Final
Construction Closure and Certification Report
Davis Howland Oil Company Site
City of Rochester
Monroe County, New York

VOLUME I

Site Number: 8-28-088

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List of Abbreviations and Acronyms

AGC	annual guideline concentrations
AMP	air monitoring program
AS	air sparging
ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
CAP	contractor application for payment
CATOX	catalytic oxidizer
cfs	cubic feet per second
CO	change order
DHOC	Davis Howland Oil Company
DPW	Division of Pure Waters
EDR	Environmental Data Resources
EEEPC	Ecology and Environment Engineering, P.C.
EEO	Equal Employment Opportunity
ENSR	ENSR of Rochester, New York
Frac	fraculation
FFS	Focused Feasibility Study
gpm	gallons per minute
HASP	health and safety plan

List of Abbreviations and Acronyms (cont.)

HDPE	high density polyethylene
µg/L	micrograms per Liter
$\mu g/m^3$	micrograms per cubic meter
M/WBE	Minority/Women-Owned Business Enterprise
MCDPW	Monroe County Department of Public Works
MSLF	Mill Seat Landfill
NEEP	Northeast Environmental Products
NIOSH	National Institute for Occupational Safety
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSOSC	New York State Office of the State Comptroller
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
OU-1	operable unit-1
PCB	polychlorinated biphenyl
PCO	potential change order
PID	photoionization detector
PLI	Pollution Liability Insurance
PPE	personal protective equipment
ppm	parts per million
PRC	prevailing rate compensation
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RCRA	Resource Conservation and Recovery Act
REA	Request for Equitable Adjustment

List of Abbreviations and Acronyms (cont.)

RFI	request for information
RI	Remedial Investigation
ROD	Record of Decision
SAP	sampling and analysis plan
SGC	Short-term Guideline Concentrations
SOP	Standard Operating Procedure
SOW	Scope of Work
SVE	Soil Vapor Extraction
SVOC	semi-volatile organic compound
TAGM	Technical and Administrative Guidance Document
TSDF	treatment, storage, and disposal facility
UFPO	Underground Facilities Protection organization
EPA	(United States) Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1 Site Background

1.1 Site Location and Description

The former Davis-Howland Oil Company Site (hereafter referred to as "the site"), New York State Department of Environmental Conservation (NYSDEC) Site No. 8-28-088, is located at 190-220 Anderson Avenue and a portion of 176 Anderson Avenue in the city of Rochester in Monroe County, New York. The approximately 1-acre parcel is located in a mixed-use area of residential, municipal, and industrial properties and is bordered by railroad tracks to the north and east, Anderson Avenue to the south, and operational commercial and retail buildings to the west (see Figure 1-1). The site consists of four buildings of various sizes and an open area adjacent to the railroad tracks (see Figure 1-2).

1.2 Site History

In an effort to review the historical use of the site, Sanborn maps were purchased from Environmental Data Resources, Inc. (EDR) (see Appendix A). Sanborn maps, which are used to assist fire insurance agents in determining the degree of hazard associated with a particular property, chronicle the history of property as early as 1867. These oversized maps depict a building's size and shape and provide details regarding construction, including fire walls, windows and doors, sprinkler systems, and roof types. For purposes of the construction project, historical maps for 200 Anderson Avenue and surrounding properties were obtained and reviewed for the years 1892, 1912, 1938, 1950, and 1971.

In 1892, a portion of the site was a working lumber processing and planning mill. Residential buildings were located on Fairmount Avenue, Norwood Street, and the east end of Anderson Avenue. East of Anderson Avenue, near the intersection of Atlantic Avenue, the New York and Hudson Railroads had a car repair facility along with an iron and wood shop. Two hotels were located on Atlantic Avenue at the intersections of Anderson Avenue and Norwood Avenue.

In 1912, a portion of the site was operated by Hartmann and Burns as a preserved fruit and packaging company. A lumber storage building also located on the eastern portion of the site. Residential dwellings were still located along Fairmount Avenue, Norwood Street, and Anderson Avenue. East of Anderson Avenue, near

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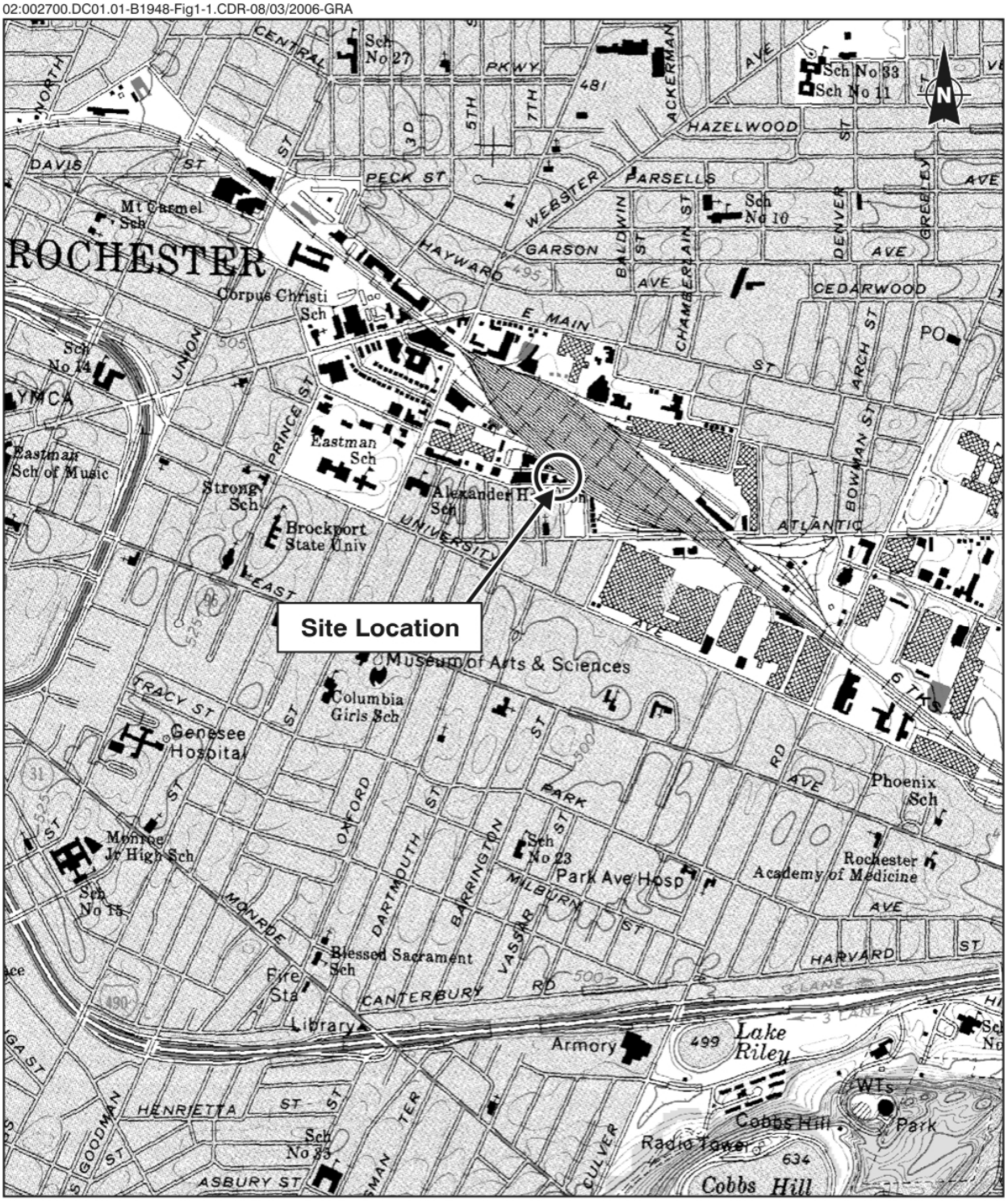
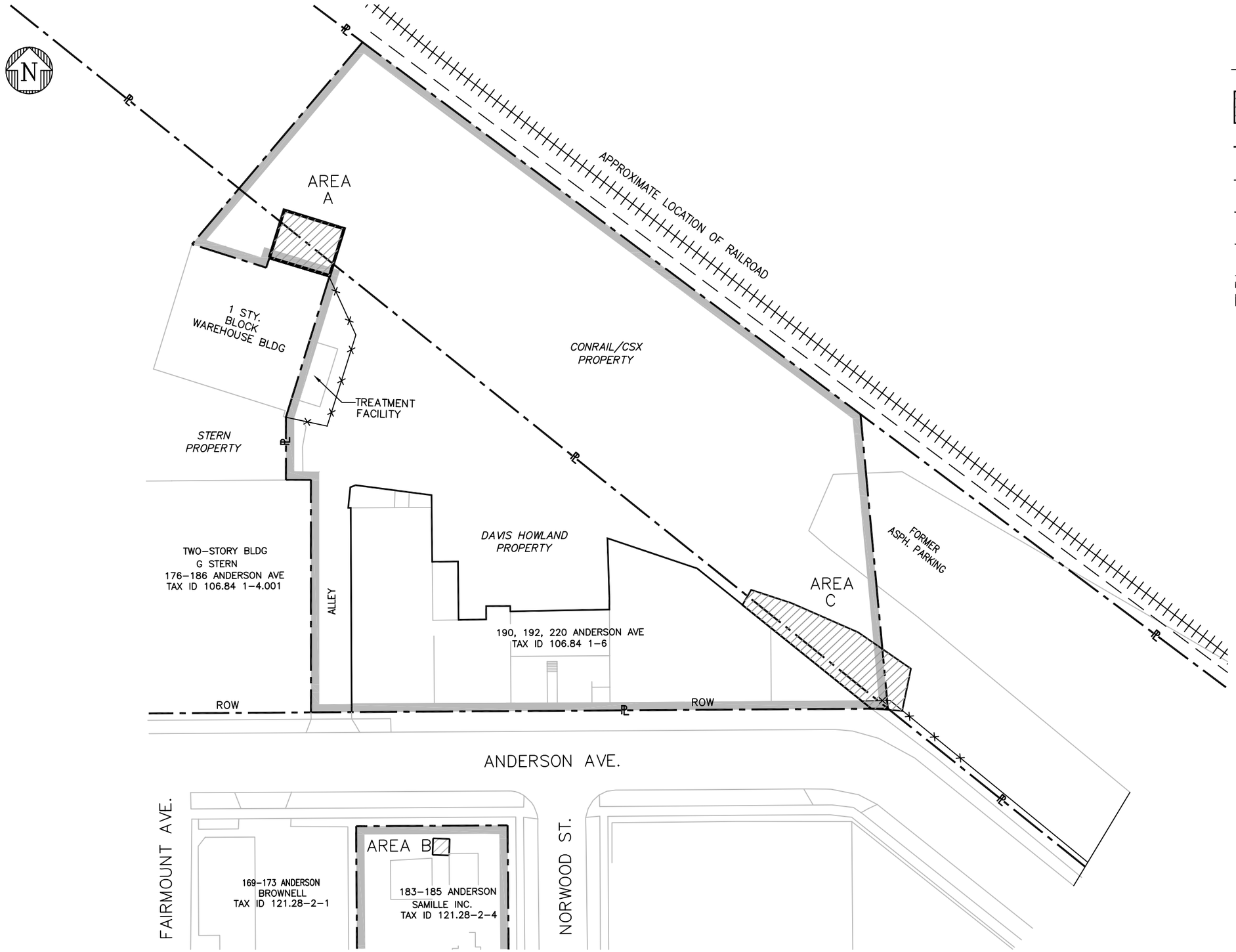


MAP SOURCE: USGS Topographic 7.5 Minute Series,
Rochester East Quadrangle, Monroe County, New York

Figure 1-1 Site Location Map, Davis Howland Oil Company Site



LEGEND

- EXCAVATION AREAS
- PROPERTY LINE OR RIGHT-OF-WAY (ROW)
- FENCING
- GUARD RAIL
- RAILROAD TRACKS
- AS/SVE TREATMENT ZONE

0 60 120

SCALE IN FEET

FIGURE 1-2

SITE LAYOUT AND
OFF-SITE EXCAVATION AREAS,
DAVIS HOWLAND OIL COMPANY SITE

Atlantic Avenue, the New York Central and Hudson Railroad had a large railroad car repair facility and rail yard. In 1938, the Davis-Howland site operated as an open storage facility with coal processing and bins in the eastern portion of the facility. Residential dwellings continued to exist along Fairmount Avenue, Norwood Street, and Anderson Avenue.

The site was used for production of industrial chemicals, oils, greases, and other lubricants from 1942 to 1972. Davis-Howland Oil Company (DHOC) operated the site from 1972 to sometime in 1994, when operations began to decrease significantly. DHOC ceased operations sometime in 1994. Several reports of spills and releases of materials, including waste oil, mineral oil, hydrochloric acid, and sulfuric acid, on the site were reported to NYSDEC during DHOC's operational period. NYSDEC inspected the site in June 1991 and found several hundred drums of oils, solvents, and other materials, some of which were leaking, as well as several areas of stained soil.

A soil investigation was subsequently performed in 1991 by NYSDEC, which included soil sampling, waste inventory and characterization, and overpacking and containerizing leaking drums. Analytical results indicated that the soil was contaminated with petroleum and solvents. Subsequent soil and groundwater sampling performed in June 1992 by Clean Harbors, Inc., revealed significant contamination of site groundwater with chlorinated and non-chlorinated solvents. Clean Harbors, Inc., then removed all drums and the uppermost surface to a depth of 1 foot. The site was listed on the New York State Registry of Inactive Hazardous Waste Sites (Site No. 8-28-088), indicating that it poses a significant threat to human health and the environment. The first phase of a two-phase Remedial Investigation (RI) was completed in October 1996 by Lawler, Matusky & Skeller Engineers and Galson/Lozier Engineers. A Focused Feasibility Study (FFS) of Operable Unit 1 (OU-1), which encompasses the shallow groundwater, surface soil, and subsurface soil on the site, was completed in October 1997 by the same firms. The remedial alternative recommended in the FFS was the use of soil vapor extraction (SVE)/air sparging (AS) for overburden soils and groundwater, and excavation and off-site disposal of selected surface soils. The second phase of the RI was completed in October 1997 by Lawler, Matusky & Skeller Engineers and Galson/Lozier Engineers. An additional Pre-Remedial Design Investigation was performed in September and October 1998 by Lawler, Matusky & Skeller Engineers and Galson/Lozier Engineers. A Record of Decision (ROD) was signed in March 1997 for the selected remedial alternative for OU-1. An additional ROD was signed in March 1998 for OU-2, which consists of the bedrock groundwater at the site.

Contract Documents for remedial construction at the site and a Limited Site Data document were prepared by ENSR of Rochester, New York (ENSR) and were issued for bidding in September 2000.

1.3 Design Consultant and Construction Management Consultant

1.3.1 Design Consultant

The original designer of the remedial project was ENSR. As a result of the expiration of ENSR's New York State Standby Contract, ENSR could not oversee the construction contract. ENSR was, however, still able to prepare and finalize the September 2000 Contract Documents, Limited Site Data Documents, and Contract Drawings as requested by NYSDEC for bidding purposes (see Appendices B, C, and D).

1.3.2 Construction Management Consultant

NYSDEC issued a work assignment to Ecology and Environment Engineering, P.C. (EEEPC) of Lancaster, New York (see Appendix E) to perform bidding support, construction monitoring, inspection oversight, and management services for the project. Work Assignment Number 23.0 was issued under EEEPC's State Standby Superfund Contract Number D003493.

The work assignment requested by NYSDEC involved three tasks:

- Task 1 – Work plan and budget development and background review,
- Task 2 – Pre-award services, and
- Task 3 – Remedial Construction Management.

1.3.2.1 Work Plan, Budget, and Background Review

On September 26, 2000, an initial budget was authorized for the formal development of the work plan and budget and background review for the work assignment. The final work plan and budget were issued in December 2000 and approved by NYSDEC in January 2001. A copy of EEEPC's approved work plan and budget for this work assignment are included in Appendix F.

During the initial phase of the work assignment's start-up, EEEPC reviewed the previous remedial investigation reports in accordance with the work assignment's scope of work and assessed the condition of the Contract Documents for public bidding.

The initial review included the RI and pre-remedial design reports prepared by ENSR. An initial site inspection was performed by NYSDEC's project manager and EEEPC staff on October 23, 2000, to develop an understanding of the physical scope of the work and potential constraints on the remedial remedy. The information gathered during the site inspection provided a basis for review and comment for the Contract Drawings and other documents for the project.

During review of the Contract Documents following the site inspection, a number of items were found to be inconsistent and in conflict with the THEN? current site conditions. Because of these discrepancies, the Contract Documents could not be publicly bid in December 2000. Further review of the Contract Documents and drawings by EEEPC indicated that a number of clarifications were required to bring the documents into biddable condition and allow more administrative control by EEEPC's construction management team. The clarifications requested by EEEPC would reduce the amount of potential field clarifications that would affect the project costs and contractor claims and allow EEEPC's construction management team to control the construction based on their experience in the installation of these systems.

1.3.3 Public Bidding Phase Support (Pre-award Services)

EEEPC provided contract bid support services during the public bidding phase of the project. EEEPC staff initially met with ENSR's design engineer and project manager in their offices on February 8, 2001. The purpose of the meeting was to answer a number of EEEPC's questions that arose during review of the Contract Documents and Drawings. The meeting also included the NYSDEC project manager (via conference phone), who responded to any administrative issues resulting from the design engineer's responses. The meeting provided additional clarifications and information regarding the development of the remedial design, which were subsequently included in the Contract addenda (Addenda Number 2 and Number 3) issued by EEEPC and NYSDEC during the bidding phase.

Three addenda were prepared and issued during the public bidding phase of the project. Addenda Number 1 was prepared, sealed, and issued by NYSDEC on December 21, 2000 (see Appendix G). The addendum established a pre-bid walkthrough and public bid opening date. In addition, the document provided updated bid forms, updated standard clauses for all New York State contracts, access agreement information on the CSX Transportation property, revised tables of project analytical requirements, Monroe County sewer connection requirements and construction details, and updated information to support the Limited Site Data Document.

Addendum Number 2 was prepared, sealed, and issued by NYSDEC on January 25, 2001, to delay the public bid opening until February 28, 2001. This was done in order to allow sufficient time to answer questions received from the pre-bid walkthrough held on January 17, 2001, and prepare additional construction details and supplemental specification to finalize conflicts and inconsistencies with the contract specifications and drawings. In addition, the document included Minority/Women-owned Business Enterprise (M/WBE)–Equal Employment Opportunity (EEO) requirements, pre-bid meeting minutes, pre-bid questions and answers, and pre-bid meeting attendance list (see Appendix H).

Addendum Number 3 was prepared, sealed, and issued by EEEPC on February 21, 2001, which updated and corrected the bid forms, supplementary specifica-

tions, and on-site drum inventory; clarified existing drawing details; provided new drawing details and cross-sections to address questions from bidders; and responded to additional prepared questions by potential contractors bidding on the project. The clarifications to the drawing details and new drawings were prepared after discussing the project with the design engineer (ENSR) and obtaining the design criteria and agreement for the changes (see Appendix I).

1.4 Purpose of this Report

EEEPC was retained by NYSDEC under Work Assignment No. D003493-23 to provide remedial construction management and oversight services for the construction project (Contract No. D004181).

This report provides a summary of the construction project along with specific documentation of the Separable Parts of the Remedial Construction Activities (as described in Section 2) that were performed at the DHOC site, as described in Tasks 3 and 4 of EEEPC's work plan and revisions (approved in December 2000). The report also documents contractor-developed information or "record documentation" associated with the remedial cleanup and operations performed under Contract No. D004181. Closure documentation and certification that remedial work was performed in accordance with the Contract Documents and the conditions of the Contract also provided.

Tasks specified in the work plan submitted by EEEPC (December 2000) include:

- Assisting NYSDEC with issuing addenda,
- Reviewing contractor submittals,
- Attending meetings,
- Supporting the pre-bid inspection,
- Reviewing contractors' five- and 14-day submissions,
- Attending pre-award and pre-construction meetings,
- Conducting daily project inspections,
- Reviewing contractor payment requests,
- Responding to requests for further project information (RFIs),
- Reviewing planned versus completed project schedules,
- Holding progress meetings and preparing meeting minutes,

- Providing photographic documentation support,
- Reviewing and responding to potential change orders (PCOs),
- Maintaining all construction records,
- Preparing daily reports,
- Responding to Requests of Equitable Adjustment by the contractor and supporting NYSDEC in the defense and denial of the request,
- Preparing and inspecting all incomplete work lists for each substantial completion phase of work, and
- Processing project change orders and contractor applications for payment (CAPs).

2 Summary of Pre-Remedial Activities

2.1 General

2.1.1 Scope of Work

The construction project, as stipulated in Section VI of the Contract Documents, was broken down into the following separable parts of work required to be performed by the Contractor:

Part A. Remedial Construction. Mobilization, site preparation, selective demolition, utility installation, contaminated soil excavation/disposal, backfilling, trenching/backfilling, groundwater monitoring well abandonment, pumping well installation, blasted trench installation, groundwater extraction/recovery well installation, treatment equipment procurement and shop fabrication, cleanup, preparation of operation and maintenance (O&M) plans, and demobilization of temporary services and facilities.

Part B. Start-up Operations. Treatment equipment installation, treatment system start-up, treatment system discharge sampling and analysis, and preparation of the final draft of the O&M plan.

Part C. Substantial Completion/Continuous Operations. Contractor operation of the remedial treatment systems, monitoring and maintenance of the treatment systems, and submission of the final O&M plan.

Final Completion. Submittal of all post-construction documentation by the Contractor and closeout of the contract.

The remedial construction phase (Separable Part A) included construction or installation of:

- Forty-six positive-pressure AS points and discharge lines and valve control manholes;
- Installation of eight interior SVE points and 1,300 linear feet of horizontal SVE collection lines;

- Installation of three groundwater extraction wells with discharge lines and six groundwater observation piezometers;
- Installation of 2,700 linear feet of subsurface SVE collector line and control manholes and valves;
- Decommission of eight monitoring wells;
- Installation of two blasted bedrock trench recovery wells;
- Excavation and off-site disposal of an underground storage tank (UST);
- Excavation and off-site disposal of contaminated soils in Areas A, B, and C;
- Installation of asphalt cover over the north and west end of the site;
- Fabrication and installation of a trailer-mounted remediation system utilizing an AS, SVE system, low-profile air stripper, and catalytic oxidizer; and
- Tie-in of a new treated discharge line to the existing County of Monroe combined sanitary sewer.

The start-up operations phase (Separable Part B) consisted of treatment systems start-up and operations:

- Start-up and shakedown of the remediation system for 60 days.

The continuous operations phase (Separable Part C) consisted of treatment systems operations:

- Operation, monitoring, and maintenance of the remediation system for 155 calendar days following successful completion of the start-up period.

For purposes of contract time, Separable Part A, Remedial Construction, was allocated 120 calendar days for completion, Separable Part B, Start-up Operations, was allocated 60 calendar days, and Separable Part C, Substantial Completion/Continuous Operations, was allocated 155 calendar days. Project substantial completion would take place 335 calendar days from the Notice to Proceed. Project Final Completion was to take place 30 calendar days after overall project Substantial Completion, for a total contract time of 365 calendar days.

2.1.2 General Project Schedule

NYSDEC advertised the notice for bidders for remedial construction at the site in December 2000, and the Contract Documents were available for purchase. Three separate addenda to the Contract Documents were issued on December 15, 2000, January 25, 2001, and February 21, 2001. A mandatory pre-bid meeting was held

at the site on January 17, 2001. Minutes from that meeting, along with questions received during the meeting, were included in Addendum 2 to the Contract Documents. Addendum 3 provided additional responses to written bidder questions along with corrected drawing details and supplementary specifications. Formal bids were received by NYSDEC at 1:00 P.M. on February 28, 2001. Copies of the bids received at the public bid opening are provided as Appendix J. The Tyree Organization, Ltd. (Tyree) of Latham, New York, was the apparent low bidder, with a total bid of $1,269,301.13 for the remedial construction services. NYSDEC mailed a letter of apparent low bidder to Tyree on March 1, 2001, and a Notice of Intent to Award was mailed to Tyree on March 16, 2001. A post-bid meeting with Tyree took place in Albany, New York, on April 11, 2001, to discuss questions regarding the project and to identify and establish a schedule of preliminary project submittals. Tyree was given an official Notice of Award on May 14, 2001. The official Notice to Proceed date for the project was established as May 23, 2001 (see Appendix K). A preconstruction meeting was held at the NYSDEC offices in Albany, New York, on May 23, 2001. A copy of the preconstruction meeting agenda and meeting minutes are provided as Appendix L.

Tyree officially mobilized to the site on June 4, 2001, and began site preparation, which included installation of construction fencing and the project office. Because of overall delays on critical path items by Tyree during 2001, grading and paving activities had to be postponed by Tyree until spring 2002. Tyree demobilized from the site December 19, 2001, and remobilized in April 11, 2002. Grading and paving activities were completed in June 2002. Treatment system connections and start-up activities to substantially complete Separable Part A were performed on June 24, 2002. The O&M phase of contract work began at the start of the five-day start-up and 24-hour 25-day trials. Continuous operation of the treatment system (Separable Part B) was officially on September 21, 2002. The actual operation, maintenance, and monitoring phase (Separable Part C) began on September 21, 2002, and was completed on February 23, 2003. A punch list of incomplete work items for all parts of the project were accumulated into one list for final project closure. All outstanding incomplete work items were finalized by Tyree on August 8, 2003, and the project proceeded to final closeout (Final Completion).

2.2 Site Preparation

2.2.1 Project Work Plan

Work plans were developed and prepared by Tyree and submitted to EEEPC as part of the five-day submittal review package required by Section III, Article 5, of the Contract Documents. Specific details and requirements that needed to be addressed for each plan were located in Section XI, Supplementary Specifications. The site-specific work plan consisted of a description of the procedures, methods, and materials to be employed during the remedial construction, a list of required permits, drawings of work areas, and procedures for construction water management, erosion and sediment control, site security, well decommissioning plans, paving plan, sheeting and shoring plans, treatment trailer installation, groundwater

pumping well installation, and a project schedule. The plan(s) further discussed the construction of the SVE lines, AS points, remedial treatment system, installation and start-up, installation of blasted bedrock wells, piezometers and groundwater wells, remedial waste management, former monitoring well decommissioning, O&M and site restoration, and paving. EEEPC and NYSDEC reviewed the initial project work plan and returned the document to Tyree with comments for revision and resubmittal. Tyree incorporated these comments into the revised project work plan and resubmitted the document as part of their 14-day submittal package. The final version of the project-specific work plan was approved as in compliance with the requirements of the Contract Documents by EEEPC on June 11, 2001.

2.2.2 Sampling and Analysis Plan (SAP)

A Sampling and Analysis Plan (SAP) was prepared and developed by Tyree and submitted with the five-day submittal package to EEEPC for review and approval. The SAP described procedures to be employed by Tyree for environmental sampling, sample preparation, sample transportation, and quality assurance/quality control (QA/QC) procedures to be implemented for any sampling performed during the remedial construction and O&M phases of the work. The specific sampling plan included sampling and analytical methods for: soils prior to construction, incidental matrix waste parameters found during construction, and real-time air monitoring. The plan also included project-specific aspects of data quality objectives; field sampling operations; sample custody and holding time requirements; sample integrity; laboratory data collection, reduction, validation, and reporting; calibration procedures and frequencies; and corrective actions for field and/or laboratory errors. EEEPC and NYSDEC reviewed the initial SAP and returned the document to Tyree with comments for revision and re-submittal. Tyree incorporated these comments into the revised project work plan and resubmitted the document as part of their 14-day submittal package. The final version of the project-specific work plan was approved as in compliance with the requirements of the Contract Documents by EEEPC on July 2, 2001.

2.2.3 Quality Assurance Project Plan (QAPP)

A Quality Assurance Project Plan (QAPP) was prepared and developed by Tyree and submitted to EEEPC with the five-day submittal package for review and approval. The QAPP specifically describes all sampling and testing procedures to be employed during the course of the remedial construction and each task to ensure conformance with the Contract Documents and standards of practice, including sampling and testing of asphalt, pipe bedding and select fill sources, performance testing of piping systems, and verification sampling of environmental media to ensure adequate treatment/removal. EEEPC and NYSDEC reviewed the initial QAPP and returned the document to Tyree with comments for revision and resubmittal. Tyree incorporated these comments into the revised project work plan and resubmitted the document as part of their 14-day submittal package. The final version of the project-specific work plan was approved as in compliance with the requirements of the Contract Documents by EEEPC on July 2, 2001.

2.2.4 Excavation and Disposal of Contaminated Materials Work Plan

An Excavation and Disposal of Contaminated Materials Work Plan was prepared and developed by Tyree and submitted to EEEPC for approval. The plan specified methods and materials to be used during trenching, excavation, and drilling activities. Tyree included their Standard Operating Procedures (SOPs) for Heavy Equipment Operations, Excavation and Trenching, and Spill Control. Tyree's Excavation and Disposal of Contaminated Materials Work Plan was reviewed by EEEPC and NYSDEC and was approved as noted on June 11, 2001.

2.2.5 Project Schedule

The project schedule prepared and developed by Tyree described the order in which the contractor and subcontractors would perform the work to allow for successful completion of the project in the allotted time. The DHOC project allotted 120 calendar days from the Notice to Proceed date (May 23, 2001) for the completion of Separable Part A (system construction), 60 calendar days for Separable Part B (treatment equipment start-up), 155 calendar days for Separable Part C (treatment systems operations and maintenance), and 30 calendar days for final project completion, for a total of 365 calendar days initially to complete the project. A project schedule was included as part of Tyree's Work Plan, and the Pre-Construction Meeting Minutes predicted a treatment system start-up date of September 4, 2001. Change orders and other project delays postponed the treatment system's five-day start-up trials until July 22, 2002.

The original project schedule was approved by EEEPC on June 11, 2001. During the course of the project, updates were provided by Tyree regarding critical path items and delays that were encountered.

2.2.6 Transportation Plan

A Transportation Plan was prepared and developed by Tyree and submitted to EEEPC for approval. It included descriptions of intended waste haulers and hauling routes and times, and copies of permits of their intended waste transporters. EEEPC and NYSDEC reviewed the initial Transportation Plan and returned the document to Tyree with comments for revision and resubmittal on May 30, 2001. Tyree incorporated these comments into the revised project work plan and resubmitted the document as part of their 14-day submittal package. The final version of the project-specific Transportation Plan was approved as in compliance with the requirements of the Contract Documents by EEEPC on June 11, 2001.

2.2.7 Blasting Plan

A Blasting Plan was prepared for the installation of two deep-groundwater pumping wells by Tyree's blasting subcontractor, Nothnagle Enterprises, Inc. (Nothnagle) of Scottsville, New York. The five-day submittal plan was then submitted by Tyree to EEEPC for review and approval on March 12, 2001. The plan specified blasting methods, materials, and monitoring equipment to be used. Also included in the submittal were licenses of proposed project personnel, a City of Rochester

blasting permit, the planned method of conducting a pre-blast survey of nearby structures, and an informational pamphlet to be distributed to neighboring businesses that may be affected by the blasting. EEEPC and NYSDEC reviewed the initial Blasting Plan and returned the document to Tyree with comments for revision and resubmittal on April 6, 2001. Tyree incorporated these comments into the revised project work plan and resubmitted the document as part of their 14-day submittal package on May 8, 2001. The final version of the project-specific Blasting Plan was approved as in compliance with the requirements of the Contract Documents by EEEPC on June 11, 2001.

2.2.8 Excavation Work – Sheeting and Shoring Plans

A Sheeting and Shoring Plan was prepared for on-site deep excavation work required for installation of the shallow groundwater pumping lines (P-1, P-2, and P-3); the plan was submitted by Tyree to EEEPC for review and approval on July 26, 2001. The plan detailed procedures for the installation of the 4-inch diameter effluent discharge to the existing combined sewer, approximately 12 feet below ground surface. The plan specified the use of two extendable trench boxes once the excavation exceeded a depth of 5 feet. EEEPC reviewed and approved Tyree's Sheeting and Shoring Plan on August 9, 2001.

A second Sheeting and Shoring Plan was required for the installation of the pumping line from PW-2 (south side of Anderson Street) and the effluent discharge line from the catalytic oxidizer (CATOX) unit into the sanitary sewer of the Monroe County Department of Public Works (MCDPW). Tyree issued the second Sheeting and Shoring Plan to EEEPC on September 28, 2001, for review and approval. EEEPC reviewed and approved Tyree's second Sheeting and Shoring Plan on October 1, 2001.

Both plans were critical-path shop drawing submittal items because each entailed work (deep excavation) that needed to be performed prior to installation of the AS and SVE, paving, treatment systems, etc. Both submittals were prepared and submitted late into the project. Further discussion of submittals as they affected delays to the project is provided in Section 7.

2.2.9 Bid Breakdown

The contractor was required to provide the bid breakdown for each individual bid item. The bid breakdown costs per Section III, Article 12, of the Contract Documents are used to review for any discrepancies, ambiguities, or conflicts encountered with the payment of individual bid items. The bid breakdown is also used as a tool for measurement and payment in conjunction with the contractor's application for payment and contract price fluctuations for any adjustments in quantities that may occur during the work. The initial bid breakdown submitted by Tyree on March 30, 2001, was incomplete due to the lack of an individual bid breakdown and errors in the summation of the overall project cost. The initial bid breakdown with comments by EEEPC was returned to Tyree for revision and resubmittal on April 11, 2001. The bid breakdown was resubmitted by Tyree on June 19, 2001,

and approved by EEEPC on June 25, 2001. To provide support documentation for later discussions, a copy of Tyree's bid breakdown has been provided as Appendix M and M-1.

2.3 Health and Safety

2.3.1 General Health and Safety

Tyree prepared a Health and Safety Plan (HASP) that outlined guidance and procedures pertaining to potential physical and chemical hazards, personnel training, medical surveillance, site monitoring, personal protective equipment, record keeping, decontamination, site control, and emergency response. The initial HASP was submitted to EEEPC for review on March 12, 2001. The HASP was returned with comments for revision and resubmittal on April 6, 2001. Tyree incorporated these comments into the revised project HASP and resubmitted the document as part of their 14-day submittal package on May 8, 2001. The final version of the project-specific HASP was found to be in compliance with the Contract Documents by EEEPC on June 11, 2001. Tyree's designated site Health and Safety Officer for the project was Doug Weatherhog of DW Environmental of Hilton, New York.

Nothnagle developed their own site-specific Blasting and Drilling HASP and submitted it to EEEPC for review and approval on June 12, 2001. The HASP was reviewed and found to be in compliance with the Contract Documents on June 13, 2001. Nothnagle's HASP focused more on their site-specific duties (i.e., drilling and blasting), but similar to Tyree's, it outlined guidance and procedures pertaining to potential physical and chemical hazards, personnel training, medical surveillance, site monitoring, personal protective equipment, daily safety talks, record keeping, decontamination, site control, and emergency response.

2.3.2 Decontamination of Equipment and Personnel

A Decontamination and Soil Staging Plan was submitted to EEEPC on June 20, 2001, and approved on June 25, 2001. Tyree constructed a decontamination pad east of the work area for use in decontaminating equipment and personnel that may have come into contact with contaminated soil and/or groundwater. Prior to installation and after its removal, Tyree was required to obtain samples of soil from beneath the decontamination pad to verify that it did not further contaminate the site. The decontamination pad contained a primary and secondary high-density polyethylene (HDPE) liner. A portable steam cleaner was used to wash equipment. Separate holding tanks were brought on site to contain wash water and contaminated water. All trucks and equipment used within the work area exclusion zone that may have been exposed to contaminants were washed at the decontamination pad to reduce the chances of spreading contamination off site. Water used during decontamination procedures was collected and held in a portable 21,000-gallon fraculation (frac) tank until it could be processed through the treatment system once the system became operational.

2.3.3 Contingency Measures

An emergency contingency section was included as part of Tyree's HASP, including emergency alarms, notifications, evacuation routes, and procedures in the event of a spill, injury, fire, or explosion. Emergency telephone numbers and a map with the route to the nearest hospital were included as an attachment and presented at Progress Meeting Number 1.

2.3.4 Air Monitoring Program (AMP)

Air Monitoring Program (AMP) procedures and action levels are outlined in Tyree's HASP. Doug Wetherhog of DW Environmental performed real-time community air monitoring outside the exclusion zone during intrusive activities including, but not limited to, the shallow groundwater pump and lateral excavation work and installation of deep groundwater pumping and effluent discharge lines. Airborne particulates were monitored using an MIE Personal DataRAM particulate dust monitor, and volatile organic compounds (VOCs) were monitored using a hand-held photoionization detector (PID). The NYSDEC Technical and Administrative Guidance Memorandum (TAGM) Number 4031 action level for fugitive dust is 150 micrograms per cubic meter [$\mu g/m^3$]. When an exceedence was detected above the action level, Tyree used a water hose from a mobile water truck to wet down the area, and excavation work was continued.

2.3.5 Work Zone Air Monitoring

Tyree performed air monitoring for VOCs during excavation activities primarily using an HNu PID. Tyree personnel and/or effected subcontractors upgraded the level of personal protective equipment (PPE) when action levels were exceeded. VOC monitoring was performed by DW Environmental.

The PPE was upgraded as a result of increased VOCs in air that occurred for a period of three days, August 2 through 5, 2001, during the excavation work performed by Bedrock Construction as part of the installation of the P-1 line and pump.

2.4 Site Services Provided

Tyree provided the following site services for the duration of the project:

- Office for use by NYSDEC/EEEPC;
- Site utilities, including electricity, telephone, and restrooms;
- Site utilities, including electricity, gas, and telephone to treatment trailer;
- Drinking water;
- Copier/fax machine;
- Garbage disposal;

- Snow removal;
- Operation and maintenance services;
- Signage, including a NYSDEC project sign and hazardous waste warning signs; and
- Overnight, weekend, and holiday security services. These services were performed by Argenbright Security, Inc., of Rochester, New York. As required by contract, Tyree installed new gates and security locks to provide limited vehicular traffic and secured the equipment staging area, which was locked at the end of each work day. In addition, security lighting was installed (by change order) in order to protect the exclusion zone, equipment staging area, and contamination reduction zone during off-hours and weekends.

2.5 Project Submittals

The submittal process is detailed in Sections 01300 and 01340 in Division I of the Supplementary Specifications Section of the Contract Documents. Tyree submitted a total of 236 project shop drawings or project submittals. The completed project submittal log is provided in Appendix N.

2.5.1 Equipment and Materials

The equipment and materials specified for use in this project were reviewed and approved by NYSDEC/EEEPC, as required in the Contract Documents. Equipment and materials that were submitted by Tyree for approval included: treatment equipment, including pumps, piping, fittings, valves, and controls; paving and backfill materials; and precast concrete manholes and chambers. (See the submittal log provided in Appendix N for a full list of equipment and materials submitted for review.)

2.5.2 Methods and Procedures

As required by the Contract Documents, Tyree was required to submit a five-day and 14-day submittal package, which included the plans described in Section 2.2. These plan submittals were prepared to evaluate whether Tyree had a thorough understanding of the scope of work to be provided and that adequate procedures would be in place for performance of the contract work. While Tyree had a basic understanding of the project, numerous technical clarifications from both parties (EEEPC and Tyree) were required to allow adjustments for the differing subsurface conditions encountered during the course of excavation work. Updating of the contractor work plans were required for critical project items such as railroad tracks and ties, large stones, and concrete.

In addition, Tyree submitted approvals for pressure-testing procedures for the AS/SVE lines, hydrostatic tests for the sewer lateral, as well as additional details on trenching and excavation procedures.

Where there were concerns about the specific use of the approved methods or procedures, RFIs were issued to clarify or understand Tyree's approach. Specific project RFIs are discussed in Section 7.

2.6 Tyree's Request for Equitable Adjustment

On May 16, 2003, Tyree submitted an Equitable Adjustment Request to substantiate their claim for additional time and money associated with the project. The request detailed their perception of the delays encountered and the relief from liquidated damages and disputed scope of work items. Denial of the Request for Equitable Adjustment was handed down by NYSDEC on April 13, 2004. Tyree accepted NYSDEC's response, and project closure was finalized on May 2, 2004. Further details of the Equitable Adjustment Request are provided in Section 7.

3 Summary of Remedial Activities

3.1 General

3.1.1 Temporary Construction Easements, Permits, and General Project Facilities

The project area for remedial construction required obtaining temporary construction easements from CSX Transportation to allow installation of the remedial treatment system and appurtenances. Temporary construction easements were initially obtained by NYSDEC prior to bidding the project.

After further evaluation by EEEPC identified the potential need for expanded work limits from the original scope of work shown on the Contract Drawings, an additional temporary easement was obtained from CSX Transportation by the NYSDEC Project Manager. The amended access agreement was signed and issued prior to the start up of construction. (See Section 7.6 for additional details.)

A road cut permit was obtained by Tyree from the City of Rochester, Division of Highways, in July 2001 for installation of groundwater pumping service and discharge lines within the right-of-way of Anderson Avenue. In addition, a sewer tapping permit was obtained from the County of Monroe, Division of Environmental Services, to tie in the effluent discharge from the treatment trailer to the sanitary trunk sewer in July 2001. The permit for treated water discharge was also obtained through Tyree.

Offices for EEEPC representatives and Tyree were established in the second floor offices of the 200 Anderson Avenue complex. The offices were used by Tyree and EEEPC/Lu Engineers personnel for project administration and equipment storage. Utilities were connected, and the area was functional as the project's base of operations. Lu Engineers provided the primary construction oversight and monitoring of the remedial construction as part of a teaming effort with EEEPC.

All project progress meetings and project discussions were held at the 200 Anderson Avenue field offices during the course of the project.

3.2 Site Mobilization and Site Preparation Activities

Tyree mobilized project personnel and equipment to the Davis Howland site on June 4, 2001. Preliminary mobilization work included the installation of high visibility construction fencing around the perimeter of the work area and clearing and grubbing in select areas of the project site. The project sign was installed at the proposed site truck entrance on the east access gates located on Anderson Avenue. During site preparation, Tyree found a large volume of aerosol paint cans littered across the site as a result of graffiti artists applying spray paint to the vertical walls of the Davis Howland buildings on the north side of the site. As a result of the extensive amount of paint spray cans and debris, Tyree requested and submitted a PCO to collect and dispose of the cans and debris. (See Section 3.15 for disposal of project waste streams.)

Prior to any drilling or excavation activities, Tyree contacted the New York State Underground Facilities Protection Organization (UFPO) to demarcate any known buried and active utilities in the work area and along the public right-of-way in with the immediate vicinity of the project.

Light poles installed by CSX Transportation on the north side of the remedial area conflicted with installation of the future AS/SVE system and the paved cap area. As confirmed by CSX officials, the power to each light pole within the remediation area was disconnected and de-energized. As required by the contract scope of work, the poles were cut down and removed for later disposal.

All remaining miscellaneous debris that could affect installation of the remedial system and appurtenances was removed or relocated prior to remedial construction. These additional items included the existing drums on site, conveying equipment for roofing, waste asphalt piles, and miscellaneous construction debris that needed to be removed prior to excavation for system installation and well decommissioning.

Tyree installed a waste soil stockpile storage area and a decontamination station to prepare for on-site excavation and decontamination activities. Prior to installation of the soil staging area and decontamination station, soil samples were taken to obtain analytical results for use as the basis for site cleanup. Once the remediation was completed, post-construction samples were taken from the same areas and analyzed to determine whether the final contaminate levels exceeded pre-construction activity levels. The results of the post-construction sample analyses for these areas indicated no increase in the level of contamination prior to the start of remedial activities.

On-site air monitoring was established by D.W. Environmental, Inc. With these health and safety items in place and approved, Tyree was able to begin remedial activities at the site.

3.3 Removal, Characterization, and Disposal of Waste at Designated Contamination Areas (A, B, and C)

Based on prior remedial investigations, three specific shallow (6 inches to 2 feet in depth) areas of contaminated soils were designated for excavation and disposal under the scope of work of the contract. The RI analytical results indicated that the soils contained VOCs and benzene, ethylbenzene, toluene, and xylene (BETX) compounds that exceeded the NYSDEC cleanup criteria but were below the criteria limit for hazardous waste disposal. The excavation limits of the contaminated soils (designated as Area A, Area B, and Area C; see Figure 1-2) were surveyed and demarcated by O.M. Popli of Rochester, New York, a licensed New York State land surveyor. The soils were then excavated by Tyree and staged on HDPE liner in the soils staging area located to the east of the work limits on the CSX railroad property. As with the decontamination pad and soil stockpile areas, Tyree obtained confirmation samples of soil at the bottom of the excavations to confirm that the remedial cleanup objectives had been met. Tyree performed community air monitoring for dusts with recording dust meters and real-time air monitoring for VOCs with a HNu PID during all excavation work. Air monitoring results for both contaminants were within acceptable limits during excavation of Areas A, B, and C.

The work to be performed in Area A included the excavation and removal of soils in an area measuring 30 feet by 40 feet by approximately 2 feet deep. The primary contaminants of concern in Area A were priority pollutant metals and semi-volatile organic compounds (SVOCs).

In Area B, located on the south side of Anderson Avenue on the west corner of Norwood Street, excavation was performed within an area measuring 10 feet by 10 feet by 6 inches deep. The primary contaminants of concern in Area B were priority pollutant metals and SVOCs.

Area C, located on the east side the remedial area behind the east side of the 200 Anderson Avenue facility, included a raised area of soils measuring approximately 65 feet by 15 feet by approximately 2 feet deep and defined by railroad ties. The primary contaminants of concern in Area C were priority pollutant metals, SVOCs, and VOCs.

Upon excavation of Areas A, B, and C to the required limits and depths, each excavation was visually examined to determine whether additional soils needed to be removed prior to taking confirmation samples. The samples were collected in accordance with the requirements in Table 01400-1 in the Specification Section 01400 – Quality Assurance and Quality Control Services.

For Area A, nine confirmatory soil samples were taken of the finished floor and walls of the excavation. The analytical results indicated that contaminant concentrations in the remaining soils were below the remedial action objectives.

For Area B, five confirmatory soil samples were taken of the finished floor and walls of the excavation. The analytical results indicated that contaminant concentrations in the remaining soils were below the remedial action objectives. Upon acceptance of the analytical results from the confirmation samples, all areas were below the remedial action objectives. Area B was then backfilled with approved topsoil and restored with grass.

For Area C, 12 confirmatory soil samples were taken of the finished floor and walls of the excavation. The analytical results from all areas indicated that contaminant concentrations in the remaining soils were below the remedial action objectives.

Additional disposal information is provided in Section 3.16.4. The analytical results for all areas of cleanup are discussed in Section 4.

3.4 Area C Subsurface Chamber Removal

A previously unknown subsurface conveyance system was discovered during excavation work in Area C. The chamber was found to contain liquids and mechanical conveying equipment and had been previously backfilled with general site debris. The liquid in the chamber was sampled and the analytical results indicated low levels of BTEX. Tyree, upon approval of the waste profile, secured the services of Industrial Oil Tank Service, of Oriskony, New York, and pumped 442 gallons from the subsurface chamber for off-site treatment and disposal.

The concrete chamber was demolished, and the concrete debris was transported off-site to Alpco Recycling, Inc., in Macedon, New York, for recycling along with other on-site concrete associated with the remedial work. The remaining construction debris was transported off-site with other construction and site debris. All work performed by Tyree on the subsurface chamber work was included in PCO No. 11 as an extra cost to the project.

3.5 Removal and Disposal of On-site Drummed Wastes

The contract's scope of work included the cleanup and disposal of a number of drums of waste leftover from owner operations and/or past remedial investigations. An inventory of drums was prepared on December 11, 1998, and was included in the bid documents for evaluation by the contractors. After the Notice to Proceed was issued to Tyree, a second inventory was prepared for comparison to the original inventory of drums. The results of this inventory differed from the original, and additional samples and negotiations were required to complete the drum removal phase of the remedial operations. The accumulated drummed waste originated from past facility operations, remedial investigations and drilling performed by the property owner, or bench testing of groundwater pumped during evaluations by previous consultants hired by NYSDEC. All existing 55-gallon drums were consolidated and staged on plastic lining for pickup and disposal.

Forty-eight drums were inventoried by Tyree and confirmed by the EEEPC on-site representative. Six leaking drums were sampled and placed in overpack drums, 16 drums were sampled and staged, one drum contained a carbon canister previously used in groundwater treatment pumping trials and purge water from past sampling events from monitoring wells, three drums contained tar and stone from previous paving operations, and the remaining 22 drums were empty and in poor structural condition. The results of the sampling and characterization of the drums' contents provided adequate information for the development of waste profiles for disposal firms selected for off-site waste disposal. Sampling information is provided in the sampling log provided in Section 4. Transport and disposal information for each waste stream is provided in the Transportation and Waste Disposal Tracking Log in Appendix O. The six overpack drums were disposed of through General Environmental Management, Inc., in Cleveland, Ohio. One drum containing carbon stripper and three drums of tar and stone were disposed of at the Chemtron Corporation facility in Avon, Ohio. The remaining 22 empty and structurally unsound drums were cut up and disposed of as scrap metal at the Mill Seat Landfill (MSLF) in Riga, New York.

3.6 Removal and Closure of Underground Storage Tank(s)

Tyree located the UST shown on Contract Drawing C-2 on July 2, 2001. Upon opening the cover, it was discovered that the tank had been previously filled with flowable fill (i.e., K-crete) and it was closed per the City of Rochester tank closure requirements. Upon presentation of this information by Tyree and review by NYSDEC and EEEPC, it was determined that the tank had been previously inerted and closed. Removal of the large tank could potentially cause more property damage because it was filled with concrete. Therefore, the decision was made by NYSDEC to leave the previously closed tank in place and to work the remediation and cap around the tank.

An additional abandoned UST was discovered in the alley west of the former DHOC building during excavation for the discharge line from the treatment trailer to the sanitary sewer. Tyree removed approximately 500 gallons of groundwater, excavated the tank, cut open the tank head, and decontaminated the tank on site. Samples of the liquid were collected from the tank and analyzed, and the results indicated low levels of BTEX. The water in the tank was pumped to the on-site frac tank to be processed once the treatment system became operational. Krieger Recycling of Rochester, New York, accepted the tank as metal scrap waste for recycling.

3.7 Installation of Blasted Groundwater Pumping Wells (PW-Wells), Valve Boxes, Pumping Lines, and Controls

As part of the overall remedial treatment system, a groundwater pumping system was designed to keep the groundwater from interfacing with the shallow AS and SVE system. The groundwater system included the installation of two blasted

fractured bedrock trenches at 38 feet below ground surface (BGS) to improve pumping rate capacities. One bedrock well (PW-1) was located north of the treatment trailer in the capped area of the site. The second bedrock well (PW-2) was installed on the south side of Anderson Avenue across for the building at 200 Anderson Avenue. Both bedrock wells required the bedrock to be fractured by blasting to obtain a minimum design pumping rate.

Prior to installation, all pumping wells, valve boxes, pumping lines, and controls were located by O.M. Popli. Tyree subcontracted all blasting and drilling activities for the bedrock wells to Nothnagle. Haley & Aldrich was subcontracted to perform a pre-blast survey. The pre-blast survey included video/photographic documentation of pre-existing conditions at nearby buildings that could potentially be affected by the blasting. Blasting for PW-2 (located south of Anderson Avenue at the corner of Norwood Street) was performed on June 15, 2001, and blasting for PW-1 (located north of the buildings at 200 Anderson Avenue) was performed on June 19, 2001. Seismic monitoring indicated that no off-site impacts had occurred. Nothnagle installed pumping wells with screens and riser casings per the Contract Drawings in each of the blasted trenches and also developed PW-1 and PW-2. Pump tests of PW-1 and PW-2 are discussed in Section 5.1. Well logs detailing well construction and soils encountered and pump tests are included in Appendices P-1 and P-2. The locations of the pumping wells, pumping lines, and appurtenances are located on the Project Record Drawing in Appendix Q.

The discussion regarding the shallow pumping wells is presented in Section 3.10.

3.8 Installation of Interior Air Sparging Headers and Points

Prior to installation, all interior AS headers and points were located by Tyree through O.M. Popli. Interior AS points (AS36, AS37, AS39, AS40, AS41, AS42, AS43, AS44, AS45, and AS46) were drilled to the required depths shown on the drawings and installed by Nothnagle between July 20 and 26, 2001, using a skid-mounted Dietrich D25 drill rig. Ancoma Mechanical Contractors of Rochester, New York, installed the interior AS headers, lateral connections, mechanical valve systems, and enclosure boxes to each of the AS points. The locations of the installed AS headers, laterals, and valve boxes are provided on the Project Record Drawings in Appendix Q.

3.9 Installation of Interior Soil Vapor Extraction Headers, Points, and Valve Boxes

Prior to installation, all interior SVE headers and points were located by Tyree. SVE points were drilled and installed by Nothnagle using a skid-mounted Dietrich D25 drill rig.

Ancoma Mechanical Contractors was subcontracted by Tyree to install all interior, aboveground piping, fittings, valves, and appurtenances associated with the interior SVE system, while all buried SVE laterals were installed by Tyree. Ancoma was also responsible for coring piping penetrations into building foundations and installing pipe hangers for all overhead laterals inside the building that returned to the treatment trailer. The final locations of the SVE headers, valve boxes, and laterals are shown on the Project Record Drawings in Appendix Q.

3.10 Installation of Groundwater Extraction Wells (P-Wells), Pumping Lines, and Trench Compaction

Three additional shallow groundwater wells (P-1, P-2, and P-3) were installed on the north side of the building at 200 Anderson Avenue at other locations in the capped area. The depth of these wells ranged from 10 to 16 feet, and they were installed with perforated laterals draining to low-point pumps. The shallow wells were installed below the depth of the SVE system to reduce the amount of moisture in the treatment system.

Prior to installation, all shallow groundwater extraction wells were located by O.M. Popli. Bedrock Construction of Rochester, New York, was subcontracted by Tyree to install the HDPE groundwater extraction wells, slotted underdrains, and force mains.

The Contract Documents required pre-qualification testing of backfill materials, including a sieve analysis, to determine maximum dry density by the modified proctor method (American Society for Testing and Materials [ASTM] D1557) and to develop moisture-density curves. Backfill was compacted using a plate tamper. Testing was performed to ensure proper compaction (95% of maximum dry density) of the backfill once it was placed and compacted. Testing in-place density by ASTM Method D1556 (Sand-Cone method), as specified in the Contract Documents, was abandoned in favor of nuclear methods (as in ASTM Method D2922), with approval of the engineer. Atlantic Testing, Inc., of Rochester, New York, was subcontracted by Tyree to perform compaction testing using a Troxler nuclear gauge. Areas that did not meet compaction requirements were re-scarified and re-compacted until the project compaction requirement was met. The subgrade soil and stone base compaction records are provided as Appendix R.

3.11 Decommissioning of Existing Wells

Nothnagle decommissioned existing monitoring wells MW-1R, MW-4R, MW-4S, CHI-4, MW-6R, MW-7R, and MW-7S in accordance with NYSDEC well decommissioning procedures. Wells CHI-2 and CHI-3 could not be located. Although eight wells were scheduled for decommissioning in the original scope of work, MW-1R was also decommissioned, as it was anticipated that the well would be rendered useless after blasting due to its proximity to groundwater pumping well PW-2. The Project Record Drawings (see Appendix Q) provide the previous locations of the wells decommissioned as part of this project.

3.12 Installation of External Air Sparging Laterals, Chambers, and Points

Prior to installation, all external AS points (AS-1 through AS-35) were located by O.M. Popli according to the schedule from the Contract Drawings. Tyree subcontracted the installation of all external AS points to Nothnagle. These were installed between June 25 and 28, 2001, according the schedule of depth requirements listed in the Contract Drawings. Tyree installed all laterals, chambers, and electrical pull boxes associated with the AS system. Scaccia Construction of Dickson City, Pennsylvania, provided assistance to Tyree for chambers and lateral installation. The locations of the installed AS headers, laterals, and points are provided on the Project Record Drawings in Appendix Q.

3.13 Installation of External Soil Vapor Extraction Lines and Appurtenances

Prior to installation, all external SVE lines were field located by O.M. Popli according to the schedule from the Contract Drawings. Tyree installed SVE lines and appurtenances with assistance from Scaccia Construction. The locations of the installed SVE extraction lines and appurtenances are provided on the Project Record Drawings in Appendix Q.

3.14 Installation of Sanitary Sewer Discharge Line and Cleanouts

John W. Danforth Mechanical Contractors of Rochester, New York, installed the sanitary sewer discharge line and cleanouts from the treatment trailer to the connection into the sanitary sewer in the middle of Anderson Avenue. The discharge permit and connection fees were paid by Tyree per the conditions of the contract. The sewer connection was not made until Tyree demonstrated that the lateral passed tightness testing requirements and the treatment system, after continuous operation and analytical testing, could meet the pretreatment discharge requirements as stipulated by the Monroe County Division of Pure Waters (MCDPW) in the Contract Documents. Upon approval from NYSDEC and MCDPW, after Separable Part B was substantially completed, the treatment system discharge was permanently connected to the sanitary sewer on August 26, 2002. The system was operated another 25 calendar days under an operational treat and debugging period. Sampling and analysis was performed on a weekly basis by Tyree to monitor the treatment system's compliance. On September 21, 2002, acceptance of Separable part B to allow continuous O&M operations (Separable Part C) was granted by EEEPC and NYSDEC. The location of the sanitary discharge line and appurtenances that were installed are provided on the Project Record Drawings in Appendix Q.

3.15 Treatment System Inspection Prior to Installation

In accordance with EEEPC's work assignment from NYSDEC, EEEPC and Lu Engineers inspected the treatment system and trailer at the factory in Seekonk,

Massachusetts, on Wednesday, September 26, 2001, prior to shipment. M. Steffan (EEEPC), J. Till (Lu Engineers), S. Phelps (Tyree), and R. Davis (Northeast Environmental Products [NEEP]) were in attendance on the trip to the factory. The purpose of the trip was to inspect and review the current condition of the trailer and onboard treatment system before mobilization in order to identify any field conditions that could affect installation of the treatment system.

EEEPC prepared a letter report for NYSDEC and Tyree detailing the results of the inspection and evaluation. The letter, which included photo-documentation, identified nine items requiring correction, as well as other systems whose installation needed to be coordinated with installation of the treatment trailer. Appendix S includes a copy of the letter dated October 15, 2001.

The system was mobilized on site on June 17, 2002, and placed on concrete pads previously constructed by Tyree. Tyree's electrical subcontractor, McGovern Electrical Services, Inc. of Castleton, New York, made all electrical connections to the trailer and performed all necessary testing of their work. Tyree began connecting piping to the treatment trailer and catalytic oxidizing unit on July 11, 2002. NEEP representatives were on site on July 16, 2002, to give the system a final inspection and verify that all alarms and controls were operating properly.

3.15.1 Air Guide I Treatment System Discharge Permit Review

Per Section 11275 – Treatment Equipment, Article 1.04C and Section 01011 – Project Submittals of the Contract Documents, Tyree, through their subconsultant Mr. Uriel Oko, P.E., submitted a simulation analysis and permit application for the air discharge from the CATOX unit to EEEPC on May 3, 2002 (see Appendix T). The submittal package and calculations were then submitted to NYSDEC for review. On May 10, 2002, comments were returned from NYSDEC in response to the original project submittal. EEEPC's comments to revise and resubmit the shop drawing based on comments requested by NYSDEC were returned to Tyree on May 10, 2002. Mr. Oko's report was resubmitted and received by EEEPC on May 28, 2002 (see Appendix T). The report and calculations were submitted for final review to NYSDEC on May 28, 2002. Upon review, the document was accepted and an approval was returned to Tyree from EEEPC on May 28, 2002.

3.16 Disposal of Project-Generated Waste Streams

3.16.1 Non-hazardous Solid Waste

Corbett Management, a waste broker, was subcontracted by Tyree to broker and process waste profiles for non-hazardous material disposals, including excavation spoils and drill cuttings for disposal to the MSLF located in the town of Riga, Monroe County, New York. Corbett arranged subcontracted waste transportation for Tyree, including Rochester Waste, Inc., and Silvarole Trucking, for the project. MSLF also accepted asphalt spoils, crushed drums, boulders, concrete, railroad ties, decontamination pad materials, and other non-hazardous materials. The MSLF accepted a total of 152 loads, or approximately 3,140 tons, of non-

hazardous material from the DHOC site. Project transportation and disposal tracking logs are presented in Appendix O.

Much of the excavated spoils from the remedial area of the site were screened on-site using a portable screen to remove large, bulky items such as railroad ties, railroad rails, oversized boulders, and miscellaneous concrete debris under PCO No. 23. In order to reduce the volume of materials disposed of off-site, some screened spoils were used on-site as backfill, provided the materials met prequalification requirements for backfill and compaction requirements were achieved. Additional screened spoils were used as daily cover at the MSLF due to its low levels of contamination and acceptable engineering properties.

Railroad ties, concrete and debris from the subgrade chamber discovered in Area C, and miscellaneous pieces of concrete were transported by Rochester Waste Inc., to Alpco Recycling Inc., in Macedon, New York, to be recycled. Alpco accepted 18 loads, or approximately 250 tons, of material.

Sixteen 55-gallon drums of miscellaneous non-hazardous wastes from the original on-site drum inventory in the Contract Documents were transported by St. Joseph Motor Lines to General Environmental Management's recycling and pretreatment facility in Cleveland, Ohio. Chemtron accepted three 55-gallon drums of "stone and tar," which were found on-site at the time of mobilization. These drums were outside of the original scope of work and handled under PCO No. 5.

One 55-gallon drum of soiled/used PPE, mainly consisting of disposable Tyvek suits and disposable rubber gloves from previous remedial investigations, was transported by Precision Industrial Maintenance to Adirondack Resource Recovery's incineration facility in Hudson Falls, New York.

The Manifest Tracking Log summarizing all non-hazardous solid waste disposal performed at the DHOC site is provided in Appendix O.

3.16.2 Non-hazardous Liquid Waste

Liquid waste generated from decontamination activities, excavation dewatering, and pump testing was held in frac tanks until it could be run through the treatment system. All wastewater, including groundwater treated during system start-up and shakedown, was held until both NYSDEC and MCDPW determined that, based on the analytical results of verification sampling, the water was suitable for discharge to the sanitary sewer. MCDPW would not allow any sludge from frac tanks to be discharged to the sanitary sewer. Therefore, Tyree vacuumed the residual water/sludge from the frac tank into six 55-gallon drums. These drums were disposed of, along with the six overpacked drums of liquid generated during construction, as non-hazardous waste at Cycle Chem, Inc., in Elizabeth, New Jersey.

Approximately 442 gallons of groundwater from the subgrade chamber discovered in Area C was disposed of at Industrial Oil Tank Service in Oriskany, New York.

The Manifest Tracking Log summarizing all non-hazardous liquid waste disposal performed at the DHOC site is provided in Appendix O.

3.16.3 Hazardous Wastes

The only materials disposed of as hazardous waste were one 55-gallon drum of depleted activated carbon that had been used during a previous site investigation and bench testing study, two sacks of spent aerosol paint cans (approximately 1 cubic yard in volume collected around the site), and six 55-gallon drums. The aerosol cans were transported for disposal to Cycle Chem, Inc., a Resource Conservation and Recovery Act (RCRA)-permitted treatment, storage, and disposal facility (TSDF) located in Elizabeth, New Jersey. The six drums and the spent carbon were transported to Chemtron Corporation, a RCRA-permitted TSDF located in Avon, Ohio.

The Manifest Tracking Log summarizing all hazardous waste disposal performed as part of the DHOC remedial work is provided in Appendix I. Since the waste was disposed of as hazardous waste, the waste was reported in the annual hazardous waste report. A copy of the 2001 Annual Hazardous Waste Disposal Report is provided as Appendix U.

A summary of the volumes of all wastes disposed of from the DHOC site remediation is provided in Table 3-1.

Table 3-1 Davis Howland Oil Company Site Waste Stream Disposal

Bid Item	Location	Description	Amount
LS-1	North Area	Drummed waste	55 drums
LS-1	North Area	Spent aerosol cans	2 cubic yards
LS-1	North Area	Asphalt waste	four 55-gallon drums
LS-1	North and East Areas	Cleared and grubbed vegetative wastes	20 cubic yard
LS-1	North Area	Roof demolition waste	10 cubic yards
LS-1	Alley	UST	one 550-gallon tank
LS-1	North Area	Site surface debris – non-hazardous	60 tons
LS-1	North Area	Non-hazardous oversized spoils	926 tons
UC-2	Areas A, B and C	Non-hazardous soils	630 tons
LS-1	Area C liquids	Non-hazardous	442 gallons
UC-2	General	Hazardous soils	0 tons

3.16.4 Soils Disposal and Confirmation Analysis - Areas A, B, and C

The excavated spoils from Areas A, B, and C were relocated to the stockpile storage area for analytical profiling and waste characterization prior to disposal. Samples were collected from the excavated and stockpiled soils to characterize the method of disposal according to the contract bid items. Following acceptance of the waste profile, the excavated soils were disposed of at MSLF in Riga, New York, which is owned by Monroe County and operated by Waste Management of New York, LLC. Six hundred and thirty tons of excavated soils were disposed of as non-hazardous spoils as part of the remediation of Areas A, B, and C. The volume of soil removed from Areas A, B, and C is provided in Table 3-2. The analytical results for each of the removal areas are provided in Appendix V.

Table 3-2 Volume of Soils Removed – Areas A, B, and C

Bid Item	Removal Areas	Volume of Soils Removed (Tons)
UC - 2	A and B	493
UC - 3	C	137
	Total	**630 Tons**

3.17 Site Restoration

Tyree and its paving subcontractors (Stevens Paving and Wesley Construction) were responsible for placement and grading of subbase (native) and subgrade (crusher run) materials. CME Associates and Atlantic Testing performed in-place density testing of both materials using a Troxler nuclear densitometer in August, November, and December 2001 and May 2002.

Wesley Construction requested and received permission from EEEPC to allow finished grade to be 0.5 inch below the top of structures, such as manholes and valve boxes. This was accepted, provided that the uppermost layer of pavement is sloped up to each structure to promote drainage away from them. In order to achieve this, a 5.5-inch layer of subgrade material was placed, rather than the 6-inch thick layer specified in the Contract Drawings.

Subbase and subgrade placement and compaction was adversely affected by weather conditions (i.e., placed material could not pass density tests because of excessive moisture) in December 2001 and May 2002. Failure to properly install the subbase and subgrade materials combined with winter temperatures delayed the installation of pavement until the spring of 2002. Paving took place between June 7 and 24, 2002. Atlantic Testing was subcontracted to perform quality control testing of asphalt materials. Copies of the compaction test results are provided in Appendix W.

Tyree performed restoration of miscellaneous concrete areas within the former DHOC building and on the sidewalk along Anderson Avenue. Tyree also brought topsoil on site and performed seeding in miscellaneous areas. Atlas Fence of

Rochester, New York, was subcontracted to install a security fence around the perimeter of the remedial treatment trailer and CATOX unit work area.

4 Sampling and Analysis

4.1 General

Upstate Labs, Inc., of Syracuse, New York, was the primary provider of analytical services to Tyree for the project. Mitkem Corporation of Warwick, Rhode Island, provided additional analytical services to support Tyree when Upstate did not have availability or laboratory capacity. Depending on the contract requirements for the level of reporting, either New York State Analytical Services Protocol (ASP) Category A or B deliverables were provided with each analysis. Data validation was performed by Chemworld Environmental of Rockville, Maryland. The overall project sample summary log is provided as Appendix X. A summary of original versus actual analytical quantities and costs at completion of the project are provided in Table 4-1.

Table 4-1 Project Analytical Quantities and Costs, Original Versus Actual

Bid Item and Description	Unit Cost ($)	Original Contract Quantity	Contract Price ($)	Final Quantity	Final Cost ($)
Soils Analysis					
UC-26A - EPA Method 8021B	122.00	5	610.00	12	1,464.00
UC-26B - EPA Method 8270	144.00	5	720.00	0	0.00
UC-26C - EPA Method 8260	100.00	2	200.00	0	0.00
UC-26D - EPA Method 8270	194.00	40	7,760.00	30	5,820.00
UC-26E - EPA Method 1311	11.10	46	510.60	6	66.60
UC-26F - EPA Method 1010	13.35	22	293.70	0	0.00
UC-26G - EPA Method 846 - 6010B/7000	14.50	46	667.00	29	420.50
UC-26H - EPA Method SW846, 7.3	44.35	26	1,153.10	0	0.00
UC-26I - EPA Method 9095	7.80	26	202.80	0	0.00
UC-26J - EPA Method 9045	8.90	26	231.40	23	204.70
UC-26K - EPA Method 8270	11.00	5	55.00	0	0.00
UC-26L - EPA Method 6010B	7.20	5	36.00	1	7.20
UC-26M - EPA Method 8240	99.75	24	2,394.00	4	399.00
Liquid-Phase Analysis					
UC-26N - NYSDOH Method 310-13 (2 Day TAT)	83.50	8	668.00	48	4,008.00
UC-26O - NYSDOH Method 310-13 (24 Hour TAT)	166.30	15	2,494.50	15	2,494.50
UC-26P - EPA Method 8260 (2 DAY TAT)	155.20	16	2,483.20	48	7,449.60
UC-26Q - EPA Method 8260 (24 hour TAT)	211.00	10	2,110.00	15	3,165.00
UC-26R - EPA Method 8270B (24 hour TAT)	388.00	5	1,940.00	5	1,940.00

Table 4-1 Project Analytical Quantities and Costs, Original Versus Actual

Bid Item and Description	Unit Cost ($)	Original Contract Quantity	Contract Price ($)	Final Quantity	Final Cost ($)
UC-26S - EPA Method 8270B (2 day TAT)	332.50	8	2,660.00	25	8,312.50
UC-26T - EPA Method 8081B (2 day TAT)	166.25	8	1,330.00	25	4,156.25
UC-26U - EPA Method 8081B (24 hour TAT)	221.60	5	1,108.00	5	1,108.00
UC-26V - EPA Method 608 (2 day TAT)	111.00	8	888.00	25	2,775.00
UC-26W - EPA Method 608 (24 hour TAT)	167.00	5	835.00	5	835.00
Vapor-Phase Analysis					
UC-26X - EPA Method TO-14	188.50	104	19,604.00	85	16,022.50
UC-26 Summary or Analysis Quantities and Cost Totals		**470**	**50,954.30**	**406**	**60,648.35**

The analytical results used for cleanup confirmation purposes are included and noted as appendices.

4.2 Air Monitoring Program (AMP) – Real-time

Tyree implemented an AMP to assess potential impacts on the neighboring community from any fugitive dust migration resulting from intrusive operations at the site. During intrusive excavation work, Tyree's subcontractor, DW Environmental, conducted real-time air upwind and downwind monitoring for total dusts and VOCs. Real-time air monitoring for dust was performed using PDR dust meters, and real-time air monitoring for VOCs was performed using a Gas Tech Photovac organic vapor analyzer.

DW Environmental conducted baseline air sampling for dust and VOCs at the sample locations prior to intrusive activities to determine ambient air quality. All air sample results were within the established regulatory guidelines and action levels for fugitive dusts, VOCs, and metals except during the period from July 31 to August 3, 2001. The work performed during this 4-day period included excavation work for the P-1 pumping system line trench just north of the 200 Anderson Avenue facility. During this period, high VOC readings were obtained, causing upgrades in worker protection to Level C for Tyree and the excavation contractor in the exclusion zone. Installation of the pumping line spiked the PID to 30 and 50 parts per million (ppm) on August 2 and 3, 2001, respectively, but these were not sustained readings. Areas outside the exclusion zone and downwind (east) of the site had PID readings that were at non-detect levels.

The north area of the site was an active excavation work area for the cap installation from July 2001 to May 2002. Readings from downgradient PDR dust monitors typically averaged 0 to 10 µg/m^3, which were below the action levels of 150 µg/m^3. On the following dates, total nuisance dust exceeded action levels:

- August 10, 2001 – 350 µg/m^3;
- August 21, 2001 – 180 µg/m^3;

- October 4, 2001 – 200 µg/m^3 - 600 µg/m^3; and
- April 19, 2002 – 200 µg/m^3.

As soon as air quality action levels were exceeded, engineering controls (water or covering areas) from the approved work plan were implemented to suppress nuisance dust. On occasion, when high winds were predicted, engineering controls were instituted in advance as precautionary measures. These measures proved successful in reducing downwind levels of nuisance dust.

4.3 On-site Documentation Air Monitoring

DW Environmental conducted documentation air sampling upwind and downwind of intrusive activities and on "at-risk" personnel working in the exclusion zone. Samples were collected and analyzed for nuisance dusts and VOCs in accordance with specified National Institute for Occupational Safety and Health (NIOSH) methods. Action levels for airborne contaminants were established or regulatory guidelines were utilized in the Contract Documents to minimize the threat to workers and the surrounding community.

Tyree installed and maintained an on-site meteorological station for the duration of intrusive activities in accordance with the Contract Documents. The meteorological station recorded ambient air temperature, wind direction, and wind velocity. This data was documented on a daily basis during all periods of intrusive work activities.

Tyree submitted air monitoring results and meteorological data to EEEPC on a weekly basis. Tyree's community air monitoring program results for VOCs and nuisance dusts are provided as Appendix Y-1. The real-time air monitoring results for VOCs in soils, exclusion zones, and background are provided in Appendix Y-2.

4.4 Remediation Areas A, B, and C Cleanup Confirmation Analysis

These areas required sample analysis after the completion of excavation to the limits and depths shown on the Contract Drawings and after any visual identification of contamination encountered during the excavation. Sampling was performed on the floor and sidewalls of each excavation. Analysis was performed for SVOCs and priority pollutants metals for all three locations, as well as for VOCs for Area C only. The areas are indicated on Figure 1-2.

4.5 Waste Stream Characterization

Before a disposal facility could accept waste from the site, a waste profile had to be provided to and accepted by the disposal facility. Sampling for waste characterization analysis was performed for the following areas and/or waste streams for the DHOC remediation project:

- Areas A, B, and C soils;
- Railroad ties;
- Concrete – inside building demolition and chamber in Area C;
- Area C chamber liquids;
- Asphalt spoil piles;
- Soil spoil piles; and
- Surface/excavation water.

The analytical results, including the waste profiles, were sent to Corbett Management Services, Inc., of Manlius, New York, subcontractor for Tyree for the disposal of all waste streams shipped off-site. Each waste stream was accepted by the individual disposal firms listed by Tyree in their approved disposal plan. Disposal location information for the waste is provided in the waste tracking log in Appendix O.

4.6 Treatment System Analytical Testing

4.6.1 Treatment System Start-up – Five-Day and 25-Day

As a part of the treatment system start-up program, sampling was performed on the influent and effluent water and air phases. During the first five days of the start-up period, various portions of the system were brought on-line until the entire AS/SVE and groundwater pumping systems were integrated into the treatment system. Required systems O&M was performed during the five-day start-up period. The air to the CATOX unit (influent and effluent) and water from the air stripping unit were both sampled and analyzed for compliance parameters on a daily basis during the course of the start-up program. The initial five-day start-up program occurred from July 22 through 29, 2002. During the second day of start-up, a system shutdown occurred due to operational difficulties with the CATOX unit. Tyree continued to sample the remainder of the entire start-up period with the anticipation that another five-day start-up would be required to comply with the requirements of the Contract Documents.

For air, this included sampling both the influent and effluent of the CATOX unit for VOCs using United States Environmental Protection Agency (EPA) Method TO-14. For waters, samples were collected from the treatment system's influent and effluent and analyzed for VOCs, SVOCs, total petroleum hydrocarbons, pesticides, polychlorinated biphenyls (PCBs), and pH. The analytical results from the initial start-up were in compliance with the cleanup requirements of the Contract Documents except for the need for continuous operations.

A second round of treatment system start-up was performed from August 7 through 15, 2002. As with the first system start-up, the AS/SVE and pumping systems were phased into the treatment system. Based on the performance of the treatment equipment and a review of the analytical results, it was determined that the system was acceptable to operate for the next phase—the 25-day continuous operation trial.

The 25-day start-up period began on August 27, 2002, and weekly compliance sampling was performed for both air and water for the next four weeks. Operation, maintenance, and monitoring of the treatment unit were performed by Tyree. The treatment system's 25-day trial was completed on September 20, 2002. Based on a review of the analytical results and the efficiency of the treatment systems, all results were acceptable and Separable Part B was substantially complete. Separable Part C was initiated on September 21, 2002. Details of Separable Part B are discussed in Section 5, and Separable Part C is discussed in Section 6.

5 Performance Trials of Treatment Equipment and Support Infrastructure Improvement – Separable Part B

5.1 Groundwater Extraction Well Pump Test Performance

After installation, Tyree performed pump tests on PW-1 and PW-2 per Addendum No. 3. Addendum No. 3 required a minimum sustained yield of 6 gallons per minute (gpm), which was met by both wells. The first test was performed following well installation as an unofficial test. The test was performed on July 10, 2001, and achieved the contract objective of pumping a minimum of 6 gpm from both wells. The second pump test was performed immediately prior to connection of PW-1 and PW-2 with the treatment system. The test was performed on November 9, 2001, and achieved the contract objective of pumping a minimum of 6 gpm into the treatment system. A summary of final performance test results, boring logs and well construction, and recharge data is provided as Appendix P.

5.2 Pressure Testing Results of Air Sparging, Soil Vapor Extraction, and Sanitary Sewer Discharge Lines

Pneumatic and hydrostatic testing was performed by Tyree and/or its subcontractors. AS and SVE lines were tested with air pressure at 50 psi for 1 hour. Pumping lines were tested with water pressure at 25 psi for 1 hour. The contractor responsible for the installation of each system was responsible for performing the pressure testing and ensuring their quality of work (e.g., Ancoma Mechanical Contractors pressure tested all interior SVE lines). All lines were required to pass the required pressure tests before acceptance.

For the sanitary sewer, preliminary low pressure air (4 psi), or infiltration, testing was performed for the entire lateral prior to any connections being made to the County of Monroe sewer system. Upon acceptance of the infiltration test based on no pressure loss, a final exfiltration test was performed by filling the lateral with water and evaluating the volume of loss over 24 hours. No loss was observed over the required testing period.

On several occasions, initial hydrostatic or pneumatic testing results did not meet acceptance criteria. Tyree continued pressure tests under the direct monitoring and inspection of EEEPC's site representative. Only after the specific pressure tests required for each utility passed the acceptance criteria were these utility lines accepted for remedial operations use. EEEPC's site representative observed all

tests. A summary of all system performance pressure test results and acceptance by EEEPC's site representative are provided as Appendix Z.

5.3 Performance Start-up Trials of Treatment Equipment – Five-Day Trials

System start-up (continuous 3-hour operation) occurred on July 22, 2002. The treatment system was brought on-line in stages. Groundwater treated during day one through day five of the continuous 3-hour operation failed to meet effluent discharge requirements. Tyree made system adjustments before this water was run through the system again to satisfy discharge requirements. Tyree was required to perform a second set of five-day operational 3-hour trials to satisfy contract requirements. Once the results of the five-day trials were accepted, the 25-day continuous trials could begin. Performance trials were completed on August 27, 2002, and 25-day continuous operation trials began the same day. A summary of performance testing is provided as Appendix AA.

5.4 Performance of Treatment Equipment – 25-Day Continuous Trials

Tyree began continuous operation of the treatment system on August 27, 2002. During the 25-day continuous trials, Tyree collected weekly influent and effluent groundwater samples prior to and after the air stripper, as well as influent and effluent vapor samples prior to and after the CATOX unit. Tyree balanced the system and made minor adjustments to optimize system performance. The test was concluded on September 20, 2002. All sample results were reviewed, and the analytical results achieved acceptable levels during this period. A summary of the 25-day continuous trial program and performance testing is provided as Appendix BB.

As a result of the successful completion of the 25-day continuous trials, Substantial Completion of Separable Part B was achieved on September 20, 2002. Tyree was able to proceed to Separable Part C work, which required operations, maintenance, and monitoring of the remedial treatment system for 155 calendar days, or approximately five months.

6 Contractor Operations and Maintenance – Separable Part C

6.1 General

Separable Part C included 155 calendar days (approximately five months) of O&M and monitoring of the treatment system. As previously mentioned in Section 5, the treatment system start-up was successful, and the official start-up of O&M services began on September 21, 2002.

The 155 calendar days of O&M services included operating the treatment system in accordance with the manufacturer's equipment requirements and the O&M manual during that period. During the O&M service period, Tyree was responsible for determining the need for any changes in order to maintain the optimum contaminant removal efficiency and optimal groundwater removal rate. Operation of the AS and SVE systems was performed in accordance with the Contract Documents (Supplementary Specification Section XI, Section 01600 – Operations and Maintenance).

As a part of the O&M work, Tyree conducted sampling of the collected influent/effluent groundwater and influent/effluent air from the CATOX unit to monitor system performance and verify that the compliance requirements for water and air discharges were being met. In addition, field measurements of groundwater levels were taken throughout the area, and piezometers were installed to evaluate whether groundwater levels remained below the treatment zone of the AS and SVE systems. The water table had to maintain a minimum depth of 48 inches below the existing surface grade to allow the SVE system to be above groundwater and to prevent excess water or moisture from entering into the contaminant air stream. The five groundwater pumping systems maintained the minimum design depth required for operation. Copies of all contractor maintenance reports, analytical results, and other supportive data were submitted to the engineer for evaluation on a monthly basis. After review of the data, EEEPC's project manger prepared monthly reports summarizing the results for system compliance. The reports were submitted to NYSDEC's project manager and the MCDPW for evaluation and comment.

6.2 Treatment System Operations and Maintenance

Tyree began treatment system O&M after the trials for start-up and analytical results were accepted by EEEPC. Acceptance of the treatment system and supportive infrastructure equipment occurred on September 21, 2002, or the first day after notice of substantial completion of Separable Part B work.

The treatment system was commissioned for full remedial operations on September 21, 2002. This was certified after successful demonstration of system operation, acceptance of the analytical test results, and EEEPC's inspection for Substantial Completion (Separable Part B) on September 26, 2002. However, as a result of EEEPC's inspection, a list of incomplete work was developed, and the work needed to be completed by Tyree prior to final contract acceptance.

Tyree provided weekly O&M checks required by the Contract Documents. The treatment system performance requirements (outlined within Section 01600 – Section XI – Supplementary Specifications of the Contract Documents) included:

- General Requirements – System up-time operations of at least 90%;

- Soil Vapor Extraction:
  - Maintain vacuum of between 30 and 40 inches of water:
  - Maintain flow rate between 150 and 220 standard cubic feet per minute (scfm);

- Air Sparge:
  - Maintain 12 psi at each sparge point;
  - Maintain 0.5 to 1.5 cubic feet per minute (cfm) at each sparge point;

- Groundwater Recovery – Maintain the following design flow rates at each groundwater pumping well:
  - P-1 – 13.2 gpm
  - P-2 – 9.3 gpm
  - P-3 – 3.7 gpm
  - PW-1 – 3.0 gpm
  - PW-2 – 3.0 gpm
  - Maintain piezometer depth below 48 inches below ground surface (BGS);

- Groundwater Treatment – Meet the effluent discharge limits of Monroe County;

- Vapor Phase – Operate the CATOX unit to treat extracted soil gas so as not to exceed NYSDEC Air Guide 1 (NYSDEC 1991) Criteria for Short-term Guideline Concentrations (SGC) and Annual Guideline Concentrations (AGC).

Tyree was required by contract to regularly monitor system performance. At a minimum, weekly inspections of the operating system were required, with more frequent inspections performed as required to maintain system performance and compliance. During the 155-calendar day O&M period, Tyree was to determine the need for any changes to the system to maintain the optimum AS delivery and soil vapor contaminant removal efficiency, and the optimum sustainable groundwater removal rate from each of the constructed groundwater pumping wells.

6.2.1 Performance Monitoring

During the 155-calendar day O&M period, Tyree completed performance monitoring by sampling and analytical testing on a monthly basis to evaluate the overall system performance. This monitoring included:

- Influent sampling and analysis (before air stripping) and effluent sampling and analysis (after air stripping); and
- Air discharge sampling and analysis (influent to the CATOX unit) and effluent sampling and analysis (air discharge after the CATOX unit).

The performance monitoring for waters included the parameters included on the interim permit from the County of Monroe and included:

- EPA Wastewater - CFR 136 - Method 601 – Purgable Halocarbons;
- EPA Wastewater – CFR 136 – Method 602 – Purgable Aromatic Hydrocarbons;
- EPA Wastewater – CFR136 - Method 608 – PCBs and Pesticides;
- EPA Wastewater – CFR 136 – Method 625 – Base/Neutrals and Acid Extractables;
- Method 310.13 – Petroleum Products; and
- Method 150.1 – pH.

The performance monitoring for air emissions was performed by EPA Method TO-14A – VOCs in Air.

6.2.2 Monthly Status Compliance Reporting

During the 155 calendar days of O&M services, Tyree provided EEEPC with monthly status compliance reports on treatment system operations. These reports were required to be submitted by the 10th of the following month to NYSDEC and the permit agencies and were to contain the following details:

- O&M activities and status;

- Updated operations and maintenance logs;
- Technical support activities;
- Health and safety activities and problems;
- Planned and future activities and schedules for completion;
- Monitoring of operating equipment, including influent flow rates, totalizer flow readings, differential pressures on the air stripper, and AS/SVE pressures;
- Groundwater elevations from the piezometers and groundwater monitoring wells; and
- Utility readings, including gas and electric.

The results of the 155 calendar days of O&M services are further described in the discussion of Tyree's Final Status Report received by EEEPC March 20, 2003. The full report of operations and monitoring was submitted by Tyree and reviewed for contract compliance. EEEPC provided a separate and independent review of the O&M service manual in January 2003. The Final O&M Manual document was transmitted under separate cover to NYSDEC's project manager in July 2003. Due to its size, the O&M document has not been included in this Closure Certification Report.

6.3 Treatment System Training

In accordance with supplementary specifications (11200 – General Provisions - Process of Section XI of the Supplementary Specifications), training of future O&M personnel was required. Training was provided by Tyree and NEEP personnel in March 2003. EEEPC, Lu, and Niagara Environmental Dynamics attended the training.

The qualifications of the contractors' training staff, determined through the shop drawing review process, were submitted, and a training program and schedule were developed to instruct future personnel on the O&M treatment system and ancillary equipment.

The training program was performed on March 2, 2003, at the treatment facility. The training instructed the personnel in hands-on operation and preventive maintenance procedures for each piece of equipment.

6.4 O&M Manuals

As required by the Contract Documents, Tyree provided system O&M data in the form of instructional manuals for use by NYSDEC's personnel following the first five months of O&M requirements outlined within the Contract.

The manual included all product-related information and documents for the equipment installed and/or modified in the field. The manual also was to include all data as directed by current regulations of any relevant government agency.

The submittal schedule of the document to EEEPC per the Supplementary Specification (Section 01600) was as follows:

- Outline of O&M procedures and information at 50% construction completion (under Separable Part A of the Contract);
- Draft O&M plan submitted prior to 90% of the construction was completed (under Separable Part A of the Contract);
- Draft final O&M plan submitted one week following the 30-day start-up period (under Separable Part B of the Contract); and
- Submission of updated O&M procedures and information plan prior to the end of the 155 days of system operation.

The Contractor's document submittals were usually late. The actual schedule of interim submissions by Tyree to finalize the O&M manual and responses by EEEPC was as follows:

- June 6, 2002: Draft Project O&M manual submitted by Tyree;
- September 17, 2002: Review comments of the O&M manual outline by EEEPC;
- December 10, 2002: Resubmission of draft detail O& M manual by Tyree;
- February 18, 2003: Review comments of draft details of O&M manual by EEEPC;
- March 17, 2003: Draft Final O &M document submitted by Tyree; and
- July 3, 2003: The final document submittal was reviewed for final acceptance by EEEPC.

6.5 Results of 155 Calendar Days of System O&M

As required by the Contract Documents (Separable Part C), the final status report was issued by Tyree to EEEPC after completion of 155 calendar days of operation. The final report summarizing the status of the treatment system and ancillary support equipment was received by EEEPC from Tyree on March 12, 2004. The reason for the delay in the submittal of the final report was the late submission of Tyree's individual November and December 2002 O & M reports. Preliminary analytical reports were issued to EEEPC in December 2002 and January 2003, but no official final monthly report was issued. The delay in submitting the final analytical results and report was a result of nonpayment of services by Tyree to the analytical laboratory. Upon resolution of payment with the laboratory, the final reports were officially submitted by Tyree on December 4 and 17, 2003. In addition, until the resolution of Tyree's Equitable Adjustment Request dated May 16, 2003, the Separable Part C report could not be finalized.

The following is a summary of Tyree's operational phase work for this report:

- The treatment system operated 72.7% of the time during the contract period. The system was less than 60% operational during the months of December 2002 and January 2003 because of low-pressure resulting from freezing water in the air stripper trays and restricted air flows to the CATOX unit. Operational up-time was less than 50% in February 2003 and only 19% in March 2003 for reasons mentioned above.

- Approximately 960,000 gallons of groundwater were treated through the system from August 27, 2002, to March 13, 2003. Approximately 46.6 pounds of VOCs were removed by the air stripper and CATOX unit based on calculations from analytical results and flows.

- Though the system operated less than 100% of the time, the quantity of treated discharges from the system were in compliance for effluent discharge limits for the 155 days of O&M services.

A copy of the report is provided as Appendix CC.

6.6 Separable Part C – Substantial Completion

On February 23, 2003, Tyree requested a Separable Part C Substantial Completion inspection. In accordance with the Contract Documents, Section VIII, Article 13.6, EEEPC and NYSDEC performed the inspection on March 13, 2003, to evaluate whether substantial completion of the separable part of work was achieved and if any incomplete work remained with the separable part.

On March 27, 2003, as result of the inspection performed by EEEPC, Lu Engineers, and Tyree representatives on March 13, 2003, a certificate of Substantial Completion of Separable Part C was issued to Tyree for signature and acceptance.

The certificate, besides establishing the completion of the separable part, included a list of incomplete work items, including assessed costs to be held from payment until completed. As a part of the document, a completion schedule was requested from Tyree for the completion of all outstanding items. Tyree submitted the schedule request for project completion on May 2, 2003, which was accepted by EEEPC. As with previous Separable Part certificates for Substantial Completion, Tyree would not sign the certificate. A copy of the certificate of Substantial Completion of Separable Part C and finalized punch list items for all Separable Parts under the Contract is provided as Appendix DD.

The contract was officially completed and ready for closure on May 20, 2004.

6.7 Final Project Completion

Correspondence from Tyree was received by NYSDEC on July 23, 2003, notifying them that the work for the entire contract was complete. A final completion letter from NYSDEC is provided in Appendix EE.

6.8 Equipment and Product Warrantee and Guarantees

As part of the Contract Documents, Tyree was required to provide warrantee and guarantees for a number of pieces of equipment to be delivered to EEEPC. All warranties and guarantees for products and equipment covered under the contract are provided in Appendix FF.

7 Issues and Changes to the Contract

7.1 Contractor

7.1.1 Project Schedule

In accordance with the Contract Documents (Section VI – Agreement – Attachment A – Separable Parts of Work) the project was broken down into the following separable parts, or milestones:

- Separable Part A – Construction - 120 days from Notice to Proceed;
- Separable Part B – Treatment System Startup – 60 days after completion of Separable Part A;
- Separable Part C - Operation and Maintenance – 155 days after completion of Separable Part B; and
- Final Completion – 60 days after completion of Separable Part C.

The overall project was required to be completed 365 calendar days from issuance of the Notice to Proceed, which was officially issued by NYSDEC on May 23, 2001.

The initial schedule was submitted by Tyree at the preconstruction meeting on May 23, 2001 (the preconstruction meeting minutes and project schedule are presented in Appendix L). The project schedule was reviewed and approved by EEEPC on June 11, 2001. EEEPC's review indicated that the project start-up date of June 4, 2001, needed to be adjusted to May 23, 2001 (i.e., the date of the Notice to Proceed). Otherwise, the schedule was approved in accordance with the contract time required in the Contract Documents.

The initial schedule submitted by Tyree indicated that Separable Part A work (construction) would be completed by September 7, 2001; Separable Part B (start-up) would be completed by November 5, 2001; and Separable Part C and Final Completion would be completed by June 7, 2002.

A comparison of the proposed schedule and the actual schedule is provided in Table 7-1.

Table 7-1 Tyree's Construction Schedule: Planned Versus Actual*

Separable Parts	Days by Contract	Estimated Completion Dates Based on NTP**	Tyree's Proposed Schedule	Days Proposed by Tyree	Tyree's Actual Schedule***	Tyree's Actual Days
Part A	120	9/20/01	9/7/01	107	6/24/02	397
Part B	60	11/19/01	11/5/01	60	9/21/02	89
Part C	155	4/24/02	4/11/02	155	2/23/03	155
Final	30	5/24/02	5/11/02	30	5/2/04****	69
Totals	**365**			**352**		**710**

* Tyree's Actual Schedule includes time given as a result of approved PCOs/COs.
** Notice to Proceed established as May 23, 2001.
*** Based on actual Substantial Completion of each Separable Part.
**** Based on 20 additional days from date of Denial of Request for Equitable Adjustment -April 13, 2004.
Key:
NTP = Notice to Proceed.

As a result of Tyree's critical path schedule delays in submitting shop drawings (Sheeting and Shoring Plans), hiring unqualified subcontractors (Bedrock Construction for installation of pumping wells), changing subcontractors (Stevens Paving versus Wesley Construction), changing site superintendents, and normal asphalt plant shutdown during the winter season, the length of the project exceeded the contract time by almost 100%.

While a number of cost and time PCOs were issued, no time recovery on the established construction schedule could be made up as a result of the critical loss of scheduled tasks created by Tyree in Separable Part A. These items included delays in critical shop drawing submittals, delays caused by hiring unqualified subcontractors, and delays in asphalt paving installation. The contract was exceeded by a total of 335 days. This figure was reduced by 96 days because paving could not be performed during winter months. The total number of days to be used for the assessment of liquidated damages was, therefore, reduced to 239 (see Appendix TT).

7.1.2 Project Requests for Information (RFIs)

The procedures establishing how requests for project information and clarifications on technical project items were reviewed by NYSDEC with Tyree at the initial preconstruction meeting. Tyree submitted several formal written RFIs to EEEPC throughout the course of the project. Many were requests for clarifications or interpretations of the Contract Documents or Drawings. None of the RFIs presented by Tyree resulted in project cost increases or time delays.

Four RFIs were generated by EEEPC for either information on the progress of a specific Tyree work procedure or to gain additional information on non-specified products used with the collection and treatment system. The 39 project-related RFIs generated by Tyree or EEEPC during the project were responded to during

the contract. Of the 39 RFIs, only three resulted in PCOs. Four RFIs additional were written by EEEPC for clarification on paving and treatment trailer set up. All other RFIs were generated by Tyree seeking further clarification and understanding of the technical specification requirements. The log summarizing all project RFIs is included in Appendix GG.

7.1.3 Project Potential Change Orders (PCOs)

The procedure for submitting PCOs was reviewed by NYSDEC with Tyree at the preconstruction meeting. Tyree submitted 38 PCOs to EEEPC to perform work they determined not to be included in the Contract Documents and out of the original scope of work. The PCOs were processed and reviewed by EEEPC in accordance with Section VIII – General Conditions, Article 9 – Changes in the Work of the Contract Documents. The PCOs were either returned for additional information, accepted, or rejected. Twenty-five PCOs were accepted by EEEPC where cost and time affected the final project cost, and 13 PCOs were rejected. Many PCOs could not be finalized due to a lack of proper documentation, confirmation of work actually performed based on oversight review, and mathematical errors by Tyree. PCOs were not finalized until all proper documentation and corrected costs had been received from Tyree.

A log summarizing all project PCOs is presented as Appendix HH. The log includes dates and descriptions of changes and/or additions to the scope of work and their impacts on the project cost and schedule.

7.1.4 Project Change Orders (COs)

Three change orders (COs) for this project were approved by NYSDEC and executed by the New York State Office of the State Comptroller (NYSOSC). A summary of the project COs is provided in Table 7-2. Some of the original quantities provided in the bid form were adjusted to match the actual quantities that were necessary and installed during construction activities. The change in quantities was primarily due to the fact that the actual site conditions encountered during excavation work and systems construction were different from those anticipated during the project design phase and project start-up phase.

Table 7-2 Summary of Project Change Orders, Davis Howland Oil Company Site

Change Order	Date Executed*	Major Changes	Value (in dollars)	Additional Contract Days
1	November 1, 2001	■ Additional drum disposal ■ Additional site clearing and cleanup ■ Unsafe roofing removal ■ Additional well decommissioning	$12,234.00	9

Table 7-2 Summary of Project Change Orders, Davis Howland Oil Company Site

Change Order	Date Executed*	Major Changes	Value (in dollars)	Additional Contract Days
2	July 16, 2002	■ Removal of additional substructure chamber ■ Security lights ■ Additional survey requirements ■ SVE line spoils disposal ■ Disposal of oversized spoils ■ Disposal of Area C soils ■ Deletion of hazardous soils for disposal ■ Engineer's overtime services	$98,211.68	57
3	May 10, 2004	■ Deletion of Geotextile ■ Site Prep – access controls ■ Asphalt cover increase ■ SVE piping increase ■ Analytical increase ■ Decrease in waters ■ Liquidated damages	($71,645.27)[1]	5

*Executed by the New York State Controller.

[1] Includes the recovery of project liquidated damages in Change Order No. 3 of $91,025

Due to Tyree's late submission of supporting documentation, delays were encountered in finalizing COs No. 2 and No. 3.

EEEPC issued CO No. 1 on September 9, 2001, which increased the cost of the contract by $12,234 and the project schedule by nine calendar days. CO No.1 was executed and approved by NYSDEC on November 16, 2001. CO No. 2 was issued by EEEPC on May 30, 2002, which increased the cost of the contract by $98,211.68 and the contract time for Separable Part A by 57 days. CO No. 2 was executed and approved by NYSDEC on July 31, 2002. CO No. 3 was issued by EEEPC on March 23, 2003, upon resolving the Equitable Adjustment Request, and decreased the cost of the contract by $71,645.27 and increased the project schedule by 5 calendar days. The overall contract cost at completion for remedial construction, treatment equipment start-up services, and O&M services was $1,308,101.54. The final contract was $38,800.41 over the original bid amount of $1,269,301.13, an increase of 3.057% over the original bid amount. Copies of the executed COs are provided in Appendix W, (II-1, II-2, and II-3).

7.1.5 Completion of Separable Parts A, B, and C

Official substantial completion of Separable Part A (construction) occurred on June 24, 2002. As a result of the inspection of Separable Part A performed on July 24, 2002, EEEPC developed a list of incomplete work (31 items) and the costs associated with their completion. NYSDEC issued the Certificate of Substantial Completion - Separable Part A to Tyree on August 6, 2002. The Certificate of Substantial Completion – Separable Part A was never signed or returned by Tyree, but a schedule was developed and negotiated with Tyree for completion of the remaining work items. Due to Tyree's failure to complete Separable Part A

within the contract schedule, liquidated damages were reviewed and assessed by NYSDEC at project completion.

Official substantial completion of Separable Part B (equipment start-up) occurred on September 21, 2002. The Separable Part B inspection performed on September 26, 2002, resulted in another incomplete work list (72 items), along with the outstanding list of incomplete work from Separable Part A. NYSDEC issued the Certificate of Substantial Completion - Separable Part B to Tyree on October 4, 2002. The Certificate of Substantial Completion - Separable Part B was never signed or returned by Tyree, but a schedule was developed and negotiated with Tyree for completion of the remaining work items. Due to Tyree's delays in completing Separable Parts A and B, liquidated damages were assessed by NYSDEC at project completion.

Project substantial completion of Separable Part C and Final Completion (O&M services) occurred on February 23, 2003. The Separable Part C inspection performed on March 13, 2003, resulted in another incomplete work list (67 items), along with the outstanding list of incomplete work from Separable Parts A and B. NYSDEC issued the Certificate of Separable Part C Completion to Tyree on March 27, 2003. The Certificate of Substantial Completion for Separable Part C was never signed or returned by Tyree, but a schedule was developed and negotiated with Tyree for completion of the remaining work. Due to Tyree's failure to complete Separable Parts A, B, and C within the contract schedule, liquidated damages were assessed by NYSDEC at project completion.

Final Contract Completion

Per the requirements of the Contract Documents, the project was required to be completed within 365 calendar days of issuance of the Notice to Proceed. Because of delays caused by Tyree, a total of 109 calendar days in liquidated damages were assessed under Separable Part A, 29 calendar days were assessed under Separable Part B, and 101 calendar days were assessed under Separable Part C and Final Completion (O&M services). Seventy-one calendar days were allotted for the PCOs submitted by Tyree and accepted by NYSDEC. None of the Substantial Completion Certificates issued for each separable part designated in the contract were ever signed by Tyree.

7.2 Engineer – Design

7.2.1 General

The design engineer contracted by NYSDEC for this project was ENSR of Rochester, New York (ENSR). ENSR prepared the Contract Documents entitled *Davis-Howland Oil Company Site, Site Number 8-28-088, City of Rochester, Monroe County, New York* (September 2000).

EEEPC was issued the work assignment after ENSR's Standby Superfund contract with NYSDEC expired. ENSR was occasionally consulted by NYSDEC and EEEPC project engineers for clarification on the intent of the design and construc-

tion details. Three addenda were issued with the Contract Documents during the bidding phase of the project.

Three addenda to the Contract Documents were issued on December 15, 2000, January 25, 2001, and February 21, 2001. Addendum No. 1 was primarily used to revise the bid date, Contract Document general administrative items, and other agency-provided updates. Addendum No. 2 provided a list of attendees at the pre-bid meeting, pre-bid questions and answers, and additional administrative updates. Addendum No. 3 addressed the technical issues and changes necessary to make the Contract Documents consistent for competitive bidding.

7.3 Engineer – Construction Management and Monitoring

7.3.1 Statement of Work (SOW)

The work performed by EEEPC under the work assignment included:

- **Task 1: Work Plan and Background Review**
  EEEPC developed a work plan for the overall scope of services, including background review work and a site visit to gain an understanding of the site remedy and construction constraints.

- **Task 2: Pre-award Services**
  EEEPC assisted NYSDEC's project manager in recording attendance, answering technical questions, and preparing draft minutes of the meeting for inclusion in the addenda; prepared new contract specifications and contract drawing details in preparation of addenda required by NYSDEC; reviewed the engineer's final construction cost estimate; and prepared easement maps as required for the project.

- **Task 3: Remedial Construction Management**
  The purpose of remedial construction management was to provide professional engineering services to properly monitor and inspect remedial construction projects. These services included acting as liaison between NYSDEC and the contractor on all issues related to the project, providing construction quality assurance, monitoring health and safety conditions, completing record keeping of all construction activities and operations, and monitoring waste disposals and maintenance activities during the contract period.

EEEPC provided the oversight and construction monitoring work through their master services agreement with Lu Engineers. Lu Engineers is a certified minority-owned business enterprise in New York State.

7.3.2 Budget Issues – Construction Oversight and Monitoring Services

As a result of the project's extended construction period, additional oversight expenses occurred. These increased costs primarily affected the oversight work performed by EEEPC and Lu Engineers under Separable Parts A, B, and C. Budget

changes were made through normal work assignment revisions and budget modifications in accordance with EEEPC's Standby Superfund Contract.

7.3.3 EEEPC Overtime Reimbursement

During the course of the project, overtime was incurred by EEEPC and Lu Engineers personnel. Overtime costs were reimbursable to the work assignment per the Contract Documents and through the contractor by CO. The overtime was approved by Tyree and included in the appropriate CO processed by EEEPC's project engineer.

CO No. 2 included 127.5 hours of overtime for Lu Engineers for reimbursable costs to the work assignment. The reimbursable costs amounted to $7,832.09. For CO No. 3, 28 hours of overtime were accrued by Lu Engineers at a reimbursable cost of $1,512.81 to the work assignment. The total cost of reimbursable overtime to the contract amounted to $9,344.90.

7.3.4 Project Progress Meetings

During the project construction period (Separable Parts A, B, and C), progress meetings were held to assess the progress of the project relative to the requirements of the Contract Documents and deliverables required for project completion. Twenty-one project progress meetings were held in which a prepared agenda was developed for the meeting (see Table 7-3).

Table 7-3 Project Progress Meetings

Meeting No.	Date	Location
Pre-Construction	5/23/2001	Albany, New York
1	6/7/2001	Davis Howland, Rochester, New York
2	6/21/2001	Davis Howland, Rochester, New York
3	7/9/2001	Davis Howland, Rochester, New York
4	7/19/2001	Davis Howland, Rochester, New York
5	8/2/2001	Davis Howland, Rochester, New York
5A	8/8/2001	Davis Howland, Rochester, New York
6	8/22/2001	Davis Howland, Rochester, New York
7	9/5/2001	Davis Howland, Rochester, New York
8	9/20/2001	Davis Howland, Rochester, New York
9	10/11/2001	Davis Howland, Rochester, New York
10	10/25/2001	Davis Howland, Rochester, New York
11	11/9/2001	Davis Howland, Rochester, New York
12	11/29/2001	Davis Howland, Rochester, New York
13	4/11/2002	Davis Howland, Rochester, New York
14	4/25/2002	Davis Howland, Rochester, New York
15	5/9/2002	Davis Howland, Rochester, New York
16	5/29/2002	Davis Howland, Rochester, New York
17	6/13/2002	Davis Howland, Rochester, New York
18	8/22/2002	Davis Howland, Rochester, New York
19	9/26/2002	Davis Howland, Rochester, New York
20	12/20/2002	Davis Howland/Lu Engineers, Rochester, New York

Each meeting was chaired either by the project manger from EEEPC or NYSDEC, and minutes of the meeting were taken. Meeting minutes were then prepared and issued for review and approval at the next scheduled meeting. Comments or amendments to the previous meeting minutes were written or documented for the next meeting. Copies of the project progress meeting minutes are provided in Appendix JJ.

7.3.5 Project Photo-documentation

During the project construction period (Separable Parts A and B), photo-documentation was provided by EEEPC and Tyree. Photos provided by Tyree are presented in Appendix KK. (Only a limited number of project photos were provided by Tyree as a result of computer problem encountered in April 2002.)

7.3.6 Project Daily Construction Monitoring Reports

EEEPC's work assignment included providing daily monitoring reports of contractor activities during the remedial construction period. Lu Engineers provided the oversight monitoring and daily reporting for all remedial activities. Copies of all daily reports completed during the remedial construction period and photo documentation are provided in Appendix LL. (Note: Only electronic copies of the daily inspection/monitoring reports are provided in this Closure Certification Report.)

7.4 Contract Costs

7.4.1 Original Bid Quantities and Costs

The original bid quantities and costs associated with the DHOC site remediation project are presented in Table 7-4.

Table 7-4 Original Bid Quantities and Contract Costs

Item	Contract Quantity	Units	Description	Cost/Unit ($)	Overall Contract Cost ($)
LS-1	1	LS	Site Preparation	59,562.00	59,562.00
LS-2	1	LS	Site Services	38,395.00	38,395.00
LS-3	1	LS	Treatment Trailer and Equipment	296,295.00	296,295.00
LS-4	1	LS	UST Removal and Disposal	3,003.00	3,003.00
LS-5	1	LS	Site Electric	32,852.00	32,852.00
UC-1	180	Days	Health and Safety	55.00	9,900.00
UC-2	510	Tows	Excavation and Disposal of Contaminated Soils in Areas A, B, and C, and UST	48.52	24,745.20
UC-3	137	Tows	Hazardous Soil Removal and Disposal	223.50	30,619.50
UC-4	0	–	Not Used	0.00	0.00
UC-5	300	CY	Clean Fill	24.48	7,344.00
UC-6	5,200	SY	Asphaltic Cover	22.15	115,180.00
UC-7	9	EA	Well Abandonment	1,072.12	9,649.08
UC-8	35	EA	Exterior Air Sparge Head	1,329.00	46,515.00

Table 7-4 Original Bid Quantities and Contract Costs

Item	Contract Quantity	Units	Description	Cost/Unit ($)	Overall Contract Cost ($)
UC-9	46	EA	Air Sparge Points	541.00	24,886.00
UC-10	6	EA	Soil Vapor Extraction Point	845.00	5,070.00
UC-11	1,100	LF	Air Sparge and Soil Vapor Extraction Pipe Trench	26.31	28,941.00
UC-12	1,500	LF	Air Sparge and Soil Vapor Extraction Pipe	24.81	37,215.00
UC-13	655	LF	Well Discharge Line	14.75	9,661.25
UC-14	1,240	LF	Soil Vapor Extraction Trench (Type 1)	49.72	61,652.80
UC-15	500	LF	Soil Vapor Extraction Trench (Type 2)	216.80	108,400.00
UC-16	130	LF	Soil Vapor Extraction Trench - Concrete Surface	128.70	16,731.00
UC-17	5	EA	Well Head	2,725.00	13,625.00
UC-18	2	EA	Blasted Bedrock - Recovery Well	16,482.00	32,964.00
UC-19	950	LF	Interior Piping	36.82	34,979.00
UC-20	13	EA	Interior Above-grade AS and SVE Points	1,315.00	17,095.00
UC-21	180	LF	Gravity Drain	60.15	10,827.00
UC-22	30		Pavement Restoration - City ROW	60.00	1,800.00
UC-23	500	SF	Sidewalk Restoration - City ROW	14.00	7,000.00
UC-24	30	Days	Treatment System Start-up	885.00	26,550.00
UC-25	155	Days	Treatment System O&M	200.00	31,000.00
UC-26A	5	EA	Lab Samples	122.00	610.00
UC-26B	5	EA	Lab Samples	144.00	720.00
UC-26C	2	EA	Lab Samples	100.00	200.00
UC-26D	40	EA	Lab Samples	194.00	7,760.00
UC-26E	46	EA	Lab Samples	11.10	510.60
UC-26F	22	EA	Lab Samples	13.35	293.70
UC-26G	46	EA	Lab Samples	14.50	667.00
UC-26H	26	EA	Lab Samples	44.35	1,153.10
UC-26I	26	EA	Lab Samples	7.80	202.80
UC-26J	26	EA	Lab Samples	8.90	231.40
UC-26K	5	EA	Lab Samples	11.00	55.00
UC-26L	5	EA	Lab Samples	7.20	36.00
UC-26M	24	EA	Lab Samples	99.75	2,394.00
UC-26N	8	EA	Lab Samples	83.50	668.00
UC-26O	15	EA	Lab Samples	166.30	2,494.50
UC-26P	16	EA	Lab Samples	155.20	2,483.20
UC-26Q	10	EA	Lab Samples	211.00	2,110.00
UC-26R	5	EA	Lab Samples	388.00	1,940.00
UC-26S	8	EA	Lab Samples	332.50	2,660.00
UC-26T	8	EA	Lab Samples	166.25	1,330.00
UC-26U	5	EA	Lab Samples	221.60	1,108.00
UC-26V	8	EA	Lab Samples	111.00	888.00
UC-26W	5	EA	Lab Samples	167.00	835.00

Table 7-4 Original Bid Quantities and Contract Costs

Item	Contract Quantity	Units	Description	Cost/Unit ($)	Overall Contract Cost ($)
UC-26X	104	EA	Lab Samples	188.50	19,604.00
UC-27	6	EA	Piezometer Point	1,425.00	8,550.00
UC-28	460	LF	Trench Excavation - deeper than 36 inches	33.00	15,180.00
UC-29	1,600	Tons	Compacted Aggregate Stone Base Course	18.10	28,960.00
UCA-1	16,000	Per 1,000 Gallons Units	Treated Discharge Water	1.45	23,200.00
					1,269,301.13

7.4.2 Contract Closeout Quantities and Costs

Final project closeout quantities and costs are presented in Table 7-5.

Table 7-5 Final Project Closeout Quantities and Costs

Item	Final Quantity	Units	Description	Cost/Unit ($)	Overall Contact Cost ($)
LS-1	1	LS	Site Preparation	218,929.66	218,929.66
LS-2	1	LS	Site Services	39,085.00	39,085.00
LS-3	1	LS	Treatment Trailer and Equipment	298,671.00	298,671.00
LS-4	0.5	LS	UST Removal and Disposal	3,003.00	1,501.50
LS-5	1	LS	Site Electric	32,852.00	32,852.00
LS-6	1	LS	Engineers' Overtime	-7,832.09	-7,832.09
LS-7	1	LS	Additional Engineers' Overtime	-1,512.81	-1,512.81
LS-8	1	LS	Liquidated Damages	-91,025.00	-91,025.00
UC-1	180	Days	Health and Safety	55.00	9,900.00
UC-2	630	Tons	Excavation and Disposal of Contaminated Soils in Areas A, B, and C, and UST	48.52	30,567.60
UC-3	0	Tons	Hazardous Soil Removal and Disposal	223.50	0.00
UC-4	0	–	Not Used	0.00	0.00
UC-5	343	CY	Clean Fill	24.48	8,396.64
UC-6	5,813.7	SY	Asphaltic Cover	22.15	128,774.00
UC-7	8	EA	Well Abandonment	1,072.12	8,576.96
UC-8	36	EA	Exterior Air Sparge Head	1,329.00	47,844.00
UC-9	47	EA	Air Sparge Points	541.00	25,427.00
UC-10	7	EA	Soil Vapor Extraction Point	845.00	5,915.00
UC-11	1,530	LF	Air Sparge and Soil Vapor Extraction Pipe Trench	26.31	40,254.30
UC-12	1,537	LF	Air Sparge and Soil Vapor Extraction Pipe	24.81	38,132.97
UC-13	983	LF	Well Discharge Line	14.75	14,499.25
UC-14	732	LF	Soil Vapor Extraction Trench (Type 1)	49.72	36,395.04
UC-15	479	LF	Soil Vapor Extraction Trench (Type 2)	216.80	103,847.20

Table 7-5 Final Project Closeout Quantities and Costs

Item	Final Quantity	Units	Description	Cost/Unit ($)	Overall Contact Cost ($)
UC-16	93	LF	Soil Vapor Extraction Trench - Concrete Surface	128.70	11,969.10
UC-17	5	EA	Well Head	2,725.00	13,625.00
UC-18	2	EA	Blasted Bedrock - Recovery Well	16,482.00	32,964.00
UC-19	836	LF	Interior Piping	36.82	30,781.52
UC-20	19	EA	Interior Above-grade AS and SVE Points	1,315.00	24,985.00
UC-21	193	LF	Gravity Drain	60.15	11,608.95
UC-22	30	LF	Pavement Restoration - City ROW	60.00	1,800.00
UC-23	337	SF	Sidewalk Restoration - City ROW	14.00	4,718.00
UC-24	30	Days	Treatment System Start-up	885.00	26,550.00
UC-25	173	Days	Treatment System O&M	200.00	34,600.00
UC-26A	12	EA	Lab Samples	122.00	1,464.00
UC-26B	0	EA	Lab Samples	44.00	0.00
UC-26C	0	EA	Lab Samples	100.00	0.00
UC-26D	30	EA	Lab Samples	194.00	5,820.00
UC-26E	6	EA	Lab Samples	11.10	66.60
UC-26F	0	EA	Lab Samples	13.35	0.00
UC-26G	29	EA	Lab Samples	14.50	420.50
UC-26H	0	EA	Lab Samples	44.35	0.00
UC-26I	0	EA	Lab Samples	7.80	0.00
UC-26J	23	EA	Lab Samples	8.90	204.70
UC-26K	0	EA	Lab Samples	11.00	0.00
UC-26L	1	EA	Lab Samples	7.20	7.20
UC-26M	4	EA	Lab Samples	99.75	399.00
UC-26N	48	EA	Lab Samples	83.50	4,008.00
UC-26O	15	EA	Lab Samples	166.30	2,494.50
UC-26P	48	EA	Lab Samples	155.20	7,449.60
UC-26Q	15	EA	Lab Samples	211.00	3,165.00
UC-26R	5	EA	Lab Samples	388.00	1,940.00
UC-26S	25	EA	Lab Samples	332.50	8,312.50
UC-26T	25	EA	Lab Samples	166.25	4,156.25
UC-26U	5	EA	Lab Samples	221.60	1,108.00
UC-26V	25	EA	Lab Samples	111.00	2,775.00
UC-26W	5	EA	Lab Samples	167.00	835.00
UC-26X	85	EA	Lab Samples	188.50	16,022.50
UC-27	6	EA	Piezometer Point	1,425.00	8,550.00
UC-28	567	LF	Trench Excavation - deeper than 36 Inches	33.00	18,711.00
UC-29	1,962	Tons	Compacted Aggregate Stone Base Course	18.10	35,512.20
UCA-1	1,296	Per 1,000 Gallons Units	Treated Discharge Water	1.45	1,879.20
			Contract Work Total		**1,308,101.54**

As discussed in Section 7.1.4, the overall contract cost at completion of remedial construction, treatment equipment start-up services, and O&M services was $1,308,101.54. The final contract was $38,800.41 over the original bid amount of $1,269,301.13, an increase of 3.057% over the original bid amount.

7.4.3 Contractor Application Payments (CAP)

A total of ten CAPs and one release of final retainage were submitted for Contract No. D004181. Table 7-6 provides CAP information from project inception to project completion. The table includes notations where COs were included in each CAP request. Copies of all CAPs for the project are provided in Appendix MM.

Table 7-6 Contractor (Tyree) Application for Payment (CAPs)

CAP No.	Dates of Coverage	Amount (in Dollars - $)**	Change Order ($)	Encumbered Liens	Liquidated Damage or Incomplete Work Assessment ($)
1	5/23/01- 6/15/01	67,026.16	None	None	-
2	6/16/01 – 8/25/01	205,276.43	None	None	-
3	8/26/01 – 9/29/01	180,929.12	None	None	-
4	9/30/01 – 11/30/01	102,212.20	12,234.00	None	-
5	12/1/01 – 12/31/01	Rejected[1]	-	-	-
5 (New)	12/1/01 – 6/15/02	64,838.45	None	None	-
6	6/16/02 – 7/30/02	415,288.45	98,211.68	None	134,800[2]
7	8/1/02 – 8/30/02	20,402.48	None	None	-
8	8/31/02 – 9/15/02	Rejected[3]	-	-	52,950
9	8/1/02 – 1/15/03	Rejected[4]	-	-	106,250
10	1/16/03 – 5/1/04	51,923.17	(71,645.27)	None	[5]
Release of Retention	5/2/04 – 6/11/04	65,405.08	None	None	-
Totals	**-**	**1,308,101.54**	**Net 38,800.41**	**None**	**0.00**

* Original Contract Amount - $1,269,301.13.

** Payment less 5% retainage.

1 CAP No. 5 request was rejected because it exceeded the 50% measurement and payment clause on discrete bid items for Substantial Completion of Separable Part A.

2 CAP No. 6 request was reduced because of the potential assessment of liquidated damages of $57,000 and assessed incomplete work in Separable Part A of $77,800, for a total reduction of $134,800.

3 CAP No. 8 request was rejected because the amount being withheld for potential liquidated damages and uncompleted work assessment exceeded the CAP requested amount.

4 CAP No. 9 request was rejected because the amount being withheld for potential liquidated damages and the uncompleted work assessment exceeded the CAP requested amount.

5 CAP No. 10 request included liquidated damages as a result of the denial of the request for Equitable Adjustment by NYSDEC. Waiver of all liens satisfied upon submittal of CAP No. 10.

On numerous occasions, mechanics liens were filed with the New York State Controller's office by subcontractors that had been hired by Tyree for portions of project-related work. The amount of these liens was subtracted from the CAP payment until restitution or a waiver from the subcontractor was received by NYSOSC. Upon completion of the project, a Waiver of Liens was requested from

all subcontractors associated with the project. Appendix NN provides waiver information received from all subcontractors associated with Tyree's contract for the DHOC site remediation project.

7.4.4 Payment Issues

7.4.4.1 Pollution Liability Insurance

During the bid process, all contractors providing bids were requested to provide Pollution Liability Insurance (PLI) costs as required by Article 4 – Insurance of the General Conditions of the Contract Documents. These costs are provided in the bid for use by NYSDEC in determining whether obtaining PLI for the project is in the best interest of NYSDEC.

In the case of the DHOC project, Tyree provided no cost for the purchase of PLI for the project. In providing a $0.00 cost for PLI, NYSDEC then exercised its right, by contract, to purchase the PLI for the project; however, Tyree could not claim additional costs for this item under the contract.

7.4.4.2 Cash Flow Issues

Due to extensive delays in the completion of Separable Part A, cash flow apparently became an issue for Tyree. Per the requirements of the Contract Documents, of the 30 bid items in the contract, 16 bid items could not exceed 50% of the pay item until Substantial Completion of Separable Part A was achieved.

As initially proposed by Tyree, Separable Part A would be completed on or ahead of schedule within 120 days from the Notice to Proceed (September 20, 2001). However, Substantial Completion of Separable Part A was not achieved until June 24, 2002. CAP No. 5 was rejected because all 16 items exceeded the discrete 50% payment clause. Once Substantial Completion was achieved in June 2002, CAP No. 6 was issued for payment in the amount of $415,288.45, or approximately 25% of the total project amount.

The delays in Substantial Completion of Separable Part A are discussed in Section 7.1.1.

Additional cash flow issues mounted as a result of NYSDEC exercising the right to assess liquidated damages for the delays caused by Tyree and numerous incomplete work items that were assessed costs until completion.

7.5 General Project Issues

7.5.1 Additional Easements for Construction

During EEEPC's review of the Contract Documents and drawings, it became apparent that the extent of the limits of remedial work was not consistent with the work requested to be performed. Specifically, the extent of the exterior AS/SVE system to be installed was beyond the limit of work established in the Contract Documents and project drawings. NYSDEC was notified of this issue prior to issuance of the project Notice to Proceed to Tyree. The extension of the limits of

work affected construction on the CSX Transportation property. NYSDEC contacted CSX with an amended easement agreement on February 8, 2001. The additional easement was accepted and signed on March 30, 2001. Information regarding the expanded easement on the CSX property was then provided to Tyree on May 23, 2001. A copy of the additional easement acceptance is provided as Appendix OO.

7.5.2 Security Problems

Damage, theft, and vandalism to equipment and completed work were a continuous problem to Tyree during the course of the project. Unauthorized dumping of construction debris by others on the project site also took place on several occasions. Illegal entry often occurred at night or on weekends, when only part-time security was provided by Tyree or Arkenbright Security, Inc., of Rochester, New York (subcontractor). All costs associated with repairing completed work or replacing damaged or stolen equipment was absorbed by Tyree and/or its subcontractors.

Daily patrol reports were provided on second and third shifts, weekends, and holidays. Security reports were provided until Substantial Completion of Separable Part B, or until the site and treatment equipment was fenced and locked and all Tyree construction equipment was off-site. Copies of the security reports were received and reviewed by EEEPC and Lu Engineers. The security reports have not been provided as a part of this construction certification report.

7.5.3 Subsurface Excavation Challenges

Large items such as boulders, railroad ties, and construction debris were often discovered during trenching activities for the overburden groundwater pumping lines (discussed in Section 3.7) and the AS distribution system and SVE laterals. These unclassified materials had to be removed, resulting in the trenches being excavated beyond the trench cross-section limits and creating the potential for additional deep trench cave-ins. Bedrock Construction performed the excavation work and subsequently performed benching or shelving of each excavation to safely construct the required trench improvements for the overburden groundwater pumping system.

When constructing the SVE laterals in the interior of the former DHOC building, the large voids that were created damaged the existing concrete floor slab, which required additional select backfill and concrete restoration.

The excavated subsurface materials were intended for reuse in excavations as bedding for constructed utilities. The mix of railroad ties, unclassified non-uniform size stone, and other unusable debris prohibited the reuse of materials until they were screened and sized. To reduce the amount of imported materials used as utility backfill, a power screen was brought in under PCO (PCO No.23 – CO No. 2 – Item J) to size and extract undesirable debris from the on-site excavated spoil. After processing, the screened materials were acceptable for use as

utility backfill. The spoils from the screening process (i.e., railroad ties, oversized stone, concrete, and other debris) were disposed of under an approved waste profile at an approved disposal facility. The waste disposal tracking log provides the date, trucking information, and final disposal location of residual spoils from this phase of the project work. The additional project item disposal was provided in another PCO (PCO No. 27 – CO No. 2 – Item N.).

7.5.4 Additional UST

Upon excavation of the treatment system discharge line and the AS/SVE local lateral lines in the alley from Anderson Avenue to the treatment trailer, a previously unknown 500-gallon vertical heating tank was uncovered. The tank serviced the facility at 200 Anderson Avenue. Samples of residual liquids found near the tank were collected and evaluated for BTEX and other VOCs; the samples were found to contain low levels of BETX. The liquids were pumped into the on-site frac tanks for processing through the site remedial treatment system once it became operational. The soils around the tank were screened using PID instrumentation and found to be consistent with other native soils on site to be used for backfill. The soils surrounding the tank were then used with the other soils for the new utility discharge and treatment system lateral trenches. The excavated spoils were screened on-site for later use as trench backfill for the constructed utilities and pavement subgrade materials. The tank was excavated and remained on-site until residual vapors could be removed from the unit. The tank was then disposed of off-site, and its safe and regulated disposal was documented. A copy of the tank disposal record is provided in Appendix PP.

7.5.5 Fraculation (Frac) Tank Spills

Upon remobilization to the site in April 2002 after the winter shutdown, Tyree discovered that the flange on the discharge valve located at the end of the frac tank had cracked and that all but a very small amount (approximately 0.5 liter) of liquid had drained from the tank. The tank contained approximately 7,000 gallons of liquid when Tyree demobilized and left the site in January 2002. The liquid in the tank was groundwater dewatered from trenches during excavation activities. The water had not been previously sampled for disposal purposes. Potential contaminants, if any, in the groundwater included petroleum products and solvents. Tyree notified NYSDEC's Spill Hotline of the incident (Spill No. 0200542) and notified the frac tank supplier, Rain for Rent, of the cracked valve. A Rain for Rent technician came to the site to replace the valve and perform an inspection of the tank. Tyree collected samples of the residuals in the frac tank and submitted them to their subcontract laboratory for analysis. The analytical results provided on April 19, 2002, indicated positive hits for trichloroethene (5 micrograms per liter [µg/L]) and cis-1,2 –dichloroethene (41 µg/L). The spilled water had infiltrated into each previously installed manhole. Tyree pumped the water out of the manholes and into a smaller portable holding tank and then into the repaired frac tank. On May 7, 2002, after reviewing the analytical results, NYSDEC Region 8 officials requested analysis of additional soil samples from the immediate area and water samples from the closest monitoring well. The samples were collected by

Tyree on May 20, 2002, and the analytical results were submitted to NYSDEC Region 8 for final evaluation. On July 2, 2002, NYSDEC Region 8 determined that, based on the analytical results from the soil and monitoring well samples, no further corrective actions were required.

A second frac tank spill was discovered on August 20, 2002. The wing nuts on one of the man-way hatches located on the tank sidewall had been loosened by vandals, allowing approximately 2,000 gallons of liquid to escape. Tyree reported the spill to NYSDEC's Spill Hotline (Spill No. 0205282). Tyree collected a sample of the tank contents for analysis. The analytical results were submitted to NYSDEC Region 8 for review. The results were below regulatory levels, and no further action was required.

7.5.6 Critical Project Delays and Issues

7.5.6.1 Sheeting and Shoring Plans – Type 2 Trench and Pumping Line Construction

Concerns over the submittal of the critical path Sheeting and Shoring Plan for the deep pumping lines and the schedule for the excavation work were brought up at Progress Meeting No. 2, held on June 21, 2001. NYSDEC and EEEPC stated that no excavation work could be performed until shop drawings of the Sheeting and Shoring Plan had been reviewed and approved by EEEPC. The Sheeting and Shoring Plan was received on July 9, 2001. After being reviewed by EEEPC, the plan was returned to Tyree for revision and resubmission on July 17, 2001. The revised Sheeting and Shoring Plan addressed the initial comments and was resubmitted to EEEPC on July 26, 2001. The sheeting and shoring plan for the excavation of the pumping lines was approved by EEEPC for use on August 9, 2001. The delays in the critical path shop drawing submission by Tyree caused the project to be delayed by almost seven weeks. This late submission created a large delay in the overall project, which was never made up.

7.5.6.2 Pumping Line Construction (P-1, P-2, and P-3)

Bedrock Construction was hired by Tyree to perform the deep excavation work for construction of the overburden pumping lines. As discussed in the July 9, 2001, progress meeting (Progress Meeting No. 3), proper Occupational Safety and Health Administration (OSHA) certifications to work on hazardous waste sites had not been received from Bedrock Construction. It was discovered at Progress Meeting No. 4 (July 19, 2001) that the medical fitness and OSHA certifications for work on hazardous waste sites for Bedrock Construction's project personnel were out of date. Further delays were encountered because Bedrock Construction's employees required medical surveillance and refresher training before any work could be performed. At Progress Meeting No. 5 (August 2, 2001), it was determined that all the necessary medical and OSHA refreshers of Bedrock Construction's project personnel had been received (on July 31, 2001). The certifications were reviewed and accepted, allowing Bedrock Construction's personnel to work on-site. Work was initiated on August 9, 2001, almost five weeks later than Tyree's proposed schedule for the work of July 7, 2001.

7.5.6.3 Second Sheeting and Shoring – Alley Sanitary Sewer

A second Sheeting and Shoring Plan was required for the treatment system's sanitary sewer delivery system as a result of Tyree changing subcontractors from Bedrock Construction to John W. Danforth as discussed at Progress Meeting No. 7 (September 5, 2001). The plan was for deep excavation work to be performed in the Anderson Avenue right-of-way and down the alley. According to Tyree's schedule, the work was to be initiated on August 13, 2001. The second Sheeting and Shoring Plan was received by EEEPC on September 28, 2001, and was approved on October 1, 2001. Construction for the installation of the sanitary sewer service was initiated on October 2, 2001, almost six weeks later than originally planned in Tyree's schedule.

7.5.7 Certified Payroll Issues

EEEPC's oversight and monitoring process included the review of the prime contractor's and subcontractor's certified payrolls associated with the contract. The individual certified payrolls were extensively reviewed with regard to the hours and days spent on the project and the prevailing wage required under the contract established by the New York State Department of Labor, Prevailing Rate Compensation (PRC) determination for the DHOC site. PRC No. 0004712 for Monroe County determined the prevailing wage rates for individual construction staff and equipment operators.

EEEPC's field representative evaluated weekly certified payroll submissions from Tyree and approved subcontractors against the required prevailing wage and the hours each was on site. Certified payrolls from the following contractor and subcontractors were reviewed for compliance with the prevailing wage rates according to the guidelines under the New York State Department of Labor regulations:

- Tyree Organization Ltd, Latham, New York;
- Scaccia Construction Co., Inc., Dickson City, Pennsylvania;
- Nothnagle Drilling, Rochester, New York;
- O.M. Popli, LLS, Rochester, New York;
- Bedrock Construction Enterprises, Rochester, New York;
- Ancoma Mechanical Contractors, Inc, Rochester, New York;
- Stevens Paving, Inc., Rochester, New York;
- McGovern Electric, Inc., Castleton, New York;
- Atlas Fence, Inc., Rochester, New York;

- Wesley Construction, Inc., Victor, New York;
- John W. Danforth, Inc., Victor, New York; and
- New York State Fence Co., Inc., Hilton, New York.

7.5.8 Mechanic Liens

A number of mechanics liens were filed by subcontractors for nonpayment of incurred project costs or services provided. The official mechanics liens filed with the New York State Controller include:

- Corbett Management, Albany, New York – Waste Disposal;
- Steven Paving, Rochester, New York – Grading and Paving;
- Nothnagle Drilling, Rochester, New York – Drilling and Blasting;
- Ancoma Mechanical Contractors, Rochester, New York – Interior Piping;
- Atlas Fence, Inc., Rochester, New York – Fencing;
- Bedrock Construction Enterprises, Rochester, New York – Excavation Work - Pumping lines; and
- John W. Danforth, Inc., Victor, New York –Excavation and Piping work.

Tyree attempted to terminate their contract with Stevens Paving for non-performance. Stevens placed a mechanics lien on the project for nonpayment of services rendered.

A Waiver of Liens release was received by EEEPC in April 2004 for all major subcontracts associated with the DHOC site, Contract No. D004181. A copy of the Waiver of Liens log is provided as Appendix NN.

7.5.9 Replacement of Tyree's Project Manager and Site Superintendent

Tyree's project manager and site superintendent during the initial construction phase of the project (May 2001 to December 2001) was Mr. Jim Nowell. Mr. Nowell's qualifications were presented and reviewed along with the project work plan. The work plan was reviewed and approved by EEEPC on June 11, 2001. As a result of repeated delays with numerous construction items and poor coordination with subcontractors on the project, Mr. Nowell was replaced in December 2001. Tyree submitted Mr. Stephen Phelps as the new project manager and site superintendent in January 2002. Mr. Phelps previously handled administrative matters and acted as the assistant superintendent at times during 2001. Upon re-

view of Mr. Phelps credentials and previous work experience with the project, he was recommended by EEEPC and approved by NYSDEC to manage the project for Tyree in February 2002.

7.5.10 Miscellaneous Project Communications

7.5.10.1 Tyree Request for 30-Day Time Extension – Substantial Completion – Part A

As a result of the mounting issues associated project delays, Tyree submitted a request for a 30-day contract extension on September 25, 2001. The request stated that delays were encountered due to unforeseen conditions, including underground unknowns such as a buried tank, concrete structures, foundations, and railroad ties. There also were some design ambiguities in the Contract Documents prepared by ENSR regarding site grading, soil handling, and stockpiling of oversized materials that required resolution by EEEPC.

In the cases of the underground unknowns, PCOs were diligently developed and negotiated for the additional time and costs Tyree incurred. Tyree did not address in their request the delays that resulted from their late submittal of the Sheeting and Shoring Plan and the lack of 40-hour health and safety training and medical surveillance by their subcontractor in performance of critical path work items. Upon evaluation of the request by NYSDEC, a time extension was rejected on October 10, 2001.

7.5.10.2 Grading Issues of the Asphalt Cap Area

Site grading was an issue for Tyree as a result of the additional spoils generated by the screening of oversized materials, railroad ties, rails, and concrete from the area to be capped with asphalt. The initial surveys required in the Contract Documents were performed by Tyree to assess the amount of spoils remaining on site and to balance the spoils to minimize the amount of off-site disposal by the contractor. Upon excavation, it was determined that the subsurface contained materials undesirable for creating a homogenous zone for AS/SVE action. PCOs were developed to physically screen the undesirable materials and transport and dispose of the materials off-site. Section 7.5.3 discusses the oversized spoils associated with the project. The Contract Documents allowed Tyree to develop a grading plan that was beneficial to their operations and still allow drainage from the site. Tyree neither provided backfill to meet the contract Documents Grading Plan nor developed their own grading plan for review.

A special Progress Meeting (Progress Meeting No. 5A) was held on August 8, 2001, to clarify on-site spoil and grading issues. The meeting resulted in the performance of an additional survey to allow Tyree to effectively balance the remaining screened spoils to allow their incorporation into the final grading plan.

7.5.10.3 Treatment System and CATOX Operations by Tyree

During the five months of Separable Part C O&M services (September 12, 2002, to March 13, 2003), CATOX unit performance declined below the 80% uptime

required by the Contract Documents. Correspondence was received from Tyree on January 28 and February 14, 2003, in response to EEEPC's discussions regarding the lack of uptime of equipment operations. Tyree stated that technical difficulties with the CATOX unit had been encountered, and the unit was being evaluated by Tyree and the manufacturer. Tyree stated that there were design inefficiencies with the CATOX unit and integrated systems, and Tyree would no longer expend time and money to solve the issue. The extreme cold weather issues also were continuing to affect the uptime operations of the CATOX unit.

After consulting with Anguil Environmental, the CATOX unit manufacturer, EEEPC determined that Tyree's personnel lacked the experience to efficiently operate the unit and troubleshoot problem issues with the unit. NYSDEC accepted the final uptime operations of the treatment system and CATOX unit by Tyree. O&M services for the CATOX unit and the entire remedial system are now handled by EEEPC.

On March 13, 2003, Substantial Completion inspection of Separable Part C was performed. While uptime operations were not at 80%, future O&M services would be performed under EEEPC's current work assignment to resolve uptime operations issues.

7.5.11 Tyree's Request for an Equitable Adjustment (REA)

On May 16, 2003, NYSDEC and EEEPC received a Request for Equitable Adjustment (REA) from Tyree regarding project delays encountered during the DHOC site remedial work. The basis for Tyree's adjustment request was that delays encountered were beyond their direct control and were not contemplated at the time of bidding. The delays mentioned in the REA included:

- Delays in the work caused by PCOs that were approved by the Department (with corresponding time extensions);
- Delays that resulted from site grading issues;
- Delay caused by the cumulative effect of PCOs, both approved and denied, resulting in Tyree's work being pushed into the winter. Tyree was precluded from performing work during this period due to contractual restriction and seasonal procurement limitations;
- Delays caused by the decommissioning and winter protection of previously installed work;
- Delays caused by the removal of winter protection and re-commissioning of installed work after the winter period;
- Delays caused by the marginal ability of the native soils to reach the compaction percentage required by the contract; and

- Delays caused by over-inspection by the owner's representative in connection with site grading.

The document also requested a time extension and relief from any liquidated damages by Tyree, stating that the delays were beyond their control and were not caused by their management of operations. In addition, compensation for PCOs 30, 31, 32, and 33, previously denied on July 2, 2002, were requested to be reinstated. Details of the request are provided as Appendix QQ (text only).

On July 16, 2004, EEEPC prepared a final review of Tyree's REA for NYSDEC. Upon review of Tyree's request, EEEPC determined that the document and supportive exhibits lacked sufficient justification and essential or correct details for consideration of merit by NYSDEC. EEEPC believed that Tyree's delays resulted from the following actions, which were within Tyree's control:

- Failure to comply with conditions specified in the Contract Documents;
- Delays caused by Tyree's untimely performance of critical shop drawing submittals;
- Delays caused by switching approved subcontractors and hiring unqualified subcontractors;
- Delays caused by mechanics' liens from subcontractors; and
- Overly optimistic scheduling of project work completion.

On February 3, 2004, a meeting was held at the NYSDEC offices in Albany, New York, to present and discuss the issues in the Equitable Adjustment request. Attendees included project representatives from EEEPC (M. Steffan and D. Miller), EEEPC's resident site representative (Lu Engineers – R. Galasso), NYSDEC's project management (R. Knizek and D. Chiusano), Tyree's Construction Consultant – Alliance Construction Consultant, Inc. (R. Williams), and members of the Tyree Organization Ltd. (T. Tyree, P. Holloway, M. Wright, and S. Phelps).

At the meeting, Tyree representatives restated their request and concerns regarding the change in conditions issues and delays. Much of the discussion was about the scheduling and grading issues, for which Tyree requested relief. NYSDEC's response pointed out that, in all cases, Tyree controlled all efforts for the project, including hiring unqualified subcontractors (deep excavation work lacking required OSHA hazardous worker health and safety certifications), changing qualified subcontractors due to imposed mechanics liens (paving), and delays in critical path shop drawing submittals (sheeting and shoring plans).

After review of additional critical information presented by NYSDEC and EEEPC at that meeting, and based on Tyree's acceptance and approval of meeting minutes, prepared winter work schedules, and critical construction path delays, it was concluded that the REA lacked sufficient justification to merit further consideration. The meeting concluded with Tyree's understanding and acceptance that the claim had been invalidated based on factual information and documentation presented by NYSDEC and EEEPC.

A copy of EEEPC's letter and supportive documents refuting the Equitable Adjustment Claim submitted to NYSDEC is provided as Appendix RR.

An official response to the REA was prepared by NYSDEC's Mr. Edward Belmore, Director of Remedial Bureau D, Division of Environmental Remediation, on April 13, 2004 (see Appendix SS [cover letter only]). The conclusion reached upon review of the factual details presented by EEEPC and NYSDEC project managers was that, based on the circumstances related to the generation of the REA by Tyree, the REA did not provide technical justification nor met timeliness requirements under the Contract Documents. As a result, the REA was not accepted and the decision, final and conclusive, did not merit compensation. Mr. Belmore stated that a written appeal could be filed with a designated NYSDEC official in 20 days from receipt of NYSDEC's letter. Later verbal response from Tyree's project manager was that no future appeal would be filed, and the final project CO, including liquidated damages, should be prepared and executed. Liquidated damages were assessed in the amount of $91,025. CO No. 3 was signed and executed by the New York State Controller on May 10, 2004.

8 Engineer's Construction Certification

Ecology and Environment Engineering, P.C. certifies that the remedial action for the Davis Howland Oil Corporation, Site No. 8-28-088, was completed in substantial compliance with approved plans, the Contract Documents entitled, *Davis Howland Oil Company site, Site Number 8-28-088, City of Rochester, Monroe County, New York, Prepared and Designed by ENSR, Engineering New York (September 2000)*, and Addenda No. 1, No. 2, and No. 3 issued December 15, 2000, January 25, 2001, and February 21, 2001, respectfully.

Ecology and Environment Engineering, P.C.'s services were performed and completed under Contract Number D003493, Work Assignment Number 23, Revision Number 6, dated November 2005.

Signature: Gerald Strobel

Gerald A. Strobel, P.E.
Program Director

Date: 11-09-06