Three Day X	NY ASP A Package ____
E-Mail Address: khassing@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY ___ NJ ___	RUSH - Four Day ☐	NY ASP B Package ____
				Standard(5-7 Days) ☐	*Electronic Deliverables:* EDD (Specify Type) ____ Excel ____

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes: S - soil; Other - specify(oil, etc.); WW - wastewater; GW - groundwater; DW - drinking water; Air-A - ambient air; Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Common Miscellaneous Parameters			Special Instructions
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity	Nitrate	Color	Field Filtered ☐
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity	Nitrite	Phenols	Lab to Filter ☐
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL MetCN	Ignitability	TKN	Cyanide-T	
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point	Tot.Nitrogen	Cyanide-A	
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.	Ammonia-N	BOD5	
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part360 Reactive	Heterotrophs	Chloride	CBOD5	
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part360 Leachate	TOX	Phosphate	BOD28	
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part360 Volatile	BTU/lb.	Tot. Phos.	COD	
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part360 Semi-Volatile	Aquatic Tox.	Oil&Grease	TSS	
Halog.only	NJDEP list	App. IX	Chlordane	Info. Metals	Air TICs	NYCDEP Sewer	TOC	E.O.G.	Total Solids	
App IX list	SPLP or TCLP	TCLP BNA	608 Pest	CST Below	Methane	NYSDEC Sewer	Asbestos	pH	TDS	
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica	ABAS	TPH-1664	

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-31 05-1	5/31/13 14:15	S	Total Lead, SPLP Lead	1-4oz glass
ELB-31 15-2	14:18	↓	X Please run on 3day TAT ↓	↓
TRIP	00:00	↓		

Comments: Please run against CT DEEP RSR's [illegible] authorized by Langan

Preservation (Check those Applicable): 4°C ____ Frozen ____ HCl ____ MeOH ____ HNO_3 ____ H_2SO_4 ____ NaOH ____ ZnAc ____ Ascorbic Acid ____ Other ____

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
[signature]	5/31 6:56		
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt: ____ °C

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FAX (203) 357-0166

Field Chain-of-Custody Record

13F0185

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York Project No. 13F0008

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type
Company: Langan Engineering	Company: Same	Company: Same	140068605	RUSH - Same Day ☐	Summary Report ___
Address: 555 Long Wharf Dr. New Haven CT 06511	Address:	Address:	Purchase Order No.	RUSH - Next Day ☐	Summary w/ QA Summary ___
Phone No. 203-562-5771	Phone No.	Phone No.		RUSH - Two Day ☐	CT RCP Package ___
Contact Person: Kathleen Blessing	Attention:	Attention:		RUSH - Three Day ☒	CTRCP DQA/DUE Pkg X
E-Mail Address: kblessing@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY___ NJ___	RUSH - Four Day ☐	NY ASP A Package ___
				Standard(5-7 Days) ☐	NY ASP B Package ___
					NJDEP Red. Deliv. ___
					Electronic Data Deliverables (EDD)
					Simple Excel X and PDF
					NYSDEC EQuIS ___
					EQuIS (std) ___
					EZ-EDD (EQuIS) ___
					NJDEP SRP HazSite EDD ___
					GIS/KEY (std) ___
					Other ___
					York Regulatory Comparison
					Excel Spreadsheet ___
					Compare to the following Regs: (please fill in):

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Samples Collected/Authorized By (Signature): Kyle Zalaski

Name (printed): Kyle Zalaski

Matrix Codes
S - soil
Other - specify (soil, etc.)
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CTETPH	TAL MeCN	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part360-Routine	Heterotrophs
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part360-Hazardous	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part360-Expanded Site Specific List	BTU/lb
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part360-Expanded Full List	Aquatic Tox.
Halog. only	NJDEP list	App. IX	Chlordane	Indiv. Metals	Air TICs	NYCDEP Sewer	TOC
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Sample Identification	Date/Time Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
ELB-23 0.5-1	5/31/13 07:30	S	Total Lead, SPLP Lead	1-4oz glass
ELB-23 1.5-2	07:30		* Please run on 3 day TAT	
HA-4A 1.5-2	08:00			
HA-5A 1.5-2	08:05			
ELB-32 0.5-1	08:20			
ELB-32 1.5-2	08:30		* Please run on 3 day TAT	1-4oz glass
ELB-33 0.5-1	08:35			1-4oz glass
ELB-34 0.25-0.5	10:00		~~Total Lead~~ (RCP), SPLP Lead, VOCs (8260), SVOC (8270), CTETPH, RCRA 8 Metals	1-4oz glass, 1-8oz glass, 3 ENCORES
ELB-35 0.25-0.5	09:20			
ELB-36 0.25-0.5	09:40			

Comments

RLs must meet CTDEEP RSRs
Please provide DQA spreadsheet
* HOLD Analyses until authorized by Langan

Preservation (Check those Applicable): 4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other ___

Special Instructions: Field Filtered ☐ Lab to Filter ☐

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
[signature]	5/31 6:00	[signature]	5-31-13 18:00
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time

Temperature on Receipt ___ °C

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for:

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Report Date: 04/01/2013
Client Project ID: 140068601
York Project (SDG) No.: 13C0564

CT License No. PH-0723 New Jersey License No. CT-005 New York License No. 10854 PA License No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 (203) 325-1371 FAX (203) 357-0166

Report Date: 04/01/2013
Client Project ID: 140068601
York Project (SDG) No.: 13C0564

Langan Engineering & Environmental Services (CT)
Long Wharf Maritime Center, 555 Long Wharf Drive
New Haven CT, 06511
Attention: Kyle Zalaski

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on March 20, 2013 and listed below. The project was identified as your project: **140068601**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the attachment to this report, and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
13C0564-01	TRIP BLANK	Water	03/19/2013	03/20/2013
13C0564-02	FIELD BLANK	Water	03/19/2013	03/20/2013
13C0564-03	DUP	Water	03/19/2013	03/20/2013
13C0564-04	ELB-14 (OW)	Water	03/19/2013	03/20/2013
13C0564-05	ELB-12 (OW)	Water	03/19/2013	03/20/2013
13C0564-06	ELB-6 (OW)	Water	03/19/2013	03/20/2013
13C0564-07	ELB-5 (OW)	Water	03/19/2013	03/20/2013

General Notes for York Project (SDG) No.: 13C0564

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation, unless otherwise noted.
6. All analyses conducted met method or Laboratory SOP requirements. See the Qualifiers and/or Narrative sections for further information.
7. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
8. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.

Approved By: **Date:** 04/01/2013

Robert Q. Bradley
Laboratory Director

YORK

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: TRIP BLANK

York Sample ID: 13C0564-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
78-93-3	2-Butanone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
591-78-6	2-Hexanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
67-64-1	Acetone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
107-13-1	Acrylonitrile	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
71-43-2	Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
108-86-1	Bromobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
74-97-5	Bromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-25-2	Bromoform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: TRIP BLANK

York Sample ID: 13C0564-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
74-83-9	Bromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-15-0	Carbon disulfide	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
108-90-7	Chlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-00-3	Chloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
67-66-3	Chloroform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
74-87-3	Chloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
74-95-3	Dibromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-09-2	Methylene chloride	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
91-20-3	Naphthalene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
95-47-6	o-Xylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
100-42-5	Styrene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
109-99-9	Tetrahydrofuran	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
108-88-3	Toluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
79-01-6	Trichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: TRIP BLANK | **York Sample ID:** 13C0564-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Volatile Organics, CT RCP List

Sample Prepared by Method: EPA 5030B

Log-in Notes:

Sample Notes:

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-01-4	Vinyl Chloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:02	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*127 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*99.8 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*96.8 %*	*70-130*

Sample Information

Client Sample ID: FIELD BLANK | **York Sample ID:** 13C0564-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 2:00 pm	03/20/2013

Volatile Organics, CT RCP List

Sample Prepared by Method: EPA 5030B

Log-in Notes:

Sample Notes:

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **FIELD BLANK** **York Sample ID:** **13C0564-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 2:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
594-20-7	2,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
78-93-3	**2-Butanone**	**3.3**		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
591-78-6	2-Hexanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
67-64-1	Acetone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
107-13-1	Acrylonitrile	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
71-43-2	Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
108-86-1	Bromobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
74-97-5	Bromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-25-2	Bromoform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
74-83-9	Bromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-15-0	Carbon disulfide	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
108-90-7	Chlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-00-3	Chloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
67-66-3	Chloroform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
74-87-3	Chloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
74-95-3	Dibromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-09-2	Methylene chloride	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
91-20-3	Naphthalene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
95-47-6	o-Xylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **FIELD BLANK** **York Sample ID:** **13C0564-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 2:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
100-42-5	Styrene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
109-99-9	Tetrahydrofuran	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
108-88-3	Toluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
79-01-6	Trichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 02:38	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*118 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*97.4 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*99.0 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/L	0.556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
120-83-2	2,4-Dichlorophenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
105-67-9	2,4-Dimethylphenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
51-28-5	2,4-Dinitrophenol	ND		ug/L	11.1	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
91-58-7	2-Chloronaphthalene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
95-57-8	2-Chlorophenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
91-57-6	2-Methylnaphthalene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
95-48-7	2-Methylphenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
88-74-4	2-Nitroaniline	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **FIELD BLANK** **York Sample ID:** **13C0564-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 2:00 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
88-75-5	2-Nitrophenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
99-09-2	3-Nitroaniline	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/L	11.1	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
106-47-8	4-Chloroaniline	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
100-01-6	4-Nitroaniline	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
100-02-7	4-Nitrophenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
83-32-9	Acenaphthene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
208-96-8	Acenaphthylene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
62-53-3	Aniline	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
120-12-7	Anthracene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
56-55-3	Benzo(a)anthracene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
50-32-8	Benzo(a)pyrene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
85-68-7	Benzyl butyl phthalate	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
117-81-7	**Bis(2-ethylhexyl)phthalate**	**30.8**		ug/L	0.556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
86-74-8	Carbazole	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
218-01-9	Chrysene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
132-64-9	Dibenzofuran	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
84-66-2	Diethyl phthalate	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
131-11-3	Dimethyl phthalate	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
84-74-2	Di-n-butyl phthalate	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
117-84-0	Di-n-octyl phthalate	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
206-44-0	Fluoranthene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
86-73-7	Fluorene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **FIELD BLANK** **York Sample ID:** **13C0564-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 2:00 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
118-74-1	Hexachlorobenzene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
87-68-3	Hexachlorobutadiene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
67-72-1	Hexachloroethane	ND		ug/L	0.556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
78-59-1	Isophorone	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
91-20-3	Naphthalene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
98-95-3	Nitrobenzene	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
82-68-8	Pentachloronitrobenzene	ND		ug/L	0.111	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
87-86-5	Pentachlorophenol	ND		ug/L	0.556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
85-01-8	Phenanthrene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
108-95-2	Phenol	ND		ug/L	5.56	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
129-00-0	Pyrene	ND		ug/L	0.0556	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR
110-86-1	Pyridine	ND		ug/L	0.111	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 12:49	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*87.7 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*60.7 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*33.1 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*67.3 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*21.2 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*88.2 %*	*30-130*

Polychlorinated Biphenyls (PCB)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW
11104-28-2	Aroclor 1221	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW
11141-16-5	Aroclor 1232	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW
53469-21-9	Aroclor 1242	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW
12672-29-6	Aroclor 1248	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW
11097-69-1	Aroclor 1254	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW
11096-82-5	Aroclor 1260	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW
1336-36-3	Total PCBs	ND		ug/L	0.0571	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:15	JW

	Surrogate Recoveries	Result	Acceptance Range
2051-24-3	*Surrogate: Decachlorobiphenyl*	*73.1 %*	*30-150*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **FIELD BLANK** **York Sample ID:** **13C0564-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 2:00 pm	03/20/2013

Polychlorinated Biphenyls (PCB)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*68.5 %*			*30-150*					

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	**ETPH (Extractable Total Petroleum Hydrocarbons)**	**0.0985**		mg/L	0.0769	1	CT DEP ETPH	03/21/2013 07:46	03/22/2013 15:24	SR

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*71.4 %*	*25.9-150*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-38-2	Arsenic	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-39-3	Barium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-41-7	Beryllium	ND		mg/L	0.0001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-43-9	Cadmium	ND		mg/L	0.0005	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-47-3	Chromium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-50-8	Copper	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7439-92-1	Lead	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-02-0	Nickel	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7782-49-2	Selenium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-22-4	Silver	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-28-0	Thallium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-62-2	Vanadium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW
7440-66-6	**Zinc**	**0.015**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 10:53	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.0002	1	EPA SW846-7470	03/22/2013 10:00	03/22/2013 10:00	AA

Sample Information

Client Sample ID: **DUP** **York Sample ID:** **13C0564-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: DUP

York Sample ID: 13C0564-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Volatile Organics, CT RCP List

Sample Prepared by Method: EPA 5030B

Log-in Notes:

Sample Notes:

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
78-93-3	2-Butanone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
591-78-6	2-Hexanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
67-64-1	Acetone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
107-13-1	Acrylonitrile	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
71-43-2	Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
108-86-1	Bromobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
74-97-5	Bromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-25-2	Bromoform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
74-83-9	Bromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: DUP

York Sample ID: 13C0564-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
75-15-0	Carbon disulfide	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
108-90-7	Chlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-00-3	Chloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
67-66-3	Chloroform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
74-87-3	Chloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
74-95-3	Dibromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-09-2	Methylene chloride	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
91-20-3	Naphthalene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
95-47-6	o-Xylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
100-42-5	Styrene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
109-99-9	Tetrahydrofuran	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
108-88-3	Toluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
79-01-6	Trichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:14	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: DUP

York Sample ID: 13C0564-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate Recoveries	**Result**			**Acceptance Range**					
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*123 %*			*70-130*					
460-00-4	*Surrogate: p-Bromofluorobenzene*	*102 %*			*70-130*					
2037-26-5	*Surrogate: Toluene-d8*	*96.8 %*			*70-130*					

Semi-Volatiles, CT RCP BNA List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
120-83-2	2,4-Dichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
105-67-9	2,4-Dimethylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
51-28-5	2,4-Dinitrophenol	ND		ug/L	10.5	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
91-58-7	2-Chloronaphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
95-57-8	2-Chlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
91-57-6	2-Methylnaphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
95-48-7	2-Methylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
88-74-4	2-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
88-75-5	2-Nitrophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
99-09-2	3-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/L	10.5	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
106-47-8	4-Chloroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
100-01-6	4-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
100-02-7	4-Nitrophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
83-32-9	Acenaphthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
208-96-8	Acenaphthylene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
62-53-3	Aniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **DUP** **York Sample ID:** **13C0564-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
120-12-7	Anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
56-55-3	Benzo(a)anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
50-32-8	Benzo(a)pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
85-68-7	Benzyl butyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
117-81-7	**Bis(2-ethylhexyl)phthalate**	**266**		ug/L	5.26	10	EPA SW-846 8270C	03/22/2013 07:41	03/25/2013 18:04	SR
86-74-8	Carbazole	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
218-01-9	Chrysene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
132-64-9	Dibenzofuran	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
84-66-2	Diethyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
131-11-3	Dimethyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
84-74-2	Di-n-butyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
117-84-0	Di-n-octyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
206-44-0	Fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
86-73-7	Fluorene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
118-74-1	Hexachlorobenzene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
87-68-3	Hexachlorobutadiene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
67-72-1	Hexachloroethane	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
78-59-1	Isophorone	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
91-20-3	Naphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
98-95-3	Nitrobenzene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
82-68-8	Pentachloronitrobenzene	ND		ug/L	0.105	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
87-86-5	Pentachlorophenol	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
85-01-8	Phenanthrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
108-95-2	Phenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: DUP

York Sample ID: 13C0564-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
129-00-0	Pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR
110-86-1	Pyridine	ND		ug/L	0.105	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:20	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*108 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*77.8 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*42.3 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*86.1 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*27.3 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*91.6 %*	*30-130*

Polychlorinated Biphenyls (PCB)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW
11104-28-2	Aroclor 1221	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW
11141-16-5	Aroclor 1232	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW
53469-21-9	Aroclor 1242	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW
12672-29-6	Aroclor 1248	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW
11097-69-1	Aroclor 1254	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW
11096-82-5	Aroclor 1260	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW
1336-36-3	Total PCBs	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:34	JW

	Surrogate Recoveries	Result	Acceptance Range
2051-24-3	*Surrogate: Decachlorobiphenyl*	*53.7 %*	*30-150*
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*43.0 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	ETPH (Extractable Total Petroleum Hydrocarbons)	ND		mg/L	0.0789	1	CT DEP ETPH	03/21/2013 07:46	03/22/2013 15:24	SR

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*94.4 %*	*25.9-150*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: DUP | **York Sample ID:** 13C0564-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:00 pm	03/20/2013

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-38-2	**Arsenic**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-39-3	**Barium**	**0.396**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-41-7	Beryllium	ND		mg/L	0.0001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-43-9	Cadmium	ND		mg/L	0.0005	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-47-3	**Chromium**	**0.005**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-50-8	**Copper**	**0.040**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7439-92-1	**Lead**	**0.002**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-02-0	**Nickel**	**0.008**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7782-49-2	**Selenium**	**0.003**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-22-4	Silver	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-28-0	Thallium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-62-2	**Vanadium**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW
7440-66-6	**Zinc**	**0.014**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:00	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.0002	1	EPA SW846-7470	03/22/2013 10:00	03/22/2013 10:00	AA

Sample Information

Client Sample ID: ELB-14 (OW) | **York Sample ID:** 13C0564-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 10:40 am	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-14 (OW)** **York Sample ID:** **13C0564-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 10:40 am	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
95-63-6	**1,2,4-Trimethylbenzene**	**0.62**		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
78-93-3	2-Butanone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
591-78-6	2-Hexanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
67-64-1	Acetone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
107-13-1	Acrylonitrile	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
71-43-2	Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
108-86-1	Bromobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
74-97-5	Bromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-25-2	Bromoform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
74-83-9	Bromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-15-0	Carbon disulfide	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
108-90-7	Chlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-00-3	Chloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
67-66-3	Chloroform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
74-87-3	Chloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-14 (OW)** **York Sample ID:** **13C0564-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 10:40 am	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
124-48-1	Dibromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
74-95-3	Dibromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-09-2	Methylene chloride	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
91-20-3	Naphthalene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
95-47-6	o-Xylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
100-42-5	Styrene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
109-99-9	Tetrahydrofuran	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
108-88-3	Toluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
79-01-6	Trichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 03:49	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*122 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*99.7 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*96.6 %*	*70-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-14 (OW) **York Sample ID:** 13C0564-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 10:40 am	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
120-83-2	2,4-Dichlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
105-67-9	2,4-Dimethylphenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
51-28-5	2,4-Dinitrophenol	ND		ug/L	10.8	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
91-58-7	2-Chloronaphthalene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
95-57-8	2-Chlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
91-57-6	2-Methylnaphthalene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
95-48-7	2-Methylphenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
88-74-4	2-Nitroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
88-75-5	2-Nitrophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
99-09-2	3-Nitroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/L	10.8	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
106-47-8	4-Chloroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
100-01-6	4-Nitroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
100-02-7	4-Nitrophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
83-32-9	Acenaphthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
208-96-8	Acenaphthylene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
62-53-3	Aniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
120-12-7	Anthracene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
56-55-3	Benzo(a)anthracene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
50-32-8	Benzo(a)pyrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
85-68-7	Benzyl butyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-14 (OW)** **York Sample ID:** **13C0564-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 10:40 am	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
117-81-7	**Bis(2-ethylhexyl)phthalate**	**0.627**		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
86-74-8	Carbazole	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
218-01-9	Chrysene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
132-64-9	Dibenzofuran	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
84-66-2	Diethyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
131-11-3	Dimethyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
84-74-2	Di-n-butyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
117-84-0	Di-n-octyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
206-44-0	Fluoranthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
86-73-7	Fluorene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
118-74-1	Hexachlorobenzene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
87-68-3	Hexachlorobutadiene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
67-72-1	Hexachloroethane	ND		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
78-59-1	Isophorone	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
91-20-3	Naphthalene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
98-95-3	Nitrobenzene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
82-68-8	Pentachloronitrobenzene	ND		ug/L	0.108	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
87-86-5	Pentachlorophenol	ND		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
85-01-8	Phenanthrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
108-95-2	Phenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
129-00-0	Pyrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR
110-86-1	Pyridine	ND		ug/L	0.108	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 13:51	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*94.8 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*69.1 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*36.2 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*76.6 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*23.4 %*	*15-110*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-14 (OW)** **York Sample ID:** **13C0564-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 10:40 am	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
1718-51-0	*Surrogate: Terphenyl-d14*	*81.1 %*			*30-130*					

Polychlorinated Biphenyls (PCB)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW
11104-28-2	Aroclor 1221	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW
11141-16-5	Aroclor 1232	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW
53469-21-9	Aroclor 1242	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW
12672-29-6	Aroclor 1248	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW
11097-69-1	Aroclor 1254	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW
11096-82-5	Aroclor 1260	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW
1336-36-3	Total PCBs	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 16:54	JW

	Surrogate Recoveries	Result	Acceptance Range
2051-24-3	*Surrogate: Decachlorobiphenyl*	*47.8 %*	*30-150*
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*44.5 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	ETPH (Extractable Total Petroleum Hydrocarbons)	ND		mg/L	0.0811	1	CT DEP ETPH	03/21/2013 07:46	03/22/2013 15:24	SR

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*88.0 %*	*25.9-150*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-38-2	**Arsenic**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-39-3	**Barium**	**0.143**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-41-7	Beryllium	ND		mg/L	0.0001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-43-9	**Cadmium**	**0.001**		mg/L	0.0005	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-47-3	**Chromium**	**0.005**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-50-8	**Copper**	**0.018**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7439-92-1	Lead	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-02-0	**Nickel**	**0.024**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7782-49-2	**Selenium**	**0.003**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-22-4	Silver	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-14 (OW)** **York Sample ID:** **13C0564-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 10:40 am	03/20/2013

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-28-0	Thallium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-62-2	**Vanadium**	**0.002**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW
7440-66-6	**Zinc**	**0.017**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:07	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.0002	1	EPA SW846-7470	03/22/2013 10:00	03/22/2013 10:00	AA

Sample Information

Client Sample ID: **ELB-12 (OW)** **York Sample ID:** **13C0564-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 12:40 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-12 (OW)** **York Sample ID:** **13C0564-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 12:40 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
78-93-3	2-Butanone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
591-78-6	**2-Hexanone**	**0.67**		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
67-64-1	Acetone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
107-13-1	Acrylonitrile	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
71-43-2	Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
108-86-1	Bromobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
74-97-5	Bromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-25-2	Bromoform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
74-83-9	Bromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-15-0	Carbon disulfide	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
108-90-7	Chlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-00-3	Chloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
67-66-3	Chloroform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
74-87-3	Chloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
74-95-3	Dibromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-09-2	Methylene chloride	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
91-20-3	Naphthalene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-12 (OW) **York Sample ID:** 13C0564-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 12:40 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
104-51-8	n-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
95-47-6	o-Xylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
100-42-5	Styrene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
109-99-9	Tetrahydrofuran	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
108-88-3	Toluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
79-01-6	Trichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 04:25	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*127 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*98.1 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*97.0 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
120-83-2	2,4-Dichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
105-67-9	2,4-Dimethylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
51-28-5	2,4-Dinitrophenol	ND		ug/L	10.5	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
91-58-7	2-Chloronaphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
95-57-8	2-Chlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-12 (OW)** **York Sample ID:** **13C0564-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 12:40 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
91-57-6	2-Methylnaphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
95-48-7	2-Methylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
88-74-4	2-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
88-75-5	2-Nitrophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
99-09-2	3-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/L	10.5	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
106-47-8	4-Chloroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
100-01-6	4-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
100-02-7	4-Nitrophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
83-32-9	Acenaphthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
208-96-8	Acenaphthylene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
62-53-3	Aniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
120-12-7	Anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
56-55-3	Benzo(a)anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
50-32-8	Benzo(a)pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
85-68-7	Benzyl butyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
117-81-7	**Bis(2-ethylhexyl)phthalate**	**1.05**		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
86-74-8	Carbazole	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
218-01-9	Chrysene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
132-64-9	Dibenzofuran	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
84-66-2	Diethyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
131-11-3	Dimethyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
84-74-2	Di-n-butyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-12 (OW)** **York Sample ID:** **13C0564-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 12:40 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
117-84-0	Di-n-octyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
206-44-0	Fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
86-73-7	Fluorene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
118-74-1	Hexachlorobenzene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
87-68-3	Hexachlorobutadiene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
67-72-1	Hexachloroethane	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
78-59-1	Isophorone	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
91-20-3	Naphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
98-95-3	Nitrobenzene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
82-68-8	Pentachloronitrobenzene	ND		ug/L	0.105	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
87-86-5	Pentachlorophenol	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
85-01-8	Phenanthrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
108-95-2	Phenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
129-00-0	Pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR
110-86-1	Pyridine	ND		ug/L	0.105	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:22	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*105 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*73.5 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*36.0 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*80.4 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*22.8 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*91.6 %*	*30-130*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-12 (OW)** **York Sample ID:** **13C0564-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 12:40 pm	03/20/2013

Polychlorinated Biphenyls (PCB)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW
11104-28-2	Aroclor 1221	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW
11141-16-5	Aroclor 1232	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW
53469-21-9	Aroclor 1242	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW
12672-29-6	Aroclor 1248	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW
11097-69-1	Aroclor 1254	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW
11096-82-5	Aroclor 1260	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW
1336-36-3	Total PCBs	ND		ug/L	0.0526	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 17:53	JW

	Surrogate Recoveries	Result	Acceptance Range
2051-24-3	*Surrogate: Decachlorobiphenyl*	*63.2 %*	*30-150*
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*91.5 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	ETPH (Extractable Total Petroleum Hydrocarbons)	ND		mg/L	0.0789	1	CT DEP ETPH	03/21/2013 07:46	03/22/2013 15:24	SR

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*96.7 %*	*25.9-150*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	**Antimony**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-38-2	**Arsenic**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-39-3	**Barium**	**0.358**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-41-7	Beryllium	ND		mg/L	0.0001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-43-9	Cadmium	ND		mg/L	0.0005	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-47-3	**Chromium**	**0.004**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-50-8	**Copper**	**0.089**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7439-92-1	Lead	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-02-0	**Nickel**	**0.007**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7782-49-2	**Selenium**	**0.003**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-22-4	Silver	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-28-0	Thallium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-62-2	**Vanadium**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW
7440-66-6	**Zinc**	**0.012**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:27	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-12 (OW) **York Sample ID:** 13C0564-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 12:40 pm	03/20/2013

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.0002	1	EPA SW846-7470	03/22/2013 10:00	03/22/2013 10:00	AA

Sample Information

Client Sample ID: ELB-6 (OW) **York Sample ID:** 13C0564-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:15 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
78-93-3	2-Butanone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-6 (OW)** **York Sample ID:** **13C0564-06**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:15 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
591-78-6	**2-Hexanone**	**0.51**		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
67-64-1	Acetone	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
107-13-1	Acrylonitrile	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
71-43-2	Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
108-86-1	Bromobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
74-97-5	Bromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-27-4	Bromodichloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-25-2	Bromoform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
74-83-9	Bromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-15-0	Carbon disulfide	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
56-23-5	Carbon tetrachloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
108-90-7	Chlorobenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-00-3	Chloroethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
67-66-3	Chloroform	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
74-87-3	Chloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
74-95-3	Dibromomethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-09-2	Methylene chloride	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
91-20-3	Naphthalene	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
95-47-6	o-Xylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	1.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-6 (OW) **York Sample ID:** 13C0564-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:15 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
100-42-5	Styrene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
109-99-9	Tetrahydrofuran	ND		ug/L	2.0	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
108-88-3	Toluene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
79-01-6	Trichloroethylene	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.50	1	SW8260B	03/25/2013 15:35	03/26/2013 05:01	SS

	Surrogate Recoveries	Result	Acceptance Range
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*125 %*	*70-130*
460-00-4	*Surrogate: p-Bromofluorobenzene*	*100 %*	*70-130*
2037-26-5	*Surrogate: Toluene-d8*	*95.0 %*	*70-130*

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
120-83-2	2,4-Dichlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
105-67-9	2,4-Dimethylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
51-28-5	2,4-Dinitrophenol	ND		ug/L	10.5	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
91-58-7	2-Chloronaphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
95-57-8	2-Chlorophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
91-57-6	2-Methylnaphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
95-48-7	2-Methylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
88-74-4	2-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
88-75-5	2-Nitrophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-6 (OW)** **York Sample ID:** **13C0564-06**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:15 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
99-09-2	3-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/L	10.5	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
106-47-8	4-Chloroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
100-01-6	4-Nitroaniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
100-02-7	4-Nitrophenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
83-32-9	Acenaphthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
208-96-8	Acenaphthylene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
62-53-3	Aniline	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
120-12-7	Anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
56-55-3	Benzo(a)anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
50-32-8	Benzo(a)pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
85-68-7	Benzyl butyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
117-81-7	**Bis(2-ethylhexyl)phthalate**	**17.1**		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
86-74-8	Carbazole	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
218-01-9	Chrysene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
132-64-9	Dibenzofuran	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
84-66-2	Diethyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
131-11-3	Dimethyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
84-74-2	Di-n-butyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
117-84-0	Di-n-octyl phthalate	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
206-44-0	Fluoranthene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
86-73-7	Fluorene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
118-74-1	Hexachlorobenzene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
87-68-3	Hexachlorobutadiene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-6 (OW)** **York Sample ID:** **13C0564-06**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:15 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
67-72-1	Hexachloroethane	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
78-59-1	Isophorone	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
91-20-3	Naphthalene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
98-95-3	Nitrobenzene	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
82-68-8	Pentachloronitrobenzene	ND		ug/L	0.105	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
87-86-5	Pentachlorophenol	ND		ug/L	0.526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
85-01-8	Phenanthrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
108-95-2	Phenol	ND		ug/L	5.26	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
129-00-0	Pyrene	ND		ug/L	0.0526	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR
110-86-1	Pyridine	ND		ug/L	0.105	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 14:53	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*95.4 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*69.3 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*37.0 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*76.1 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*23.8 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*89.8 %*	*30-130*

Polychlorinated Biphenyls (PCB)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW
11104-28-2	Aroclor 1221	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW
11141-16-5	Aroclor 1232	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW
53469-21-9	Aroclor 1242	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW
12672-29-6	Aroclor 1248	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW
11097-69-1	Aroclor 1254	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW
11096-82-5	Aroclor 1260	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW
1336-36-3	Total PCBs	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:13	JW

	Surrogate Recoveries	Result	Acceptance Range
2051-24-3	*Surrogate: Decachlorobiphenyl*	*50.2 %*	*30-150*
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*46.5 %*	*30-150*

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-6 (OW) **York Sample ID:** 13C0564-06

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 3:15 pm	03/20/2013

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	ETPH (Extractable Total Petroleum Hydrocarbons)	ND		mg/L	0.0811	1	CT DEP ETPH	03/21/2013 07:46	03/22/2013 15:24	SR

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*94.0 %*	*25.9-150*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-38-2	Arsenic	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-39-3	**Barium**	**0.123**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-41-7	Beryllium	ND		mg/L	0.0001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-43-9	Cadmium	ND		mg/L	0.0005	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-47-3	**Chromium**	**0.004**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-50-8	**Copper**	**0.011**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7439-92-1	Lead	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-02-0	**Nickel**	**0.005**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7782-49-2	Selenium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-22-4	Silver	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-28-0	Thallium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-62-2	Vanadium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW
7440-66-6	**Zinc**	**0.006**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:34	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.0002	1	EPA SW846-7470	03/22/2013 10:00	03/22/2013 10:00	AA

Sample Information

Client Sample ID: ELB-5 (OW) **York Sample ID:** 13C0564-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 5:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
630-20-6	1,1,1,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
71-55-6	1,1,1-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-5 (OW)** **York Sample ID:** **13C0564-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 5:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
79-34-5	1,1,2,2-Tetrachloroethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
79-00-5	1,1,2-Trichloroethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-34-3	1,1-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-35-4	1,1-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
563-58-6	1,1-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
87-61-6	1,2,3-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
96-18-4	1,2,3-Trichloropropane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
95-63-6	1,2,4-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
96-12-8	1,2-Dibromo-3-chloropropane	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
106-93-4	1,2-Dibromoethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
95-50-1	1,2-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
107-06-2	1,2-Dichloroethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
78-87-5	1,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
108-67-8	1,3,5-Trimethylbenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
541-73-1	1,3-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
142-28-9	1,3-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
106-46-7	1,4-Dichlorobenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
594-20-7	2,2-Dichloropropane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
78-93-3	2-Butanone	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
95-49-8	2-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
591-78-6	2-Hexanone	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
106-43-4	4-Chlorotoluene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
108-10-1	4-Methyl-2-pentanone	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
67-64-1	Acetone	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
107-13-1	Acrylonitrile	ND		ug/L	1.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
71-43-2	Benzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
108-86-1	Bromobenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
74-97-5	Bromochloromethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-27-4	**Bromodichloromethane**	**0.98**		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-25-2	Bromoform	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
74-83-9	Bromomethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-15-0	Carbon disulfide	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-5 (OW)** **York Sample ID:** **13C0564-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 5:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
56-23-5	Carbon tetrachloride	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
108-90-7	Chlorobenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-00-3	Chloroethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
67-66-3	**Chloroform**	**12**		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
74-87-3	Chloromethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
156-59-2	cis-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
10061-01-5	cis-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
124-48-1	Dibromochloromethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
74-95-3	Dibromomethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-71-8	Dichlorodifluoromethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
100-41-4	Ethyl Benzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
87-68-3	Hexachlorobutadiene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
98-82-8	Isopropylbenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
80-62-6	Methyl Methacrylate	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
1634-04-4	Methyl tert-butyl ether (MTBE)	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-09-2	Methylene chloride	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
91-20-3	Naphthalene	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
104-51-8	n-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
103-65-1	n-Propylbenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
95-47-6	o-Xylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
1330-20-7P/M	p- & m- Xylenes	ND		ug/L	1.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
99-87-6	p-Isopropyltoluene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
135-98-8	sec-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
100-42-5	Styrene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
98-06-6	tert-Butylbenzene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
127-18-4	Tetrachloroethylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
109-99-9	Tetrahydrofuran	ND		ug/L	2.0	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
108-88-3	Toluene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
156-60-5	trans-1,2-Dichloroethylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
10061-02-6	trans-1,3-Dichloropropylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
110-57-6	trans-1,4-dichloro-2-butene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
79-01-6	Trichloroethylene	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-69-4	Trichlorofluoromethane	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS
75-01-4	Vinyl Chloride	ND		ug/L	0.50	1	SW8260B	03/26/2013 08:20	03/26/2013 13:48	SS

Surrogate Recoveries	Result	Acceptance Range

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: ELB-5 (OW) **York Sample ID:** 13C0564-07

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 5:00 pm	03/20/2013

Volatile Organics, CT RCP List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 5030B

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
17060-07-0	*Surrogate: 1,2-Dichloroethane-d4*	*104 %*			*70-130*					
460-00-4	*Surrogate: p-Bromofluorobenzene*	*118 %*			*70-130*					
2037-26-5	*Surrogate: Toluene-d8*	*104 %*			*70-130*					

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
95-94-3	1,2,4,5-tetrachlorobenzene	ND		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
120-82-1	1,2,4-Trichlorobenzene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
95-95-4	2,4,5-Trichlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
88-06-2	2,4,6-Trichlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
120-83-2	2,4-Dichlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
105-67-9	2,4-Dimethylphenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
51-28-5	2,4-Dinitrophenol	ND		ug/L	10.8	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
121-14-2	2,4-Dinitrotoluene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
606-20-2	2,6-Dinitrotoluene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
91-58-7	2-Chloronaphthalene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
95-57-8	2-Chlorophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
91-57-6	2-Methylnaphthalene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
95-48-7	2-Methylphenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
88-74-4	2-Nitroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
88-75-5	2-Nitrophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
65794-96-9	3- & 4-Methylphenols	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
91-94-1	3,3'-Dichlorobenzidine	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
99-09-2	3-Nitroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
534-52-1	4,6-Dinitro-2-methylphenol	ND		ug/L	10.8	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
101-55-3	4-Bromophenyl phenyl ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
59-50-7	4-Chloro-3-methylphenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
106-47-8	4-Chloroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
7005-72-3	4-Chlorophenyl phenyl ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
100-01-6	4-Nitroaniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
100-02-7	4-Nitrophenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
83-32-9	Acenaphthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
208-96-8	Acenaphthylene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
62-53-3	Aniline	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
120-12-7	Anthracene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-5 (OW)** **York Sample ID:** **13C0564-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 5:00 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
56-55-3	Benzo(a)anthracene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
50-32-8	Benzo(a)pyrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
205-99-2	Benzo(b)fluoranthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
191-24-2	Benzo(g,h,i)perylene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
207-08-9	Benzo(k)fluoranthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
85-68-7	Benzyl butyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
111-91-1	Bis(2-chloroethoxy)methane	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
111-44-4	Bis(2-chloroethyl)ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
108-60-1	Bis(2-chloroisopropyl)ether	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
117-81-7	**Bis(2-ethylhexyl)phthalate**	**3.69**		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
86-74-8	Carbazole	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
218-01-9	Chrysene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
53-70-3	Dibenzo(a,h)anthracene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
132-64-9	Dibenzofuran	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
84-66-2	Diethyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
131-11-3	Dimethyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
84-74-2	Di-n-butyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
117-84-0	Di-n-octyl phthalate	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
206-44-0	Fluoranthene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
86-73-7	Fluorene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
118-74-1	Hexachlorobenzene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
87-68-3	Hexachlorobutadiene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
77-47-4	Hexachlorocyclopentadiene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
67-72-1	Hexachloroethane	ND		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
193-39-5	Indeno(1,2,3-cd)pyrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
78-59-1	Isophorone	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
91-20-3	Naphthalene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
98-95-3	Nitrobenzene	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
621-64-7	N-nitroso-di-n-propylamine	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
86-30-6	N-Nitrosodiphenylamine	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
82-68-8	Pentachloronitrobenzene	ND		ug/L	0.108	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
87-86-5	Pentachlorophenol	ND		ug/L	0.541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
85-01-8	Phenanthrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
108-95-2	Phenol	ND		ug/L	5.41	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR
129-00-0	Pyrene	ND		ug/L	0.0541	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-5 (OW)** **York Sample ID:** **13C0564-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 5:00 pm	03/20/2013

Semi-Volatiles, CT RCP BNA List

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3510C

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
110-86-1	Pyridine	ND		ug/L	0.108	1	EPA SW-846 8270C	03/22/2013 07:41	03/22/2013 15:25	SR

	Surrogate Recoveries	Result	Acceptance Range
5175-83-7	*Surrogate: 2,4,6-Tribromophenol*	*98.7 %*	*15-110*
321-60-8	*Surrogate: 2-Fluorobiphenyl*	*70.4 %*	*30-130*
367-12-4	*Surrogate: 2-Fluorophenol*	*36.8 %*	*15-110*
4165-60-0	*Surrogate: Nitrobenzene-d5*	*76.6 %*	*30-130*
4165-62-2	*Surrogate: Phenol-d5*	*22.8 %*	*15-110*
1718-51-0	*Surrogate: Terphenyl-d14*	*94.9 %*	*30-130*

Polychlorinated Biphenyls (PCB)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
12674-11-2	Aroclor 1016	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW
11104-28-2	Aroclor 1221	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW
11141-16-5	Aroclor 1232	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW
53469-21-9	Aroclor 1242	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW
12672-29-6	Aroclor 1248	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW
11097-69-1	Aroclor 1254	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW
11096-82-5	Aroclor 1260	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW
1336-36-3	Total PCBs	ND		ug/L	0.0541	1	EPA SW 846-8082A	03/21/2013 07:53	03/21/2013 18:32	JW

	Surrogate Recoveries	Result	Acceptance Range
2051-24-3	*Surrogate: Decachlorobiphenyl*	*76.1 %*	*30-150*
877-09-8	*Surrogate: Tetrachloro-m-xylene*	*67.5 %*	*30-150*

Extractable Total Petroleum Hydrocarbons (ETPH)

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-3510C Low Level

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
CT ETPH	ETPH (Extractable Total Petroleum Hydrocarbons)	ND		mg/L	0.0811	1	CT DEP ETPH	03/21/2013 07:46	03/22/2013 15:24	SR

	Surrogate Recoveries	Result	Acceptance Range
3386-33-2	*Surrogate: 1-Chlorooctadecane*	*102 %*	*25.9-150*

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-36-0	Antimony	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-38-2	Arsenic	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-39-3	**Barium**	**0.023**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-41-7	Beryllium	ND		mg/L	0.0001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-43-9	Cadmium	ND		mg/L	0.0005	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW

YORK
ANALYTICAL LABORATORIES, INC.

Sample Information

Client Sample ID: **ELB-5 (OW)** **York Sample ID:** **13C0564-07**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
13C0564	140068601	Water	March 19, 2013 5:00 pm	03/20/2013

Metals, CTDEP RCP

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA 3010A

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7440-47-3	**Chromium**	**0.003**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-50-8	**Copper**	**0.005**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7439-92-1	**Lead**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-02-0	**Nickel**	**0.002**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7782-49-2	Selenium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-22-4	Silver	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-28-0	Thallium	ND		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-62-2	**Vanadium**	**0.001**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW
7440-66-6	**Zinc**	**0.025**		mg/L	0.001	1	EPA SW846-6020	03/26/2013 07:17	03/26/2013 11:54	MW

Mercury by 7470/7471

Log-in Notes: **Sample Notes:**

Sample Prepared by Method: EPA SW846-7470

CAS No.	Parameter	Result	Flag	Units	RL	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
7439-97-6	Mercury	ND		mg/L	0.0002	1	EPA SW846-7470	03/22/2013 10:00	03/22/2013 10:00	AA

REASONABLE CONFIDENCE PROTOCOL

LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

RCP Methods Used: See Narrative and Method Reference Section of this Technical Report

1	For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed (including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP RCPs)?	YES
1A	Were the method specified preservation and holding time requirements met?	YES
1B	VPH and EPH Methods only: Was the VPH or EPH method conducted without significant modifications (see Section 11.3 of respective RCP methods)?	NR
2	Were all samples received by the laboratory in a condition consistent with that described on the associated chain-of-custody document(s)?	YES
3	Were samples received at an appropriate temperature (<6°C)?	YES
4	Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?	NO
5A	Were reporting limits specified or referenced on the chain-of-custody?	YES
5B	Were these reporting limits met?	NO
6	For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?	YES
7	Are project-specific matrix spikes and laboratory duplicates included in this data set?	NO

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to questions #1, #1A, or #1B is "No", the data package does not meet the requirements for "Reasonable Confidence".
This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature: Robert Q. Bradley

Position: Laboratory Director

Printed Name: Robert Q. Bradley

Date: 04/01/2013

YORK

YORK
ANALYTICAL LABORATORIES, INC.

Case Narrative

Client: Langan Engineering & Environmental Services (CT)
Client Project ID: 140068601
Prepared for: Kyle Zalaski

Introduction

This Case Narrative applies to the following samples submitted to our laboratory on **3/20/2013 3:20:00 PM** :

DUP	**Water**
ELB-12 (OW)	**Water**
ELB-14 (OW)	**Water**
ELB-5 (OW)	**Water**
ELB-6 (OW)	**Water**
FIELD BLANK	**Water**
TRIP BLANK	**Water**

The 7 sample(s) were received intact in a custody-sealed cooler unless otherwise noted. Upon receipt, the temperature of the cooler was determined. The cooler temperature was acceptable (2-6oC) and measured cooler 1 @ 3.4 C at time of receipt as measured by a NIST traceable digital infrared thermometer. Chain-of-custody was maintained from receipt through analysis in the laboratory.

Methodology

Preparation and analysis were conducted according to the SW-846 methods, as detailed in the sample information table, and the requirements of the State of Connecticut Reasonable Confidence Protocols (RCP).

Volatile Organics (RCP List)

No problems were encountered with analysis of the samples, other than detailed below. Analysis acceptance criteria were achieved and the reporting requirements as detailed in the RCP protocols for volatiles by method 8260 dated July, 2006, Version 3.0, pages 8 through 11 are included herein.

The following compounds do not meet the current action levels defined in the State of Connecticut Remedial Standard Regulations (RSR) groundwater protection criteria (GWPC) due to method limitations: trans-1,4-Dichloro-2-butene, Ethylene Dibromide, and Hexachlorobutadiene. In addition, dilutions required due to levels of target compounds or matrix interference, if noted below, may also affect detection limits.

Initial Calibration

In the initial calibration data for analytical method V3RCPA80, Dichlorodifluoromethane, Methylene Chloride, Acetone, Tetrahydrofuran, 2-Hexanone, trans-1,3-Dichloropropane, 1,1,2,2-Tetrachloroethane, and 1,2,4-Trichlorobenzene exceeded 15% RSD. Samples “Trip Blank”, “Field Blank”, “DUP”, “ELB-14 (OW)”, “ELB-12 (OW)”, and “ELB-6 (OW) were run using this method.

In the initial calibration data for analytical method V6RCP010, Methylene Chloride, Acrylonitrile, Acetone, 2-Butanone, Ethylbenzene, Styrene, 1,2,3-Trichloropropane, Isopropylbenzene, n-Propylbenzene, 2-Chlorotoluene,

4-Chlorotoluene, tert-Butylbenzene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, sec-Butylbenzene, p-Isopropyltoluene, n-Butylbenzene, Napthalene, and 1,2,3-Trichlorobenzene exceeded 15% RSD. Sample "ELB-5 (OW)" was run using this method.

Initial Calibration Verification

In the initial calibration verification for method V3RCPA80, 2-Hexanone and 4-Methyl-2-Pentanone recovered outside the 80-120% window.

In the initial calibration verification for method V6RCP010, Acetone, 4-Methyl-2-Pentanone, 1,2-Dibromo-3-Chloropropane, and 1,2,4-Trimethylbenzene recovered outside the 80-120% window.

Continuing Calibration Verification

In the continuing calibration verification affecting samples "Trip Blank", "Field Blank", "DUP", "ELB-14 (OW)", "ELB-12 (OW)", and "ELB-6 (OW), Bromomethane, Tetrahydrofuran, Carbon Tetrachloride, cis-1,3-Dichloropropene, and Napthalene exceeded 30% difference.

In the continuing calibration verification affecting sample "ELB-5 (OW)", Styrene and 1,2,4-Trimethylbenzene exceeded 30% difference

Method Blank

In the method blank associated with samples "Trip Blank", "Field Blank", "DUP", "ELB-14 (OW)", "ELB-12 (OW)", and "ELB-6 (OW), Acetone was detected at 4.7 ug/L and Methylene Chloride was detected at 2.9 ug/L. Where detected in the samples, the compound is flagged "B" accordingly.

In the method blank associated with sample "ELB-5 (OW)", no target analyte was detected at or above the RL.

Batch QC

An LCS/LCS Dup set was used as batch QC for this project. Please refer to the Quality Control Data attached to this report for bias information.

Dilutions

No sample dilution was required.

Semi-Volatile Organics (RCP List)

No problems were encountered with analysis of the samples other than as described below. Analysis acceptance criteria were achieved and the reporting requirements as detailed in the RCP protocols for volatiles by method 8270 dated July, 2006, Version 3.0. are included herein.

Initial Calibration

In the initial calibration data for SIMS method PAHSM09, all target compounds were within 30% RSD. All

samples were run using this method.

In the initial calibration data for analytical method BNA2M214, Aniline, Hexachlorocyclopentadiene, 2,4-Dichlorophenol, 4-Nitroaniline, 4.6-Dinitro-2-methylphenol, Pentachlorophenol, and Pentachloronitrobenzene exceeded 15% RSD. All samples were analyzed using this method.

Initial Calibration Verification

In the initial calibration verification for method BNA2M214, Aniline, 4-Chloroaniline, and n-Nitrosodiphenylamine recovered outside the 80-120% window.

Continuing Calibration Verification

In the SIMS continuing calibration verification affecting all samples, Dibenz(a,h)anthracene exceeded 30% difference.

In the scan continuing calibration verification affecting all samples, Hexachlorocyclopentadiene, 2,4-Dinitrophenol, and Dibenz(a,h)anthracene exceeded 30% difference.

In the scan continuing calibration verification affecting sample "DUP", Hexachlorocyclopentadiene and 3,3-Dichlorobenzidine exceeded 30% difference.

Method Blank

No target compound was detected at or above the RL in the method blanks.

Batch QC

The site-specific sample "ELB-14 (OW)" was used as MS/MS Dup for this project. Please refer to the Quality Control Data attached to this report for bias information

Dilutions

Sample "DUP" required dilution due to the levels of target compounds encountered. Some analyte reporting limits are elevated in the samples as a result.

PCBs

No problems were encountered during analysis of the samples.

Method Blank

No target analyte was detected at or above the RL.

Batch QC

The site-specific sample, "ELB-14 (OW)" was used as MS/MS Dup for this project. Please refer to the Quality

Control Data attached to this report for bias information.

Dilutions

No sample dilution was required. All analyte reporting limits were met.

ETPH

No problems were encountered with analysis of the sample.

Method Blank

No analyte was detected in the method blank at or above the RL.

Batch QC

The site-specific sample, "ELB-14 (OW)" was used as MS/MS Dup for this project. Please refer to the Quality Control Data attached to this report for bias information.

Dilutions

No sample dilution was required. All analyte reporting limits were met.

Metals – Total (RCP List, excluding Hg)

No problems were encountered during analysis of the sample.

Batch QC

The site-specific sample, "ELB-14 (OW)" was used as MS/Dup for this project. Please refer to the Quality Control Data attached to this report for bias information.

Method Blank

No analyte was detected at or above the RL in the method blank.

Dilutions

No sample dilution was required. All analyte reporting limits were met.

Mercury - Total

No problems were encountered during analysis of the sample.

Batch QC

The site-specific sample, "ELB-14 (OW)" was used as MS/Dup for this project. Please refer to the Quality Control Data attached to this report for bias information.

Method Blank

No analyte was detected at or above the RL in the method blank.

Dilutions

No sample dilution was required. All analyte reporting limits were met.

YORK
ANALYTICAL LABORATORIES, INC.

Analytical Batch Summary

Batch ID: BC31034 **General Method:** Gas Chromatography/Flame Ionization Determination
Prep Method: EPA SW846-3510C Low Level

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13C0564-02	FIELD BLANK	03/21/13	KAM
13C0564-03	DUP	03/21/13	KAM
13C0564-04	ELB-14 (OW)	03/21/13	KAM
13C0564-05	ELB-12 (OW)	03/21/13	KAM
13C0564-06	ELB-6 (OW)	03/21/13	KAM
13C0564-07	ELB-5 (OW)	03/21/13	KAM
BC31034-BLK1	Blank	03/21/13	KAM
BC31034-BS1	LCS	03/21/13	KAM
BC31034-MS1	Matrix Spike	03/21/13	KAM
BC31034-MSD1	Matrix Spike Dup	03/21/13	KAM

Batch ID: BC31036 **General Method:** Polychlorinated Biphenyls (PCB) by EPA SW 846-8082/EPA Comp
Prep Method: EPA SW846-3510C Low Level

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13C0564-02	FIELD BLANK	03/21/13	KAM
13C0564-03	DUP	03/21/13	KAM
13C0564-04	ELB-14 (OW)	03/21/13	KAM
13C0564-05	ELB-12 (OW)	03/21/13	KAM
13C0564-06	ELB-6 (OW)	03/21/13	KAM
13C0564-07	ELB-5 (OW)	03/21/13	KAM
BC31036-BLK1	Blank	03/21/13	KAM
BC31036-BS1	LCS	03/21/13	KAM
BC31036-MS1	Matrix Spike	03/21/13	KAM
BC31036-MSD1	Matrix Spike Dup	03/21/13	KAM

Batch ID: BC31045 **General Method:** Mercury by EPA 7000/200 Series Methods
Prep Method: EPA SW846-7470

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13C0564-02	FIELD BLANK	03/22/13	AA
13C0564-03	DUP	03/22/13	AA
13C0564-04	ELB-14 (OW)	03/22/13	AA
13C0564-05	ELB-12 (OW)	03/22/13	AA
13C0564-06	ELB-6 (OW)	03/22/13	AA
13C0564-07	ELB-5 (OW)	03/22/13	AA
BC31045-BLK1	Blank	03/22/13	AA
BC31045-BS1	LCS	03/22/13	AA
BC31045-DUP1	Duplicate	03/22/13	AA
BC31045-MS1	Matrix Spike	03/22/13	AA

YORK
ANALYTICAL LABORATORIES, INC.

Batch ID: BC31101 **General Method:** Semivolatile Organic Compounds by EPA Method 8270C
Prep Method: EPA 3510C

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13C0564-02	FIELD BLANK	03/22/13	KAM
13C0564-03	DUP	03/22/13	KAM
13C0564-04	ELB-14 (OW)	03/22/13	KAM
13C0564-05	ELB-12 (OW)	03/22/13	KAM
13C0564-06	ELB-6 (OW)	03/22/13	KAM
13C0564-07	ELB-5 (OW)	03/22/13	KAM
BC31101-BLK1	Blank	03/22/13	KAM
BC31101-BS1	LCS	03/22/13	KAM
BC31101-MS1	Matrix Spike	03/22/13	KAM
BC31101-MSD1	Matrix Spike Dup	03/22/13	KAM

Batch ID: BC31222 **General Method:** Volatile Organic Compounds by EPA SW846-8260B
Prep Method: EPA 5030B

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13C0564-01	TRIP BLANK	03/25/13	BK
13C0564-02	FIELD BLANK	03/25/13	BK
13C0564-03	DUP	03/25/13	BK
13C0564-04	ELB-14 (OW)	03/25/13	BK
13C0564-05	ELB-12 (OW)	03/25/13	BK
13C0564-06	ELB-6 (OW)	03/25/13	BK
BC31222-BLK1	Blank	03/25/13	BK
BC31222-BS1	LCS	03/25/13	BK
BC31222-BSD1	LCS Dup	03/25/13	BK

Batch ID: BC31230 **General Method:** Metals by EPA 6000 Series Methods
Prep Method: EPA 3010A

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13C0564-02	FIELD BLANK	03/26/13	MW
13C0564-03	DUP	03/26/13	MW
13C0564-04	ELB-14 (OW)	03/26/13	MW
13C0564-05	ELB-12 (OW)	03/26/13	MW
13C0564-06	ELB-6 (OW)	03/26/13	MW
13C0564-07	ELB-5 (OW)	03/26/13	MW
BC31230-BLK1	Blank	03/26/13	MW
BC31230-DUP1	Duplicate	03/26/13	MW
BC31230-MS1	Matrix Spike	03/26/13	MW
BC31230-SRM1	Reference	03/26/13	MW

YORK
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Batch ID: BC31255 **General Method:** Volatile Organic Compounds by EPA SW846-8260B
Prep Method: EPA 5030B

YORK Sample ID	Client Sample ID	Preparation Date	Prepared By
13C0564-07	ELB-5 (OW)	03/26/13	EKM
BC31255-BLK1	Blank	03/26/13	EKM
BC31255-BS1	LCS	03/26/13	EKM
BC31255-BSD1	LCS Dup	03/26/13	EKM

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31222 - EPA 5030B											
Blank (BC31222-BLK1)								Prepared & Analyzed: 03/25/2013			
1,1,1,2-Tetrachloroethane	ND	0.50	ug/L								
1,1,1-Trichloroethane	ND	0.50	"								
1,1,2,2-Tetrachloroethane	ND	0.50	"								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND	0.50	"								
1,1,2-Trichloroethane	ND	0.50	"								
1,1-Dichloroethane	ND	0.50	"								
1,1-Dichloroethylene	ND	0.50	"								
1,1-Dichloropropylene	ND	0.50	"								
1,2,3-Trichlorobenzene	ND	2.0	"								
1,2,3-Trichloropropane	ND	0.50	"								
1,2,4-Trichlorobenzene	ND	2.0	"								
1,2,4-Trimethylbenzene	ND	0.50	"								
1,2-Dibromo-3-chloropropane	ND	2.0	"								
1,2-Dibromoethane	ND	0.50	"								
1,2-Dichlorobenzene	ND	0.50	"								
1,2-Dichloroethane	ND	0.50	"								
1,2-Dichloropropane	ND	0.50	"								
1,3,5-Trimethylbenzene	ND	0.50	"								
1,3-Dichlorobenzene	ND	0.50	"								
1,3-Dichloropropane	ND	0.50	"								
1,4-Dichlorobenzene	ND	0.50	"								
2,2-Dichloropropane	ND	0.50	"								
2-Butanone	ND	2.0	"								
2-Chlorotoluene	ND	0.50	"								
2-Hexanone	ND	0.50	"								
4-Chlorotoluene	ND	0.50	"								
4-Methyl-2-pentanone	ND	0.50	"								
Acetone	4.7	2.0	"								
Acrylonitrile	ND	1.0	"								
Benzene	ND	0.50	"								
Bromobenzene	ND	0.50	"								
Bromochloromethane	ND	0.50	"								
Bromodichloromethane	ND	0.50	"								
Bromoform	ND	0.50	"								
Bromomethane	ND	0.50	"								
Carbon disulfide	ND	0.50	"								
Carbon tetrachloride	ND	0.50	"								
Chlorobenzene	ND	0.50	"								
Chloroethane	ND	0.50	"								
Chloroform	ND	0.50	"								
Chloromethane	ND	0.50	"								
cis-1,2-Dichloroethylene	ND	0.50	"								
cis-1,3-Dichloropropylene	ND	0.50	"								
Dibromochloromethane	ND	0.50	"								
Dibromomethane	ND	0.50	"								
Dichlorodifluoromethane	ND	0.50	"								
Ethyl Benzene	ND	0.50	"								
Hexachlorobutadiene	ND	0.50	"								
Isopropylbenzene	ND	0.50	"								
Methyl Methacrylate	ND	0.50	"								
Methyl tert-butyl ether (MTBE)	ND	0.50	"								
Methylene chloride	2.9	2.0	"								
Naphthalene	ND	2.0	"								
n-Butylbenzene	ND	0.50	"								

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31222 - EPA 5030B											
Blank (BC31222-BLK1)							Prepared & Analyzed: 03/25/2013				
n-Propylbenzene	ND	0.50	ug/L								
o-Xylene	ND	0.50	"								
p- & m- Xylenes	ND	1.0	"								
p-Isopropyltoluene	ND	0.50	"								
sec-Butylbenzene	ND	0.50	"								
Styrene	ND	0.50	"								
tert-Butylbenzene	ND	0.50	"								
Tetrachloroethylene	ND	0.50	"								
Tetrahydrofuran	ND	2.0	"								
Toluene	ND	0.50	"								
trans-1,2-Dichloroethylene	ND	0.50	"								
trans-1,3-Dichloropropylene	ND	0.50	"								
trans-1,4-dichloro-2-butene	ND	0.50	"								
Trichloroethylene	ND	0.50	"								
Trichlorofluoromethane	ND	0.50	"								
Vinyl Chloride	ND	0.50	"								
Surrogate: 1,2-Dichloroethane-d4	*11.4*		*"*	*10.0*		*114*	*70-130*				
Surrogate: p-Bromofluorobenzene	*9.95*		*"*	*10.0*		*99.5*	*70-130*				
Surrogate: Toluene-d8	*9.88*		*"*	*10.0*		*98.8*	*70-130*				
LCS (BC31222-BS1)							Prepared & Analyzed: 03/25/2013				
1,1,1,2-Tetrachloroethane	9.3		ug/L	10.0		93.1	70-130				
1,1,1-Trichloroethane	10		"	10.0		103	70-130				
1,1,2,2-Tetrachloroethane	8.1		"	10.0		81.3	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	8.8		"	10.0		87.6	70-130				
1,1,2-Trichloroethane	7.8		"	10.0		77.6	70-130				
1,1-Dichloroethane	8.6		"	10.0		86.4	70-130				
1,1-Dichloroethylene	8.0		"	10.0		80.5	70-130				
1,1-Dichloropropylene	8.5		"	10.0		85.1	70-130				
1,2,3-Trichlorobenzene	11		"	10.0		107	70-130				
1,2,3-Trichloropropane	9.6		"	10.0		96.2	70-130				
1,2,4-Trichlorobenzene	10		"	10.0		102	70-130				
1,2,4-Trimethylbenzene	9.4		"	10.0		94.3	70-130				
1,2-Dibromo-3-chloropropane	11		"	10.0		108	70-130				
1,2-Dibromoethane	9.4		"	10.0		93.5	70-130				
1,2-Dichlorobenzene	9.2		"	10.0		92.3	70-130				
1,2-Dichloroethane	10		"	10.0		104	70-130				
1,2-Dichloropropane	8.0		"	10.0		80.1	70-130				
1,3,5-Trimethylbenzene	9.4		"	10.0		94.1	70-130				
1,3-Dichlorobenzene	9.3		"	10.0		93.0	70-130				
1,3-Dichloropropane	8.7		"	10.0		87.1	70-130				
1,4-Dichlorobenzene	9.3		"	10.0		93.2	70-130				
2,2-Dichloropropane	10		"	10.0		101	70-130				
2-Butanone	8.0		"	10.0		80.0	70-130				
2-Chlorotoluene	9.6		"	10.0		96.0	70-130				
2-Hexanone	6.8		"	10.0		67.7	70-130	Low Bias			
4-Chlorotoluene	9.6		"	10.0		95.6	70-130				
4-Methyl-2-pentanone	5.8		"	10.0		57.6	70-130	Low Bias			
Acetone	8.3		"	10.0		83.1	70-130				
Acrylonitrile	7.1		"	10.0		70.8	70-130				
Benzene	8.3		"	10.0		82.6	70-130				
Bromobenzene	9.0		"	10.0		89.7	70-130				
Bromochloromethane	7.9		"	10.0		78.7	70-130				
Bromodichloromethane	8.7		"	10.0		86.8	70-130				

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31222 - EPA 5030B											
LCS (BC31222-BS1)							Prepared & Analyzed: 03/25/2013				
Bromoform	9.7		ug/L	10.0		96.8	70-130				
Bromomethane	5.6		"	10.0		56.3	70-130	Low Bias			
Carbon disulfide	15		"	20.0		75.2	70-130				
Carbon tetrachloride	12		"	10.0		117	70-130				
Chlorobenzene	9.4		"	10.0		93.8	70-130				
Chloroethane	7.0		"	10.0		69.7	70-130	Low Bias			
Chloroform	9.3		"	10.0		92.9	70-130				
Chloromethane	6.5		"	10.0		64.6	70-130	Low Bias			
cis-1,2-Dichloroethylene	8.9		"	10.0		89.3	70-130				
cis-1,3-Dichloropropylene	8.8		"	10.0		87.6	70-130				
Dibromochloromethane	9.7		"	10.0		97.2	70-130				
Dibromomethane	9.0		"	10.0		89.9	70-130				
Dichlorodifluoromethane	5.9		"	10.0		59.3	70-130	Low Bias			
Ethyl Benzene	9.4		"	10.0		94.2	70-130				
Hexachlorobutadiene	10		"	10.0		104	70-130				
Isopropylbenzene	9.4		"	10.0		94.1	70-130				
Methyl Methacrylate	6.5		"	10.0		65.0	70-130	Low Bias			
Methyl tert-butyl ether (MTBE)	9.7		"	10.0		97.3	70-130				
Methylene chloride	9.3		"	10.0		93.2	70-130				
Naphthalene	12		"	10.0		118	70-130				
n-Butylbenzene	9.1		"	10.0		90.6	70-130				
n-Propylbenzene	9.2		"	10.0		92.5	70-130				
o-Xylene	9.0		"	10.0		90.2	70-130				
p- & m- Xylenes	19		"	20.0		94.0	70-130				
p-Isopropyltoluene	9.7		"	10.0		97.3	70-130				
sec-Butylbenzene	9.6		"	10.0		96.1	70-130				
Styrene	9.6		"	10.0		96.1	70-130				
tert-Butylbenzene	9.1		"	10.0		91.1	70-130				
Tetrachloroethylene	9.1		"	10.0		90.6	70-130				
Tetrahydrofuran	4.0		"	10.0		39.8	70-130	Low Bias			
Toluene	8.8		"	10.0		88.1	70-130				
trans-1,2-Dichloroethylene	8.3		"	10.0		83.1	70-130				
trans-1,3-Dichloropropylene	8.8		"	10.0		87.8	70-130				
trans-1,4-dichloro-2-butene	9.0		"	10.0		89.5	70-130				
Trichloroethylene	8.3		"	10.0		83.4	70-130				
Trichlorofluoromethane	11		"	10.0		107	70-130				
Vinyl Chloride	7.0		"	10.0		70.3	70-130				
Surrogate: 1,2-Dichloroethane-d4	*11.6*		*"*	*10.0*		*116*	*70-130*				
Surrogate: p-Bromofluorobenzene	*10.4*		*"*	*10.0*		*104*	*70-130*				
Surrogate: Toluene-d8	*9.79*		*"*	*10.0*		*97.9*	*70-130*				

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31222 - EPA 5030B											
LCS Dup (BC31222-BSD1)								Prepared & Analyzed: 03/25/2013			
1,1,1,2-Tetrachloroethane	8.9		ug/L	10.0		89.0	70-130		4.50	30	
1,1,1-Trichloroethane	10		"	10.0		104	70-130		0.386	30	
1,1,2,2-Tetrachloroethane	8.3		"	10.0		83.1	70-130		2.19	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	8.5		"	10.0		85.1	70-130		2.90	30	
1,1,2-Trichloroethane	7.6		"	10.0		75.7	70-130		2.48	30	
1,1-Dichloroethane	8.4		"	10.0		84.4	70-130		2.34	30	
1,1-Dichloroethylene	8.1		"	10.0		81.2	70-130		0.866	30	
1,1-Dichloropropylene	8.4		"	10.0		84.5	70-130		0.708	30	
1,2,3-Trichlorobenzene	11		"	10.0		109	70-130		1.67	30	
1,2,3-Trichloropropane	9.5		"	10.0		95.2	70-130		1.04	30	
1,2,4-Trichlorobenzene	10		"	10.0		103	70-130		0.682	30	
1,2,4-Trimethylbenzene	9.7		"	10.0		96.8	70-130		2.62	30	
1,2-Dibromo-3-chloropropane	10		"	10.0		105	70-130		3.01	30	
1,2-Dibromoethane	9.2		"	10.0		92.1	70-130		1.51	30	
1,2-Dichlorobenzene	9.5		"	10.0		94.8	70-130		2.67	30	
1,2-Dichloroethane	11		"	10.0		108	70-130		3.31	30	
1,2-Dichloropropane	7.6		"	10.0		76.5	70-130		4.60	30	
1,3,5-Trimethylbenzene	9.4		"	10.0		94.4	70-130		0.318	30	
1,3-Dichlorobenzene	9.6		"	10.0		95.6	70-130		2.76	30	
1,3-Dichloropropane	8.3		"	10.0		82.7	70-130		5.18	30	
1,4-Dichlorobenzene	9.4		"	10.0		93.7	70-130		0.535	30	
2,2-Dichloropropane	9.7		"	10.0		97.0	70-130		4.44	30	
2-Butanone	8.9		"	10.0		89.0	70-130		10.7	30	
2-Chlorotoluene	9.4		"	10.0		93.9	70-130		2.21	30	
2-Hexanone	6.8		"	10.0		68.4	70-130	Low Bias	1.03	30	
4-Chlorotoluene	9.5		"	10.0		95.2	70-130		0.419	30	
4-Methyl-2-pentanone	6.0		"	10.0		59.7	70-130	Low Bias	3.58	30	
Acetone	9.2		"	10.0		91.5	70-130		9.62	30	
Acrylonitrile	7.1		"	10.0		71.4	70-130		0.844	30	
Benzene	8.1		"	10.0		81.2	70-130		1.71	30	
Bromobenzene	9.0		"	10.0		90.4	70-130		0.777	30	
Bromochloromethane	7.9		"	10.0		78.7	70-130		0.00	30	
Bromodichloromethane	8.4		"	10.0		83.5	70-130		3.88	30	
Bromoform	10		"	10.0		100	70-130		3.45	30	
Bromomethane	5.7		"	10.0		56.8	70-130	Low Bias	0.884	30	
Carbon disulfide	15		"	20.0		73.7	70-130		2.01	30	
Carbon tetrachloride	12		"	10.0		116	70-130		0.257	30	
Chlorobenzene	9.0		"	10.0		90.3	70-130		3.80	30	
Chloroethane	6.8		"	10.0		68.2	70-130	Low Bias	2.18	30	
Chloroform	9.4		"	10.0		94.4	70-130		1.60	30	
Chloromethane	6.4		"	10.0		63.8	70-130	Low Bias	1.25	30	
cis-1,2-Dichloroethylene	8.7		"	10.0		87.2	70-130		2.38	30	
cis-1,3-Dichloropropylene	8.4		"	10.0		84.3	70-130		3.84	30	
Dibromochloromethane	9.8		"	10.0		98.1	70-130		0.922	30	
Dibromomethane	8.9		"	10.0		88.8	70-130		1.23	30	
Dichlorodifluoromethane	5.7		"	10.0		57.2	70-130	Low Bias	3.61	30	
Ethyl Benzene	9.0		"	10.0		90.3	70-130		4.23	30	
Hexachlorobutadiene	11		"	10.0		108	70-130		3.50	30	
Isopropylbenzene	9.5		"	10.0		94.7	70-130		0.636	30	
Methyl Methacrylate	6.7		"	10.0		67.3	70-130	Low Bias	3.48	30	
Methyl tert-butyl ether (MTBE)	9.6		"	10.0		96.4	70-130		0.929	30	
Methylene chloride	9.2		"	10.0		91.9	70-130		1.40	30	
Naphthalene	12		"	10.0		124	70-130		5.12	30	
n-Butylbenzene	9.1		"	10.0		90.7	70-130		0.110	30	

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31222 - EPA 5030B											
LCS Dup (BC31222-BSD1)								Prepared & Analyzed: 03/25/2013			
n-Propylbenzene	9.2		ug/L	10.0		92.0	70-130		0.542	30	
o-Xylene	8.7		"	10.0		87.1	70-130		3.50	30	
p- & m- Xylenes	18		"	20.0		90.8	70-130		3.35	30	
p-Isopropyltoluene	9.8		"	10.0		97.8	70-130		0.513	30	
sec-Butylbenzene	9.6		"	10.0		96.4	70-130		0.312	30	
Styrene	9.9		"	10.0		98.6	70-130		2.57	30	
tert-Butylbenzene	9.1		"	10.0		90.8	70-130		0.330	30	
Tetrachloroethylene	8.9		"	10.0		89.3	70-130		1.45	30	
Tetrahydrofuran	4.2		"	10.0		41.7	70-130	Low Bias	4.66	30	
Toluene	8.6		"	10.0		85.5	70-130		3.00	30	
trans-1,2-Dichloroethylene	8.0		"	10.0		79.8	70-130		4.05	30	
trans-1,3-Dichloropropylene	8.5		"	10.0		84.8	70-130		3.48	30	
trans-1,4-dichloro-2-butene	8.8		"	10.0		88.3	70-130		1.35	30	
Trichloroethylene	8.2		"	10.0		82.0	70-130		1.69	30	
Trichlorofluoromethane	11		"	10.0		106	70-130		0.0939	30	
Vinyl Chloride	6.9		"	10.0		68.6	70-130	Low Bias	2.45	30	
Surrogate: 1,2-Dichloroethane-d4	*12.1*		*"*	*10.0*		*121*	*70-130*				
Surrogate: p-Bromofluorobenzene	*10.3*		*"*	*10.0*		*103*	*70-130*				
Surrogate: Toluene-d8	*9.65*		*"*	*10.0*		*96.5*	*70-130*				
Batch BC31255 - EPA 5030B											
Blank (BC31255-BLK1)								Prepared & Analyzed: 03/26/2013			
1,1,1,2-Tetrachloroethane	ND	0.50	ug/L								
1,1,1-Trichloroethane	ND	0.50	"								
1,1,2,2-Tetrachloroethane	ND	0.50	"								
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	ND	0.50	"								
1,1,2-Trichloroethane	ND	0.50	"								
1,1-Dichloroethane	ND	0.50	"								
1,1-Dichloroethylene	ND	0.50	"								
1,1-Dichloropropylene	ND	0.50	"								
1,2,3-Trichlorobenzene	ND	2.0	"								
1,2,3-Trichloropropane	ND	0.50	"								
1,2,4-Trichlorobenzene	ND	2.0	"								
1,2,4-Trimethylbenzene	ND	0.50	"								
1,2-Dibromo-3-chloropropane	ND	2.0	"								
1,2-Dibromoethane	ND	0.50	"								
1,2-Dichlorobenzene	ND	0.50	"								
1,2-Dichloroethane	ND	0.50	"								
1,2-Dichloropropane	ND	0.50	"								
1,3,5-Trimethylbenzene	ND	0.50	"								
1,3-Dichlorobenzene	ND	0.50	"								
1,3-Dichloropropane	ND	0.50	"								
1,4-Dichlorobenzene	ND	0.50	"								
2,2-Dichloropropane	ND	0.50	"								
2-Butanone	ND	2.0	"								
2-Chlorotoluene	ND	0.50	"								
2-Hexanone	ND	0.50	"								
4-Chlorotoluene	ND	0.50	"								
4-Methyl-2-pentanone	ND	0.50	"								
Acetone	ND	2.0	"								
Acrylonitrile	ND	1.0	"								
Benzene	ND	0.50	"								
Bromobenzene	ND	0.50	"								

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31255 - EPA 5030B											
Blank (BC31255-BLK1)								Prepared & Analyzed: 03/26/2013			
Bromochloromethane	ND	0.50	ug/L								
Bromodichloromethane	ND	0.50	"								
Bromoform	ND	0.50	"								
Bromomethane	ND	0.50	"								
Carbon disulfide	ND	0.50	"								
Carbon tetrachloride	ND	0.50	"								
Chlorobenzene	ND	0.50	"								
Chloroethane	ND	0.50	"								
Chloroform	ND	0.50	"								
Chloromethane	ND	0.50	"								
cis-1,2-Dichloroethylene	ND	0.50	"								
cis-1,3-Dichloropropylene	ND	0.50	"								
Dibromochloromethane	ND	0.50	"								
Dibromomethane	ND	0.50	"								
Dichlorodifluoromethane	ND	0.50	"								
Ethyl Benzene	ND	0.50	"								
Hexachlorobutadiene	ND	0.50	"								
Isopropylbenzene	ND	0.50	"								
Methyl Methacrylate	ND	0.50	"								
Methyl tert-butyl ether (MTBE)	ND	0.50	"								
Methylene chloride	ND	2.0	"								
Naphthalene	ND	2.0	"								
n-Butylbenzene	ND	0.50	"								
n-Propylbenzene	ND	0.50	"								
o-Xylene	ND	0.50	"								
p- & m- Xylenes	ND	1.0	"								
p-Isopropyltoluene	ND	0.50	"								
sec-Butylbenzene	ND	0.50	"								
Styrene	ND	0.50	"								
tert-Butylbenzene	ND	0.50	"								
Tetrachloroethylene	ND	0.50	"								
Tetrahydrofuran	ND	2.0	"								
Toluene	ND	0.50	"								
trans-1,2-Dichloroethylene	ND	0.50	"								
trans-1,3-Dichloropropylene	ND	0.50	"								
trans-1,4-dichloro-2-butene	ND	0.50	"								
Trichloroethylene	ND	0.50	"								
Trichlorofluoromethane	ND	0.50	"								
Vinyl Chloride	ND	0.50	"								
Surrogate: 1,2-Dichloroethane-d4	*10.2*		*"*	*10.0*		*102*	*70-130*				
Surrogate: p-Bromofluorobenzene	*12.0*		*"*	*10.0*		*120*	*70-130*				
Surrogate: Toluene-d8	*10.2*		*"*	*10.0*		*102*	*70-130*				

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31255 - EPA 5030B											
LCS (BC31255-BS1)							Prepared & Analyzed: 03/26/2013				
1,1,1,2-Tetrachloroethane	9.5		ug/L	10.0		94.9	70-130				
1,1,1-Trichloroethane	10		"	10.0		101	70-130				
1,1,2,2-Tetrachloroethane	10		"	10.0		105	70-130				
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	9.4		"	10.0		94.4	70-130				
1,1,2-Trichloroethane	9.2		"	10.0		92.5	70-130				
1,1-Dichloroethane	9.8		"	10.0		98.1	70-130				
1,1-Dichloroethylene	9.4		"	10.0		93.9	70-130				
1,1-Dichloropropylene	9.2		"	10.0		91.7	70-130				
1,2,3-Trichlorobenzene	11		"	10.0		106	70-130				
1,2,3-Trichloropropane	9.6		"	10.0		96.0	70-130				
1,2,4-Trichlorobenzene	11		"	10.0		105	70-130				
1,2,4-Trimethylbenzene	15		"	10.0		154	70-130	High Bias			
1,2-Dibromo-3-chloropropane	7.3		"	10.0		73.4	70-130				
1,2-Dibromoethane	10		"	10.0		101	70-130				
1,2-Dichlorobenzene	9.6		"	10.0		96.4	70-130				
1,2-Dichloroethane	9.7		"	10.0		96.9	70-130				
1,2-Dichloropropane	9.1		"	10.0		91.3	70-130				
1,3,5-Trimethylbenzene	12		"	10.0		115	70-130				
1,3-Dichlorobenzene	9.6		"	10.0		96.1	70-130				
1,3-Dichloropropane	9.2		"	10.0		92.3	70-130				
1,4-Dichlorobenzene	9.8		"	10.0		98.5	70-130				
2,2-Dichloropropane	10		"	10.0		104	70-130				
2-Butanone	11		"	10.0		106	70-130				
2-Chlorotoluene	9.6		"	10.0		95.5	70-130				
2-Hexanone	9.9		"	10.0		99.0	70-130				
4-Chlorotoluene	10		"	10.0		99.7	70-130				
4-Methyl-2-pentanone	7.5		"	10.0		75.1	70-130				
Acetone	7.9		"	10.0		79.3	70-130				
Acrylonitrile	9.3		"	10.0		93.2	70-130				
Benzene	10		"	10.0		102	70-130				
Bromobenzene	9.4		"	10.0		93.8	70-130				
Bromochloromethane	9.9		"	10.0		99.4	70-130				
Bromodichloromethane	9.9		"	10.0		99.0	70-130				
Bromoform	11		"	10.0		110	70-130				
Bromomethane	9.7		"	10.0		97.4	70-130				
Carbon disulfide	19		"	20.0		93.8	70-130				
Carbon tetrachloride	10		"	10.0		100	70-130				
Chlorobenzene	9.4		"	10.0		94.4	70-130				
Chloroethane	9.9		"	10.0		99.3	70-130				
Chloroform	10		"	10.0		102	70-130				
Chloromethane	10		"	10.0		102	70-130				
cis-1,2-Dichloroethylene	10		"	10.0		102	70-130				
cis-1,3-Dichloropropylene	10		"	10.0		100	70-130				
Dibromochloromethane	11		"	10.0		106	70-130				
Dibromomethane	9.6		"	10.0		95.9	70-130				
Dichlorodifluoromethane	12		"	10.0		118	70-130				
Ethyl Benzene	10		"	10.0		99.9	70-130				
Hexachlorobutadiene	10		"	10.0		102	70-130				
Isopropylbenzene	10		"	10.0		101	70-130				
Methyl Methacrylate	12		"	10.0		116	70-130				
Methyl tert-butyl ether (MTBE)	9.9		"	10.0		98.9	70-130				
Methylene chloride	7.0		"	10.0		70.0	70-130				
Naphthalene	12		"	10.0		122	70-130				
n-Butylbenzene	10		"	10.0		99.5	70-130				

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31255 - EPA 5030B											
LCS (BC31255-BS1)							Prepared & Analyzed: 03/26/2013				
n-Propylbenzene	10		ug/L	10.0		99.8	70-130				
o-Xylene	9.8		"	10.0		97.7	70-130				
p- & m- Xylenes	22		"	20.0		108	70-130				
p-Isopropyltoluene	11		"	10.0		111	70-130				
sec-Butylbenzene	10		"	10.0		102	70-130				
Styrene	15		"	10.0		154	70-130	High Bias			
tert-Butylbenzene	9.8		"	10.0		98.1	70-130				
Tetrachloroethylene	9.0		"	10.0		89.9	70-130				
Tetrahydrofuran	11		"	10.0		105	70-130				
Toluene	9.5		"	10.0		95.3	70-130				
trans-1,2-Dichloroethylene	9.0		"	10.0		89.8	70-130				
trans-1,3-Dichloropropylene	9.9		"	10.0		98.6	70-130				
trans-1,4-dichloro-2-butene	9.4		"	10.0		94.4	70-130				
Trichloroethylene	9.4		"	10.0		94.1	70-130				
Trichlorofluoromethane	10		"	10.0		102	70-130				
Vinyl Chloride	9.6		"	10.0		96.3	70-130				
Surrogate: 1,2-Dichloroethane-d4	*10.4*		*"*	*10.0*		*104*	*70-130*				
Surrogate: p-Bromofluorobenzene	*10.1*		*"*	*10.0*		*101*	*70-130*				
Surrogate: Toluene-d8	*9.83*		*"*	*10.0*		*98.3*	*70-130*				
LCS Dup (BC31255-BSD1)							Prepared & Analyzed: 03/26/2013				
1,1,1,2-Tetrachloroethane	9.7		ug/L	10.0		97.1	70-130		2.29	30	
1,1,1-Trichloroethane	11		"	10.0		106	70-130		4.94	30	
1,1,2,2-Tetrachloroethane	10		"	10.0		101	70-130		3.20	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	10		"	10.0		100	70-130		5.76	30	
1,1,2-Trichloroethane	9.2		"	10.0		91.6	70-130		0.978	30	
1,1-Dichloroethane	9.9		"	10.0		99.3	70-130		1.22	30	
1,1-Dichloroethylene	9.9		"	10.0		99.3	70-130		5.59	30	
1,1-Dichloropropylene	9.6		"	10.0		96.3	70-130		4.89	30	
1,2,3-Trichlorobenzene	11		"	10.0		108	70-130		2.05	30	
1,2,3-Trichloropropane	9.4		"	10.0		93.5	70-130		2.64	30	
1,2,4-Trichlorobenzene	11		"	10.0		107	70-130		1.13	30	
1,2,4-Trimethylbenzene	16		"	10.0		163	70-130	High Bias	5.74	30	
1,2-Dibromo-3-chloropropane	6.9		"	10.0		69.0	70-130	Low Bias	6.18	30	
1,2-Dibromoethane	9.5		"	10.0		95.2	70-130		5.62	30	
1,2-Dichlorobenzene	10		"	10.0		101	70-130		5.06	30	
1,2-Dichloroethane	9.3		"	10.0		93.1	70-130		4.00	30	
1,2-Dichloropropane	9.1		"	10.0		90.7	70-130		0.659	30	
1,3,5-Trimethylbenzene	12		"	10.0		125	70-130		8.17	30	
1,3-Dichlorobenzene	10		"	10.0		103	70-130		6.83	30	
1,3-Dichloropropane	9.0		"	10.0		90.0	70-130		2.52	30	
1,4-Dichlorobenzene	10		"	10.0		103	70-130		4.76	30	
2,2-Dichloropropane	11		"	10.0		108	70-130		3.49	30	
2-Butanone	8.8		"	10.0		88.4	70-130		17.8	30	
2-Chlorotoluene	10		"	10.0		102	70-130		6.58	30	
2-Hexanone	8.9		"	10.0		89.0	70-130		10.6	30	
4-Chlorotoluene	11		"	10.0		105	70-130		5.46	30	
4-Methyl-2-pentanone	6.8		"	10.0		67.9	70-130	Low Bias	10.1	30	
Acetone	6.9		"	10.0		68.9	70-130	Low Bias	14.0	30	
Acrylonitrile	8.6		"	10.0		85.8	70-130		8.27	30	
Benzene	10		"	10.0		103	70-130		1.17	30	
Bromobenzene	9.7		"	10.0		96.9	70-130		3.25	30	
Bromochloromethane	9.6		"	10.0		96.1	70-130		3.38	30	
Bromodichloromethane	9.8		"	10.0		98.3	70-130		0.710	30	

YORK
ANALYTICAL LABORATORIES, INC.

Volatile Organic Compounds by EPA SW846-8260B - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31255 - EPA 5030B											
LCS Dup (BC31255-BSD1)								Prepared & Analyzed: 03/26/2013			
Bromoform	11		ug/L	10.0		108	70-130		1.38	30	
Bromomethane	9.6		"	10.0		95.8	70-130		1.66	30	
Carbon disulfide	20		"	20.0		98.4	70-130		4.79	30	
Carbon tetrachloride	10		"	10.0		105	70-130		4.19	30	
Chlorobenzene	9.7		"	10.0		97.3	70-130		3.03	30	
Chloroethane	10		"	10.0		103	70-130		3.95	30	
Chloroform	10		"	10.0		103	70-130		0.389	30	
Chloromethane	11		"	10.0		105	70-130		2.89	30	
cis-1,2-Dichloroethylene	10		"	10.0		102	70-130		0.391	30	
cis-1,3-Dichloropropylene	9.8		"	10.0		98.1	70-130		2.12	30	
Dibromochloromethane	10		"	10.0		102	70-130		3.85	30	
Dibromomethane	9.4		"	10.0		93.7	70-130		2.32	30	
Dichlorodifluoromethane	12		"	10.0		121	70-130		2.85	30	
Ethyl Benzene	10		"	10.0		104	70-130		3.64	30	
Hexachlorobutadiene	11		"	10.0		108	70-130		6.28	30	
Isopropylbenzene	11		"	10.0		111	70-130		8.86	30	
Methyl Methacrylate	11		"	10.0		110	70-130		5.67	30	
Methyl tert-butyl ether (MTBE)	9.0		"	10.0		90.0	70-130		9.42	30	
Methylene chloride	7.0		"	10.0		70.3	70-130		0.428	30	
Naphthalene	12		"	10.0		119	70-130		2.42	30	
n-Butylbenzene	11		"	10.0		109	70-130		9.11	30	
n-Propylbenzene	11		"	10.0		110	70-130		9.45	30	
o-Xylene	10		"	10.0		100	70-130		2.53	30	
p- & m- Xylenes	22		"	20.0		112	70-130		3.44	30	
p-Isopropyltoluene	12		"	10.0		120	70-130		8.21	30	
sec-Butylbenzene	11		"	10.0		112	70-130		9.44	30	
Styrene	15		"	10.0		151	70-130	High Bias	2.04	30	
tert-Butylbenzene	11		"	10.0		106	70-130		7.93	30	
Tetrachloroethylene	9.7		"	10.0		96.6	70-130		7.18	30	
Tetrahydrofuran	9.2		"	10.0		92.1	70-130		13.2	30	
Toluene	9.8		"	10.0		98.2	70-130		3.00	30	
trans-1,2-Dichloroethylene	9.2		"	10.0		92.3	70-130		2.75	30	
trans-1,3-Dichloropropylene	9.3		"	10.0		92.8	70-130		6.06	30	
trans-1,4-dichloro-2-butene	9.4		"	10.0		93.6	70-130		0.851	30	
Trichloroethylene	9.9		"	10.0		98.8	70-130		4.87	30	
Trichlorofluoromethane	11		"	10.0		108	70-130		5.99	30	
Vinyl Chloride	10		"	10.0		103	70-130		6.72	30	
Surrogate: 1,2-Dichloroethane-d4	*10.1*		*"*	*10.0*		*101*	*70-130*				
Surrogate: p-Bromofluorobenzene	*10.6*		*"*	*10.0*		*106*	*70-130*				
Surrogate: Toluene-d8	*9.91*		*"*	*10.0*		*99.1*	*70-130*				

YORK
ANALYTICAL LABORATORIES, INC.

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31101 - EPA 3510C											
Blank (BC31101-BLK1)								Prepared & Analyzed: 03/22/2013			
Acenaphthene	ND	0.0500	ug/L								
Acenaphthylene	ND	0.0500	"								
Aniline	ND	5.00	"								
Anthracene	ND	0.0500	"								
Benzo(a)anthracene	ND	0.0500	"								
Benzo(a)pyrene	ND	0.0500	"								
Benzo(b)fluoranthene	ND	0.0500	"								
Benzo(g,h,i)perylene	ND	0.0500	"								
Benzo(k)fluoranthene	ND	0.0500	"								
Benzyl butyl phthalate	ND	5.00	"								
4-Bromophenyl phenyl ether	ND	5.00	"								
Carbazole	ND	5.00	"								
4-Chloro-3-methylphenol	ND	5.00	"								
4-Chloroaniline	ND	5.00	"								
Bis(2-chloroethoxy)methane	ND	5.00	"								
Bis(2-chloroethyl)ether	ND	5.00	"								
Bis(2-chloroisopropyl)ether	ND	5.00	"								
2-Chloronaphthalene	ND	5.00	"								
2-Chlorophenol	ND	5.00	"								
4-Chlorophenyl phenyl ether	ND	5.00	"								
Chrysene	ND	0.0500	"								
Dibenzo(a,h)anthracene	ND	0.0500	"								
Dibenzofuran	ND	5.00	"								
Di-n-butyl phthalate	ND	5.00	"								
3,3'-Dichlorobenzidine	ND	5.00	"								
2,4-Dichlorophenol	ND	5.00	"								
Diethyl phthalate	ND	5.00	"								
2,4-Dimethylphenol	ND	5.00	"								
Dimethyl phthalate	ND	5.00	"								
4,6-Dinitro-2-methylphenol	ND	10.0	"								
2,4-Dinitrophenol	ND	10.0	"								
2,4-Dinitrotoluene	ND	5.00	"								
2,6-Dinitrotoluene	ND	5.00	"								
Di-n-octyl phthalate	ND	5.00	"								
Bis(2-ethylhexyl)phthalate	ND	0.500	"								
Fluoranthene	ND	0.0500	"								
Fluorene	ND	0.0500	"								
Hexachlorobenzene	ND	0.0500	"								
Hexachlorobutadiene	ND	5.00	"								
Hexachlorocyclopentadiene	ND	5.00	"								
Hexachloroethane	ND	0.500	"								
Indeno(1,2,3-cd)pyrene	ND	0.0500	"								
Isophorone	ND	5.00	"								
2-Methylnaphthalene	ND	5.00	"								
2-Methylphenol	ND	5.00	"								
3- & 4-Methylphenols	ND	5.00	"								
Naphthalene	ND	5.00	"								
2-Nitroaniline	ND	5.00	"								
3-Nitroaniline	ND	5.00	"								
4-Nitroaniline	ND	5.00	"								
Nitrobenzene	ND	5.00	"								
2-Nitrophenol	ND	5.00	"								
4-Nitrophenol	ND	5.00	"								
N-nitroso-di-n-propylamine	ND	5.00	"								

YORK
ANALYTICAL LABORATORIES, INC.

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31101 - EPA 3510C											
Blank (BC31101-BLK1)							Prepared & Analyzed: 03/22/2013				
N-Nitrosodiphenylamine	ND	5.00	ug/L								
Pentachloronitrobenzene	ND	0.100	"								
Pentachlorophenol	ND	0.500	"								
Phenanthrene	ND	0.0500	"								
Phenol	ND	5.00	"								
Pyrene	ND	0.0500	"								
Pyridine	ND	0.100	"								
1,2,4,5-tetrachlorobenzene	ND	0.500	"								
1,2,4-Trichlorobenzene	ND	5.00	"								
2,4,6-Trichlorophenol	ND	5.00	"								
2,4,5-Trichlorophenol	ND	5.00	"								
Surrogate: 2,4,6-Tribromophenol	*72.5*		*"*	*75.0*		*96.6*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*35.0*		*"*	*50.0*		*69.9*	*30-130*				
Surrogate: 2-Fluorophenol	*26.6*		*"*	*75.0*		*35.5*	*15-110*				
Surrogate: Nitrobenzene-d5	*39.7*		*"*	*50.2*		*79.1*	*30-130*				
Surrogate: Phenol-d5	*16.5*		*"*	*75.1*		*22.0*	*15-110*				
Surrogate: Terphenyl-d14	*48.5*		*"*	*50.0*		*97.1*	*30-130*				
LCS (BC31101-BS1)							Prepared & Analyzed: 03/22/2013				
Acenaphthene	42.2	0.0500	ug/L	50.0		84.3	40-140				
Acenaphthylene	41.4	0.0500	"	50.0		82.9	40-140				
Aniline	37.8	5.00	"	50.0		75.5	40-140				
Anthracene	44.9	0.0500	"	50.0		89.7	40-140				
Benzo(a)anthracene	45.0	0.0500	"	50.0		89.9	40-140				
Benzo(a)pyrene	55.0	0.0500	"	50.0		110	40-140				
Benzo(b)fluoranthene	47.4	0.0500	"	50.0		94.8	40-140				
Benzo(g,h,i)perylene	54.7	0.0500	"	50.0		109	40-140				
Benzo(k)fluoranthene	47.7	0.0500	"	50.0		95.4	40-140				
Benzyl butyl phthalate	40.1	5.00	"	50.0		80.2	40-140				
4-Bromophenyl phenyl ether	46.9	5.00	"	50.0		93.7	40-140				
Carbazole	47.9	5.00	"	50.0		95.8	40-140				
4-Chloro-3-methylphenol	39.9	5.00	"	50.0		79.8	30-130				
4-Chloroaniline	63.0	5.00	"	50.0		126	40-140				
Bis(2-chloroethoxy)methane	43.1	5.00	"	50.0		86.2	40-140				
Bis(2-chloroethyl)ether	41.7	5.00	"	50.0		83.5	40-140				
Bis(2-chloroisopropyl)ether	41.6	5.00	"	50.0		83.1	40-140				
2-Chloronaphthalene	41.1	5.00	"	50.0		82.1	40-140				
2-Chlorophenol	34.5	5.00	"	50.0		69.0	30-130				
4-Chlorophenyl phenyl ether	42.4	5.00	"	50.0		84.7	40-140				
Chrysene	41.7	0.0500	"	50.0		83.4	40-140				
Dibenzo(a,h)anthracene	61.4	0.0500	"	50.0		123	40-140				
Dibenzofuran	42.6	5.00	"	50.0		85.2	40-140				
Di-n-butyl phthalate	40.8	5.00	"	50.0		81.5	40-140				
3,3'-Dichlorobenzidine	65.2	5.00	"	50.0		130	40-140				
2,4-Dichlorophenol	41.8	5.00	"	50.0		83.7	30-130				
Diethyl phthalate	42.8	5.00	"	50.0		85.6	40-140				
2,4-Dimethylphenol	39.1	5.00	"	50.0		78.2	30-130				
Dimethyl phthalate	43.9	5.00	"	50.0		87.7	40-140				
4,6-Dinitro-2-methylphenol	53.0	10.0	"	50.0		106	30-130				
2,4-Dinitrophenol	66.4	10.0	"	50.0		133	30-130	High Bias			
2,4-Dinitrotoluene	44.0	5.00	"	50.0		88.0	40-140				
2,6-Dinitrotoluene	45.9	5.00	"	50.0		91.9	40-140				
Di-n-octyl phthalate	35.5	5.00	"	50.0		70.9	40-140				
Bis(2-ethylhexyl)phthalate	38.0	0.500	"	50.0		75.9	40-140				

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Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31101 - EPA 3510C											
LCS (BC31101-BS1)							Prepared & Analyzed: 03/22/2013				
Fluoranthene	43.6	0.0500	ug/L	50.0		87.2	40-140				
Fluorene	42.7	0.0500	"	50.0		85.4	40-140				
Hexachlorobenzene	43.7	0.0500	"	50.0		87.4	40-140				
Hexachlorobutadiene	38.6	5.00	"	50.0		77.3	40-140				
Hexachlorocyclopentadiene	26.4	5.00	"	50.0		52.7	40-140				
Hexachloroethane	35.6	0.500	"	50.0		71.3	40-140				
Indeno(1,2,3-cd)pyrene	60.0	0.0500	"	50.0		120	40-140				
Isophorone	43.4	5.00	"	50.0		86.7	40-140				
2-Methylnaphthalene	42.3	5.00	"	50.0		84.7	40-140				
2-Methylphenol	29.8	5.00	"	50.0		59.6	30-130				
3- & 4-Methylphenols	25.4	5.00	"	50.0		50.8	30-130				
Naphthalene	39.6	5.00	"	50.0		79.3	40-140				
2-Nitroaniline	46.1	5.00	"	50.0		92.3	40-140				
3-Nitroaniline	54.5	5.00	"	50.0		109	40-140				
4-Nitroaniline	55.2	5.00	"	50.0		110	40-140				
Nitrobenzene	42.0	5.00	"	50.0		83.9	40-140				
2-Nitrophenol	44.2	5.00	"	50.0		88.3	30-130				
4-Nitrophenol	14.7	5.00	"	50.0		29.4	30-130	Low Bias			
N-nitroso-di-n-propylamine	42.5	5.00	"	50.0		85.1	40-140				
N-Nitrosodiphenylamine	54.8	5.00	"	50.0		110	40-140				
Pentachloronitrobenzene	41.6	0.100	"	50.0		83.1	40-140				
Pentachlorophenol	51.2	0.500	"	50.0		102	30-130				
Phenanthrene	44.0	0.0500	"	50.0		88.1	40-140				
Phenol	10.8	5.00	"	50.0		21.6	30-130	Low Bias			
Pyrene	43.9	0.0500	"	50.0		87.8	40-140				
Pyridine	10.5	0.100	"	50.0		21.1	40-140	Low Bias			
1,2,4,5-tetrachlorobenzene	36.2	0.500	"	50.0		72.3	40-140				
1,2,4-Trichlorobenzene	38.8	5.00	"	50.0		77.7	40-140				
2,4,6-Trichlorophenol	45.3	5.00	"	50.0		90.6	30-130				
2,4,5-Trichlorophenol	43.9	5.00	"	50.0		87.8	30-130				
Surrogate: 2,4,6-Tribromophenol	*86.6*		*"*	*75.0*		*116*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*39.9*		*"*	*50.0*		*79.8*	*30-130*				
Surrogate: 2-Fluorophenol	*28.8*		*"*	*75.0*		*38.3*	*15-110*				
Surrogate: Nitrobenzene-d5	*42.8*		*"*	*50.2*		*85.4*	*30-130*				
Surrogate: Phenol-d5	*20.3*		*"*	*75.1*		*27.1*	*15-110*				
Surrogate: Terphenyl-d14	*45.6*		*"*	*50.0*		*91.2*	*30-130*				

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ANALYTICAL LABORATORIES, INC.

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31101 - EPA 3510C											
Matrix Spike (BC31101-MS1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/22/2013				
Acenaphthene	44.2	0.0541	ug/L	54.1	ND	81.7	40-140				
Acenaphthylene	42.7	0.0541	"	54.1	ND	79.1	40-140				
Aniline	28.8	5.41	"	54.1	ND	53.2	40-140				
Anthracene	44.9	0.0541	"	54.1	ND	83.0	40-140				
Benzo(a)anthracene	46.1	0.0541	"	54.1	ND	85.3	40-140				
Benzo(a)pyrene	54.8	0.0541	"	54.1	ND	101	40-140				
Benzo(b)fluoranthene	48.7	0.0541	"	54.1	ND	90.1	40-140				
Benzo(g,h,i)perylene	44.6	0.0541	"	54.1	ND	82.6	40-140				
Benzo(k)fluoranthene	58.8	0.0541	"	54.1	ND	109	40-140				
Benzyl butyl phthalate	42.9	5.41	"	54.1	ND	79.3	40-140				
4-Bromophenyl phenyl ether	44.6	5.41	"	54.1	ND	82.5	40-140				
Carbazole	50.6	5.41	"	54.1	ND	93.6	40-140				
4-Chloro-3-methylphenol	42.5	5.41	"	54.1	ND	78.7	30-130				
4-Chloroaniline	45.9	5.41	"	54.1	ND	85.0	40-140				
Bis(2-chloroethoxy)methane	46.3	5.41	"	54.1	ND	85.6	40-140				
Bis(2-chloroethyl)ether	46.7	5.41	"	54.1	ND	86.4	40-140				
Bis(2-chloroisopropyl)ether	46.2	5.41	"	54.1	ND	85.4	40-140				
2-Chloronaphthalene	43.3	5.41	"	54.1	ND	80.1	40-140				
2-Chlorophenol	39.5	5.41	"	54.1	ND	73.0	30-130				
4-Chlorophenyl phenyl ether	43.8	5.41	"	54.1	ND	80.9	40-140				
Chrysene	41.5	0.0541	"	54.1	ND	76.7	40-140				
Dibenzo(a,h)anthracene	53.3	0.0541	"	54.1	ND	98.6	40-140				
Dibenzofuran	44.2	5.41	"	54.1	ND	81.8	40-140				
Di-n-butyl phthalate	43.0	5.41	"	54.1	ND	79.6	40-140				
3,3'-Dichlorobenzidine	38.4	5.41	"	54.1	ND	71.1	40-140				
2,4-Dichlorophenol	44.5	5.41	"	54.1	ND	82.3	30-130				
Diethyl phthalate	44.7	5.41	"	54.1	ND	82.8	40-140				
2,4-Dimethylphenol	43.1	5.41	"	54.1	ND	79.8	30-130				
Dimethyl phthalate	45.0	5.41	"	54.1	ND	83.3	40-140				
4,6-Dinitro-2-methylphenol	54.0	10.8	"	54.1	ND	100	30-130				
2,4-Dinitrophenol	70.0	10.8	"	54.1	ND	129	30-130				
2,4-Dinitrotoluene	46.4	5.41	"	54.1	ND	85.9	40-140				
2,6-Dinitrotoluene	47.3	5.41	"	54.1	ND	87.4	40-140				
Di-n-octyl phthalate	44.2	5.41	"	54.1	ND	81.8	40-140				
Bis(2-ethylhexyl)phthalate	43.9	0.541	"	54.1	0.627	80.0	40-140				
Fluoranthene	46.0	0.0541	"	54.1	ND	85.1	40-140				
Fluorene	44.9	0.0541	"	54.1	ND	83.1	40-140				
Hexachlorobenzene	42.3	0.0541	"	54.1	ND	78.3	40-140				
Hexachlorobutadiene	43.4	5.41	"	54.1	ND	80.2	40-140				
Hexachlorocyclopentadiene	27.0	5.41	"	54.1	ND	49.9	40-140				
Hexachloroethane	40.9	0.541	"	54.1	ND	75.7	40-140				
Indeno(1,2,3-cd)pyrene	51.1	0.0541	"	54.1	ND	94.6	40-140				
Isophorone	45.3	5.41	"	54.1	ND	83.9	40-140				
2-Methylnaphthalene	46.6	5.41	"	54.1	ND	86.2	40-140				
2-Methylphenol	33.9	5.41	"	54.1	ND	62.7	30-130				
3- & 4-Methylphenols	28.8	5.41	"	54.1	ND	53.4	30-130				
Naphthalene	44.3	5.41	"	54.1	ND	82.0	40-140				
2-Nitroaniline	47.0	5.41	"	54.1	ND	86.9	40-140				
3-Nitroaniline	48.6	5.41	"	54.1	ND	89.8	40-140				
4-Nitroaniline	55.6	5.41	"	54.1	ND	103	40-140				
Nitrobenzene	46.5	5.41	"	54.1	ND	86.0	40-140				
2-Nitrophenol	47.8	5.41	"	54.1	ND	88.5	30-130				
4-Nitrophenol	3.07	5.41	"	54.1	ND	5.68	30-130	Low Bias			
N-nitroso-di-n-propylamine	46.3	5.41	"	54.1	ND	85.7	40-140				

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Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31101 - EPA 3510C											
Matrix Spike (BC31101-MS1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/22/2013				
N-Nitrosodiphenylamine	54.2	5.41	ug/L	54.1	ND	100	40-140				
Pentachloronitrobenzene	40.6	0.108	"	54.1	ND	75.2	40-140				
Pentachlorophenol	51.6	0.541	"	54.1	ND	95.5	30-130				
Phenanthrene	44.5	0.0541	"	54.1	ND	82.4	40-140				
Phenol	17.0	5.41	"	54.1	ND	31.4	30-130				
Pyrene	47.3	0.0541	"	54.1	ND	87.4	40-140				
Pyridine	9.14	0.108	"	54.1	ND	16.9	40-140	Low Bias			
1,2,4,5-tetrachlorobenzene	38.0	0.541	"	54.1	ND	70.2	40-140				
1,2,4-Trichlorobenzene	43.3	5.41	"	54.1	ND	80.2	40-140				
2,4,6-Trichlorophenol	45.2	5.41	"	54.1	ND	83.6	30-130				
2,4,5-Trichlorophenol	44.2	5.41	"	54.1	ND	81.8	30-130				
Surrogate: 2,4,6-Tribromophenol	*88.7*		*"*	*81.1*		*109*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*43.7*		*"*	*54.1*		*80.8*	*30-130*				
Surrogate: 2-Fluorophenol	*36.2*		*"*	*81.1*		*44.7*	*15-110*				
Surrogate: Nitrobenzene-d5	*50.9*		*"*	*54.3*		*93.9*	*30-130*				
Surrogate: Phenol-d5	*25.5*		*"*	*81.2*		*31.4*	*15-110*				
Surrogate: Terphenyl-d14	*52.6*		*"*	*54.1*		*97.3*	*30-130*				
Matrix Spike Dup (BC31101-MSD1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/22/2013				
Acenaphthene	38.8	0.0541	ug/L	54.1	ND	71.7	40-140		13.0	20	
Acenaphthylene	37.9	0.0541	"	54.1	ND	70.1	40-140		12.0	20	
Aniline	22.1	5.41	"	54.1	ND	40.8	40-140		26.3	20	Non-dir.
Anthracene	41.1	0.0541	"	54.1	ND	76.1	40-140		8.68	20	
Benzo(a)anthracene	42.4	0.0541	"	54.1	ND	78.5	40-140		8.35	20	
Benzo(a)pyrene	50.8	0.0541	"	54.1	ND	94.0	40-140		7.63	20	
Benzo(b)fluoranthene	44.0	0.0541	"	54.1	ND	81.5	40-140		10.0	20	
Benzo(g,h,i)perylene	44.8	0.0541	"	54.1	ND	82.8	40-140		0.314	20	
Benzo(k)fluoranthene	45.1	0.0541	"	54.1	ND	83.4	40-140		26.4	20	Non-dir.
Benzyl butyl phthalate	37.7	5.41	"	54.1	ND	69.8	40-140		12.9	20	
4-Bromophenyl phenyl ether	41.5	5.41	"	54.1	ND	76.9	40-140		7.03	20	
Carbazole	45.4	5.41	"	54.1	ND	84.0	40-140		10.9	20	
4-Chloro-3-methylphenol	36.9	5.41	"	54.1	ND	68.3	30-130		14.2	20	
4-Chloroaniline	36.3	5.41	"	54.1	ND	67.2	40-140		23.3	20	Non-dir.
Bis(2-chloroethoxy)methane	39.6	5.41	"	54.1	ND	73.2	40-140		15.7	20	
Bis(2-chloroethyl)ether	39.0	5.41	"	54.1	ND	72.2	40-140		18.0	20	
Bis(2-chloroisopropyl)ether	39.8	5.41	"	54.1	ND	73.6	40-140		14.8	20	
2-Chloronaphthalene	37.8	5.41	"	54.1	ND	69.9	40-140		13.7	20	
2-Chlorophenol	33.4	5.41	"	54.1	ND	61.7	30-130		16.8	20	
4-Chlorophenyl phenyl ether	38.9	5.41	"	54.1	ND	72.0	40-140		11.7	20	
Chrysene	39.2	0.0541	"	54.1	ND	72.5	40-140		5.57	20	
Dibenzo(a,h)anthracene	52.1	0.0541	"	54.1	ND	96.4	40-140		2.30	20	
Dibenzofuran	38.9	5.41	"	54.1	ND	71.9	40-140		12.8	20	
Di-n-butyl phthalate	38.1	5.41	"	54.1	ND	70.5	40-140		12.1	20	
3,3'-Dichlorobenzidine	38.3	5.41	"	54.1	ND	70.8	40-140		0.366	20	
2,4-Dichlorophenol	38.5	5.41	"	54.1	ND	71.2	30-130		14.5	20	
Diethyl phthalate	38.5	5.41	"	54.1	ND	71.2	40-140		15.0	20	
2,4-Dimethylphenol	36.4	5.41	"	54.1	ND	67.3	30-130		17.0	20	
Dimethyl phthalate	39.5	5.41	"	54.1	ND	73.0	40-140		13.1	20	
4,6-Dinitro-2-methylphenol	49.8	10.8	"	54.1	ND	92.1	30-130		8.20	20	
2,4-Dinitrophenol	62.2	10.8	"	54.1	ND	115	30-130		11.8	20	
2,4-Dinitrotoluene	39.8	5.41	"	54.1	ND	73.7	40-140		15.2	20	
2,6-Dinitrotoluene	41.4	5.41	"	54.1	ND	76.7	40-140		13.1	20	
Di-n-octyl phthalate	38.1	5.41	"	54.1	ND	70.5	40-140		14.9	20	
Bis(2-ethylhexyl)phthalate	34.7	0.541	"	54.1	0.627	63.0	40-140		23.5	20	Non-dir.

YORK
ANALYTICAL LABORATORIES, INC.

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31101 - EPA 3510C											
Matrix Spike Dup (BC31101-MSD1)	*Source sample: 13C0564-04 (ELB-14 (OW))							Prepared & Analyzed: 03/22/2013			
Fluoranthene	40.5	0.0541	ug/L	54.1	ND	74.8	40-140		12.9	20	
Fluorene	39.8	0.0541	"	54.1	ND	73.6	40-140		12.1	20	
Hexachlorobenzene	39.6	0.0541	"	54.1	ND	73.2	40-140		6.63	20	
Hexachlorobutadiene	37.7	5.41	"	54.1	ND	69.7	40-140		14.1	20	
Hexachlorocyclopentadiene	25.3	5.41	"	54.1	ND	46.7	40-140		6.58	20	
Hexachloroethane	36.0	0.541	"	54.1	ND	66.6	40-140		12.8	20	
Indeno(1,2,3-cd)pyrene	50.2	0.0541	"	54.1	ND	92.9	40-140		1.79	20	
Isophorone	39.1	5.41	"	54.1	ND	72.3	40-140		14.8	20	
2-Methylnaphthalene	39.8	5.41	"	54.1	ND	73.7	40-140		15.6	20	
2-Methylphenol	28.4	5.41	"	54.1	ND	52.6	30-130		17.7	20	
3- & 4-Methylphenols	24.5	5.41	"	54.1	ND	45.3	30-130		16.3	20	
Naphthalene	37.9	5.41	"	54.1	ND	70.1	40-140		15.7	20	
2-Nitroaniline	40.8	5.41	"	54.1	ND	75.5	40-140		14.1	20	
3-Nitroaniline	41.5	5.41	"	54.1	ND	76.7	40-140		15.8	20	
4-Nitroaniline	47.0	5.41	"	54.1	ND	86.9	40-140		16.8	20	
Nitrobenzene	39.5	5.41	"	54.1	ND	73.1	40-140		16.2	20	
2-Nitrophenol	40.1	5.41	"	54.1	ND	74.3	30-130		17.5	20	
4-Nitrophenol	2.94	5.41	"	54.1	ND	5.44	30-130	Low Bias	4.32	20	
N-nitroso-di-n-propylamine	39.2	5.41	"	54.1	ND	72.6	40-140		16.5	20	
N-Nitrosodiphenylamine	49.1	5.41	"	54.1	ND	90.8	40-140		10.0	20	
Pentachloronitrobenzene	36.0	0.108	"	54.1	ND	66.7	40-140		12.0	20	
Pentachlorophenol	44.8	0.541	"	54.1	ND	82.9	30-130		14.2	20	
Phenanthrene	40.6	0.0541	"	54.1	ND	75.1	40-140		9.27	20	
Phenol	9.97	5.41	"	54.1	ND	18.4	30-130	Low Bias	52.1	20	Non-dir.
Pyrene	41.0	0.0541	"	54.1	ND	75.8	40-140		14.2	20	
Pyridine	7.22	0.108	"	54.1	ND	13.4	40-140	Low Bias	23.4	20	Non-dir.
1,2,4,5-tetrachlorobenzene	33.2	0.541	"	54.1	ND	61.5	40-140		13.3	20	
1,2,4-Trichlorobenzene	37.5	5.41	"	54.1	ND	69.4	40-140		14.4	20	
2,4,6-Trichlorophenol	39.6	5.41	"	54.1	ND	73.3	30-130		13.1	20	
2,4,5-Trichlorophenol	39.1	5.41	"	54.1	ND	72.4	30-130		12.2	20	
Surrogate: 2,4,6-Tribromophenol	*82.6*		*"*	*81.1*		*102*	*15-110*				
Surrogate: 2-Fluorobiphenyl	*39.0*		*"*	*54.1*		*72.1*	*30-130*				
Surrogate: 2-Fluorophenol	*31.3*		*"*	*81.1*		*38.5*	*15-110*				
Surrogate: Nitrobenzene-d5	*43.4*		*"*	*54.3*		*80.0*	*30-130*				
Surrogate: Phenol-d5	*22.1*		*"*	*81.2*		*27.3*	*15-110*				
Surrogate: Terphenyl-d14	*45.5*		*"*	*54.1*		*84.2*	*30-130*				

YORK
ANALYTICAL LABORATORIES, INC.

Polychlorinated Biphenyls (PCB) by EPA SW 846-8082/EPA Compendium Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31036 - EPA SW846-3510C Low Level											
Blank (BC31036-BLK1)							Prepared & Analyzed: 03/21/2013				
Aroclor 1016	ND	0.0500	ug/L								
Aroclor 1221	ND	0.0500	"								
Aroclor 1232	ND	0.0500	"								
Aroclor 1242	ND	0.0500	"								
Aroclor 1248	ND	0.0500	"								
Aroclor 1254	ND	0.0500	"								
Aroclor 1260	ND	0.0500	"								
Total PCBs	ND	0.0500	"								
Surrogate: Tetrachloro-m-xylene	*0.126*		*"*	*0.200*		*63.0*	*30-150*				
Surrogate: Decachlorobiphenyl	*0.136*		*"*	*0.201*		*67.7*	*30-150*				
LCS (BC31036-BS1)							Prepared & Analyzed: 03/21/2013				
Aroclor 1016	0.768	0.0500	ug/L	1.00		76.8	40-140				
Aroclor 1260	0.663	0.0500	"	1.00		66.3	40-140				
Surrogate: Tetrachloro-m-xylene	*0.128*		*"*	*0.200*		*64.0*	*30-150*				
Surrogate: Decachlorobiphenyl	*0.119*		*"*	*0.201*		*59.2*	*30-150*				
Matrix Spike (BC31036-MS1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/21/2013				
Aroclor 1016	0.462	0.0541	ug/L	1.08	ND	42.8	40-140				
Aroclor 1260	0.484	0.0541	"	1.08	ND	44.8	40-140				
Surrogate: Tetrachloro-m-xylene	*0.101*		*"*	*0.216*		*46.5*	*30-150*				
Surrogate: Decachlorobiphenyl	*0.120*		*"*	*0.217*		*55.2*	*30-150*				
Matrix Spike Dup (BC31036-MSD1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/21/2013				
Aroclor 1016	0.447	0.0541	ug/L	1.08	ND	41.3	40-140		3.47	200	
Aroclor 1260	0.459	0.0541	"	1.08	ND	42.4	40-140		5.37	200	
Surrogate: Tetrachloro-m-xylene	*0.0941*		*"*	*0.216*		*43.5*	*30-150*				
Surrogate: Decachlorobiphenyl	*0.121*		*"*	*0.217*		*55.7*	*30-150*				

YORK
ANALYTICAL LABORATORIES, INC.

Gas Chromatography/Flame Ionization Determination - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31034 - EPA SW846-3510C Low Level											
Blank (BC31034-BLK1)								Prepared: 03/21/2013 Analyzed: 03/22/2013			
ETPH (Extractable Total Petroleum Hydrocarbo	ND	0.0750	mg/L								
Surrogate: 1-Chlorooctadecane	*0.0910*		*"*	*0.100*		*91.0*	*25.9-150*				
LCS (BC31034-BS1)								Prepared: 03/21/2013 Analyzed: 03/22/2013			
ETPH (Extractable Total Petroleum Hydrocarbo	0.721	0.0750	mg/L	0.750		96.1	60-120				
Surrogate: 1-Chlorooctadecane	*0.138*		*"*	*0.100*		*138*	*25.9-150*				
Matrix Spike (BC31034-MS1)	*Source sample: 13C0564-04 (ELB-14 (OW))							Prepared: 03/21/2013 Analyzed: 03/22/2013			
ETPH (Extractable Total Petroleum Hydrocarbo	0.561	0.0811	mg/L	0.811	ND	69.2	50-150				
Surrogate: 1-Chlorooctadecane	*0.107*		*"*	*0.108*		*99.0*	*25.9-150*				
Matrix Spike Dup (BC31034-MSD1)	*Source sample: 13C0564-04 (ELB-14 (OW))							Prepared: 03/21/2013 Analyzed: 03/22/2013			
ETPH (Extractable Total Petroleum Hydrocarbo	0.551	0.0811	mg/L	0.811	ND	68.0	50-150		1.75	30	
Surrogate: 1-Chlorooctadecane	*0.107*		*"*	*0.108*		*98.8*	*25.9-150*				

YORK
ANALYTICAL LABORATORIES, INC.

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31230 - EPA 3010A											
Blank (BC31230-BLK1)							Prepared & Analyzed: 03/26/2013				
Antimony	ND	0.001	mg/L								
Arsenic	ND	0.001	"								
Barium	ND	0.001	"								
Beryllium	ND	0.0001	"								
Cadmium	ND	0.0005	"								
Chromium	ND	0.001	"								
Copper	ND	0.001	"								
Lead	ND	0.001	"								
Nickel	ND	0.001	"								
Selenium	ND	0.001	"								
Silver	ND	0.001	"								
Thallium	ND	0.001	"								
Vanadium	ND	0.001	"								
Zinc	ND	0.001	"								
Duplicate (BC31230-DUP1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/26/2013				
Antimony	0.0001	0.001	mg/L		ND					20	
Arsenic	0.001	0.001	"		0.001				22.5	20	Non-dir.
Barium	0.144	0.001	"		0.143				1.29	20	
Beryllium	0.00005	0.0001	"		0.00006				12.4	20	
Cadmium	0.001	0.0005	"		0.001				2.56	20	
Chromium	0.005	0.001	"		0.005				3.25	20	
Copper	0.019	0.001	"		0.018				0.962	20	
Lead	0.0006	0.001	"		0.0009				32.7	20	Non-dir.
Nickel	0.023	0.001	"		0.024				2.68	20	
Selenium	0.003	0.001	"		0.003				0.986	20	
Silver	0.00009	0.001	"		0.00009				1.53	20	
Thallium	0.0002	0.001	"		0.0002				3.94	20	
Vanadium	0.002	0.001	"		0.002				31.1	20	Non-dir.
Zinc	0.017	0.001	"		0.017				0.868	20	

YORK
ANALYTICAL LABORATORIES, INC.

Metals by EPA 6000 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31230 - EPA 3010A											
Matrix Spike (BC31230-MS1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/26/2013				
Antimony	0.171	0.001	mg/L	0.200	ND	85.6	75-125				
Arsenic	0.109	0.001	"	0.100	0.001	108	75-125				
Barium	0.578	0.001	"	0.500	0.143	87.1	75-125				
Beryllium	0.061	0.0001	"	0.0500	0.00006	121	75-125				
Cadmium	0.044	0.0005	"	0.0500	0.001	86.1	75-125				
Chromium	0.196	0.001	"	0.200	0.005	95.3	75-125				
Copper	0.185	0.001	"	0.200	0.018	83.2	75-125				
Lead	0.077	0.001	"	0.100	0.0009	75.7	75-125				
Nickel	0.215	0.001	"	0.200	0.024	95.5	75-125				
Selenium	0.057	0.001	"	0.0500	0.003	107	75-125				
Silver	0.038	0.001	"	0.0500	0.00009	75.7	75-125				
Thallium	0.038	0.001	"	0.0500	0.0002	75.0	75-125				
Vanadium	0.198	0.001	"	0.200	0.002	97.7	75-125				
Zinc	0.443	0.001	"	0.500	0.017	85.1	75-125				
Reference (BC31230-SRM1)							Prepared & Analyzed: 03/26/2013				
Antimony	0.040	0.001	mg/L	0.0450		89.4	70-130				
Arsenic	0.017	0.001	"	0.0133		126	70-130				
Barium	1.90	0.001	"	1.82		104	85.2-115				
Beryllium	0.008	0.0001	"	0.00764		106	84.9-115				
Cadmium	0.013	0.0005	"	0.0141		94.4	80.1-120				
Chromium	0.074	0.001	"	0.0729		102	85-115				
Copper	0.508	0.001	"	0.521		97.6	90-110				
Lead	0.012	0.001	"	0.0130		95.0	70-130				
Nickel	0.097	0.001	"	0.0981		99.1	85-115				
Selenium	0.090	0.001	"	0.0913		98.5	80-120				
Silver	0.233	0.001	"	0.245		95.0	88.6-111				
Thallium	0.006	0.001	"	0.00611		95.7	70-130				
Vanadium	1.26	0.001	"	1.31		95.9	90.1-110				
Zinc	1.10	0.001	"	1.07		102	90-110				

YORK
ANALYTICAL LABORATORIES, INC.

Mercury by EPA 7000/200 Series Methods - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BC31045 - EPA SW846-7470											
Blank (BC31045-BLK1)							Prepared & Analyzed: 03/22/2013				
Mercury	ND	0.0002	mg/L								
LCS (BC31045-BS1)							Prepared & Analyzed: 03/22/2013				
Mercury	0.002054	0.0002	mg/L	0.00200		103	80-120				
Duplicate (BC31045-DUP1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/22/2013				
Mercury	ND	0.0002	mg/L		ND					20	
Matrix Spike (BC31045-MS1)	*Source sample: 13C0564-04 (ELB-14 (OW))						Prepared & Analyzed: 03/22/2013				
Mercury	0.0018	0.0002	mg/L	0.00200	ND	91.4	75-125				

YORK
ANALYTICAL LABORATORIES, INC.

DATA QUALITY ASSESSMENT WORKSHEET - VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
STANDARD RCP DELIVERABLES	NONE
Data Package Inspection	NONE
Reasonable Confidence Evaluation	NONE
Chain of Custody Evaluation	NONE
Sample Result Evaluation	NONE
Sample Preservation and Holding Time Evaluation	NONE
Method Blank Evaluation	QC Sample BC31222-BLK1 failed criteria for Acetone in Volatile Organics, CT RCP List. MDL = 0.90 ug/L MRL = 2.0 ug/L Result = 4.7 ug/L Criterion = 1 x MDL QC Sample BC31255-BLK1 failed criteria for Acetone in Volatile Organics, CT RCP List. MDL = 0.90 ug/L MRL = 2.0 ug/L Result = 1.5 ug/L Criterion = 1 x MDL QC Sample BC31222-BLK1 failed criteria for Methylene chloride in Volatile Organics, CT RCP List. MDL = 0.26 ug/L MRL = 2.0 ug/L Result = 2.9 ug/L Criterion = 1 x MDL QC Sample BC31222-BLK1 failed criteria for Naphthalene in Volatile Organics, CT RCP List. MDL = 0.090 ug/L MRL = 2.0 ug/L Result = 0.64 ug/L Criterion = 1 x MDL

YORK
ANALYTICAL LABORATORIES, INC.

DATA QUALITY ASSESSMENT WORKSHEET - VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
Laboratory Control Samples Recovery Evaluation	LCS Recovery for 2-Hexanone (67.7%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 4-Methyl-2-pentanone (57.6%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Bromomethane (56.3%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Chloroethane (69.7%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Chloromethane (64.6%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Dichlorodifluoromethane (59.3%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List

YORK
ANALYTICAL LABORATORIES, INC.

DATA QUALITY ASSESSMENT WORKSHEET - VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
	- This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Methyl Methacrylate (65.0%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Tetrahydrofuran (39.8%) was outside acceptance limits (70-130) in BC31222-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 2-Hexanone (68.4%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 4-Methyl-2-pentanone (59.7%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Bromomethane (56.8%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this

YORK
ANALYTICAL LABORATORIES, INC.

DATA QUALITY ASSESSMENT WORKSHEET - VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
	nature. LCS Recovery for Chloroethane (68.2%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Chloromethane (63.8%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Dichlorodifluoromethane (57.2%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Methyl Methacrylate (67.3%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Tetrahydrofuran (41.7%) was outside acceptance limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Vinyl Chloride (68.6%) was outside acceptance

YORK
ANALYTICAL LABORATORIES, INC.

DATA QUALITY ASSESSMENT WORKSHEET - VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
	limits (70-130) in BC31222-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 1,2,4-Trimethylbenzene (154%) was outside acceptance limits (70-130) in BC31255-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Styrene (154%) was outside acceptance limits (70-130) in BC31255-BS1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 1,2,4-Trimethylbenzene (163%) was outside acceptance limits (70-130) in BC31255-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 1,2-Dibromo-3-chloropropane (69.0%) was outside acceptance limits (70-130) in BC31255-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 4-Methyl-2-pentanone (67.9%) was outside acceptance limits (70-130) in BC31255-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference

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DATA QUALITY ASSESSMENT WORKSHEET - VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
	method has certain limitations with respect to analytes of this nature. LCS Recovery for Acetone (68.9%) was outside acceptance limits (70-130) in BC31255-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Styrene (151%) was outside acceptance limits (70-130) in BC31255-BSD1 for Volatile Organics, CT RCP List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
Laboratory Control Samples Precision Evaluation	NONE
Surrogate Recovery Evaluation	NONE
Site Specific Matrix Spike Recovery Evaluation	NOT APPLICABLE
Site Specific Matrix Spike Precision Evaluation	NOT APPLICABLE
Tentatively Identified Compounds	NOT APPLICABLE

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DATA QUALITY ASSESSMENT WORKSHEET - SEMI-VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
STANDARD RCP DELIVERABLES	NONE
Data Package Inspection	NONE
Reasonable Confidence Evaluation	NONE
Chain of Custody Evaluation	NONE
Sample Result Evaluation	NONE
Sample Preservation and Holding Time Evaluation	NONE
Method Blank Evaluation	NONE
Laboratory Control Samples Recovery Evaluation	LCS Recovery for 2,4-Dinitrophenol (133%) was outside acceptance limits (30-130) in BC31101-BS1 for Semi-Volatiles, CT RCP BNA List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for 4-Nitrophenol (29.4%) was outside acceptance limits (30-130) in BC31101-BS1 for Semi-Volatiles, CT RCP BNA List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Phenol (21.6%) was outside acceptance limits (30-130) in BC31101-BS1 for Semi-Volatiles, CT RCP BNA List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature. LCS Recovery for Pyridine (21.1%) was outside acceptance limits (40-140) in BC31101-BS1 for Semi-Volatiles, CT RCP BNA List - This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
Laboratory Control Samples Precision Evaluation	NOT APPLICABLE

DATA QUALITY ASSESSMENT WORKSHEET - SEMI-VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
Surrogate Recovery Evaluation	Surrogate Recovery for 2,4,6-Tribromophenol (116%) was outside acceptance limits (15-110) in BC31101-BS1 for Semi-Volatiles, CT RCP BNA List - The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

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DATA QUALITY ASSESSMENT WORKSHEET - SEMI-VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
Site Specific Matrix Spike Recovery Evaluation	Matrix Spike Recovery for 4-Nitrophenol (5.68%) was outside acceptance limits (30-130) in BC31101-MS1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Recovery for Pyridine (16.9%) was outside acceptance limits (40-140) in BC31101-MS1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Recovery for 4-Nitrophenol (5.44%) was outside acceptance limits (30-130) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Recovery for Phenol (18.4%) was outside acceptance limits (30-130) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Recovery for Pyridine (13.4%) was outside acceptance limits (40-140) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.

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DATA QUALITY ASSESSMENT WORKSHEET - SEMI-VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
Site Specific Matrix Spike Precision Evaluation	Matrix Spike Duplicate RPD for 4-Chloroaniline (23.3%) was above the acceptance limit (20) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Duplicate RPD for Aniline (26.3%) was above the acceptance limit (20) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Duplicate RPD for Benzo(k)fluoranthene (26.4%) was above the acceptance limit (20) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Duplicate RPD for Bis(2-ethylhexyl)phthalate (23.5%) was above the acceptance limit (20) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Duplicate RPD for Phenol (52.1%) was above the acceptance limit (20) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable. Matrix Spike Duplicate RPD for Pyridine (23.4%) was above the acceptance limit (20) in BC31101-MSD1 for Semi-Volatiles, CT RCP BNA List

DATA QUALITY ASSESSMENT WORKSHEET - SEMI-VOLATILES

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
	- The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
Tentatively Identified Compounds	NOT APPLICABLE

DATA QUALITY ASSESSMENT WORKSHEET - PCBs

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
STANDARD RCP DELIVERABLES	NONE
Data Package Inspection	NONE
Reasonable Confidence Evaluation	NONE
Chain 0f Custody Evaluation	NONE
Sample Result Evaluation	NONE
Sample Preservation and Holding Time Evaluation	NONE
Method Blank Evaluation	NONE
Laboratory Control Samples Recovery Evaluation	NONE
Laboratory Control Samples Precision Evaluation	NOT APPLICABLE
Surrogate Recovery Evaluation	NONE
Site Specific Matrix Spike Recovery Evaluation	NONE
Site Specific Matrix Spike Precision Evaluation	NONE
Tentatively Identified Compounds	NOT APPLICABLE

DATA QUALITY ASSESSMENT WORKSHEET - ETPH

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
STANDARD RCP DELIVERABLES	NONE
Data Package Inspection	NONE
Reasonable Confidence Evaluation	NONE
Chain of Custody Evaluation	NONE
Sample Result Evaluation	NONE
Sample Preservation and Holding Time Evaluation	NONE
Method Blank Evaluation	NONE
Laboratory Control Samples Recovery Evaluation	NONE
Laboratory Control Samples Precision Evaluation	NOT APPLICABLE
Surrogate Recovery Evaluation	NONE
Site Specific Matrix Spike Recovery Evaluation	NONE
Site Specific Matrix Spike Precision Evaluation	NONE
Tentatively Identified Compounds	NOT APPLICABLE

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DATA QUALITY ASSESSMENT WORKSHEET - METALS

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
STANDARD RCP DELIVERABLES	NONE
Data Package Inspection	NONE
Reasonable Confidence Evaluation	NONE
Chain of Custody Evaluation	NONE
Sample Result Evaluation	NONE
Sample Preservation and Holding Time Evaluation	NONE
Method Blank Evaluation	NONE
Laboratory Control Samples Recovery Evaluation	NONE
Laboratory Control Samples Precision Evaluation	NOT APPLICABLE
Standard Reference Material Recovery Evaluation	NONE
Site Specific Matrix Spike Recovery Evaluation	NONE
Site Specific Matrix Spike Precision Evaluation	NOT APPLICABLE
Duplicate Precision Evaluation	Duplicate RPD for Arsenic (22.5%) was above the acceptance limit (20) in BC31230-DUP1 for Metals, CTDEP RCP Duplicate RPD for Lead (32.7%) was above the acceptance limit (20) in BC31230-DUP1 for Metals, CTDEP RCP Duplicate RPD for Vanadium (31.1%) was above the acceptance limit (20) in BC31230-DUP1 for Metals, CTDEP RCP

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DATA QUALITY ASSESSMENT WORKSHEET - MERCURY

Laboratory Name:	York Analytical Laboratories, Inc.	*Client:*	Langan Engineering & Environmental Serv
Project Location:	140068601	*Lab Project No.:*	**13C0564**
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	*Sampling Date(s):*	03/19/2013 - 03/19/2013

Describe the intended use of the data:
The intended use of this data is determined by the project conceptual site model.

Data Quality Assessment Elements	Data Quality Assessment Nonconformances
STANDARD RCP DELIVERABLES	NONE
Data Package Inspection	NONE
Reasonable Confidence Evaluation	NONE
Chain of Custody Evaluation	NONE
Sample Result Evaluation	NONE
Sample Preservation and Holding Time Evaluation	NONE
Method Blank Evaluation	NONE
Laboratory Control Samples Recovery Evaluation	NONE
Laboratory Control Samples Precision Evaluation	NOT APPLICABLE
Standard Reference Material Recovery Evaluation	NONE
Site Specific Matrix Spike Recovery Evaluation	NONE
Site Specific Matrix Spike Precision Evaluation	NOT APPLICABLE
Duplicate Precision Evaluation	Duplicate RPD for Arsenic (22.5%) was above the acceptance limit (20) in BC31230-DUP1 for Metals, CTDEP RCP Duplicate RPD for Lead (32.7%) was above the acceptance limit (20) in BC31230-DUP1 for Metals, CTDEP RCP Duplicate RPD for Vanadium (31.1%) was above the acceptance limit (20) in BC31230-DUP1 for Metals, CTDEP RCP

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DATA QUALITY ASSESSMENT SUMMARY

Laboratory:	York Analytical Laboratories, Inc.	Client:	Langan Engineering & Environmental Services (
Project:	140068601	Lab Project No:	13C0564
Laboratory Sample ID(s):	13C0564-01 - 13C0564-07	Sampling Date(s):	03/19/2013 - 03/19/2013
Review Date(s):	04/01/2013 - 04/01/2013	Laboratory Reviewer(s):	JD

QC Sample Nonconformances

Batch ID: BC31222

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31222-BS1	2-Hexanone	6.8 ug/L	LCS	67.7	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BS1	4-Methyl-2-pentanone	5.8 ug/L	LCS	57.6	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BS1	Bromomethane	5.6 ug/L	LCS	56.3	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BS1	Chloroethane	7.0 ug/L	LCS	69.7	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BS1	Chloromethane	6.5 ug/L	LCS	64.6	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

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Batch ID: BC31222

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31222-BS1	Dichlorodifluoromethane	5.9 ug/L	LCS	59.3	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BS1	Methyl Methacrylate	6.5 ug/L	LCS	65.0	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BS1	Tetrahydrofuran	4.0 ug/L	LCS	39.8	70-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	2-Hexanone	6.8 ug/L	LCS Dup	68.4	70-130	Low Bias	1.03	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	4-Methyl-2-pentanone	6.0 ug/L	LCS Dup	59.7	70-130	Low Bias	3.58	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	Bromomethane	5.7 ug/L	LCS Dup	56.8	70-130	Low Bias	0.884	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

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Batch ID: BC31222

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31222-BSD1	Chloroethane	6.8 ug/L	LCS Dup	68.2	70-130	Low Bias	2.18	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	Chloromethane	6.4 ug/L	LCS Dup	63.8	70-130	Low Bias	1.25	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	Dichlorodifluoromethane	5.7 ug/L	LCS Dup	57.2	70-130	Low Bias	3.61	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	Methyl Methacrylate	6.7 ug/L	LCS Dup	67.3	70-130	Low Bias	3.48	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	Tetrahydrofuran	4.2 ug/L	LCS Dup	41.7	70-130	Low Bias	4.66	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31222-BSD1	Vinyl Chloride	6.9 ug/L	LCS Dup	68.6	70-130	Low Bias	2.45	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

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Batch ID: BC31255

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31255-BS1	1,2,4-Trimethylbenzene	15 ug/L	LCS	154	70-130	High Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31255-BS1	Styrene	15 ug/L	LCS	154	70-130	High Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31255-BSD1	1,2,4-Trimethylbenzene	16 ug/L	LCS Dup	163	70-130	High Bias	5.74	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31255-BSD1	1,2-Dibromo-3-chloropropane	6.9 ug/L	LCS Dup	69.0	70-130	Low Bias	6.18	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31255-BSD1	4-Methyl-2-pentanone	6.8 ug/L	LCS Dup	67.9	70-130	Low Bias	10.1	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31255-BSD1	Acetone	6.9 ug/L	LCS Dup	68.9	70-130	Low Bias	14.0	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

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Batch ID: BC31255

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31255-BSD1	Styrene	15 ug/L	LCS Dup	151	70-130	High Bias	2.04	30		This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.

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Batch ID: BC31101

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31101-BS1	2,4-Dinitrophenol	66.4 ug/L	LCS	133	30-130	High Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31101-BS1	4-Nitrophenol	14.7 ug/L	LCS	29.4	30-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31101-BS1	Phenol	10.8 ug/L	LCS	21.6	30-130	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
BC31101-BS1	Pyridine	10.5 ug/L	LCS	21.1	40-140	Low Bias				This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
	Surrogate: 2,4,6-Tribromophenol	86.6 ug/L	Surrogate	116	15-110	High Bias				The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
BC31101-MS1	4-Nitrophenol	3.07 ug/L	Matrix Spike (ELB-14 (OW))	5.68	30-130	Low Bias				The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.

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Batch ID: BC31101

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31101-MS1	Pyridine	9.14 ug/L	Matrix Spike (ELB-14 (OW))	16.9	40-140	Low Bias				The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
BC31101-MSD1	Aniline	22.1 ug/L	Matrix Spike Dup (ELB-14 (OW))	40.8	40-140		26.3	20	Non-dir.	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
BC31101-MSD1	Benzo(k)fluoranthene	45.1 ug/L	Matrix Spike Dup (ELB-14 (OW))	83.4	40-140		26.4	20	Non-dir.	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
BC31101-MSD1	4-Chloroaniline	36.3 ug/L	Matrix Spike Dup (ELB-14 (OW))	67.2	40-140		23.3	20	Non-dir.	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
BC31101-MSD1	Bis(2-ethylhexyl)phthalate	34.7 ug/L	Matrix Spike Dup (ELB-14 (OW))	63.0	40-140		23.5	20	Non-dir.	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
BC31101-MSD1	4-Nitrophenol	2.94 ug/L	Matrix Spike Dup (ELB-14 (OW))	5.44	30-130	Low Bias	4.32	20		The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.

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Batch ID: BC31101

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31101-MSD1	Phenol	9.97 ug/L	Matrix Spike Dup (ELB-14 (OW))	18.4	30-130	Low Bias	52.1	20	Non-dir.	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
BC31101-MSD1	Pyridine	7.22 ug/L	Matrix Spike Dup (ELB-14 (OW))	13.4	40-140	Low Bias	23.4	20	Non-dir.	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.

Batch ID: BC31230

QC Sample ID	Analyte	Result	Type of QC Nonconformance	%REC	%REC Limits	Bias	RPD	RPD Limit	Bias	Comments
BC31230-DUP1	Arsenic	0.001 mg/L	Duplicate (ELB-14 (OW))				22.5	20	Non-dir.	
BC31230-DUP1	Lead	0.0006 mg/L	Duplicate (ELB-14 (OW))				32.7	20	Non-dir.	
BC31230-DUP1	Vanadium	0.002 mg/L	Duplicate (ELB-14 (OW))				31.1	20	Non-dir.	
BC31230-MS1	Thallium	0.038 mg/L	Matrix Spike (ELB-14 (OW))	75.0	75-125	Low Bias				

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Batch Summary

Batch ID: BC31101 **General Method:** Semivolatile Organic Compounds by EPA Method 8270C

YORK Sample ID	Client Sample ID
13C0564-02	FIELD BLANK
13C0564-03	DUP
13C0564-04	ELB-14 (OW)
13C0564-05	ELB-12 (OW)
13C0564-06	ELB-6 (OW)
13C0564-07	ELB-5 (OW)
BC31101-BLK1	Blank
BC31101-BS1	LCS
BC31101-MS1	Matrix Spike
BC31101-MSD1	Matrix Spike Dup

Batch ID: BC31222 **General Method:** Volatile Organic Compounds by EPA SW846-8260B

YORK Sample ID	Client Sample ID
13C0564-01	TRIP BLANK
13C0564-02	FIELD BLANK
13C0564-03	DUP
13C0564-04	ELB-14 (OW)
13C0564-05	ELB-12 (OW)
13C0564-06	ELB-6 (OW)
BC31222-BLK1	Blank
BC31222-BS1	LCS
BC31222-BSD1	LCS Dup

Batch ID: BC31230 **General Method:** Metals by EPA 6000 Series Methods

YORK Sample ID	Client Sample ID
13C0564-02	FIELD BLANK
13C0564-03	DUP
13C0564-04	ELB-14 (OW)
13C0564-05	ELB-12 (OW)
13C0564-06	ELB-6 (OW)
13C0564-07	ELB-5 (OW)
BC31230-BLK1	Blank
BC31230-DUP1	Duplicate
BC31230-MS1	Matrix Spike
BC31230-SRM1	Reference

Batch ID: BC31255 **General Method:** Volatile Organic Compounds by EPA SW846-8260B

YORK Sample ID	Client Sample ID
13C0564-07	ELB-5 (OW)
BC31255-BLK1	Blank
BC31255-BS1	LCS
BC31255-BSD1	LCS Dup

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No Sample Nonconformances Found

Notes: Other RCP nonconformances, if any, are detailed in the Data Quality Assessment worksheets.

For multiple surrogate analyses such as semi-volatiles, volatiles, etc, single surrogate excursions do not necessarily indicate a bias in the sample. Samples with multiple surrogate excursions may exhibit a bias in the results.

Definitions:
LCS - Laboratory Control Sample
LCS dup - Laboratory Control Sample Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
BS - Blank Spike also called LCS
BSD - Blank Spike Duplicate also called LCS dup
SRM - Standard Reference Material
DUP - Duplicate

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Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
QL-02	This LCS analyte is outside Laboratory Recovery limits due the analyte behavior using the referenced method. The reference method has certain limitations with respect to analytes of this nature.
B	Analyte is found in the associated analysis batch blank. For volatiles, methylene chloride and acetone are common lab contaminants. Data users should consider anything <10x the blank value as artifact.

ND	Analyte NOT DETECTED at the stated Reporting Limit (RL) or above.
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
MDL	METHOD DETECTION LIMIT - the minimum concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. If requested or required, a value reported below the RL and above the MDL is considered estimated and is noted with a "J" flag.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two.
For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

YORK
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(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

NOTE: York's Std. Terms & Conditions are listed on the back side of this document. This document serves as your written authorization to York to proceed with the analyses requested and your signature binds you to York's Std. Terms & Conditions unless superseded by written contract.

York Project No. 13C0564

YOUR Information	Report To:	Invoice To:	YOUR Project ID	Turn-Around Time	Report Type
Company: Langan Eng.	Company: same	Company: same	14006860 1	RUSH - Same Day ☐	Summary Report
Address: 555 Long Wharf Drive, New Haven, CT 06511	Address:	Address:	Purchase Order No. 14006860 1	RUSH - Next Day ☐	Summary w/ QA Summary
Phone No. 203. 562. 5771	Phone No.	Phone No.		RUSH - Two Day ☐	CT RCP Package
Contact Person: K. Zalaski	Attention:	Attention:		RUSH - Three Day ☐	CTRCP DQA/DUE Pkg X pdf
E-Mail Address: kzalaski@langan.com	E-Mail Address:	E-Mail Address:	Samples from: CT X NY ___ NJ ___	RUSH - Four Day ☐	NY ASP A Package
				Standard(5-7 Days) X	NY ASP B Package
					NJDEP Red. Deliv.
					Electronic Data Deliverables (EDD)
					Simple Excel
					NYSDEC EQuIS
					EQuIS (std)
					EZ-EDD (EQuIS)
					NJDEP SRP HazSite EDD
					GIS/KEY (std)
					Other
					York Regulatory Comparison
					Excel Spreadsheet pdf
					Compare to the following Regs (please fill in):

Print Clearly and Legibly. All Information must be complete. Samples will NOT be logged in and the turn-around time clock will not begin until any questions by York are resolved.

Kyle Zalaski
Samples Collected/Authorized By (Signature)

Kyle Zalaski
Name (printed)

Matrix Codes
S - soil
Other - specify (soil, etc.)
WW - wastewater
GW - groundwater
DW - drinking water
Air-A - ambient air
Air-SV - soil vapor

Volatiles		Semi-Vols.	Pest/PCB/Herb	Metals	Misc. Org.	Full Lists	Misc.
8260 full	TICs	8270 or 625	8082PCB	RCRA8	TPH GRO	Pri.Poll.	Corrosivity
624	Site Spec.	STARS list	8081Pest	PP13 list	TPH DRO	TCL Organics	Reactivity
STARS list	Nassau Co.	BN Only	8151Herb	TAL	CT ETPH	TAL Met/CN	Ignitability
BTEX	Suffolk Co.	Acids Only	CT RCP	CT15 list	NY 310-13	Full TCLP	Flash Point
MTBE	Ketones	PAH list	App. IX	TAGM list	TPH 1664	Full App. IX	Sieve Anal.
TCL list	Oxygenates	TAGM list	Site Spec.	NJDEP list	Air TO14A	Part 360 Routine	Heterotrophs
TAGM list	TCLP list	CT RCP list	SPLP or TCLP	Total	Air TO15	Part 360 Baseline	TOX
CT RCP list	524.2	TCL list	TCLP Pest	Dissolved	Air STARS	Part 360 Expanded for Chosen Parameters	BTU/lb
Arom. only	502.2	NJDEP list	TCLP Herb	SPLP or TCLP	Air VPH	Part 360 Expanded Full List	Aquatic Tox.
Halog.only	NJDEP list	App. IX	Chlordane	Indic. Metals	Air TICs	NYCDEP Sewer	TOC
App.IX list	SPLP or TCLP	TCLP BNA	608 Pest	LIST Below	Methane	NYSDEC Sewer	Asbestos
8021B list		SPLP or TCLP	608 PCB		Helium	TAGM	Silica

Sample Identification	Date Sampled	Sample Matrix	Choose Analyses Needed from the Menu Above and Enter Below	Container Description(s)
TRIP BLANK	3/19/13 00:00	AQ	VOCs (8260)	2 VOAs
FIELD BLANK	14:00	AQ	VOCs (8260), SVOCs (8270), PCBs (8082), CT ETPH, CT LISTED METALS	3 VOAs, 3 1L Ambers, 1 500mL plastic
DUP	00:00	GW	↓	↓
ELB-14 (OW)	10:40	↓	↓	↓
ELB-12 (OW)	12:40	↓	↓	↓
ELB-6 (OW)	15:15	↓	↓	↓
ELB-5 (OW)	17:00	↓	↓	↓

Comments
RLS must meet CT DEEP RSRS

Preservation
Check those Applicable
4°C ___ Frozen ___ HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___
ZnAc Ascorbic Acid Other

Special Instructions
Field Filtered ☐
Lab to Filter ☐

Samples Relinquished By	Date/Time	Samples Received By	Date/Time
Kyle Zalaski	3/19/13 14:20	Chris C	3-20-13 14:20
Samples Relinquished By	Date/Time	Samples Received in LAB by	Date/Time
		J. Hu	3/20/13-1520

Temperature on Receipt 3.4 °C