59413

PROJECT NAME: Bowe Systems and Machinery - (1-30-048)

WA #: D004437-2

TO: Dale A. Desnoyers

The attached Work Plan is submitted for your approval. It has been checked and approved by:

	Name	***Initials***	***Date***
Project Manager (scope, level-of-effort, subcontracting).	Brian Jankauskas	BFJ	8/8/06
Contract Manager/Cost Reviewer (conformance with contract, protocols, and cost reasonableness).	Lisa Cerniglia	Lisa	8/8/06
M/WBE Unit	Brenda Moulhem		8/11/06
Chief, Contracts Section	Swapan Gupta	Sg	8/9/06
T. Wolosen, Fiscal Management Section	Tim Wolosen	Tim W	8/14/06
Bureau Director	Donna Weigel TS	DW	8/15/06

PLEASE CALL THERESA COUSER AT 2-9764 AFTER SIGN-OFF

Remember
No dashes in the site #

Bowe D004437-2

New York State Department of Environmental Conservation

I have reviewed the cost sections for the above referenced WA. The cost sections appear to be reasonable and satisfactorily completed. The following checklist outlines the review process and review comments.

	GENERAL COST REVIEW CHECKLIST	**Yes**	**No**	**Comments**
	Is there a complete set of 2.11 Schedules (a) through (h)?	✓		
1.	**Schedule 2.11(a)**			
	Do rates for indirect and fee match contract rates? (Are sliding rates applicable?)	✓		
	Do numbers add up?	✓		
2.	**Schedule 2.11(b) - Direct Labor**			
	Are average reimbursement rates used for each year? (Check rates in contract vs. time period of WA.)	✓		
	Are hours segregated by year?	✓		
	Is total cost for each NSPE level shown?	✓		
	Does total direct labor costs match amount on Schedule 2.11(a)?	✓		
	Do total hours match hours on Schedule 2.11(h)?	✓		
	Is the Principal's (NSPE level 9) time less than 2% of total time?	✓		
3.	**Schedule 2.11(b-1) - Direct Administrative Labor Hours**			
	Is breakdown of Schedule 2.11(b-1) reasonable (i.e within acceptable guidelines - 4% overall budget and 2% for Principal)? If not, did Consultant submit acceptable justification?	✓		
4.	**Schedules 2.11(c) and (d) - Direct Non-Salary**			
	Are rates listed in Schedule 2.11(c) consistent with contract?	✓		
	Are rates for in-house and/or miscellaneous costs in their contract? If not, are quotes included for any item (<u>including</u> equipment purchases & rentals; <u>excluding</u> air fare) >$1k?	✓		
	Are there any unallowable costs? (e.g. telephone and shipping cannot be reimbursed as a direct cost if included in ICR.)			
	Are appropriate lodging/per diem rates used?	✓		
	Are rates approved for consultant-owned equipment?			N/A
	Does total direct non-salary costs match amount on Schedule 2.11(a)?	✓		
	Are other direct costs (# of travel days, lodging, and field equipment usage) reasonable based on field work schedule or supporting documentation from consultant?	✓		
5.	**Schedule 2.11(e) - Cost-plus-fixed-fee subcontracts**			
	Is proposed subconsultant on standby? If not, does proposed subconsultant have DEC approved rates with another standby consultant?	✓		
	Is subcontract contract active and do rates (salary, indirect and fee) match?	✓		
	Is there a breakdown of direct non-salary costs (i.e, are additional Sch. 2.11's needed)?			

	GENERAL COST REVIEW CHECKLIST	**Yes**	**No**	**Comments**
	Does total subcontract amount match Schedule 2.11(a)?	✓		
	Has subcontractor justified/obtained adequate quotes for any subcontracted work?			
6.	**Schedule 2.11(f) - Unit Price Subcontracts**			
	Are proposed subcontractors on standby? If not, are there quotes for subcontracts >$1k? Bids should be comparable (quantities and items) and provide unit costs plus job total.	✓		
	Standby Drillers (Two phase process) - Are costs from at least 3 standbys compared? If not, an additional quote from a non-standby driller may be needed. Are proper unit costs and mob/demob costs used?			
	Standby Lab and Data Validators (Used on a rotational basis) - Do unit cost per sample match unit cost in standby contract?			
	Other - Standard solicitation rules (quotes) apply for services >$1k.			
	M/WBE - Are sole source M/WBE contracts <5k and cost reasonableness documented?			
	Is management fee calculated only on non-professional unit priced subs > $10k? Appropriate rate?			
7.	**Schedule 2.11(g) - Cost Control Report**			
	Do individual 2.11(g)s equal summary 2.11(g) and costs match 2.11(a).?	✓		
8.	**Supplemental 2.11(g) - Cost Control Report (subs)**			
	Do schedules include all applicable subcontracts and management fee?	✓		
9.	**Schedule 2.11(h) - Summary of Labor Hours**			
	Do hours on 2.11(h) match those on 2.11(b)?	✓		
10	**Supplemental Supporting Cost Information**			
	Has additional cost info. been supplied which has not been incorporated into WA budget documentation? List:			

☑ APPROVED

Lisa M. Cemiglia 8/8/06

8/8/06

WORK PLAN
SOIL VAPOR INTRUSION EVALUATION
BOWE SYSTEMS AND MACHINERY
(Site No.: 1-30-048)
200 Frank Street, Hicksville, New York

Prepared for

New York State Department of Environmental Conservation

Prepared by

Camp Dresser & McKee
Raritan Plaza I, Raritan Center
Edison, New Jersey

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Table of Contents

Section 1 – Introduction.. 1-1
1.1 Site Background and History..1-3
1.1.1 Location..1-3
1.1.2 Operational History 1-3
1.1.3 Remedial History..1-3
1.1.3.1 Soil Quality 1-5
1.1.3.1 Groundwater Quality...1-5
1.1.4 Site Geology and Hydrogeology 1-6
1.2 Project Objectives..1-6

Section 2 – Scope of Work.... 2-1
2.1 Task 1 – Work Plan Development..2-1
2.2 Task 2 – Soil Vapor Investigation..2-1
2.2.1 Soil Vapor Sample Collection 2-1
2.2.2 Groundwater Sample Collection...2-3
2.2.3 Soil Sampling..2-3
2.2.4 Investigated Derived Waste...2-3
2.2.5 Decontamination Procedure 2-4
2.2.6 Sample Location..2-4
2.2.7 Sample Identification and Laboratory Analysis and Validation 2-4
2.3 Task 3 – Field Documentation and Reporting...2-4
2.3.1 Field Documentation Procedures...2-4
2.3.2 Reporting 2-5

Section 3 – Project Schedule 3-1

Section 4 – Budget Estimates 4-1

Section 5 – Budget Estimates 5-1
5.1 Project Manager 5-1
5.2 Program Manager...5-1
5.3 Program Quality Assurance Manager..5-1
5.4 Health and Safety Officer 5-1
5.5 Field Manager……..5-1
5.6 Field Technician………… 5-2
5.7 Project Engineer ……..5-2

Section 6 – Description of Subcontractor Needs.. 6-1
6.1 Drilling and Groundwater Monitoring Well Installation – Zebra Environmental Corp...6-1
6.2 Analytical Laboratory - Chemtech...6-1
6.3 Data Validation - Data Validation Services 6-1
6.4 M/WBE Reporting – Kenneth Shider...6-1

Section 7 – MBE/WBE Utilization Plan.. 7-1

List of Figures

1-1 Location Map
1-2 Site Map
2-1 Well and Vapor Point Location Map

List of Tables

2-1 Analytical Program Summary

Appendices

A Quality Assurance Procedures Plan (QAPP)
B Health and Safety Plan (HASP)
C Schedule 2.11
D Subcontractor Backup

Section 1
Introduction

This Work Plan for the Bowe Systems and Machinery (Bowe) site (herein identified as the "site") was prepared by Camp Dresser & McKee (CDM) for the New York State Department of Environmental Conservation (NYSDEC) under the Engineering Services for Investigation and Design, Standby Contract No. D004437. The Work Plan was developed in accordance with the "*Standby Contract Work Assignment No. D004437-2, Soil Vapor Intrusion Evaluation at Bowe Systems and Machinery (Site No.:1-30-048)*". This Work Plan is consistent with the *"Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated February 2005"* and the "*Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002"*.

The major focus of this Work Assignment is to determine if volatile organic compounds (VOCs) are present in the soil vapor. In addition to collection of soil vapor samples, groundwater samples will be collected to determine if residual groundwater contamination is present at the water table and how groundwater quality relates to potential VOCs in soil vapor. Based on the results, the soil vapor pathway shall be assessed to determine if soil vapors are a concern to the structures located in the vicinity of the site.

This Work Plan is comprised of the following sections:

- **Section 1-Introduction**

  This section presents the site description and history, containing the location, operational and remedial history as well as the project objectives

- **Section 2-Scope of Work**

  This section presents the scope of work for the following three tasks of this work assignment:

  1. Task 1: Work Plan Develop
  2. Task 2: Soil Vapor Investigation
  3. Task 3: Field Documentation and Reporting

- **Section 3-Project Schedule**

  The project schedule for the performance of the above three tasks is presented in this section.

- **Section 4-Budget Estimate**

A detailed work assignment budget is presented in this section, itemized by tasks and sub-tasks utilizing schedule 2.11 in accordance with the contract's budget reporting requirements, cost rates and factors contained in the base contract.

- **Section 5-Staffing Plan**

  The staffing plan identifies the roles and responsibilities of the CDM project team. CDM has assembled a team of environmental engineers and scientists experienced with vapor intrusion and NYSDEC regulations.

- **Section 6-Subcontracting**

  This section identifies the services provided by subcontractors on this work assignment. The name and location of each proposed subcontractor is also presented in this section.

- **Section 7- MBE/WBE Utilization Plan**

  The Minority Business Enterprise (MBE) and Woman Business Enterprise (WBE) Utilization Plan is presented in this section. CDM's subcontractors have been carefully selected to provide the most reasonable cost-effective services while achieving the contract-specific MBE/WBE utilization goals.

The following appendices are also included in this Work Plan:

- **Appendix A-Quality Assurance Project Plan**

  The site-specific Quality Assurance Project Plan (QAPP) presented in Appendix A specifies the detailed procedures and methods used during the field investigation activities to ensure quality during the execution of this work assignment.

- **Appendix B-Health and Safety Plan**

  The site-specific Health and Safety Plan (HASP) presented in Appendix B specifies the health and safety procedures to ensure safe work practices are employed.

- **Appendix C-Schedule 2.11**

  The schedule 2.11 presented in Appendix C contains a detailed cost estimate by task and subtask of all work elements contained in this work assignment.

- **Appendix D-Subcontractor Backup**

Appendix D contains individual quotes for drilling, laboratory and validation services to provide documentation for reasonable competitive costs.

1.1 Site Background and History

The following subsections describe the Bowe site and provide a brief overview of the operational history of the site.

1.1.1 Location

The Bowe Systems and Machinery site (herein identified as the "site") is a former dry cleaner testing facility located at 200 Frank Street in Hicksville, Nassau County, New York. The site covers approximately 2.1 acres at the end of Frank Street (Figure 1-1). A single story masonry building covers approximately 25,000 square feet. The general area is developed with light industry and commercial facilities to the north and west. Residential properties are located to the southeast. General site conditions are illustrated on Figure 1-2.

1.1.2 Operational History

Bowe occupied the site from 1990 until 1991. The company vacated the facility in 1991 before returning again in 1994. Bowe sold automated mail processing equipment. American Permac, a subsidiary of Bowe, imported, assembled and tested dry cleaning machinery at the site during the late 1980s. American Permac ceased operations in 1990. During the testing of dry cleaning machinery, tetrachloroethylene (PCE) was used. During routine operation and testing, PCE was not discharged at the site. However, in 1989, a spill of approximately 10 - 15 gallons of PCE occurred into the floor drain system which discharged into an onsite leaching pool system.

1.1.3 Remedial History

In December 1989, an environmental assessment was conducted in response to an accidental discharge of PCE at the site. The investigation revealed elevated concentrations of PCE in the soil in three on-site leaching pools DW-1, DW-2 and DW- 3 at 2,400 parts per million (ppm), 0.14 ppm and 10 ppm, respectively. Soil beneath a former spray paint booth was also found to be impacted by volatile organic compounds (VOCs). Four groundwater monitoring wells were installed on-site (MW-l, MW-2, MW-3, and MW-4). Sampling and analysis of the monitoring wells detected PCE at 130 parts per billion (ppb) and 8,100 ppb in downgradient monitoring wells MW-3 and MW-4, respectively.

In March 1991, the New York State Department of Environmental Conservation (NYSDEC) oversaw the excavation and removal of approximately 450 tons of contaminated soil from leaching pools DW-1, DW-2 and DW-3. The soil was removed by a licensed waste hauler to an approved Treatment, Storage, and Disposal Facility (TSDF). The final excavation extended to a maximum depth of 29 feet below ground surface (bgs). Laboratory analysis of the confirmatory soil samples revealed PCE concentrations below 1 ppm in all samples. Upon completion of the excavation, the piping from the building to the leaching pool system was disconnected and sealed.

In October 18, 1991, the site was listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site.

In August 1992, prior to the initiation of the remedial investigation/feasibility study (RI/FS), the potentially responsible party (PRP) conducted a site screening investigation (SSI). The objectives of the SSI were to investigate the following areas of concern: Area 1 (DW-1, DW-2, and DW-3); Area 2 (DW-8 in loading dock); Area 3 (former spray paint booth); Area 4 (sanitary leaching pool system on north side of building). The results of the SSI are as follows:

- Area 1: VOC analysis of soil beneath Area 1 revealed the following detections: DW-1 (30'-32' bgs) <l ppm total VOCs, (40-42' bgs) <l ppm total VOCs; DW-2 (14'-16' bgs) <1 ppm total VOCs; DW-3 (23'-25' bgs) <l ppm total VOCs.
- Area 2: VOC analysis of the soil from DW-8 revealed the following detection: (10'-12' bgs) 0.081 ppm of PCE.
- Area 3: A soil gas survey revealed elevated concentrations of VOCs. Two samples were acquired from locations exhibiting the highest photoionization detector (PID) responses and were analyzed for VOCs revealing the following detections: SB-1 (2'-4' bgs) 2.3 ppm PCE; SB-2 (2'-4' bgs) 0.91 ppm PCE.
- Area 4: Sludge samples were acquired for VOC analysis from the bottom of he two sanitary leaching pool (LP-1, LP-2) and a septic tank (ST) and revealed the following detections: LP-1, <1 ppm total VOCs; LP-2, 1.98 ppm total VOCs; ST, <1ppm total VOCs.

As a result of SSI conducted in August, 1992 the following interim remedial measures (IRM) were undertaken in September, 1992.

- Area 1: This area was the subject of an earlier IRM overseen by NYSDEC and discussed earlier in this document.
- Area 2: In September, 1992, the bottom five feet of soil/sediment was removed from DW-8. The contaminated soil was transported to Athens Hocking Reclamation Center, an approved TSDF. A confirmatory soil sample detected PCE below 1 ppm.
- Area 3: In September, 1992, approximately 27 cubic yards of soil was excavated from the location of the former spray paint booth and transported to Athens Hocking Reclamation Center. Confirmatory soil samples collected at the base of the excavation at an approximate depth of four feet bgs revealed total VOCs below 1 ppm.
- Area 4: In September, 1992, approximately 3,000 gallons of sanitary liquid was removed from the sanitary leaching pool system and discharged with approval to the local publicly owned treatment works (Cedar Creek). A vacuum truck was utilized to remove the bottom three feet of sludge/sediment from leaching pool

LP-2. Confirmatory soil samples revealed total VOCs below 1 ppm in the bottom of the sanitary leaching pools. Thereafter, the facility was connected to the municipal sewer system.

The Remedial Investigation (RI) was conducted in two phases. Phase I was conducted beginning in September, 1992 and Phase II began in September, 1993. A report entitled Remedial Investigation/Feasibility Study dated November, 1998 was prepared, which describes the field activities and findings of the RI in detail.

1.1.3.1 Soil Quality

Confirmatory soil samples previously acquired from drywells DW-1, DW-2, and DW-3 (Area 1) revealed that the IRM conducted in March, 1991 was successful in reducing PCE concentrations to levels below those prescribed in TAGM #4046.

Soil borings advanced through drywells DW-4, 5, 6, 7, and 8 revealed PCE concentrations below TAGM #4046 in all cases. Drywells DW-4, 5, 6, and 7 had not been investigated prior to the RI. DW-8 was the subject of an IRM conducted in September, 1992.

In order to determine the extent of contamination remaining around the former spray paint booth, a soil gas survey was conducted, two soil borings performed and two surface soil samples were acquired via hand auger. The highest concentration of PCE observed in any of these samples was 0.14, ppm, demonstrating the IRM was successful in removing soil contamination.

Based upon prior sampling of the sanitary leaching pool system, leaching pool LP-2 was found to contain elevated levels of VOCs and was the subject of an IRM. A soil boring was advanced through this pool during the RI and revealed no detections of VOCs.

1.1.3.2 Groundwater Quality

Two additional monitoring wells (MW-8, MW-9) were installed during the Phase I RI to supplement previously installed monitoring wells. The VOC of concern was PCE which was detected at levels above the New York State Ambient Water Quality Standards for Class GA groundwater of 5 ppb. In order to ascertain the areal extent of groundwater contamination which may have migrated off-site, one permanent and seven temporary groundwater monitoring wells were installed downgradient of the site during the Phase II RI. Temporary exploratory wells EW-2, EW-3, and EW-4 were installed and sampled in July, 1993. Temporary exploratory wells EW-5, EW-7, EW-8, and EW-9 were installed and sampled in July, 1995. Permanent monitoring well OW-1 was installed and sampled in July, 1997.

After the completion of an on-site and off-site remedial investigation a record of decision (ROD) was issued in March 1999. As prescribed in the ROD, groundwater sampling was conducted on a quarterly basis for three years starting in June 2000.

Quarterly groundwater results indicated that contaminant levels have consistently been below the New York state Ambient Water Quality Standards for Class GA groundwater.

In February 26, 2004, the site was delisted when the groundwater quality goals (NYS Drinking Water Standards) were obtained.
Monitoring wells utilized during the site activities were sealed.

1.1.4 Site Geology and Hydrogeology

Previous reports indicate that subsurface materials at site consist of loam.

Based on documented groundwater measurements, the depth to groundwater was approximately 53 feet below site grade and the groundwater flow direction is towards the south-southwest.

1.2 Project Objectives

The object of this soil vapor intrusion evaluation is to determine if VOCs are elevated in the soil vapor and to define vapor condition at the Bowe Systems and Machinery Site. In order to achieve this objective, the following activities will be conducted:

- Task 1 – Work Plan Development
  The development of a site specific work plan which includes a site specific Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP)

- Task 2 – Soil Vapor Investigation
  The investigation will include:
  - Soil Vapor Sample Collection, collection of soil vapor samples at five direct push locations from two depth intervals, approximately 8 feet bgs and 53 feet bgs
  - Groundwater Sample Collection, collection of groundwater sample at five direct push locations
  - Soil Sampling, collection of soil samples at up to three locations if elevated vapor reading are detected
  - Investigative Derived Waste, properly handle the derived waste from the investigation
  - Decontamination Procedures, perform the decontamination procedure
  - Sample Location, identification of direct push sample locations utilizing a Global Positioning System (GPS)

- Task 3 – Field Documentation and Reporting

Section 2
Scope of Work

2.1 Task 1 - Work Plan Development

This Work Plan includes a site specific Quality Assurance Project Plan (QAPP) presented in Appendix A and a site specific Health and Safety Plan (HASP) presented in Appendix B. The QAPP presents the field activities that will be performed, defines the procedures and methods that will be used to collect field data including project samples, and focuses on the analytical methods and quality assurance/ quality control (QA/QC) procedures that will be used to analyze project samples, ensure the data are of known and acceptable quality, and manage the resultant data. The HASP describes the site health and safety for the field activities that will be performed.

2.2 Task 2 – Soil Vapor Investigation

This task includes soil vapor, groundwater, and/or soil sampling at up to five locations in the vicinity of the site. The proposed sample locations are illustrated on Figure 2-1.

This task will include:

- Collect five soil vapor samples at foundation depth (approximately 8 feet) for VOC
- Collect five soil vapor samples from two feet above the groundwater table for VOC
- Collect five groundwater samples in the vicinity of the soil vapor sample locations at the surface of the groundwater table for VOC
- Collect approximately three soil samples for VOC, SVOC, and metals, if elevated VOCs are detected with field equipment or visual inspection reveals staining.

These samples will be collected in accordance with the "***Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated February 2005"*** and the "***Draft Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, dated December 2002".*** Preliminary sample results will be available within two weeks and final results will be provided within the standard turnaround time (30 days).

2.2.1 Soil Vapor Sample Collection

Soil vapor samples will be collected at five locations selected by the NYSDEC (Figure 2-1). Two separate vapor boreholes will be co-located at one location to collect the two vapor samples, approximately 8 feet below site grade and 2 feet above the water table interface, which is estimated to be approximately 53 feet below site grade. The shallow and deep co-located vapor borehole will be drilled at one location and setup for the collection of vapor samples. Drilling will be initiated at the second location prior to initiating the collection of vapor samples from the first location to minimize standby time during vapor sample collection. Soil vapor boreholes will be drilled using direct-push technology to drive steel rods equipped with a detachable steel drive point to the desired depth. The soil vapor sampling procedure for both the shallow (8 feet below grade) and deep (53 feet below grade) locations is provided in the QAPP (Appendix A).

The tubing will be connected to a vacuum/volume system which is a combined diaphragm pump and calibrated gauge system specifically designed for soil gas sampling. The tubing is fitted with a needle valve regulator which can easily be throttled to a flow rate of less then 100 milliliters (ml) per minute. Syringes will be utilized to purge the tubing if obtaining a flow rate of 100 ml/min is difficult with vacuum/volume system. Approximately three probe volumes (i.e. volume of sample probe and tubing) will be purged at a flow rate less than 100 ml per minute. The poly tubing has an inside diameter of ¼ inch and a volume of 9.65 ml/foot. Purging for the eight foot vapor locations assuming 3 feet of extra tubing at the surface to work with yields a purging volume of 318.45 ml over a 3.18 minute time frame. Purging for the 53 foot vapor locations assuming 3 feet extra tubing at the surface yields a purging volume of 540 ml over a 5.4 minute time frame. A tedlar bag will be filled toward the end of the purge volume to be screened using the PID meter. The PID readings will be observed and recorded on the appropriate field form. The vacuum/volume system will be disconnected and the end of the tubing will be connected directly to the summa canister intake valve. The samples will be collected using laboratory-certified clean summa canisters with flow regulators and a vacuum of 28 inches Hg ± 2 inches. A vacuum of 5 inches Hg ± 1 inch must be present when sample collection is terminated.

Tracer gas will be used during the soil vapor investigation in accordance with the NYSDOH guidance for evaluating soil vapor intrusion. The flow rate during sampling will not exceed 100 milliliters per minute to minimize outdoor air infiltration during sampling. During soil vapor sampling collection, an out door ambient air sample will be collected. The soil vapor samples will be sent to an off-site laboratory for VOC analysis via EPA Method TO-15. All samples will be analyzed by an ELAP certified laboratory. The analysis for air samples will achieve detection limits of 1 $\mu g/m^3$. For specific parameters identified by the NYSDOH, where selected parameters may have a higher detection limit (e.g. acetone), the higher detection limits will be designated by the NYSDOH. A hand held helium detector will be utilized by the laboratory after the sample has been extracted from the summa canister to confirm that appreciable quantities (greater than 20 percent) of helium is not detected. A NYSDEC ASP Category B data deliverable will be provided for these analyses. Table 2-1 presents a summary of the analytical program for the site.

Upon completion of the sampling, the sample tubing will be removed and the soil vapor boring (1.5 inches in diameter) will be backfilled with indigenous soil and/or clean sand and marked with a stake/flag, which will be labeled with the proper sample identification and illustrated on the site map so that it can be located at a later date. Borings performed in paved or concrete areas will be backfilled and refinished at the ground surface with concrete or cold patch.

2.2.2 Groundwater Sample Collection

Groundwater samples will be collected from five direct push locations. Groundwater samples will be collected from the deep soil vapor sampling borehole approximately one foot below the groundwater table. The first sample to be collected at the site will be a deep groundwater sample to confirm the depth of groundwater and ensure the proper placement of the deep soil vapor sample. The boreholes will be drilled using direct-push technology to drive steel rods equipped with a detachable steel drive point to the desired depth. The detailed groundwater sampling procedure is provided in the QAPP (Appendix A) and has been previously reviewed and approved by NYSDEC.

The groundwater samples will be sent to an off-site laboratory for VOC analysis via EPA Method 8260. All samples will be analyzed by an ELAP certified laboratory. A NYSDEC ASP Category B data deliverable will be provided for these analyses. Table 2-1 presents a summary of the analytical program for the site.

Upon completion of the sampling, the boreholes will be backfilled with indigenous soil and/or clean sand and marked with a stake/flag which will be labeled with the proper sample identification and will be illustrated on the site map so that it can be located at a later date. Borings performed in paved or concrete areas will be backfilled and refinished at the ground surface with concrete or cold patch.

2.2.3 Soil Sampling

Soil samples will be collected at up to three locations by direct-push sampling techniques if contamination is observed or if elevated PID readings are recorded. If elevated PID readings are not encountered or visual staining is not observed, then soil samples will not be collected. If soil sampling is required depending on site conditions, the detailed soil sampling procedure is provided in the QAPP (Appendix A). Soil samples will be analyzed in accordance with TAGM No. 4046 for VOC by EPA method 8021B, SVOC by EPA method 8270C, and metals by EPA method 7000. All samples will be analyzed by an ELAP certified laboratory. A NYSDEC ASP Category B data deliverable will be provided for these analyses. Table 2-1 presents a summary of the analytical program for the site.

2.2.4 Investigative Derived Waste

Soil cuttings and purge water will be placed and dispersed on the ground unless visible contamination or elevated PID readings are observed. If contamination is present, investigative derived waste (IDW) will be contained and analyzed to determine the appropriate disposal methods.

2.2.5 Decontamination Procedures

All non-dedicated equipment and tools used to collect samples for chemical analysis will be decontaminated prior to and between each sample interval using an Alconox rinse and potable water rinse prior to reuse. Additional cleaning of the equipment with steam may be needed under some circumstances. Decontamination fluids will be discharged to the ground surface unless a visible sheen or odor is detected either on the equipment or the fluids, at which point the decontamination water will be staged in an appropriate container and disposed of appropriately.

2.2.6 Sample Location

CDM will utilize a global positioning system (GPS) hand-held unit to identify the direct push sample locations. If interference is encountered due to poor GPS signal strength, field measurements will be collected from fixed locations (e.g. corner of the building, fence, etc.). Subsequently, these data will be used to update the sample locations on the site map.

2.2.7 Sample Identification, Laboratory Analysis and Validation

Each sample collected will be designated by an alphanumeric code that will identify the type of sampling location, matrix sampled, and the specific sample designation (identifier). Site specific procedures are described in the QAPP (Appendix A).

All samples will be analyzed by a NYSDOH approved Environmental Laboratory Approval Program (ELAP) certified laboratory. Air samples will be analyzed for VOC using EPA Method TO-15. The analysis for air samples will achieve detection limits of 1 $\mu g/m^3$ for each compound. For specific parameters identified by the New York State Department of Health (NYSDOH), where the selected parameters may have a higher detection limit (e.g., acetone), and the higher detection limits will be designated by the NYSDOH. Groundwater samples will be analyzed for VOC by EPA Method 8260. Soil samples will be analyzed in accordance with TAGM #4046 for VOC by EPA method 8021B, SVOC by EPA method 8270C, and metals by EPA method 7000. A NYSDEC Analytical Services Protocol (ASP) Category B data deliverable will be provided for these analyses (Table 2-1).

All samples collected will be validated in accordance with NYSDEC Data Usability Summary Report (DUSR) guidance by a party that is independent of the laboratory which performed the analyses and CDM. A usability analysis will be conducted by a qualified data validator and a DUSR will be submitted to the NYSDEC.

2.3 Task 3 – Field Documentation and Reporting

2.3.1 Field Documentation Procedures

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, and purge forms used during the field activities, will be submitted to the NYSDEC as part of the final report. Field and sampling procedures, including installation of the sample boreholes, existing monitoring wells, etc., will be photo-documented.

2.3.2 Reporting

A total of four copies of a draft letter report will be submitted that documents the work conducted and presents the results of the sample analysis for review and comment by NYSDEC and NYSDOH. Upon receipt of the comments, CDM will revise the draft letter report and print the four final copies and submit to NYSDEC. One copy of the final letter report; text, tables, maps, photos, etc., will be submitted as a single pdf file. All electronic files will be submitted to NYSDEC on a compact disc. The site investigation data will be submitted in the most recent version of the NYSDEC Electronic Data Deliverable (EDD) with the final report submission. Currently this is the USEPA Region 2 EDD dated December 2003.

Section 3
Project Schedule

The following tabulation provides the proposed project schedule and key milestones for this work assignment. As currently planned, field work will be initiated within two weeks of written receipt of final work plan approval. Field activity duration is estimated to be four work days assuming no delays are experienced due to inclement weather, site access problems, or for other unforeseen reason.

The scheduled submittal dates for deliverables are based on standard laboratory turnaround times of four weeks, and turnaround for data validation of three weeks.

Project Milestone	Date
Issue Work Assignment (WA)	May 15, 2006
Acknowledge Receipt of WA	5 Days after Issuance
Work plan development session	June 1, 2006
Submit Task 1 (Draft Work Plan) Deliverable	June 21, 2006
DEC/DOH Comment on Draft Work Plan	July 18,2006
Submit Task 1 (Final Work Plan) Deliverable	August 3, 2006
Notice to Proceed (NTP)	August 7, 2006
Commence Task 2 Field Work	August 28, 2006
Task 2 Field Work Completed	August 31, 2006
Task 3 Submit Draft Report	November, 20 2006
Approve Draft Report	30 Days after Draft Report Submitted
Task 3 Submit Final Report	30 Days after Approval of Draft Report

Section 4
Budget Estimates

Estimated Budget and Level of Effort (LOE) Summary
Bowe Systems and Machinery Site
Hicksville, New York
Site No. 1-30-048

Task Items	Description/Cost	Dollars
1	Work Plan Development	$7,932
2	Soil Vapor Investigation	$26,262
3	Field Documentation and Reporting	$7,289
	Total Estimate Budget (Tasks 1 - 3)	**$41,483**

Appendix C presents the detailed costs by task and subtask on the NYSDEC schedule 2.11.

General Assumptions:

- Work will be performed from June 1, 2006 to January 31, 2007.
- All costs are based upon the scope and schedule provided in this Work Plan. Costs associated with project delays or expedited schedules beyond CDM's control are not assumed.
- CDM will provide four hard copies by mail and one electronic file (pdf) by e-mail for each report submitted to the NYSDEC.

Task 1 - Work Plan Development:

- Only conference calls are anticipated to be necessary for this phase. Meetings are not assumed to be required for this task.
- Only one round of comments received concurrently is anticipated on draft deliverables. The review comments will be consolidated by NYSDEC. It is assumed that comments are minimal in nature and no re-evaluation is required. It is assumed that all comments can be addressed in 2 hours.
- Project management, subcontractor procurement, scheduling, budgeting, administrative activities are included in this task.

- A portion of the previous CDM effort regarding subcontractor procurement and contract negotiations are included in this task budget per conversations with the NYSDEC Contract Administrator.

Task 2 - Soil Vapor Investigation:

- Surveying will not be necessary for this work assignment.
- No schedule delays are assumed due to inclement weather or equipment failure.
- Only one mobilization/demobilization is assumed to be required.
- Drilling, analytical and validation will be subcontracted
- CDM will provide oversight during field activities.
- It is assumed that the site-markout will be able to determine all utility lines in the area of the proposed borings. Costs are not included for site-specific markout. It is assumed that the general utility markout will be sufficient to avoid all utility lines in the proposed sampling locations.
- CDM assumes that all material and equipment staged in access areas will be removed to allow easy access to all sampling locations by direct push equipment.
- Decontamination wastes and other investigative derived waste will not be required to be containerized and simple on-site disposal is assumed. No analytical, transportation or disposal of IDW is assumed.
- Delays due to the site owner or public are not assumed.
- No continuous air monitoring has been included in this cost estimate. One PID unit will be utilized air monitoring.

Task 3 - Field Documentation and Reporting:

- Only conference calls are anticipated to be necessary for this phase. Meetings are not assumed to be required for this task.
- Only one round of comments received concurrently is anticipated on draft deliverables. The review comments will be consolidated by NYSDEC. It is assumed that comments are minimal in nature and no re-evaluation is required.
- During site work, digital photographs and field notes will be kept.

- A letter report will be developed including a description of work conducted with field notes, photos, validated analytical data, figures, field measurements, and summary tables/purge forms
- It is assumed that only two data tables (one groundwater and one vapor) and one figure having results for both groundwater and vapor will be necessary for the letter report

Section 5
Staffing Plan

5.1 Project Manager – Maria D. Watt, P.E.

The Project Manager, Ms. Maria Watt, will have the overall responsibility for the technical and financial aspects of this project. She will assign technical staff, maintain control of the project budget and schedule, prepare monthly progress reports, review and approve project invoices, evaluate the technical quality of the project deliverables as well as the adherence to QA/QC procedures and manage subcontractors. She will serve as CDM's point of contact for this project.

5.2 Program Manager – Michael A. Memoli, P.E., DEE

The primary responsibilities for program management activities rest with the Program Manager (PRM). The Program Manager, Mr. Memoli, will have ultimate contract responsibility for the project, including responsibility for the technical content of all engineering work. Mr. Memoli will direct, review and approve all project deliverables, schedule staff and resources, resolve scheduling conflicts and identify and solve potential program problems. He will be directly accountable to NYSDEC's Division of Hazardous Waste Remediation for program execution. He has authority to assign staff, negotiate and execute contracts and amendments, as well as execute subcontracts. The PRM will communicate directly with CDM's Project Manager.

5.3 Program Quality Assurance Manager – Jeniffer M. Oxford

The Program Quality Assurance Officer, Ms. Jeniffer Oxford, will monitor QC activities of program management and technical staff, as well as identify and report needs of corrective action to the Program Manager. He will also conduct an internal review of all project deliverables prepared by CDM staff and sign off on the final investigation reports.

5.4 Health and Safety Officer – Christopher S. Marlowe, C.I.H., Q.E.P

The Program Health and Safety Officer, Mr. Chris Marlow, will review and make recommendations to the Subcontractors on health and safety plans for compliance with OSHA requirements. He will develop a Health and Safety plan for CDM and NYSDEC employees, handle over-sight activities, evaluate the performance of health and safety officers and maintain required health and safety records. He will report to the Program Manager

5.5 Field Manager – Melissa Koberle

The Field Manager, Ms. Melissa Koberle, will be responsible for overseeing and coordinating field activities. This will include, but is not limited to: overseeing the installation of monitoring wells, coordinating drill work, coordinating work with other subcontractors and monitoring health and safety conditions in accordance with the approved Health and Safety Plan. She is directly accountable to the Project Manager.

5.6 Field Technician – Anthony Grove

The Field Technician, Mr. Anthony Grove, will assist the Field Manager with the coordination of field work including, but not limited to: maintaining field data, collecting vapor samples, collecting groundwater samples, shipping samples, and preparing chain of custody forms. He is directly accountable to the Project Manager.

5.7 Project Engineer – Christine Julias, E.I.T.

The Project Engineer, Ms. Christine Julias, will assist the Project Manager with the work plan draft and final, as well as general engineering tasks related to field work, subcontractor coordination, reporting, etc. She is directly accountable to the Project Manager.

Section 6
Subcontracting

Appendix D presents a comparison of quotes from various subcontractors. CDM proposes to engage subcontractors to provide the following services for this work assignment:

6.1 Direct Push Probe – Zebra Environmental Corp.

At this time, CDM is proposing to use Zebra Environmental Corp (Zebra) as the direct push subcontractor. They are located at 30 N. Prospect Avenue, Lynbrook, New York 11563

6.2 Analytical Laboratory - Chemtech

At this time, CDM is proposing to use Chemtech (MBE) as the analytical laboratory subcontractor. They are located at 284 Sheffield Street, Mountainside, NJ 07092.

6.3 Data Validation - Data Validation Services

At this time, CDM is proposing to use Data Validation Services (WBE) as the data validation subcontractor. They are located at 120 Cobble Creek Road, P.O. Box 208, North Creek, NY 12853.

6.4 M/WBE Reporting – Kenneth Shider

At this time, CDM is proposing to utilize Ken Shider (M/WBE consultant) to prepare the quarterly M/WBE reports that are required by NYSDEC.

Section 7
MBE/WBE Utilization Plan

To meet the requirements of the MBE/WBE program, CDM has prepared the following utilization plan:

Total Dollar Value of the work assignment	**$41,483**
MBE Percentage Goal	15%
MBE Dollar Value Goal	$6,222
WBE Percentage Goal	5%
WBE Dollar Value Goal	$2,074
Combined MBE/WBE Percentage Goal	20%
Combined MBE/WBE Dollar Value Goal	$8,296

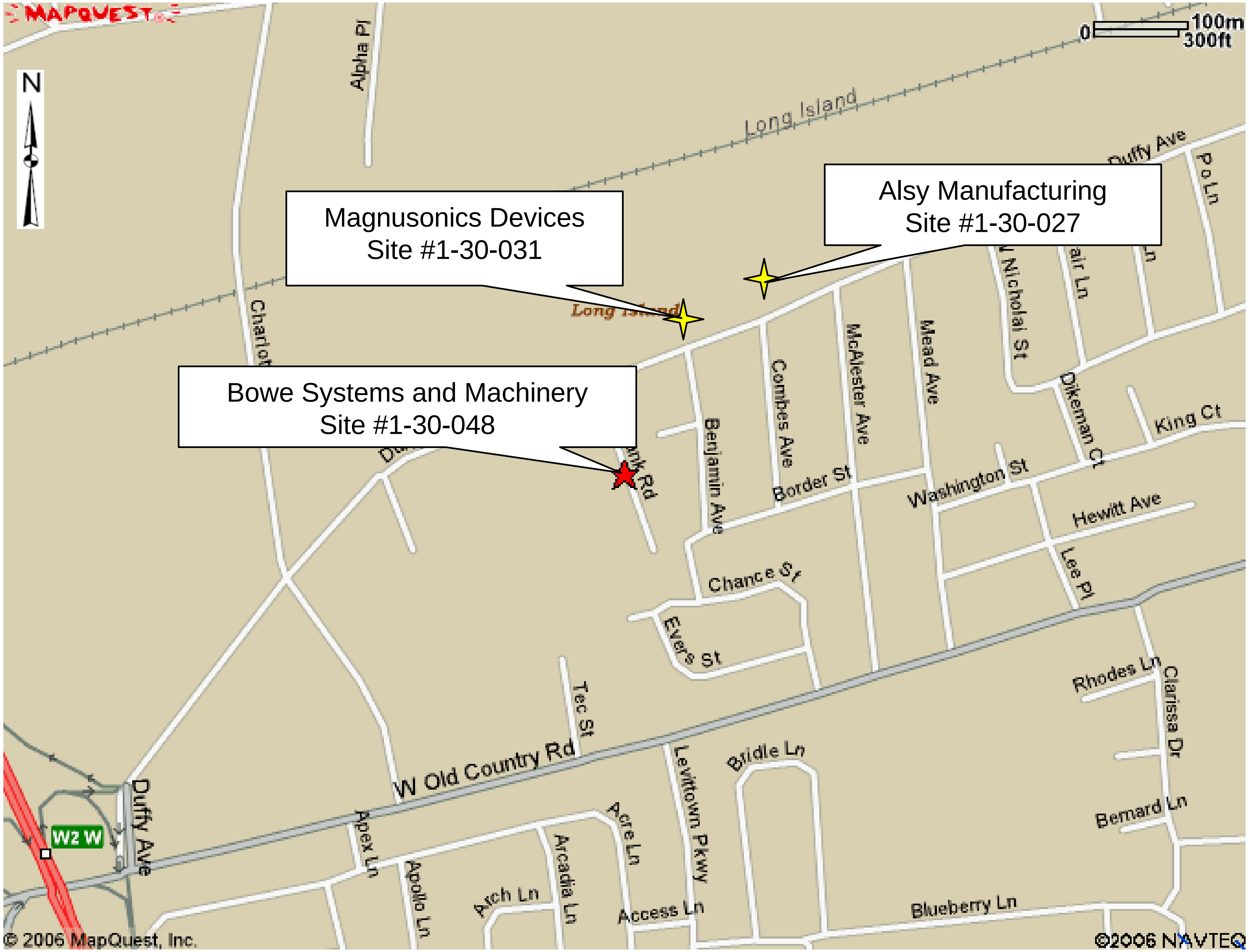
Minority and woman-owned firms are expected to participate as follows:

Services to be Provided	Description of Services	Subcontractor Name and Contact Information	Proposed Subcontract Price
Laboratory Analysis –	Vapor, Water and Soil Sample Analysis	Chemtech Joe Dockery (908) 789 8900	$7,064
Kenneth Shider	M/WBE Quarterly Reports	Kenneth Shider (518) 269-2207	$300
Data Validation	DUSR	Data Validation Services Judy Harry (518) 251 4429	$987

Table 2-1
Analytical Program Summary
Bowe Systems and Machinery
Hicksville, New York

Analytical Parameter	Sample Matrix	Number of Samples	Analytical Method	Field Duplicates (a)	MS/ MSDs	Field Blank/ Ambient Air Blank (b)	Trip Blanks (e)	Container	Sample Preservation	Holding Time
SOIL VAPOR SAMPLES										
VOCs	Vapor	10	EPA TO-15	1	(c)	3	0	6-liter SUMMA canister	None	30 days
GROUNDWATER SAMPLES										
VOCs	Groundwater	5	EPA 8260B	1	1	3	1	3 - 40ml clear glass vial with Teflon septum	HCl to pH <2; Cool to 4^{o}C	14 days
SOIL SAMPLES										
Volatile Organic Compounds	Soil	3	EPA 8260B	1	1	0	0	3 - 40 ml glass VOC with plastic cap with Teflon septum with 25 ml methanol (prepared by lab)	Cool to 4^{o}C	14 days
Semi-Volatile Organic Compounds	Soil	3	EPA 8270C	1	1	0	0	250-mL (8 oz) amber glass	Cool to 4^{o}C	7 days
Metals	Soil	3	EPA 6010B/7000Series	1	1	0	0	250-mL (8 oz) amber glass	Cool to 4^{o}C	180 days

Notes:
(a) A minimum of 5% of all samples should be collected in duplicate
(b) Groundwater field blanks are collected at a frequency of 1 per day.
(c) SUMMA canisters containing samples are not spiked in the field.
(d) Cannister should be used within 15 days of being shipped to the field for sample collection.
(e) Trip blanks are collected at a frequency of 1 per sampling event or 1 per every five days.



CDM

Figure 1-1
Site Location Map
Bowe Systems and Machinery
Hicksville, Nassau County, New York

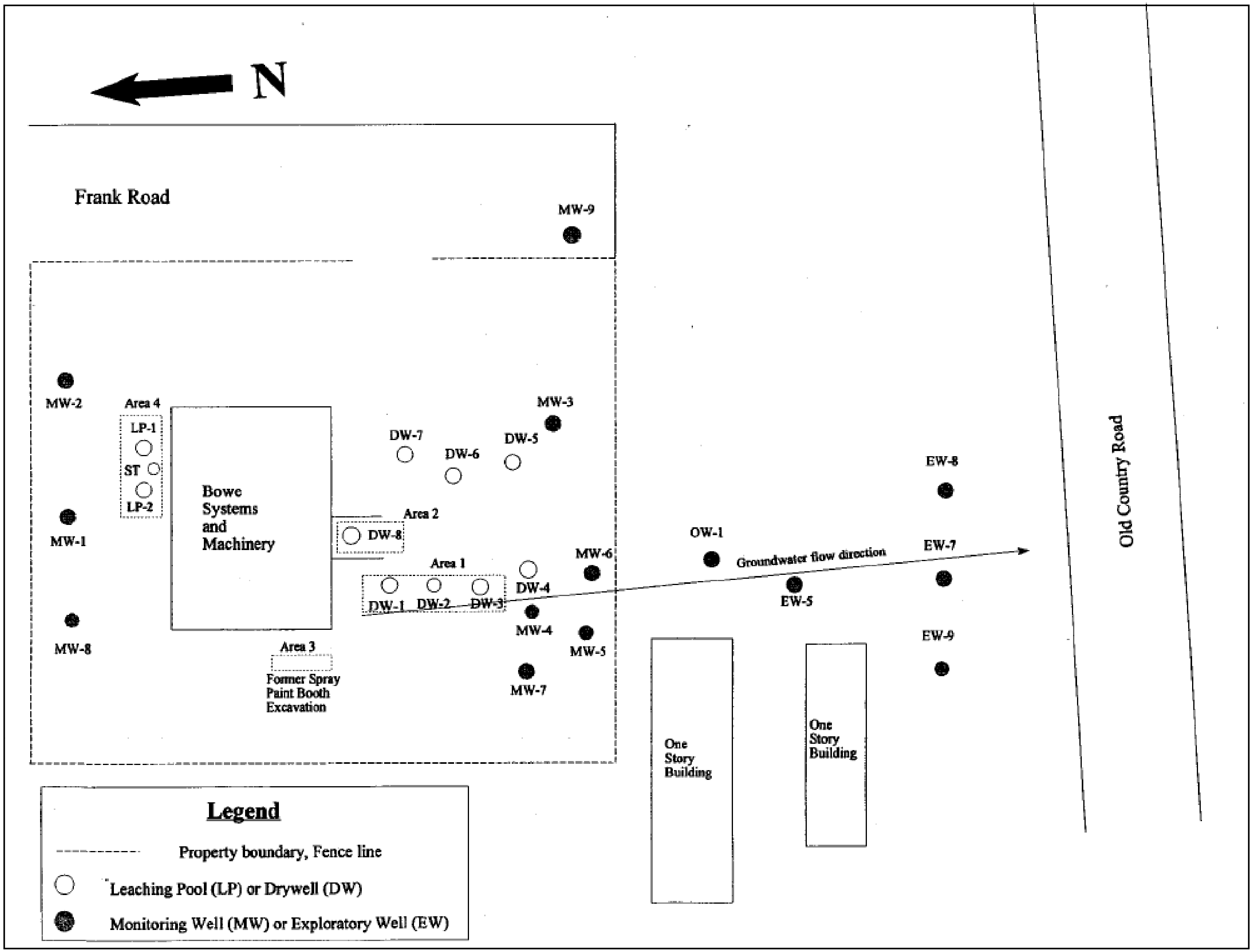
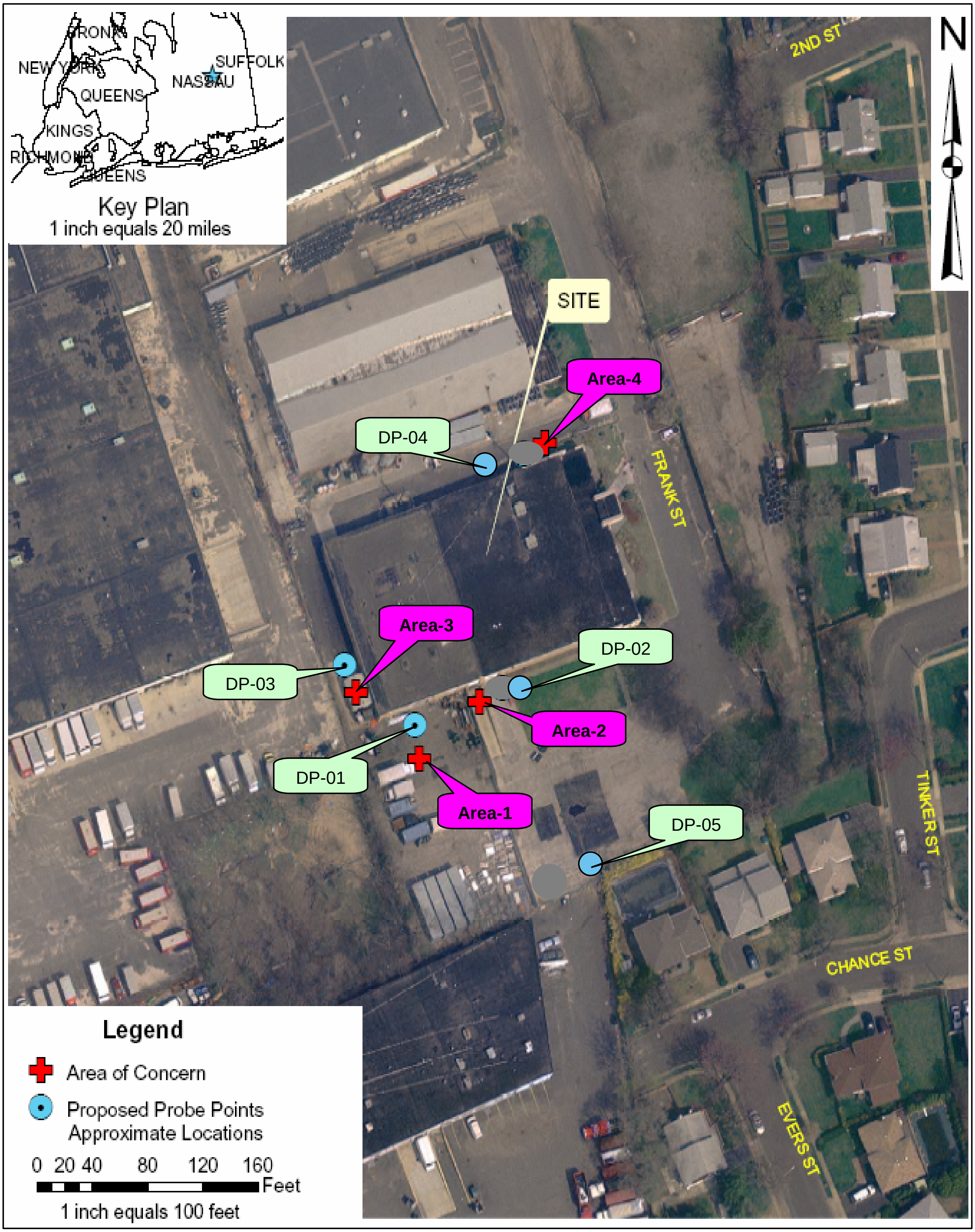


Figure 1-2
Site Map
Bowe Systems and Machinery
Hicksville, Nassau County, New York



CDM

Figure 2-1
Well and Vapor Point Location Map
Bowe Systems and Machinery
Hicksville, Nassau County, New York

Appendix A

Quality Assurance Procedures Plan (QAPP)

QUALITY ASSURANCE PROJECT PLAN
SOIL VAPOR INTRUSION EVALUTION
BOWE SYSTEMS AND MACHINERY
(Site No.:1-30-048)
Hicksville, New York

Prepared for

New York State Department of Environmental Conservation
Investigation and Design Engineering Services
Standby Contract No. D004437
Work Assignment No. D004437-2

Prepared by

Camp Dresser & McKee
Raritan Plaza I, Raritan Center
Edison, NJ 08818

August 2006

Contents

Section 1 Introduction.......... 1-1
- 1.1 Introduction… 1-1
- 1.2 Site Description 1-1
- 1.3 Remedial History 1-1
  - 1.3.1 Soil Quality 1-3
  - 1.3.2 Groundwater Quality 1-3
- 1.4 Site Geology and Hydrogeology 1-4

Section 2 Project Objectives and Organization 2-1
- 2.1 Objectives 2-1
- 2.2 Organization… 2-1
  - 2.2.1 Project Team 2-1
  - 2.2.2 Subcontractors 2-2

Section 3 Project Schedule…. 3-1

Section 4 Field Procedures… 4-1
- 4.1 Field Log Book 4-1
  - 4.1.1 Preparation 4-1
  - 4.1.2 Operation 4-1
  - 4.1.3 Post-Operation 4-3
- 4.2 Sample Documentation and Identification 4-3
  - 4.2.1 Responsibilities 4-3
  - 4.2.2 Field Notebooks 4-3
  - 4.2.3 Sample Identification 4-4
- 4.3 Chain-of-Custody Procedures 4-5
  - 4.3.1 Chain-of-Custody Forms 4-5
  - 4.3.2 Chain-of-Custody Records 4-6
- 4.4 Field Quality Control Samples 4-6
  - 4.4.1 Quality Control for Soil Vapor Sampling 4-6
  - 4.4.2 Quality Control for Groundwater Sampling 4-6
    - 4.4.2.1 Duplicate Samples 4-7
    - 4.4.2.2 Trip Blanks 4-7
    - 4.4.2.3 Field Banks 4-7
  - 4.4.3 Quality Control for Soil Sampling 4-7
    - 4.4.3.1 Duplicate Samples 4-7
    - 4.4.3.2 Field Blanks 4-7
- 4.5 Soil Vapor Sampling 4-7
  - 4.5.1 Soil Vapor Probe Installation 4-8
  - 4.5.2 Tracer Test Procedures 4-9
  - 4.5.3 Soil Vapor Sampling Procedures for Offsite Analysis 4-9
  - 4.5.4 Ambient Air Sampling Procedures for Offsite Analysis 4-11
- 4.6 Groundwater Sampling 4-12
  - 4.6.1 Purge and Sampling 4-12

4.6.2 Equipment 4-12
4.6.3 Procedure 4-12
4.7 Soil Sample Collection 4-14
4.7.1 Direct Push Soil Sampling 4-14
4.7.2 Procedure… 4-14
4.7.2.1 Assembly 4-14
4.7.2.2 Probing… 4-14
4.7.2.3 Stop-Pin Removal 4-14
4.7.2.4 Sampling 4-15
4.7.2.5 Machine Extrusion 4-15
4.8 Decontamination……. 4-16
4.9 Investigative Derived Waste 4-16

Section 5 Instrument Procedures 5-1
5.1 Photoionization Detector 5-1
5.1.1 Calibration 5-1
5.1.2 Hnu PI 101 5-2
5.1.2.1 Procedure 5-2
5.1.2.2 Limitations 5-3
5.1.3 OVM 580A 5-3
5.1.3.1 Procedures 5-3
5.2 pH Meter 5-4
5.2.1 Orion SA 250 pH Procedures 5-4
5.2.2 Model Tripar Analyzer Procedures 5-5
5.3 Conductivity Meter 5-5
5.3.1 Model SCT Procedures 5-6

Section 6 Laboratory Procedures 6-1
6.1 Data Quality Criteria 6-1
6.1.1 Precision 6-1
6.1.2 Accuracy 6-2
6.1.3 Representatives 6-2
6.1.4 Completeness 6-3
6.1.5 Comparability 6-3
6.1.6 Method Detection Limits 6-4
6.2 Quality Control 6-4
6.2.1 Internal Laboratory Quality Control 6-4
6.2.2 Program Generated Quality Control 6-4
6.2.3 QC Deliverables Package 6-5
6.2.4 Minimum Detection Limits 6-6
6.3 Data Quality Requirements 6-6
6.4 Data Deliverable ……. 6-6

List of Tables

3-1 Project Schedule
4-1 Analytical Program Summary
4-2 TO-15 Laboratory Method Detection Limit
4-3 SW-8260 Method Detection Limit for Water
4-4 SW-8260B Method Detection Limit for Low Level Soil
4-5 SW-8270C Method Detection Limit for Low Level Soil
4-6 SW-6010B Method Detection Limit for Metals
6-1 Laboratory Sample Frequency

Section 1
Introduction

1.1 Introduction

Camp Dresser & McKee (CDM) was retained to develop and implement a New York State Department of Environmental Conservation (NYSDEC) approved Work Plan for soil vapor intrusion evaluation. This soil vapor intrusion Quality Assurance Project Plan (QAPP) is the documentation of the activities, objectives and quality assurance/quality control (QA/QC) procedures required to study spatial variability of volatile organic compounds (VOCs) in soil vapor that exist under and around a dry cleaning facility located at 200 Frank Street in Hicksville, Nassau County, New York.

1.2 Site Description

The main building on the site is a single story masonry building occupying approximately 25,000 square feet. The site covers approximately 2.1 acres at the end of Frank Street (Figure 1-1). The general area is developed with light industry and commercial facilities to the north and west. Residential properties are located to the southeast. General site conditions are illustrated on Figure 1-2.

1.3 Remedial History

In December 1989, an environmental assessment was conducted in response to an accidental discharge of tetrachloroethylene (PCE) at the site. The investigation revealed elevated concentrations of PCE in the soil in three on-site leaching pools DW-1, DW-2 and DW- 3 at 2,400 parts per million (ppm), 0.14 ppm and 10 ppm, respectively. Soil beneath a former spray paint booth was also found to be impacted by VOCs. Four groundwater monitoring wells were installed on-site (MW-l, MW-2, MW-3, and MW-4). Sampling and analysis of the monitoring wells detected PCE at 130 parts per billion (ppb) and 8,100 ppb in downgradient monitoring wells MW-3 and MW-4, respectively.

In March 1991, the NYSDEC oversaw the excavation and removal of approximately 450 tons of contaminated soil from leaching pools DW-1, DW-2 and DW-3. The soil was removed by a licensed waste hauler to an approved Treatment, Storage and Disposal Facility (TSDF). The final excavation extended to a maximum depth of 29 feet below ground surface (bgs). Laboratory analysis of the confirmatory soil samples revealed PCE concentrations below 1 ppm in all samples. Upon completion of the excavation, the piping from the building to the leaching pool system was disconnected and sealed.

In October 18, 1991, the site was listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site.

In August 1992, prior to the initiation of the remedial investigation/feasibility study (RI/FS), the PRP conducted a site screening investigation (SSI). The objectives of the

SSI were to investigate the following areas of concern: Area 1 (DW-1, DW-2, and DW-3); Area 2 (DW-8 in loading dock); Area 3 (former spray paint booth); Area 4 (sanitary leaching pool system on north side of building). The results of the SSI are as follows:

- Area 1: VOC analysis of soil beneath Area 1 revealed the following detections: DW-1 (30'-32' bgs) <l ppm total VOCs, (40-42' bgs) <l ppm total VOCs; DW-2 (14'-16' bgs) <1 ppm total VOCs; DW-3 (23'-25' bgs) <l ppm total VOCs.
- Area 2: VOC analysis of the soil from DW-8 revealed the following detection: (10'-12' bgs) 0.081 ppm of PCE.
- Area 3: A soil gas survey revealed elevated concentrations of VOCs. Two samples were acquired from locations exhibiting the highest photoionization detector (PID) responses and were analyzed for VOCs revealing the following detections: SB-1 (2'-4' bgs) 2.3 ppm PCE; SB-2 (2'-4' bgs) 0.91 ppm PCE.
- Area 4: Sludge samples were acquired for VOC analysis from the bottom of he two sanitary leaching pool (LP-1, LP-2) and a septic tank (ST) and revealed the following detections: LP-1 <1 ppm total VOCs; LP-2 1.98 ppm total VOCs; ST <1ppm total VOCs.

As a result of SSI conducted in August, 1992 the following interim remedial measures (IRM) were undertaken in September, 1992.

- Area 1: This area was the subject of an earlier IRM overseen by NYSDEC and discussed earlier in this document.
- Area 2: In September, 1992, the bottom five feet of soil/sediment was removed from DW-8. The contaminated soil was transported to Athens Hocking Reclamation Center, an approved TSDF. A confirmatory soil sample detected PCE below 1 ppm.
- Area 3: In September, 1992, approximately 27 cubic yards of soil was excavated from the location of the former spray paint booth and transported to Athens Hocking Reclamation Center. Confirmatory soil samples collected at the base of the excavation at an approximate depth of four feet bgs revealed total VOCs below 1 ppm.
- Area 4: In September, 1992, approximately 3,000 gallons of sanitary liquid was removed from the sanitary leaching pool system and discharged with approval to the local publicly owned treatment works (Cedar Creek). A vacuum truck was utilized to remove the bottom three feet of sludge/sediment from leaching pool LP-2. Confirmatory soil samples revealed total VOCs below 1 ppm in the bottom of the sanitary leaching pools. Thereafter, the facility was connected to the municipal sewer system.

The Remedial Investigation (RI) was conducted in two phases. Phase I was conducted beginning in September, 1992 and Phase II began in September, 1993. A report entitled Remedial Investigation/Feasibility Study dated November, 1998 was prepared, which describes the field activities and findings of the RI in detail.

1.3.1 Soil Quality

Confirmatory soil samples previously acquired from drywells DW-1, DW-2, and DW-3 (Area 1) revealed that the IRM conducted in March, 1991 was successful in reducing PCE concentrations to levels below those prescribed in TAGM #4046.

Soil borings advanced through drywells DW-4, 5, 6, 7, and 8 revealed PCE concentrations below TAGM #4046 in all cases. Drywells DW-4, 5, 6, and 7 had not been investigated prior to the RI. DW-8 was the subject of an IRM conducted in September, 1992.

In order to determine the extent of contamination remaining around the former spray paint booth, a soil gas survey was conducted, two soil borings performed and two surface soil samples were acquired via hand auger. The highest concentration of PCE observed in any of these samples was 0.14, ppm, demonstrating the IRM was successful in removing soil contamination.

Based upon prior sampling of the sanitary leaching pool system, leaching pool LP-2 was found to contain elevated levels of VOCs and was the subject of an IRM. A soil boring was advanced through this pool during the RI and revealed no detections of VOCs.

1.3.2 Groundwater Quality

Two additional monitoring wells (MW-8, MW-9) were installed during the Phase I RI to supplement previously installed monitoring wells. The VOC of concern was PCE which was detected at levels above the New York State Ambient Water Quality Standards for Class GA groundwater of 5 ppb. In order to ascertain the areal extent of groundwater contamination which may have migrated off-site, one permanent and seven temporary groundwater monitoring wells were installed downgradient of the site during the Phase II RI. Temporary exploratory wells EW-2, EW-3, and EW-4 were installed and sampled in July, 1993. Temporary exploratory wells EW-5, EW-7, EW-8, and EW-9 were installed and sampled in July, 1995. Permanent monitoring well OW-1 was installed and sampled in July, 1997.

After the completion of an on-site and off-site remedial investigation a record of decision (ROD) was issued in March 1999. As prescribed in the ROD, groundwater sampling was conducted on a quarterly basis for three years starting in June 2000. Quarterly groundwater results indicated that contaminant levels have consistently been below the New York state Ambient Water Quality Standards for Class GA groundwater.

In February 26, 2004, the site was delisted when the groundwater quality goals (NYS Drinking Water Standards) were obtained.
Monitoring wells utilized during the site activities were sealed.

1.4 Site Geology and Hydrogeology

Previous reports indicate that subsurface materials at site consist of loam.

Based on documented groundwater measurements, the depth to groundwater was approximately 53 feet below site grade and the groundwater flow direction is towards the south-southwest.

Section 2
Project Objectives and Organization

2.1 Objectives

The objective of this soil vapor intrusion evaluation is to provide a clear delineation of vapor conditions at the Bowe Systems and Machinery Site and to determine if vapor conditions are a result of residual soil or groundwater contamination. In order to achieve this objective, the following activities will be conducted:

- Task 1 – Work Plan Development
  The development of a site specific work plan which includes a site specific Health and Safety Plan (HASP) and QAPP

- Task 2 – Soil Vapor Investigation
  The investigation will include:
  - Soil Vapor Sample Collection, collection of soil vapor samples at five direct push locations from two depth intervals, approximately 8 feet bgs and 53 feet bgs
  - Groundwater Sample Collection, collection of groundwater sample at five direct push locations
  - Soil Sampling, collection of soil samples at up to three locations if elevated vapor reading are detected
  - Investigative Derived Waste
  - Decontamination Procedures
  - Sample Location, identification of direct push sample locations utilizing a Global Positioning System (GPS)

- Task 3 – Field Documentation and Reporting

2.2 Organization

2.2.1 Project Team

The project manager, Maria Watt, will have overall responsibility for the technical and financial aspects of this project. She will assign technical staff, maintain control of the project budget and schedule, prepare monthly progress reports, review and approve project invoices, evaluate the technical quality of project deliverables, and manage subcontractors. She will serve as CDM's point of contact for this project. The project’s overall staffing plan is presented in Section 5 of the Work Plan text.

The field manager, Melissa Koberle, will be responsible for overseeing the field tasks for the site investigation. Section 2 of the Work Plan text details the tasks to be performed, number and type of samples to be collected, and the analytical parameters required. She will also be responsible for ensuring that the Health and Safety Plan is implemented during field activities and that a copy of the site-specific Health and Safety Plan is maintained at the site at all times. She is also responsible for upgrading or downgrading personnel protection based on actual conditions at the time of the investigation. The field manager must also present an overview of the Health and Safety Plan to field personnel prior to initiating any field activities and is responsible for insuring that field personnel sign off on this plan. She will contact the program health and safety officer if any questions or issues arise during the field activities that she cannot answer.

The program health and safety officer, Chris Marlowe, will review and make recommendations to the subcontractors on health and safety plans for compliance with OSHA requirements. He will approve a Health and Safety Plan for CDM and maintain required health and safety records.

The program quality assurance manager, Jennifer Oxford, will monitor QC activities of program management and technical staff, and identify and report needs or corrective action to both the CDM project manager and field manager. She will also conduct an internal review of all project deliverables prepared by CDM staff and sign off on all project deliverables.

2.3.2 Subcontractors

The following subcontractor services may be required as part of the site investigations and performed by subcontractors under CDM's supervision, including the following:

Services to be Provided	**Firm**
Drilling	Zebra
Chemical Analytical Laboratory	ChemTech
Verification Laboratory	Data Validation Services
M/WBE Quarterly Reports	Kenneth Shider

Section 3

Project Schedule

Table 3-1 provides the anticipated chronology of events for this work assignment.

Table 3-1: Project Schedule

Project Milestone	Date
Issue Work Assignment (WA)	May 15, 2006
Acknowledge Receipt of WA	5 Days after Issuance
Work plan development session	June 1, 2006
Submit Task 1 (Draft Work Plan (including QAPP and HASP)) Deliverable	June 21, 2006
DEC/DOH Comment on Draft Work Plan	July 18, 2006
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Task 3 Submit Final Report	30 Days after Approval of Draft Report

Section 4
Field Procedures

4.1 Field Log Book

Information recorded in field log books include observations, data, calculations, time, weather, description of the data collection activity, methods, instruments, and results. Additionally, the logbook may contain descriptions of wastes, biota, geologic material, and site features including sketches maps, or drawings as appropriate.

4.1.1 Preparation

In addition to this QAPP, site personnel responsible for maintaining logbooks must be familiar with other site specific standard operating procedure (SOPs). These should be consulted as necessary to obtain specific information about equipment and supplies, health and safety, sample collection, packaging, decontamination, and documentation.

Prior to use in the field, each logbook should be marked with a specific control number. The field notebook will then be assigned to an individual responsible for its care and maintenance.

Field logbooks will be bound with lined, consecutively numbered pages. All pages must be numbered prior to initial use of the logbook. The following information will be recorded inside the front cover of the logbook:

- Field logbook document number
- Activity (if the log book is to be activity-specific)
- Person and organization to whom the book is assigned, and phone number(s)
- Start date

4.1.2 Operation

The following is a list of requirements that must be followed when using a logbook:

- Record work, observations, quantities of materials, calculations, drawings, and related information directly in the log book. If data collection forms are specified by an activity-specific plan, this information need not be duplicated in the logbook. However, any forms used to record site information must be referenced in the logbook.

- Do not start a new page until the previous one is full or has been marked with a single diagonal line so that additional entries cannot be made. Use both sides of each page.

- Do not erase or blot out any entry at any time. Before an entry has been signed and dated, any changes may be made but care must be taken not to obliterate what was written originally. Indicate any deletion by a single line through the material to be deleted.

- Do not remove any pages from the book.
- Record as much information as possible.

Specific requirements for field logbook entries include:

- Initial and date each page.
- Initial and date all changes.
- Multiple authors must sign out the logbook by inserting the following:

Above notes authored by:

- (Sign name)
- (Print name)
- (Date)
- A new author must sign and print his/her name before additional entries are made.
- Draw a diagonal line through the remainder of the final page at the end of the day.
- Record the following information on a daily basis:
    - Date and time
    - Description of activity being conducted including station (i.e., well, boring, sampling location number) if appropriate
    - Weather conditions (i.e., temperature, cloud cover, precipitation, wind direction, and speed) and other pertinent data
    - Level of personnel protection to be used

Entries into the field logbook will be preceded with the time (written in military units) of the observation. The time should be recorded at the point of events or measurements that are critical to the activity being logged. All measurements made and samples collected must be recorded unless they are documented by automatic methods (e.g., data logger) or on a separate form. In these cases, the logbook must reference the automatic data record or form.

Other events and observations that should be recorded include:

- Changes in weather that impact field activities.
- Deviations from procedures outlined in any governing documents. Also record the reason for any noted deviation.

- Problems, downtime, or delays.
- Upgrade or downgrade of personnel protection equipment.

4.1.3 Post-Operation

To guard against loss of data due to damage or disappearance of logbooks, copies of completed pages will be made periodically (weekly, at a minimum) and submitted to the project manager. Documents that are separate from the logbook will be copied and submitted regularly and as promptly as possible to the project manager. This includes all automatic data recording media (printouts, logs, disks or tapes) and activity-specific data collection forms required by other SOPs.

At the conclusion of each activity or phase of site work, the individual responsible for the log book will ensure all entries have been appropriately signed and dated, and that corrections were made properly (single lines drawn through incorrect information, then initialed and dated). The completed logbook will be submitted to the records file.

4.2 Sample Documentation and Identification

The following procedures describe proper documentation to be included in field notebooks. Documentation includes describing data collection activities, logging sample locations, sample IDs, container labeling and chain-of-custody forms. Procedures for sample classification to insure proper labeling of samples are also included.

4.2.1 Responsibilities

The field manager and/or field technician is required to oversee drilling of the boreholes, collection of vapor, groundwater and soil samples, fill out field book logs, submit samples for analysis, COC forms and labeling of any waste-containing drums, if required. Also, the field manager and/or field engineer is required to adhere to the Site-Specific Health & Safety Plan. Field book entries should state starting time of monitoring, equipment used and results.

4.2.2 Field Notebooks

Complete thorough notes of all field events are essential to a timely and accurate completion of this project. The field manager and/or field engineer is responsible for accounting for particular actions and times for these actions of the subcontractor while in the field. Also, identification (numbers and description) of field samples, duplicates samples, and blank samples should also be noted in the field book. For a particular workday, the field book should contain the following:

- Field personnel name, contractors name, number of persons in crew, equipment used, weather, date, time, and location at start of day (boring number).

- Sample identification number, depth, amount of sample recovery, HNU or OVM reading and soil descriptions.
- Description of any unusual surface or subsurface soil conditions
- Record of Health and Safety monitoring; time, equipment and results
- Record of site accidents or incidents
- Record of any visitors
- Potential of delays
- Materials and equipment used during borehole installation
- Final daily summary of work completed including list of samples obtained
- Completion of daily QA/QC log sheet
- Contractor downtime, decontamination time, equipment breakdowns, movement tracking throughout the day, etc.
- Any other data that may be construed as relevant information at a later date.

The field logs should confirm the subcontractor's data. Field notes should be photocopied weekly and returned to the project manager.

4.2.3 Sample Identification

Each sample collected will be designated by an alphanumeric code that will identify the type of sampling location, matrix sampled, and the specific sample designation (identifier). Site specific procedures are described below:

Sample identification will contain a sequential code consisting of three segments. The first segment will designate the site identification which is 130048 for Bowe Systems and Machinery site. The next segment will designate the location type and specific location. Location types will be identified by a two-letter code, for example: DP (direct push boring). The specific sampling location will be identified using a two-digit number. The third segment will identify the matrix type and a sample depth designation. The matrix type will be designated by a two-letter code, for example: SV (soil vapor), SS (soil), and GW (groundwater). The sample identifier will be represented by a two-letter code identifying the depth below ground surface of the sample, for example 08 for eight feet below ground surface. The following is a general guideline for sample designation:

First Segment	**Second Segment**		**Third Segment**	
Site ID	Location Type	Specific Location	Matrix Type	Bottom Depth
130048	DP	05	SV	08

Sample ID:

The above sample identification 130048-DP05-SV08 is a soil vapor sample collected at a depth of 8 feet from the DP05 location at the Bowe site.

Location Type:

SV = Soil Vapor

GW = Groundwater

SS = Soil Sample

FB = Field Blank

TB = Trip Blank

Field duplicates will be designated by adding a "D" to the end of the sample identification. A sample depth will not be assigned to the duplicate sample ID.

4.3 Chain-of-Custody Procedures

This section describes the procedures used to ensure that sample integrity and chain-of-custody are maintained throughout the sampling and analysis program. Chain-of-custody (COC) procedures provide documentation of sample handling from the time of collection until its disposal by a licensed waste hauler. This documentation is essential in assuring that each sample collected is of known and ascertainable quality.

The COC begins at the time of sample collection. Sample collection is documented in the field notebooks in accordance with the specified SOP. At the same time, the sampler fills out the label on the sample container with the following information:

- Sample ID code
- Required analyses
- Sampler initials
- Date and time of sample collection

4.3.1 Chain-of-Custody Forms

The COC forms are a paper trail system that follows the samples collected and indicates which laboratory analyses are to be performed on which samples. Each sample should be clearly labeled and listed on the COC. The laboratory will only perform analyses on samples indicated and all other samples should be indicated with a "HOLD" designation. By labeling a sample "HOLD", the laboratory will store the sample until further instruction is given. Do not check the request for analysis blocks on the COC for samples designated with "HOLD" Status. Never indicate duplicate or blank samples on a COC.

It is the responsibility of the field manager to coordinate COC forms and supply copies of all COC to the project manager for data management use.

A COC form is filled out for each sample type at each sampling location. Each time the samples are transferred to another custodian or to the laboratory, the signatures of the people relinquishing the sample and receiving the sample, as well as the time and date, are documented. Labels will be filled out with an indelible, waterproof, marking pen.

4.3.2 Chain-of-Custody Records

The COC record is a three-part form. The laboratory retains the original form and the person relinquishing the samples keeps a copy of the form at the time of sample submittal. This form is then returned to the project manager or person in charge of data coordination.

The COC Record will be placed in a Ziplock bag and placed inside of all shipping and transport containers. All samples will be hand delivered or shipped by Federal Express to the laboratory specified by the field manager. Samples should be packed so that no breakage will occur. Custody seals will be placed on all coolers/packages containing laboratory samples during shipment.

4.4 Field Quality Control Samples

In order to maintain QA/QC in both the field and the laboratory, additional samples such as trip blanks, duplicates, field blanks, performance evaluation samples and background samples will be collected. Each type of QA/QC sample is described below and summarized in Table 4-1.

4.4.1 Quality Control for Soil Vapor Sampling

Approximately five percent of all soil samples analyzed should be QA/QC samples. These samples act as a verification of appropriate field and laboratory procedures. These samples should be recorded in the field book. All QA/QC samples should be numbered sequentially with other field samples on the soil log form.

Approximately five percent of all soil vapor samples analyzed should be duplicate samples. Soil vapor duplicates will be collected at the same soil vapor location. To ensure laboratory "blind" analyses, duplicate samples will be recorded as MD samples on sample containers and the COC forms. The actual identification of the duplicate samples will be recorded in the field book. Duplicate samples are collected from the same vapor sampler and analyzed for the same compounds. All summa canisters must be certified to be free of contaminants in accordance with QA/QC protocol.

4.4.2 Quality Control for Groundwater Sampling

Approximately five percent of all groundwater samples analyzed should be QA/QC samples. These samples act as a verification of appropriate field and laboratory procedures. These samples should be recorded in the field book. All QA/QC samples should be numbered sequentially with other field samples. The following is a breakdown of types of QA/QC samples that are to be taken:

4.4.2.1 Duplicate Samples

Approximately five percent of all groundwater samples analyzed should be duplicate samples. To ensure laboratory "blind" analysis, duplicate samples will be recorded with the location identification and the next sequential sample number on sample containers and the COC forms. Duplicate samples are collected from the same location and analyzed for the same compounds.

4.4.2.2 Trip Blanks

Each cooler packed and shipped for aqueous VOC analysis should also contain a trip blank. Trip blanks are VOA vials filled with distilled water. These vials are to be carried with the sample bottles and samples and should remain sealed the entire time. It should be documented in the field book which aqueous samples were collected and transported with the trip blank.

4.4.2.3 Field Blanks

One field blank sample will be collected per day of sampling. Field blanks are collected after a sample is taken and the equipment used (i.e., bailer) has been decontaminated. Distilled water is then poured over the decontaminated sampling equipment and collected in sample jars for analysis. It should be documented in the field book which groundwater sample preceded the field blank and which sample followed the field blank for the equipment used.

4.4.3 Quality Control for Soil Sampling

Approximately five percent of all soil samples analyzed should be QA/QC samples. These samples act as a verification of appropriate field and laboratory procedures. These samples should be recorded in the field book but should not be identified on the COC form other than with an MD (Miscellaneous Discrete). All QA/QC samples should be numbered sequentially with other field samples on the soil log form. The following is a breakdown of types of QA/QC samples that are to be taken:

4.4.3.1 Duplicate Samples

Approximately five percent of all soil samples analyzed should be duplicate samples. Soil duplicates will be field-homogenized soils samples. The identification of the duplicate samples will be recorded in the field book. Duplicate samples are collected from the same split spoon sampler, homogenized in the field and analyzed for the same compounds.

4.4.3.2 Field Blanks

A field blank will not be required for this phase of the project since dedicated field sampling equipment will be utilized.

4.5 Soil Vapor Sampling

The soil vapor sampling will be conducted at five locations. Soil gas samples will be collected at two depths (8 feet and at least 2 feet above the water table) at 5 locations

(Figure 2-1). Two separate soil vapor bore holes will be co-located at each of the five locations to independently sample the shallow (8 feet bgs) and deep (at least 2 feet above the water table) soil vapor. The first boring of this investigation will be a deep groundwater sample boring to allow for the accurate determination of the groundwater table. It is critical to ensure that moisture does not enter the summa canister which can compromise the analytical results. Subsequent sampling can proceed with the shallow vapor sample being collected prior to the deep sample at each location.

A total of 10 soil vapor samples and 4 QA/QC (including ambient air) samples will be collected, for a total of 14 samples (Table 4-1). Screening samples will be collected by the driller at each location. Vapors will be collected toward the end of the purging via a tedlar bag and screened using a PID meter obtaining a total VOC reading. The PID meter will be provided, maintained, and calibrated, by CDM. A CDM representative will record the total VOC reading. Samples will be collected by the drilling subcontractor at each location, into pre-cleaned, pre-evacuated, 6-liter mini-Summa canisters. The canisters will be provided by CDM's laboratory. The soil vapor samples will be analyzed for EPA method TO-15 (Table 4-1). Detection limits for EPA method TO-15 are presented on Table 4-2.

4.5.1 Soil Vapor Probe Installation

A. Soil vapor probe installation at all locations will be performed according to the following procedures:

1. At any location where utilities may be present, notable at location DP-04 (Figure 2-1), a vactron will be utilized to advance the boring to 5 feet bgs. Locations where a vactron is utilized, the borehole will be backfilled with indigenous soil until sampling can be completed at this location. A Geoprobe and hollow rods will then be used to push or drive a soil gas probe and disposable tip to the first sample depth (approximately 8 feet bgs). Once the probe is in place, retract the rods slightly to expose the sampling port. Insert laboratory or food grade quality new, dedicated inert tubing (polyethylene, stainless, or Teflon) through the rods and attach it to the soil gas probe just above the tip. Seal the surface of the borehole with fine grained bentonite slurry to a depth of approximately 1 foot below grade.

2. Conduct a tracer test at the location, as described in the following section (Section 4.5.2). Approximately 10 locations will require tracer tests before and after sampling.

3. Collect soil vapor sample for off site analysis, as described in Sections 4.5.4. Since the soil gas sample will require at least 1 hour to fill the summa canister, extra equipment will be necessary to install the co-located deep (53 foot) vapor sample.

4. Advance the soil gas probe and tip at a second co-located borehole to the second depth (approximately 53 feet). Once the probe is in place, retract the rods slightly to expose the sampling port. Insert new, dedicated inert tubing through the rods and attached it to the soil gas probe just above the tip. Seal the surface of the borehole with fine grained bentonite slurry to a depth of approximately 1 foot below grade.

5. Repeat steps 2 and 3 above.

6. After the deep vapor sampling is complete continue advancement of the borehole to approximately one foot below the water table (approximately 56 feet bgs) to collect a groundwater sample. Collect a groundwater sample to be sent off-site for CLP VOA analysis. Backfill the borehole with indigenous soil or clean sand.

All downhole equipment will be steam cleaned prior to each soil gas location.

4.5.2 Tracer Test Procedures

A. The Subcontractor will conduct tracer tests to verify the integrity of the soil vapor probe seal at approximately 10 locations, as directed by the CDM onsite representative.

B. The driller will be responsible for all equipment required to conduct the tracer test, including helium gas, helium detector, tubing and fittings, and container.

C. Tracer tests will be conducted according to the following procedures:

1. Set up the tracer test apparatus as described in the above cited New York State Department of Health (NYSDOH) Vapor guidance.

2. Enrich the atmosphere with helium within the enclosure over the area where the probe intersects the ground surface. Tracer gas will be applied to the space between the metal rods and the edge of the borehole as well as the space between the metal rods and the inert tubing.

3. Attach the helium detector to the tubing leading from the sample probe, and measure a vapor sample from the probe. If the reading is below 20 percent tracer gas, the probe seal is sufficient; proceed with sampling, as described in the following sections. If the reading is above 20 percent tracer gas, the probe seal is not sufficient; reseal the probe surface with bentonite and repeat the tracer test until the reading is below 20 percent tracer gas.

4.5.3 Soil Vapor Sampling Procedures for Offsite Analysis

Soil gas samples for off site analysis will be collected at two depths per soil gas location (two co-located boreholes). Once the soil gas probe is installed and a tracer test is conducted, soil gas samples for off site analysis will be collected according to the following procedures:

1. The soil vapor samples will be collected using a laboratory-certified clean summa canister with a one-hour regulator ensuring that the sample flow rate less than 100 milliliters per minute (ml/min) to minimize outdoor air infiltration during sampling. The summa canisters will have a vacuum of 28 inches mercury (in Hg) ± 2 inches prior to the collection of the soil vapor sample. The ambient air QA/QC sample will be collected during the soil vapor sampling event.

2. Calculate the dead air volume of the tubing including the screen interval as part of the dead air volume. Attach the vacuum pump and purge at least 3 dead air volumes from the tubing. The tubing will be connected to a vacuum/volume system which is a combined diaphragm pump and calibrated gauge system specifically designed for soil gas sampling. The tubing is fitted with a needle valve regulator which can easily be throttled to a flowrate of less then 100 milliliters (ml) per minute. Syringes will be utilized to purge the tubing if obtaining a flowrate of 100 ml/min is difficult with vacuum/volume system. Approximately three probe volumes (i.e. volume of sample probe and tubing) will be purged at a flow rate less than 100 ml per minute. The poly tubing has an inside diameter of ¼ inch and a volume of 9.65 ml/foot. Purging for the eight foot vapor locations assuming 3 feet of extra tubing at the surface to work with yields a purging volume of 318.45 ml over a 3.18 minute time frame. Purging for the 53 foot vapor locations assuming 3 feet extra tubing at the surface yields a purging volume of 540 ml over a 5.4 minute time frame. A tedlar bag will be filled toward the end of the purge volume to be screened using the PID meter. The PID readings will be observed and recorded on the appropriate field form. The vacuum/volume system will be disconnected and the end of the tubing will be connected directly to the summa canister intake valve. The samples will be collected using laboratory-certified clean summa canisters with flow regulators and a vacuum of 28 inches Hg ± 2 inches. A vacuum of 5 inches Hg ± 1 inch must be present when sample collection is terminated.

3. After purging is complete, record the initial pressure in the stainless steel Summa® canister to be used for the sample prior to connecting the tubing. Vacuum readings in the canister should be approximately 28-30 in Hg. If no vacuum reading is obtained, use a different canister as this indicates the canister was not properly evacuated.

4. Collect the sample into the Summa® canister, which will be provided by CDM's laboratory. An additional canister and regulator will be ordered as backup. Sample flowrate will not exceed 100 ml/min.

5. When the vacuum gauge reads 5 in Hg, close the valve. Sampling is complete. A vacuum of 5 in Hg ± 1 inch must be present when sample collection is terminated

to prevent contamination during transit. Record the final pressure reading in the Summa® canister.

6. CDM personnel will label, pack and ship the samples to an ELAP-approved laboratory. The serial numbers for the summa canisters and the regulators will be recorded on the chain of custody. Custody seals will be placed on all coolers/packages containing laboratory samples during shipment

4.5.4 Ambient Air Sampling Procedures for Offsite Analysis

Ambient air samples will be collected at a frequency of one per day of sampling and be collected simultaneously with soil vapor sampling. Ambient air samples will be collected in the same manner as soil vapor samples. Sample durations will be the same as soil vapor samples. Personnel will avoid lingering in the immediate area of the sampling device while samples are being collected. Ambient air samples will be collected in a location of as far away as possible from any boring or dust generating activities.

The following actions will be taken to document conditions during ambient air sampling:

1. Outdoor plot sketches will be drawn that include the building site, area streets, ambient air sample locations, the location of potential interferences, compass orientation, and paved areas.

2. Weather conditions (e.g. precipitation, temperature, wind direction and barometric pressure)

3. Any pertinent observations, such as odors, reading from field instruments, and significant activities in the vicinity (e.g. operation of heavy equipment) will be recorded.

The field sampling team will maintain a sample log sheet summarizing the following:

1. sample identification.

2. date and time of sample collection

3. sampling height

4. serial numbers for summa canisters and regulators

5. sampling methods and devices

6. vacuum of summa canisters before and after sample collection

7. chain of custody protocols and records used to track samples from sampling point to analysis.

4.6 Groundwater Sampling

The samples will be analyzed for VOCs at CDM's contracted laboratory by EPA method 8260B (Table 4-1). The detection limits for this analytical method are presented in Table 4-3.

4.6.1 Purge and Sampling

Standard purge techniques will be utilized to purge and sample groundwater. Standard purge and sampling techniques consist of using a check valve and tubing to purge the well at a low flow rate. The check valve intake is set approximately in the middle of the screen. The well is purged at the low rate until the field parameters (temperature, pH, specific conductivity, turbidity, dissolved oxygen, and Eh) have stabilized. The sample is then collected directly from tubing. (see Section 4.6.3).

4.6.2 Equipment

The following equipment is required:

- Polyethylene sheeting
- Monitoring instrument for measuring pH, turbidity, dissolved oxygen, conductivity, temperature (Horiba U-10 or equivalent)
- Large, wide-mouth breakers for measuring field parameters
- Photoionization detector or equivalent (PID)
- Logbook(s)
- Decontamination supplies
- Sample bottles and preservatives
- Labels and shipping products specified in the QAPP
- Personal protective equipment specified in Site Health and Safety Plan

4.6.3 Procedure

Personal protective equipment will be donned in accordance with the requirements of the Site Health and Safety Plan (HASP).

1) Assemble the screen point groundwater sampler.

2) Attach the Mill-slotted screen point groundwater sampler, onto the leading probe rod.

3) Thread the drive cap onto the top of the probe rod and advance the sampler using either the hydraulic hammer or hydraulic probe mechanism. Replace the 30-centimeter (cm) rod with the 90-cm rod as soon as the top of the sampler is driven to within 15 cm of the ground surface.

4) Advance the sampler to the interval to be sampled using the hydraulic hammer. Add additional probe rods as necessary to reach the specified sampling depth.

5) Move the probe unit back from the top of the probe rods and remove the drive cap.

6) Attach the pull cap to the top probe rod, retract the probe rods, push the screen into the formation, remove extension rods from the probe rods, and measure and record the water level, allowing time for the water level to reach equilibrium.

5) Purge at least three volumes of groundwater. During purging, monitor the field parameters (temperature, pH, turbidity, specific conductance and dissolved oxygen) approximately every 3 to 5 minutes until the parameters have stabilized to within 10 percent (plus or minus 5 percent) over a minimum of three readings. Turbidity and dissolved oxygen are typically the last parameters to stabilize. Note: once turbidity readings get below 10 NTUs, then the stabilization range can be amended to 20 percent (plus or minus 10 percent) over a minimum of three readings.

   Readings should be taken in a clean container (preferably a glass beaker) and the monitoring instrument allowed to stabilize before collection of the next sample. The Horiba instrument takes the readings consecutively and therefore the process to record all the measurements may take longer than five minutes. If so, measurements should be taken as often as practicable.

6) Once the field parameters have stabilized collect the samples using a check valve and flexible tubing system. Volatile compounds that degrade by aeration must be collected first. All sample bottles should be filled by allowing the water to flow gently down the inside of the bottle with minimal turbulence. Cap each bottle as it is filled.

7) Samples will be preserved, labeled, and placed immediately into a cooler and maintained at 4°C throughout the sampling and transportation period. Samples should be labeled, recorded on the chain-of-custody and shipped according to the proper procedures. Custody seals will be placed on all coolers/packages containing laboratory samples during shipment

4.7 Soil Sample Collection

During the soil vapor investigation, CDM will collect up to three soil samples if elevated vapor readings are detected or visible stained soil is discovered. The samples will be analyzed for VOCs, semi-volatile organic compounds (SVOCs), and metal at an ELAP-approved off-site laboratory (Table 4-1). Detection limits for these analytical methods are presented on Tables 4-4, 4-5 and 4-6.

4.7.1 Direct Push Soil Sampling

The direct push sampling is a unique soil sampling system designed for use with either manually driven rods or a direct push machine. Unlike split-spoon samplers, the Driver-Point sampler remains completely sealed while it is pushed or driven to the desired sampling depth. A piston stop-pin at the trailing end of the sampler is removed by means of extension rods inserted down the inside diameter of the probe rods after the sampler has been driven to depth. This enables the piston to retract into the sample tube as it is displaced by soil while the sample is being taken.

4.7.2 Procedure

4.7.2.1 Assembly

Decontaminate all sampling parts thoroughly in accordance with the decontaminated protocol. All parts must fit tightly. The stop-pin requires a new O-ring for each sample. The pin should be tightened down with a wrench so that is exerts pressure against the piston rod. Damage to the pin or drive head could occur during driving if the pin is not tight.

4.7.2.2 Probing

1) Attach assembled sampler onto leading direct push rod.
2) Drive the sampler into the ground. Stop when the drive head is just above the surface and re-tighten the stop-pin using a ⅜ inch wrench for the point and a 1 inch or adjustable wrench for the drive head. Most vibration that could loosen the stop-pin occurs with the initial driving.
3) Drive the sampler to the top of the desired sampling interval. Attach additional probe rods as necessary to reach depth.

4.7.2.3 Stop-Pin Removal

1) If using a Geoprobe machine, move the probe unit away from the top of the probe rods to allow for room to work.
2) Remove the drive cap and lower extension rods down the inside diameter of the probe rods using couplers to join rods together.
3) Attach the extension rod handle to the top extension rod and rotate the handle clockwise. Some resistance will be felt when the stop-pin begins to disengage. Continue to rotate the handle until resistance ends. Lift up on the handle to check if the threads are completely disengaged.

4) Remove the extension rods from the probe rods. The stop-pin should be attached to the end extension rod upon removal.

4.7.2.4 Sampling

1) Wear appropriate health and safety equipment as outlined in the HASP
2) Replace drive cap onto top probe rod. If the top of the probe rod is already in the lowest driving position, it will be necessary to attach another probe rod before driving.
3) Mark the top probe rod with a marker or tape at the appropriate distance above the ground surface.
4) Drive the sampler to the designated distance. Be careful not to over-drive the sampler which could compact the soil sample making it difficult to extract.
5) Retract the probe rods from the hold to recover the sampler.

4.7.2.5 Machine Extrusion

1) Disassemble the recovered soil sampler. Remove all parts.
2) Position the extruder rack on the foot of the Geoprobe derrick.
3) Insert the sample tube into the extruder rack with the cutting end up.
4) Position the extruder piston and push the sample out using the “probe” function on the Geoprobe. Catch the sample in a jar as it is extruded beneath the extruder rack.
5) Describe carefully the approximate recovery (length), composition, color, moisture, etc. of the recovered soil.
6) Fill jars with soil using dedicated sampling tools. All soil samples for chemical analyses, except VOCs must be homogenized by vigorous mixing in stainless steel pans with stainless steel spoons prior to being put into containers. VOC samples must be taken as discrete grab samples. These should be taken immediately from the split spoon Geoprobe, and properly packaged. Homogenization of soil samples (except for VOC samples) will be conducted as follows:

   To homogenize a sample of a soil matrix, first rocks, twigs, leaves, and other debris should be removed if they are not considered part of the sample. The soil should be removed from the sampling device using a stainless steel, fully decontaminated spatula and placed in a stainless steel pan, then thoroughly mixed using a stainless steel spoon. The sample should then be quartered and moved to the four corners of the pan. Each quarter of sample should be mixed individually, and then rolled to the center of the container and the entire sample mixed again.
7) Cool analytical samples on ice to 4oC. Samples must be shipped to the laboratory by overnight courier within the specified 24 hours from the time of collection.

8) Fill out field notebook, sample log sheet, labels, custody seals, and COC forms for analytical samples. Custody seals will be placed on all coolers/packages containing laboratory samples during shipment

4.8 Decontamination

All non-dedicated, non-disposal sampling equipment and tools used to collect samples for chemical analysis will be decontaminated prior to and between each sample interval using an Alconox rinse and potable water rinse prior to reuse. Unless disposable sampling equipment is used, the equipment will be decontaminated by the following procedure:

1) Wash with the non-phosphate detergent
2) Tap water rinse
3) Methanol or acetone, rinse
4) DI water rinse
5) Air dry and wrap in aluminum foil, shiny side out

Additional cleaning of the drilling equipment with steam may be needed under some circumstances if elevated levels of contamination appear to be present using field monitoring equipment or visible stained soils. Decontamination fluids will be discharge to the ground surface unless visible sheen or odor is detected either on the equipment or the fluids, at which point the decontamination water will be contained in a 55-gal drum, staged and properly disposed.

4.9 Investigative Derived Waste

Soil cuttings and purge water will be placed and dispersed on the ground unless visible contamination or elevated PID readings are observed. If contamination is present, investigative derived waste (IDW) will be contained and analyzed to determine the appropriate disposal methods. This investigation is not anticipated to generate IDW.

Table 4-1
Analytical Program Summary
Bowe Systems and Machinery
Hicksville, New York

Analytical Parameter	Sample Matrix	Number of Samples	Analytical Method	Field Duplicates (a)	MS/ MSDs	Field Blank/ Ambient Air Blank (b)	Trip Blanks (e)	Container	Sample Preservation	Holding Time
SOIL VAPOR SAMPLES										
VOCs	Vapor	10	EPA TO-15	1	(c)	3	0	6-liter SUMMA canister	None	30 days
GROUNDWATER SAMPLES										
VOCs	Groundwater	5	EPA 8260B	1	1	3	1	3 - 40ml clear glass vial with Teflon septum	HCl to pH <2; Cool to 4^{o}C	14 days
SOIL SAMPLES										
Volatile Organic Compounds	Soil	3	EPA 8260B	1	1	0	0	3 - 40 ml glass VOC with plastic cap with Teflon septum with 25 ml methanol (prepared by lab)	Cool to 4^{o}C	14 days
Semi-Volatile Organic Compounds	Soil	3	EPA 8270C	1	1	0	0	250-mL (8 oz) amber glass	Cool to 4^{o}C	7 days
Metals	Soil	3	EPA 6010B/7000Series	1	1	0	0	250-mL (8 oz) amber glass	Cool to 4^{o}C	180 days

Notes:
(a) A minimum of 5% of all samples should be collected in duplicate
(b) Groundwater field blanks are collected at a frequency of 1 per day.
(c) SUMMA canisters containing samples are not spiked in the field.
(d) Cannister should be used within 15 days of being shipped to the field for sample collection.
(e) Trip blanks are collected at a frequency of 1 per sampling event or 1 per every five days.

Table 4-2
TO-15 Laboratory Method Detection Limit
Bowe Systems and Machinery
Hicksville, New York

MDL STUDY FOR 2005 VOA **MATRIX** AIR

INSTRUMENT:MSVOA_L **DATE OF STUDY** 09/01/05

Column: RTX-1 0.32mm x 60M

METHOD: **EPA TO-15**

DATA FILE IDENTIFIER	RUN1	RUN2	RUN3	RUN4	RUN5	RUN6	RUN7	AVG	STD	Mol. Wt.	MDL	MDL	PQL	PQL
Spike conc/Units	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	Conc.	DEV.		ppbv	ug/m3	ppbv	ug/m3
								ppbv						
DATA FILE	VL090104	VL090105	VL090106	VL090107	VL090108	VL090109	VL090110							
Dichlorodifluoromethane	0.23	0.24	0.24	0.26	0.25	0.25	0.25	0.25	0.010	121	0.031	0.15	0.10	0.49
Chloromethane	0.24	0.24	0.22	0.25	0.24	0.25	0.24	0.24	0.010	50	0.031	0.06	0.10	0.20
Vinyl Chloride	0.22	0.21	0.22	0.24	0.23	0.22	0.23	0.22	0.010	62.5	0.031	0.08	0.10	0.26
Bromomethane	0.23	0.23	0.22	0.23	0.24	0.22	0.23	0.23	0.007	95	0.022	0.08	0.10	0.39
Chloroethane	0.23	0.21	0.22	0.22	0.22	0.23	0.23	0.22	0.008	65	0.024	0.06	0.10	0.27
Dichlorotetrafluoroethane	0.22	0.23	0.22	0.23	0.24	0.24	0.24	0.23	0.009	171	0.028	0.20	0.10	0.70
Propene	0.24	0.25	0.22	0.26	0.22	0.23	0.24	0.24	0.015	42	0.047	0.08	0.10	0.17
Heptane	0.21	0.19	0.19	0.21	0.2	0.2	0.21	0.20	0.009	100	0.028	0.12	0.10	0.41
Trichlorofluoromethane	0.23	0.24	0.22	0.26	0.25	0.24	0.24	0.24	0.013	137	0.041	0.23	0.10	0.56
1,1,2-Trichlorotrifluoroethane	0.23	0.22	0.22	0.24	0.23	0.22	0.23	0.23	0.008	187	0.024	0.18	0.10	0.76
Bromoethene	0.21	0.2	0.18	0.22	0.21	0.2	0.19	0.20	0.013	107	0.042	0.18	0.10	0.44
Acetone	0.35	0.3	0.3	0.32	0.3	0.41	0.34	0.33	0.040	58	0.126	0.30	0.20	0.47
1,3-Butadiene	0.25	0.25	0.21	0.27	0.26	0.23	0.27	0.25	0.022	54	0.069	0.15	0.10	0.22
1,1-Dichloroethene	0.22	0.22	0.2	0.22	0.23	0.23	0.21	0.22	0.011	97	0.034	0.13	0.10	0.40
Isopropyl Alcohol	0.23	0.22	0.22	0.21	0.22	0.34	0.24	0.24	0.045	60	0.142	0.35	0.20	0.49
Methylene Chloride	0.31	0.27	0.27	0.29	0.29	0.28	0.3	0.29	0.015	85	0.047	0.16	0.20	0.70
Allyl Chloride	0.21	0.19	0.19	0.2	0.19	0.19	0.2	0.20	0.008	77	0.025	0.08	0.10	0.31
trans-1,2-Dichloroethene	0.2	0.19	0.19	0.21	0.19	0.17	0.19	0.19	0.012	97	0.038	0.15	0.10	0.40
Vinyl Acetate	0.16	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.008	86	0.025	0.09	0.10	0.35
1,1-Dichloroethane	0.22	0.22	0.2	0.23	0.22	0.21	0.22	0.22	0.010	99	0.030	0.12	0.10	0.40
Ethyl Acetate	0.18	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.007	88	0.022	0.08	0.10	0.36
Hexane	0.2	0.2	0.19	0.21	0.21	0.2	0.21	0.20	0.008	86	0.024	0.08	0.20	0.70
Carbon Disulfide	0.22	0.21	0.2	0.21	0.21	0.22	0.21	0.21	0.007	76	0.022	0.07	0.10	0.31
Methyl tert-Butyl Ether	0.17	0.13	0.14	0.15	0.14	0.14	0.13	0.14	0.014	88	0.043	0.16	0.10	0.36
Chloroform	0.22	0.21	0.22	0.23	0.22	0.22	0.23	0.22	0.007	119	0.022	0.11	0.10	0.49
Cyclohexane	0.17	0.14	0.16	0.16	0.15	0.17	0.21	0.17	0.022	82	0.070	0.23	0.10	0.34
cis-1,2-Dichloroethene	0.21	0.19	0.2	0.22	0.22	0.19	0.22	0.21	0.014	97	0.043	0.17	0.10	0.40
1,1,1-Trichloroethane	0.22	0.22	0.21	0.24	0.22	0.22	0.22	0.22	0.009	133	0.028	0.15	0.10	0.54
2-Butanone	0.2	0.17	0.19	0.23	0.21	0.23	0.19	0.20	0.022	72	0.070	0.20	0.20	0.59
Carbon Tetrachloride	0.25	0.28	0.26	0.3	0.3	0.29	0.27	0.28	0.020	154	0.061	0.39	0.10	0.63
Benzene	0.23	0.23	0.22	0.24	0.23	0.25	0.24	0.23	0.010	78	0.031	0.10	0.10	0.32
1,2-Dichloroethane	0.24	0.25	0.25	0.29	0.28	0.29	0.26	0.27	0.021	99	0.065	0.26	0.10	0.40
Trichloroethene	0.27	0.27	0.27	0.3	0.3	0.29	0.28	0.28	0.014	131	0.043	0.23	0.10	0.54
1,2-Dichloropropane	0.23	0.23	0.23	0.27	0.26	0.25	0.23	0.24	0.017	113	0.054	0.25	0.10	0.46
1,4-Dioxane	0.23	0.22	0.21	0.23	0.2	0.25	0.24	0.23	0.017	88	0.054	0.19	0.20	0.72
Tetrahydrofuran	0.21	0.18	0.15	0.19	0.18	0.2	0.19	0.19	0.019	72	0.060	0.18	0.20	0.59
Bromodichloromethane	0.21	0.23	0.22	0.24	0.23	0.24	0.22	0.23	0.011	164	0.035	0.23	0.10	0.67
2,2,4-Trimethylpentane	0.23	0.24	0.23	0.25	0.24	0.25	0.24	0.24	0.008	114	0.026	0.12	0.10	0.47
t-1,3-Dichloropropene	0.2	0.21	0.21	0.2	0.17	0.18	0.19	0.19	0.015	111	0.047	0.22	0.10	0.45

Table 4-2
TO-15 Laboratory Method Detection Limit
Bowe Systems and Machinery
Hicksville, New York

MDL STUDY FOR 2005 VOA **MATRIX** AIR

INSTRUMENT:MSVOA_L **DATE OF STUDY** 09/01/05

Column: RTX-1 0.32mm x 60M

METHOD: **EPA TO-15**

DATA FILE IDENTIFIER	RUN1	RUN2	RUN3	RUN4	RUN5	RUN6	RUN7	AVG	STD	Mol. Wt.	MDL	MDL	PQL	PQL
Spike conc/Units	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	0.2ppbv	Conc.	DEV.		ppbv	ug/m3	ppbv	ug/m3
								ppbv						
DATA FILE	VL090104	VL090105	VL090106	VL090107	VL090108	VL090109	VL090110							
cis-1,3-Dichloropropene	0.22	0.21	0.21	0.22	0.21	0.23	0.22	0.22	0.008	111	0.024	0.11	0.10	0.45
1,1,2-Trichloroethane	0.24	0.23	0.22	0.25	0.25	0.25	0.22	0.24	0.014	133	0.043	0.24	0.10	0.54
Dibromochloromethane	0.2	0.21	0.19	0.21	0.22	0.23	0.21	0.21	0.013	208	0.041	0.34	0.10	0.85
Bromoform	0.17	0.17	0.15	0.18	0.16	0.18	0.16	0.17	0.011	253	0.035	0.36	0.10	1.03
4-Methyl-2-Pentanone	0.31	0.31	0.34	0.36	0.35	0.34	0.33	0.33	0.019	100	0.060	0.24	0.20	0.82
2-Hexanone	0.6	0.6	0.63	0.61	0.61	0.62	0.63	0.61	0.013	100	0.040	0.16	0.20	0.82
Tetrachloroethene	0.26	0.26	0.26	0.29	0.28	0.27	0.28	0.27	0.012	166	0.038	0.26	0.10	0.68
Toluene	0.23	0.22	0.2	0.24	0.21	0.25	0.23	0.23	0.017	92	0.054	0.20	0.10	0.38
1,2-Dibromoethane	0.21	0.21	0.19	0.21	0.2	0.22	0.23	0.21	0.013	188	0.041	0.31	0.10	0.77
Chlorobenzene	0.24	0.23	0.22	0.26	0.25	0.26	0.25	0.24	0.015	113	0.047	0.22	0.10	0.46
Ethyl Benzene	0.22	0.2	0.2	0.22	0.2	0.22	0.22	0.21	0.011	106	0.034	0.15	0.10	0.43
m/p-Xylene	0.47	0.44	0.4	0.46	0.41	0.46	0.45	0.44	0.027	106	0.084	0.36	0.20	0.87
o-Xylene	0.22	0.2	0.19	0.23	0.2	0.23	0.22	0.21	0.016	106	0.050	0.22	0.10	0.43
Styrene	0.2	0.18	0.17	0.18	0.17	0.19	0.2	0.18	0.013	104	0.040	0.17	0.10	0.43
1,1,2,2-Tetrachloroethane	0.23	0.2	0.18	0.21	0.2	0.21	0.21	0.21	0.015	168	0.047	0.33	0.10	0.69
Benzyl Chloride	0.2	0.19	0.19	0.2	0.18	0.18	0.17	0.19	0.011	141	0.035	0.20	0.10	0.58
4-Ethyltoluene	0.18	0.16	0.15	0.17	0.15	0.17	0.17	0.16	0.011	120	0.036	0.17	0.10	0.49
1,3,5-Trimethylbenzene	0.23	0.2	0.18	0.22	0.2	0.21	0.19	0.20	0.017	120	0.054	0.26	0.10	0.49
1,2,4-Trimethylbenzene	0.22	0.18	0.17	0.19	0.19	0.19	0.19	0.19	0.015	120	0.048	0.24	0.10	0.49
1,3-Dichlorobenzene	0.25	0.22	0.21	0.24	0.21	0.26	0.25	0.23	0.021	147	0.065	0.39	0.10	0.60
1,4-Dichlorobenzene	0.24	0.24	0.22	0.24	0.2	0.24	0.21	0.23	0.017	147	0.054	0.32	0.10	0.60
1,2-Dichlorobenzene	0.24	0.25	0.23	0.22	0.25	0.22	0.21	0.23	0.016	147	0.049	0.30	0.10	0.60
Hexachloro-1,3-Butadiene	0.32	0.27	0.26	0.3	0.29	0.31	0.29	0.29	0.021	261	0.066	0.71	0.10	1.07
1,2,4-Trichlorobenzene	0.22	0.21	0.22	0.23	0.24	0.23	0.26	0.23	0.016	181	0.051	0.38	0.10	0.74

Table 4-3
SW-8260 Method of Detection Limit for Water
Bowe Systems and Machinery
Hicksville, New York

PQLs, MDLs & LCS limits for WATERS by Method 8260 2006			
Matrix: Water V0Cs Analytes	***METHOD***	***PQL (ug/l)***	***MDL (ug/l)***
Acetone	8260	5.0	1.31
Acetonitrile	8260	100	6.64
Acrolein	8260	100	11.35
Acrylonitrile	8260	50	5.77
Allyl alcohol	8260	1000	---------------
Allyl chloride	8260	5.0	---------------
Benzene	8260	1.0	0.24
Benzyl chloride	8260	5.0	0.18
Bromobenzene	8260	5.0	0.39
Bromochloromethane	8260	5.0	0.34
Bromodichloromethane	8260	1.0	0.20
Bromoform	8260	4.0	0.15
Bromomethane	8260	5.0	0.49
2-Butanone	8260	5.0	1.02
Butyl Acetate	8260	10	0.39
2-Chloroethyl Vinyl Ether	8260	5.0	0.26
2-Chlorotoluene	8260	5.0	0.25
4-Chlorotoluene	8260	5.0	0.24
Carbon Disulfide	8260	5.0	0.17
Carbon Tetrachloride	8260	2.0	0.26
Chlorobenzene	8260	5.0	0.27
Chloroethane	8260	5.0	0.18
Chloroform	8260	5.0	0.17
Chloromethane	8260	5.0	0.26
Cyclohexane	8260	5.0	0.38
cis-1,2-Dichloroethene	8260	5.0	0.13
cis-1,3-Dichloropropene	8260	5.0	0.18
Dibromochloromethane	8260	5.0	0.16
1,2-Dibromo-3-chloropropane	8260	5.0	0.19
1,2-Dibromoethane	8260	5.0	0.17
Dibromomethane	8260	5.0	0.34
1,2-Dichlorobenzene	8260	5.0	0.17
1,3-Dichlorobenzene	8260	5.0	0.25
1,4-Dichlorobenzene	8260	5.0	0.26
Dichlorodifluoromethane	8260	5.0	0.25
1,1-Dichloroethane	8260	5.0	0.17
1,2-Dichloroethane	8260	2.0	0.21
1,1-Dichloroethene	8260	2.0	0.44
1,2-Dichloroethene (total)	8260	5.0	0.36
1,2-Dichloropropane	8260	1.0	0.24
1,3-Dichloropropane	8260	5.0	0.17
2,2-Dichloropropane	8260	5.0	0.32

Table 4-3
SW-8260 Method of Detection Limit for Water
Bowe Systems and Machinery
Hicksville, New York

PQLs, MDLs & LCS limits for WATERS by Method 8260 2006			
Matrix: Water ***V0Cs*** ***Analytes***	***METHOD***	***PQL (ug/l)***	***MDL (ug/l)***
1,1-Dichloropropene	8260	5.0	0.30
1,4-Dioxane	8260	1000	180.79
DIPE	8260	5.0	0.12
Epichlorohydrin	8260	100	5.70
Ethyl Acetate	8260	10	0.88
Ethyl Ether	8260	5.0	0.21
Ethylbenzene	8260	4.0	0.23
Freon TF	8260	5.0	0.32
Hexachlorobutadiene	8260	5.0	0.78
2-Hexanone	8260	5.0	0.31
Isoprene	8260	5.0	0.25
Isopropyl Acetate	8260	10	0.55
Isopropylbenzene	8260	5.0	0.23
Methyl acetate	8260	5.0	0.46
Methyl Acrylate	8260	5.0	-----------------
Methylene chloride	8260	3.0	0.24
Methylcyclohexane	8260	5.0	0.23
Methyl methacrylate	8260	5.0	0.21
4-Methyl-2-pentanone	8260	5.0	0.56
MTBE	8260	5.0	0.17
m+p-Xylene	8260	10	0.48
Naphthalene	8260	5.0	0.20
n-Butylbenzene	8260	5.0	0.23
n-Pentane	8260	5.0	0.37
n-Propylbenzene	8260	5.0	0.16
o-Xylene	8260	5.0	0.19
p-Isopropyltoluene	8260	5.0	0.23
Propyl Acetate	8260	10	0.46
sec-Butylbenzene	8260	5.0	0.20
Styrene	8260	5.0	0.16
TBA	8260	100	7.13
tert-Butylbenzene	8260	5.0	0.26
Tetrachloroethene	8260	1.0	0.28
trans-1,2-Dichloroethene	8260	5.0	0.33
trans-1,3-Dichloropropene	8260	5.0	0.12
1,1,1,2-Tetrachloroethane	8260	5.0	0.27
1,1,2,2-Tetrachloroethane	8260	1.0	0.23
Toluene	8260	5.0	0.24
1,2,3-Trichlorobenzene	8260	5.0	0.36
1,2,4-Trichlorobenzene	8260	5.0	0.39
1,1,1-Trichloroethane	8260	5.0	0.21
1,1,2-Trichloroethane	8260	3.0	0.27

Table 4-3
SW-8260 Method of Detection Limit for Water
Bowe Systems and Machinery
Hicksville, New York

PQLs, MDLs & LCS limits for WATERS by Method 8260 2006			
Matrix: Water V0Cs Analytes	***METHOD***	***PQL (ug/l)***	***MDL (ug/l)***
Trichloroethene	8260	1.0	0.27
Trichlorofluoromethane	8260	5.0	0.53
1,2,3-Trichloropropane	8260	5.0	0.20
1,2,4-Trimethylbenzene	8260	5.0	0.24
1,3,5-Trimethylbenzene	8260	5.0	0.17
Vinyl Acetate	8260	5.0	0.33
Vinyl chloride	8260	5.0	0.26
Xylenes (Total)	8260	5.0	0.55

Table 4-4
SW-8260B Method of Detection Limit for Low Level Soil
Bowe Systems and Machinery
Hicksville, New York

PQLs and MDLs for SOILS by Method 8260B LOW LEVEL - 2006			
Matrix: Soils VOCs Analytes	***METHOD***	***PQL (ug/kg)***	***MDL (ug/kg)***
Acetone	5035/8260B	5.0	0.64
Acetonitrile	5035/8260B	100	5.66
Acrolein	5035/8260B	100	14.61
Acrylonitrile	5035/8260B	50	5.36
Allyl alcohol	5035/8260B	1000	---------------
Allyl chloride	5035/8260B	5.0	---------------
Benzene	5035/8260B	1.0	0.31
Benzyl chloride	5035/8260B	5.0	0.51
Bromobenzene	5035/8260B	5.0	0.27
Bromochloromethane	5035/8260B	5.0	0.15
Bromodichloromethane	5035/8260B	1.0	0.23
Bromoform	5035/8260B	4.0	0.24
Bromomethane	5035/8260B	5.0	0.41
2-Butanone	5035/8260B	5.0	1.59
Butyl Acetate	5035/8260B	10	0.74
Carbon Disulfide	5035/8260B	5.0	0.39
Carbon Tetrachloride	5035/8260B	2.0	0.23
Chlorobenzene	5035/8260B	5.0	0.22
Chloroethane	5035/8260B	5.0	0.46
2-Chloroethyl Vinyl Ether	5035/8260B	5.0	0.67
Chloroform	5035/8260B	5.0	0.40
Chloromethane	5035/8260B	5.0	0.50
2-Chlorotoluene	5035/8260B	5.0	0.23
4-Chlorotoluene	5035/8260B	5.0	0.31
Cyclohexane	5035/8260B	5.0	0.54
cis-1,2-Dichloroethene	5035/8260B	5.0	0.38
cis-1,3-Dichloropropene	5035/8260B	5.0	0.12
Dibromochloromethane	5035/8260B	5.0	0.32
Dibromomethane	5035/8260B	5.0	0.27
1,2-Dibromo-3-chloropropane	5035/8260B	5.0	0.87
1,2-Dibromoethane	5035/8260B	5.0	0.28
1,2-Dichlorobenzene	5035/8260B	5.0	0.16
1,3-Dichlorobenzene	5035/8260B	5.0	0.20
1,4-Dichlorobenzene	5035/8260B	5.0	0.23
Dichlorodifluoromethane	5035/8260B	5.0	0.43
1,1-Dichloroethane	5035/8260B	5.0	0.26
1,2-Dichloroethane	5035/8260B	2.0	0.22
1,1-Dichloroethene	5035/8260B	2.0	0.45
1,2-Dichloroethene (total)	5035/8260B	5.0	0.61
1,2-Dichloropropane	5035/8260B	1.0	0.29
1,3-Dichloropropane	5035/8260B	5.0	0.21
2,2-Dichloropropane	5035/8260B	5.0	0.45

Table 4-4
SW-8260B Method of Detection Limit for Low Level Soil
Bowe Systems and Machinery
Hicksville, New York

PQLs and MDLs for SOILS by Method 8260B LOW LEVEL - 2006			
Matrix: Soils VOCs Analytes	***METHOD***	***PQL (ug/kg)***	***MDL (ug/kg)***
1,1-Dichloropropene	5035/8260B	5.0	0.28
1,4-Dioxane	5035/8260B	1000	143.73
DIPE	5035/8260B	5.0	0.20
Epichlorohydrin	5035/8260B	100	---------------
Ethyl Acetate	5035/8260B	10	1.37
Ethylbenzene	5035/8260B	4.0	0.30
Ethyl Ether	5035/8260B	5.0	0.34
Freon TF	5035/8260B	5.0	0.42
Hexachlorobutadiene	5035/8260B	5.0	0.30
2-Hexanone	5035/8260B	5.0	0.89
Isoprene	5035/8260B	5.0	0.42
Isopropyl Acetate	5035/8260B	10	0.93
Isopropylbenzene	5035/8260B	5.0	0.35
Methyl acetate	5035/8260B	5.0	0.54
Methyl Acrylate	5035/8260B	5.0	---------------
Methylcyclohexane	5035/8260B	5.0	0.39
Methylene chloride	5035/8260B	3.0	0.34
Methyl methacrylate	5035/8260B	5.0	0.50
4-Methyl-2-pentanone	5035/8260B	5.0	0.67
m+p -Xylene	5035/8260B	10.0	0.72
MTBE	5035/8260B	5.0	0.41
Naphthalene	5035/8260B	5.0	0.26
n-Butylbenzene	5035/8260B	5.0	0.42
n-Pentane	5035/8260B	5.0	0.54
n-Propylbenzene	5035/8260B	5.0	0.30
o-Xylene	5035/8260B	5.0	0.21
p-Isopropyltoluene	5035/8260B	5.0	0.23
Propyl Acetate	5035/8260B	10	0.98
sec-Butylbenzene	5035/8260B	5.0	0.20
Styrene	5035/8260B	5.0	0.20
TBA	5035/8260B	100	8.58
tert-Butylbenzene	5035/8260B	5.0	0.34
1,1,1,2-Tetrachloroethane	5035/8260B	5.0	0.30
1,1,2,2-Tetrachloroethane	5035/8260B	1.0	0.34
Tetrachloroethene	5035/8260B	1.0	0.37
trans-1,2-Dichloroethene	5035/8260B	5.0	0.33
trans-1,3-Dichloropropene	5035/8260B	5.0	0.19
1,2,3-Trichlorobenzene	5035/8260B	5.0	0.24
1,2,4-Trichlorobenzene	5035/8260B	5.0	0.28
1,1,1-Trichloroethane	5035/8260B	5.0	0.36
1,1,2-Trichloroethane	5035/8260B	3.0	0.21
Trichloroethene	5035/8260B	1.0	0.37

Table 4-4
SW-8260B Method of Detection Limit for Low Level Soil
Bowe Systems and Machinery
Hicksville, New York

PQLs and MDLs for SOILS by Method 8260B LOW LEVEL - 2006			
Matrix: Soils VOCs Analytes	***METHOD***	***PQL (ug/kg)***	***MDL (ug/kg)***
Trichlorofluoromethane	5035/8260B	5.0	0.34
1,2,3-Trichloropropane	5035/8260B	5.0	0.51
1,2,4-Trimethylbenzene	5035/8260B	5.0	0.28
1,3,5-Trimethylbenzene	5035/8260B	5.0	0.22
Toluene	5035/8260B	5.0	0.35
Vinyl Acetate	5035/8260B	5.0	0.39
Vinyl chloride	5035/8260B	5.0	0.37
Xylenes (Total)	5035/8260B	5.0	0.83

Table 4-5
SW-8270C Method of Detection Limit for Low Level Soil
Bowe Systems and Machinery
Hicksville, New York

PQLs and MDLs for
SOILS (Low Level) by Method 8270C
2006

Matrix: Soils (Low level) *Soxtherm* *SVOCs* *Analytes*	*METHOD*	*PQL (ug/kg)*	*MDL (ug/kg)*
Acenaphthene	8270C	330	21.22
Acenaphthylene	8270C	330	16.01
Acetophenone	8270C	330	14.48
Aniline	8270C	330	29.38
Anthracene	8270C	330	27.72
Atrazine	8270C	330	26.91
Benzaldehyde	8270C	330	22.87
Benzidine	8270C	1300	214.57
Benzo(a)anthracene	8270C	33	14.60
Benzo(a)pyrene	8270C	33	12.68
Benzo(b)fluoranthene	8270C	33	10.90
Benzo(g,h,i)perylene	8270C	330	12.98
Benzo(k)fluoranthene	8270C	33	15.47
Benzoic Acid	8270C	1650	260.64
Benzyl Alcohol	8270C	330	13.30
bis(2-chloroethoxy)methane	8270C	330	12.64
bis(2-chloroethyl)ether	8270C	33	13.18
bis(2-Chloroisopropyl)ether	8270C	330	9.51
bis(2-Ethylhexyl)phthalate	8270C	330	5.63
4-Bromophenyl-phenylether	8270C	330	24.92
Butylbenzylphthalate	8270C	330	17.56
Caprolactam	8270C	330	15.24
Carbamazepine	8270C	330	17.17
Carbazole	8270C	330	21.10
4-Chloroaniline	8270C	330	20.09
4-Chloro-3-methylphenol	8270C	330	179.58
2-Chloronaphthalene	8270C	330	13.84
2-Chlorophenol	8270C	330	150.46
4-Chlorophenyl-phenylether	8270C	330	19.84
Chrysene	8270C	330	16.76
Coumarin	8270C	330	21.32
Dibenz(a,h)anthracene	8270C	33	11.90
Dibenzofuran	8270C	330	19.87
Diethylphthalate	8270C	330	25.22
Di-n-butylphthalate	8270C	330	12.26
Di-n-octylphthalate	8270C	330	15.28
1,2-Dichlorobenzene	8270C	330	11.59
1,3-Dichlorobenzene	8270C	330	11.72
1,4-Dichlorobenzene	8270C	330	9.82
3,3-Dichlorobenzidene	8270C	670	76.22

Table 4-5
SW-8270C Method of Detection Limit for Low Level Soil
Bowe Systems and Machinery
Hicksville, New York

PQLs and MDLs for SOILS (Low Level) by Method 8270C 2006			
Matrix: Soils (Low level) ***Soxtherm*** ***SVOCs*** ***Analytes***	***METHOD***	***PQL (ug/kg)***	***MDL (ug/kg)***
2,4-Dichlorophenol	8270C	330	178.09
2,4-Dimethylphenol	8270C	330	168.95
Dimethylphthalate	8270C	330	25.69
4,6-Dinitro-2-methylphenol	8270C	1300	117.85
2,4-Dinitrophenol	8270C	1300	70.22
2,4-Dinitrotoluene	8270C	67	21.13
2,6-Dinitrotoluene	8270C	67	22.43
1,4-Dioxane	8270C	330	8.46
1,2-Diphenylhydrazine	8270C	330	21.26
Diphenyl	8270C	330	9.42
Diphenyl Ether	8270C	330	12.51
Fluoranthene	8270C	330	17.11
Fluorene	8270C	330	20.46
Hexachlorobenzene	8270C	33	20.92
Hexachlorobutadiene	8270C	67	12.79
Hexachlorocyclopentadiene	8270C	330	10.38
Hexachloroethane	8270C	33	10.81
Hydroquinone	8270C	330	+++++
Indeno(1,2,3-cd)pyrene	8270C	33	12.36
Isophorone	8270C	330	14.23
1-Methylnaphthalene	8270C	330	8.41
2-Methylnaphthalene	8270C	330	9.44
2-Methylphenol	8270C	330	159.84
4-Methylphenol	8270C	330	179.47
2-Nitroaniline	8270C	670	17.92
3-Nitroaniline	8270C	670	16.01
4-Nitroaniline	8270C	670	16.99
2-Nitrophenol	8270C	330	146.07
4-Nitrophenol	8270C	1300	173.94
Naphthalene	8270C	330	10.43
Nitrobenzene	8270C	33	14.06
N,N-Dimethylaniline	8270C	33	8.60
N-Nitrosodimethylamine	8270C	330	9.27
N-Nitroso-di-n-propylamine	8270C	33	15.19
N-nitrosodiphenylamine	8270C	330	23.73
N-Decane	8270C	330	6.39
N- Octadecane	8270C	330	12.77
O-Tricresylphosphate	8270C	330	17.73
Pentachlorophenol	8270C	1300	150.43
Phenanthrene	8270C	330	25.45

Table 4-5
SW-8270C Method of Detection Limit for Low Level Soil
Bowe Systems and Machinery
Hicksville, New York

PQLs and MDLs for SOILS (Low Level) by Method 8270C 2006			
Matrix: Soils (Low level) ***Soxtherm*** ***SVOCs*** ***Analytes***	***METHOD***	***PQL (ug/kg)***	***MDL (ug/kg)***
Phenol	8270C	330	164.56
Pyrene	8270C	330	17.41
Pyridine	8270C	330	12.53
1,2,4-Trichlorobenzene	8270C	33	10.34
2,4,5-Trichlorophenol	8270C	330	178.98
2,4,6-Trichlorophenol	8270C	330	176.92
2,3,7,8-TCDD (SCREEN)	8270C	33	+++++

Table 4-6
SW-6010B Method Detection Limit for Metals
Bowe Systems and Machinery
Hicksville, New York

2006 TRACE 1 IDL STUDY - METALS (6010B)

Element	SWIDL-1	SWIDL-2	SWIDL-3	SWIDL-4	SWIDL-5	SWIDL-6	SWIDL-7	STD	**IDL(ug/l)**
Al3082	-47.54	-56.81	-56.22	-59	-65.6	-68.98	-62.55	7.043	**22.117**
Sb2068	-1.052	2.109	2.112	1.396	2.617	0.1709	-1.796	1.715	**5.386**
As1890	1.267	0.6066	0.3576	0.7836	0.0625	-0.4889	-0.8273	0.730	**2.293**
Ba4394	-0.9246	-1.063	-0.8535	-0.7373	-0.9431	-0.9702	-0.6149	0.152	**0.477**
Be3130	-0.1347	-0.1362	-0.1357	-0.1247	-0.1448	-0.125	-0.0482	0.033	**0.104**
Cd2265	-0.7262	-0.4579	-0.5254	-0.6165	-0.6385	-0.6668	-0.4981	0.098	**0.308**
Ca3179	-12.5	-16.93	-19	-18.44	-19.71	-19.43	-14.69	2.723	**8.551**
Cr2677	0.0737	-0.0975	-0.5722	-0.2357	-0.8288	-0.3017	-0.0026	0.323	**1.013**
Co2286	0.2603	-0.096	-0.4197	-0.0707	-0.5268	-0.4876	-0.4222	0.291	**0.913**
Cu3247	-0.3276	-0.5611	-1.303	-0.7907	-1.136	-1.053	-0.5805	0.355	**1.114**
Fe2714	-23.08	-9.983	-14.79	-14.09	-22.12	-16.51	-12.42	4.862	**15.267**
Mg2790	-7.97	-8.555	-10.83	-12.63	-15.42	-13.57	-10.36	2.696	**8.466**
Mn2576	0.258	-0.1677	-0.4623	-0.58	-0.5802	-0.58	-0.2242	0.313	**0.983**
Ni2316	0.7396	0.6629	-0.9531	-0.1533	-0.3589	0.2774	0.6461	0.637	**2.001**
Ag3280	-0.2402	-0.3371	-0.215	0.15	0.1319	-0.4083	-0.0225	0.223	**0.700**
Tl1908	-3.445	-3.341	-1.526	-2.094	-3.295	0.2072	-2.658	1.319	**4.142**
V_2924	1.466	0.5405	-0.3939	-0.4116	-0.1663	-0.1552	0.1539	0.669	**2.102**
Zn2138	-0.2397	-0.5315	-0.6475	-0.5889	-0.556	-0.5902	-0.1305	0.200	**0.627**
Se1960	-3.553	-3.291	-2.415	-3.533	-2.174	-3.992	-3.2	0.650	**2.040**
Pb2203	-1.21	-2.185	-0.9271	-1.504	-0.9479	-1.805	-0.7114	0.531	**1.668**
Ti3349	0.0758	0.4094	-0.9124	0.6002	-0.9242	-0.7611	-0.2226	0.635	**1.994**
Sr4215	-0.5844	-0.5181	-0.5447	-0.5223	-0.5229	-0.5638	-0.3656	0.071	**0.224**
B_2496	0.6492	0.1056	-0.5293	-0.0176	-0.9746	-0.6798	1.544	0.867	**2.722**
Mo2020	2.339	0.6893	-0.0392	0.7032	0.4497	0.5782	-0.0137	0.797	**2.504**
Sn1899	-1.308	-0.6413	-2.355	-2.038	-2.566	-1.224	-1.809	0.684	**2.147**

Section 5
Instrument Procedures

5.1 Photoionization Detector

This procedure is specific to the HNu PI 101 and the Thermal Environmental Organic Vapor Monitor (OVM) Photoionization Detectors (PID). These portable instruments are designed to measure the concentration of trace gases in ambient atmospheres at industrial and hazardous waste sites and are intrinsically safe. The analyzers employ PIDs.

The PID sensor consist of a sealed ultraviolet light source that emits photons which are energetic enough to ionize many trace species (particularly organics) but do not ionize the major compounds of air such as O_2, N_2, CO, CO_2, or H_2O. An ionization chamber adjacent to the ultraviolet lamp source contains a pair of electrodes. When a positive potential is applied to one electrode, the field created drives any ions, formed by absorption of ultra violet (UV) light, to the collector electrode where the currents (proportional to concentration) are measured. One major difference between a flame ionization detector (FID) and a PID is that the latter responds to inorganic compounds as well as non methane type organic compounds.

To assess whether the instrument will respond to a particular species, the ionization potential (IP) should be checked. If the IP is less than the lamp energy, or, in some cases, up to 0.2-0.3 electron volts (eV) higher than the lamp energy, instrument response should occur. For example, hydrogen sulfide (IP = 10.5 eV) may be detected with a 10.2 eV lamp, but butane (IP 10.6 eV) will not be detected.

5.1.1 Calibration

Qualified personnel trained in calibration techniques for all field items perform calibration of all CDM field equipment. When a field instrument that requires calibration is obtained from the equipment room, the unit will display a calibration tag denoting the date when the instrument was last calibrated and/or maintained. All field instruments are calibrated each time they leave the equipment facility for a site. A maintenance file is kept for each calibrated field item.

PID and FID detector type instruments come with field calibration kits. A field calibration kit would be used if the instrument is to be kept out at the site for extended periods of time, or if the instrument endures prolonged environmental extremes. In either case, a calibration check standard could be introduced in the instrument to verify its accuracy. If an instrument will not calibrate or shows improper field operation, it should be sent back to the office, and another instrument reissued.

Field personnel should not try to maintain the instruments in the field. If long sampling program is required, the team leader should prepare to take more equipment for backup in case of instrument failure. Records and procedures of all calibration techniques are on file at the CDM equipment management warehouse in Edison, New Jersey.

With the instrument fully calibrated, it is now ready for use. Any results obtained should be reported as parts per millions (ppm) as isobutylene. If you need to convert these numbers based on a benzene standard, HNu offers a conversion table which is available from CDM. Important instrument specifications for each PID detector are listed as follows.

HNu PI 101 Performance	OVM Model 580A
Range - 0.1 to 2000	0 - 2000
Detection limit 0.1 PPM	0.1 PPM

HNu PI 101 Power Requirements	OVM Model 580A
Continuous use, battery >10 hours	8 hours
Recharge time, max >14 hours, 3 hours +	8 hours
NiCd Battery	Gel Cell Battery

Unit can be operated on battery charger.

Both units provide protection circuitry for the battery. This prevents deep discharging of the battery and considerably extends the battery life.

5.1.2 HNu PI 101

5.1.2.1 Procedure

1) Before attaching the probe, check the function switch on the control panel to make sure it is in the off position. The 12-pin interface connector for the probe is located just below the span adjustment on the face of the instrument. Carefully match the slotted groove on the probe to the raise slot on the 12-pin connector on the control panel. Once in line, twist the outer ring on the 12-pin connector until it locks into position (a distinct snap noise will be felt when in place).

2) Turn the function switch to the battery check position. The needle on the meter should read within or above the green battery arc on the scaleplate. The battery, if needle falls below the green arc, should be recharged before any measurements are taken. If the read LED on the instrument panel should come on, the battery needs charging and the unit cannot be operated without a charger.

3) If the battery is functioning properly, turn the function switch to the STANDBY position. If the needle on the instrument does not read 0, then turn the knob on the instrument panel until the needle deflects to the zero point on the meter.

4) Once the zero is confirmed, turn the function switch to the 0-20 position. At this point, the needle will read approximately 0.5 ppm. This reading is normal background for ambient air. For CDM health and safety reasons, the HNU PI 101 should be operated on this range to insure maximum sensitivity in the work area. The unit, however, has 2 other ranges (0-200), (0-2000) should monitoring be required for other purposes such as headspace analysis etc. where readings could exceed the 0-20 ppm range.

5.1.2.2 Limitations

1) AC power lines (high-tension lines), or power transformers can interfere with the instruments performance. This situation can be confirmed by noting a deflection of the meter while in the STANDBY position.

2) Environmental factors such as humidity, rain and extreme cold can limit the instrument performance. To verify the "water sensitivity" condition, gently blow in the hole at the end of the probe. If the needle deflects positively (on the 0-20 position) by 2 ppm or more, water sensitivity problem exists and the unit should be brought into the warehouse for service. HNU PI 101 should be kept out of the rain as much as possible or covered. This will insure longer operating times with less false positive readings.

3) Quenching the detector can limit the instrument performance. This occurs when a compound such as methane at a very high concentration is introduced to the detector. The concentration is so high that the unit does not respond at all or gives a negative reading.

5.1.3 OVM 580A

5.1.3.1 Procedures

1) With the unit being fully calibrated before receiving it, you are ready for operation. Located on the right hand side of the unit is a panel. Slide this panel off of the unit. Inside there is a switch that supplies power to the LCD portion of the instrument. Turn this switch on and replace the panel. On the top of the OVM, there is an instrument panel. Locate the on/off switch and turn the unit on. This switch activates the lamp as well as the pump. Turn this switch off when the instrument is not in use, but leave the internal switch on.

2) The unit is now in the operation mode with all readings shown on the LCD display. Options for the OVM 580A include automatic recording and alarm settings. Should any options be required, they can be set up before the instrument leaves the CDM equipment warehouse.

   Warning signals associated with the OVM include a Low Battery signal. A flashing B will appear in the left-hand corner of the bottom line of the display when the 580A is in the RUN mode. If a gas concentration >2,000 ppm is detected by the OVM, the top line of the display will show OVERRANGE. Once this occurs, the instrument will "lock out" until the unit is brought to a clean area. A clean area is described as an area where the concentration of organic vapors is below 20 PPM.

5.2 pH Meter

pH is the negative logarithm of the effective hydrogen ion concentration (or activity) in gram equivalents per liter used. This expresses both acidity, and alkalinity on a scale whose valves run from 0 to 14. Number 7 represents neutrality, and numbers greater than 7 indicate increasing alkalinity while numbers less than 7 indicate increasing acidity. pH is one of the most commonly analyzed parameters. Water supply treatments such as neutralization, softening, disinfection and corrosion control are all pH dependent. CDM has a variety of pH monitoring instruments in the equipment warehouse.

5.2.1 Orion SA 250 pH Procedures

With the instrument fully calibrated, it is now ready for use. Follow the check out procedures:

1) Slide power switch to on position. Attach BNC shorting plug to BNC connector on top of meter.

2) If LO BAT indicator on LCD remains on, the battery must be replaced.

3) Slide mode switch to mV. Display should read 0 ± .3.

4) Slide mode switch to TEMP. Display should read 25.0. If 25.0 is not displayed, scroll using an X10 key until 25.0 is displayed and press enter.

5) Slide mode switch to pH .01. Press iso. Display should read the letters ISO, then a value of 7.000. If 7.000 is not displayed, scroll until 7.00 is displayed and press enter.

6) Press slope. Display should read the letters SLP, then a value of 100.0. If 100.0 is not displayed, scroll until 100.0 is displayed and press enter.

7) Press sample. Observe the letters pH, then a steady reading of 7.00, ± 0.02 should be obtained. If not, press CAL and scroll until 200 is displayed and press enter. Press sample and observe a reading of 7.00.

8) Remove the shorting plug. After completing these steps, the meter is ready to use with an electrode.

9) Attach electrodes with BNC connectors to sensor input by sliding the connector onto the input, pushing down and turning clockwise to lock into position.

Connect reference electrodes with pin tip connectors by pushing connector straight into reference input.

10) Put the temperature probe in the sample and let it stabilize.

11) Once temperature is stable, set the unit to read pH (by 0.1 or 0.01) and take a reading in the aqueous sample. (Remembering first to remove the cap on the end of the pH probe.)

5.2.2 Model Tripar Analyzer Procedures

With the instrument fully calibrated, it is now ready for use:

1) Connect the pH probe's BNC input connector to the front of the Tripar.

2) Put the pH/mV switch on the pH position.

3) Turn the parameter display selection switch to TEMP.

4) Plug in the gray temperature plug jack in the input temperature sensor connector.

5) Put end of temperature probe in the sample.

6) Allow the temperature to stabilize.

7) Turn the temperature compensation knob to the temperature shown.

8) Turn the parameter display selection switch to pH.

9) Put pH probe in the aqueous sample (remembering first to remove the cap on the end of the probe). Let it stabilize and record the reading.

5.3 Conductivity Meter

Conductivity is a numerical expression of the ability of an aqueous solution to carry an electrical current. This ability depends on the presence of ions in the solution, and their total concentration. Factors such as mobility valence, relative concentration, and temperature also combine to create this occurrence. Solutions of most inorganic acids, bases and salts are relatively good conductors. Organic compounds in aqueous solutions are not good conductors. For example, freshly distilled water has conductivity reading of 0.5 to 2 mhos/cm and increases with time. This increase is caused by absorption of atmospheric carbon dioxide, and to a lesser extent ammonia. While industrial type wastes have conductivity readings of 10,000 ± mhos/cm.

5.3.1 Model SCT Procedures

The model 33 SCT has 3 conductivity scales of 0-500, 0-5000, and 0-50,000 mhos/cm. Salinity is scaled 0-40 parts per thousand in a temperature range of -2 to +45°C. Temperature is scaled -2° to +5°C.

With the instrument calibration verified, the unit is now ready for use. The model 33 S-C-T meter face is scaled and calibrated to give an accurate reading of the conductivity of a water sample by measuring the amount of current flow between two fixed electrodes in the probe. The unit also measures salinity in a special range conductivity circuit, which includes a user-adjusted temperature compensator. A precision thermistor in the probe measures temperature by changing its resistance in relation to the temperature of the water.

The start-up procedure is as follows:

1) Plug the probe plug receptacle in the side of the meter.

2) With the mode select in the OFF position, check to see that the meter needle is centered at the zero mark on the conductivity scale and adjust if necessary.

3) Turn the mode control switch to Red Line position.

4) Adjust the Red Line control knob so the meter needle lines up with the red line on the meter face. If this cannot be accomplished, replace the batteries. If battery replacement is necessary, use only alkaline "D" cells, as regular carbon zinc batteries will cause errors.

5) Place the probe into the solution to be measured.

6) Set the mode control to TEMPERATURE. Read the temperature on the bottom scale of the meter in Degrees C. Allow time for the probe temperature to come to equilibrium before taking a reading.

7) With the probe in the solution to be tested, adjust the conductivity scale until the meter reading is on scale. (Multiply the reading by the correction on the calibration sticker on the instrument).

8) When using the X10 and X100 scales, depress the CELL TEST button. If the reading on the dial moves ± 2%, the electrode is fouled and needs to be cleaned. Repeat the measurement on another instrument.

9) Store the probe in distilled water when not in use.

Section 6
Laboratory Procedures

The term "data quality" refers to the level of uncertainty associated with a particular data set. The data quality associated with environmental measurement data is a function of the sampling plan rationale and procedures used to collect the samples as well as the analytical methods and instrumentation used in making the measurements. Each component has its own potential sources of error and biases that can effect the overall measurement process.

Sources of error that can be traced to the sampling component of environmental data collection are: poor sampling plan design, inconsistent use of standard operating procedures, sample handling and transportation. The most common sources of error that can be traced to the analytical component of the total measurement system are calibration and contamination problems. It is recognized that by far the largest component of the total uncertainty associated with environmental data collection originates from the sampling process. All sampling programs initiated in support of this project will stress forward planning and be well conceived and reviewed prior to the collection of any samples as a way to minimize this major source of potential error.

Uncertainty cannot be eliminated from environmental measurement data. The amount of uncertainty that can be tolerated depends on the objective of the sampling program and the intended use of the data collected. The purpose of the project's quality assurance program is to assure that the data quality of all data collected be of known and ascertainable value.

6.1 Data Quality Criteria

Data quality can be assessed in terms of its precision, accuracy, representativeness, completeness, and comparability. Although not a data quality parameter per se, analytical method detection limits will also be discussed in this section.

6.1.1 Precision

Precision is a measure of the reproducibility of analyses under a given set of conditions. The overall precision of a sampling event is a mixture of sampling and analytical factors. The precision of data collected in support of this project will be assessed on two different levels:

- By calculating the relative percent difference (RPD) of laboratory matrix spike duplicates and/or laboratory replicate samples (a measure of analytical precision).

- By calculating the RPD of field duplicates samples submitted to laboratory "blind" (a measure of the precision of the entire measurement system, including sampling).

Relative percent difference will be calculated according to the following equation:

$$RPD = \frac{| A - B |}{(A + B)/2} \times 100\%$$

where: A = Sample Result
B = Replicate Sample Result

6.1.2 Accuracy

Accuracy is a measurement of the amount of bias that exists in a measurement system. This can be thought of as the degree that the reported value agrees with the supposed "true value". The accuracy of data collected in support of this project will be assessed in the following ways:

- By calculating the percent recovery (%R) of laboratory matrix spikes and/or laboratory control standards
- By documenting the level of contamination that exists (if any) in laboratory method blanks
- By documenting the level of contamination that exists (if any) in field and/or trip blanks submitted to the laboratory "blind" for analysis
- Percent recovery will be calculated according to the following equation:

$$\%R = \frac{SSR - SR}{SC} \times 100$$

where: SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Concentration

6.1.3 Representativeness

Unlike the previous two criteria which can be expressed in quantitative terms, representativeness is a qualitative parameter. However, in terms of overall data quality, representativeness may be the most important parameter of all.

The representativeness criterion is concerned with the degree to which a sample reflects (represents) a characteristic of a population, parameter variations at a specific location or an environmental condition. Sample representativeness will be addressed in support of this project through a detailed sampling plan design and rationale and through the proper use of the appropriate sampling standard operating procedures, depending on sample matrix and the parameters to be analyzed.

Composite samples will be collected in situations conducive to compositing techniques (particularly samples collected along the vertical extent of a borehole). The use of composite samples tends to maximize the representativeness of a sampling round because more information is provided about a much broader area than a single grab sample. This is especially true in situations where the objective of sampling is to determine where gross contamination exits on site and the location of any "hot spots". In these cases, broad coverage of the area to be sampled is more important than obtaining the lowest possible detection limits.

6.1.4 Completeness

Completeness is a measure of the amount of usable data obtained from a measurement system compared to the amount that was expected to be obtained under correct normal conditions. Usability will be determined by evaluation of the precision, accuracy, representativeness, and comparability parameters. Those data that are validated as correct, or are qualified as estimated or non-detect are considered usable. Rejected data are not considered usable. A completeness goal of 90% is projected. If this goal is not met, the effect of not meeting this goal will be discussed by the CDM project manager and the NYSDEC site manager. Completeness is calculated using the following equation:

$$Percent\ Completeness = \frac{DO}{DP} \times 100$$

Where:

DO = Data obtained and usable
DP = Data planned to be obtained

6.1.5 Comparability

The comparability criterion is a quality characteristic which is an expression of the confidence with which one data set can be compared with another. Comparability issues are of importance at two different levels of a sampling program. The primary comparability issues are concerned with whether the field sampling techniques, analytical procedures, and concentration units of one data set can be compared with another.

The comparability criterion also applies to the environmental conditions/ considerations present at the time of the sampling. Temporal and/or seasonal variations may make data collected from the same location at different times of the year incomparable, or comparable in a relative sense only, for example.

Comparability is judged by comparing results to other similar data sets. Consistency in the acquisition, handling, and analysis of samples is necessary for comparing results. Data developed under this investigation will be collected and analyzed using Soil Vapor Intrusion Guidance for soil vapor collection and NYSDEC Department of Remediation Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated December 2002 to ensure comparability of results with other analyses performed in a similar manner.

6.1.6 Method Detection Limits

Whenever environmental measurement data is to be used in comparison with predetermined "action levels" or other regulatory requirements, the reported method detection limits of the analytical data is of prime importance. Analytical methods specified in support of this project should have a reported detection limit at least 50% below the required action level to assure that measurements made in the vicinity of the action level are of high quality. In circumstances concerning extremely low action levels or regulatory requirements where analytical techniques will have to be pushed to their limits, every effort will be made to select the most appropriate analytical procedures. It is recognized that analytical detection limits are sample specific and are affected by sample volumes as well as the need for sample concentration or dilution. These circumstances will be accounted for in the review and interpretation of the analytical results.

6.2 Quality Control

Two separate levels of quality control exist for all samples collected in support of this project, internal laboratory quality control and program generated quality control.

6.2.1 Internal Laboratory Quality Control

Internal laboratory quality control is a function of the individual laboratory's QA/QC Plan. A laboratory's QA/QC plan contains specific criteria governing the manner in which analyses are conducted and provide information on the laboratory's performance and control of the sources of error that exist within the lab. Included in the plan are requirements for the type and frequency of quality control check samples that are to be analyzed on a routine basis.

All laboratory analysis conducted in support of this project must include the following quality control check samples:

- Surrogate spikes (where appropriate)
- Matrix spike/matrix spike duplicate or laboratory duplicates and laboratory control samples (where appropriate)
- Method blanks

The laboratory may adhere to the analysis frequency specified in their QA/QC plan for these check samples provided that the specified frequency is equal-to or greater-than the frequency specified in Table 6-1 or as modified/specified by the QAP.

6.2.2 Program Generated Quality Control

Program generated quality control consists of quality control check samples that are submitted to the laboratory for analysis "blind" along with actual environmental samples. These samples provide quality control information for the entire sampling event, from the actual sampling and handling through laboratory analysis. As such, they can provide the best overall estimate of the total uncertainty associated with the sampling round.

TABLE 6-1

LABORATORY SAMPLE FREQUENCY

QC Check Sample	Frequency of Analysis
Method Blanks	One per analytical batch or one per every twenty samples
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per analytical batch or one per every twenty samples
Surrogate Spikes	One per every trace organic analysis

The combination of laboratory duplicates and laboratory control samples may be substituted for MS/MSD analysis for parameters where they are more appropriate.

Program generated quality control samples collected in support of this project are:

- Duplicate samples
- Field blanks
- Trip blanks

Each report should have a cover page that references the CDM task number.

The cover page also provides an opportunity to describe in a narrative format any unusual problems or interferences encountered during analysis. In addition, all results should be reported on a dry weight basis for soils and at dilution-corrected concentrations for all samples.

6.2.3 QC Deliverables Package

The following quality control data is required to be reported. For "priority pollutant" type analysis, the following quality control data is required per sample batch:

- Method Blanks associated with each analytical procedure.

- Surrogate Spike Recoveries for volatile organics, PCBs, semi-volatiles and polynuclear aromatic hydrocarbons.

- MS/MSDs for all priority pollutant parameters. One MS/MSD should be run for every 20 samples.

For non-priority pollutant parameters, the following quality control data is required per sample batch:

- Method Blanks

- Laboratory Duplicates -- One duplicate analysis should be performed at a frequency of one per twenty samples.

No specific acceptance criteria for blanks and spike recoveries will be set forth here, however, all labs are expected to conform to standard EPA quality control specifications. CDM expects laboratories to reanalyze samples if quality control samples fail to meet EPA specifications.

The quality control data may be presented as a quality control section within the report or it may be integrated among the results.

6.2.4 Minimum Detection Limits

Detection limits for soil were derived based on the amount of soil required for each analysis in EPA SW846 and the projected average moisture content for soils encountered during this project. These soil MDLs are target limits and should be adhered to as closely as possible.

6.3 Data Quality Requirements

Taking into consideration a project's overall objective and intended use of the data, it should be considered that analyses be conducted in accordance with SW-846, Test Methods for Evaluating Solid Waste, Third Edition procedures. In cases where additional procedures are required, other EPA approved laboratory methods will be used. The specific method reference for a given sampling round is provided in Table 4-1.

6.4 Data Deliverable

Analytical data deliverable will be provided in accordance with NYSDEC requirements (EPA Region 2 EDD, dated December 2003).

Appendix B

Health and Safety Plan (HASP)

HEALTH AND SAFETY PLAN
SOIL VAPOR INTRUSION EVALUTION
BOWE SYSTEMS AND MACHINERY
(Site No.:1-30-048)
Hicksville, New York

Prepared for

New York State Department of Environmental Conservation
Investigation and Design Engineering Services
Standby Contract No. D004437
Work Assignment No. D004437-2

Prepared by

Camp Dresser & McKee
Raritan Plaza I, Raritan Center
Edison, NJ 08818

August 2006

HEALTH AND SAFETY PLAN FORM
CDM Health and Safety Program

This document is for the exclusive use of CDM and its subcontractors

CAMP DRESSER & McKEE INC.
PROJECT DOCUMENT #:

PROJECT NAME Bowe Systems and Machinery Site
(Site No.: 1-30-048)

PROJECT#

REGION PSG NER

JOBSITE ADDRESS 200 Frank Street
Hicksville, NY

CLIENT NYSDEC
CLIENT CONTACT Mr. Brian Jankauskas, P.E.
CLIENT CONTACT PHONE # 518-402-9620

( ) AMENDMENT TO EXISTING APPROVED H&SP
( ) H&SP AMENDMENT NUMBER?

( ) DATE EXISTING APPROVED H&SP

OBJECTIVES OF FIELD WORK:
(e.g. collect surface soil samples):

1) Collect soil vapor, groundwater, and soil sample
2) Sample Location

Type *Check as many as applicable*

Active	(X)	Landfill	( )	Unknown	( )
Inactive	( )	Uncontrolled	( )	Military	( )
Secure	( )	Industrial	( )	Other (specify)	( )
Unsecure	(X)	Recovery	( )		
Enclosed space	( )	Well Field	( )		

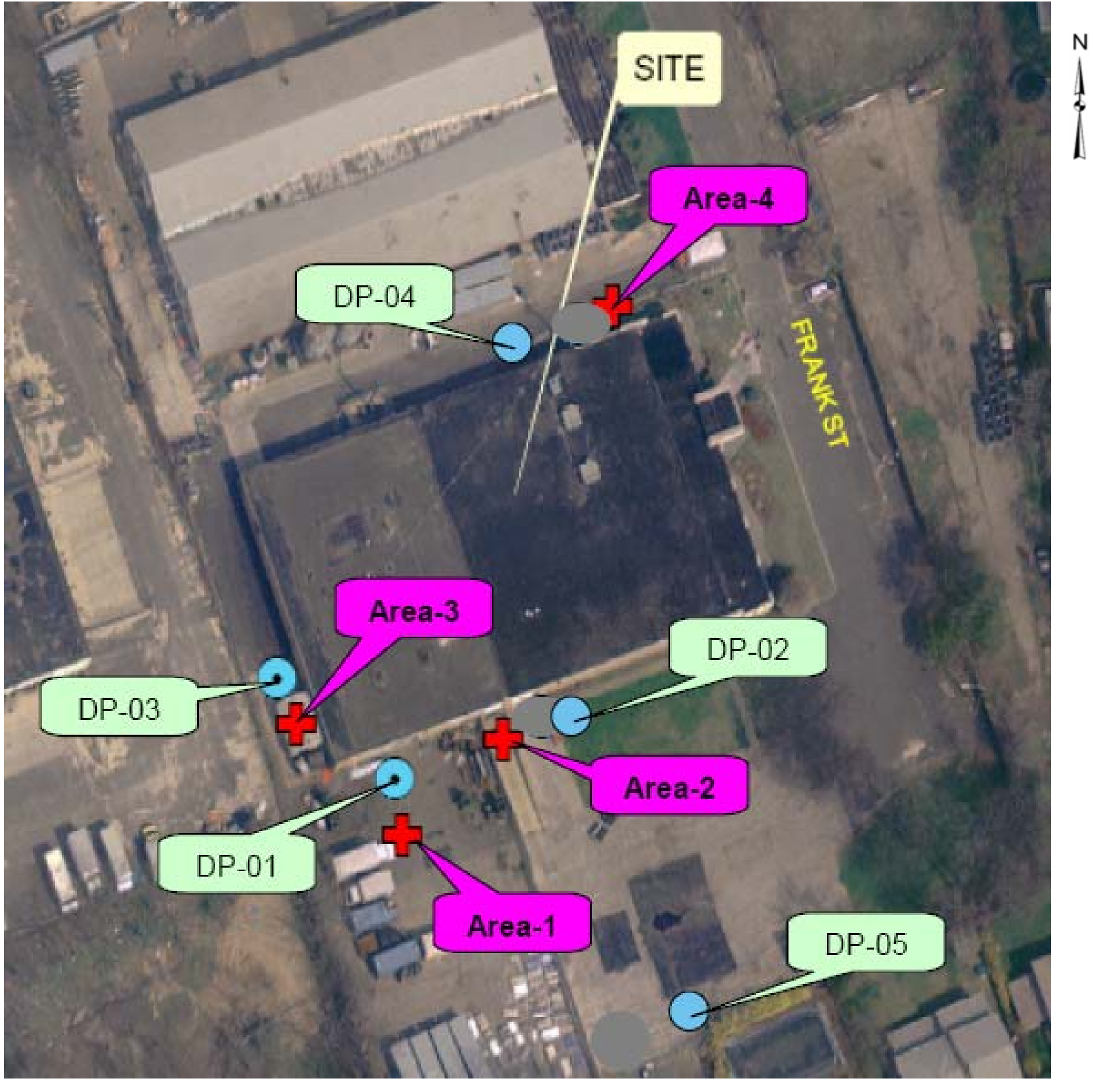
All requirements described in the CDM Health and Safety Assurance Manual for Hazardous Waste Operations are incorporated in this health and safety plan by reference.

DESCRIPTION AND FEATURES: *Include principal operations and unusual features (containers, buildings, dikes, power lines, hillslopes, rivers, etc.)*

The Bowe Systems and Machinery site is a former dry cleaner testing facility located at 200 Frank Street in Hicksville, Nassau County, New York. The site covers approximately 2.1 acres at the end of Frank Street. A single story masonry building covers approximately 25,000 square feet. The general area is developed with light industry and commercial facilities to the north and west. Residential properties are located to the southeast.

SURROUNDING POPULATION: (x) Residential ( ) Industrial (x) Commercial ( ) Rural (x) Urban OTHER:

SITE MAP: *Show Exclusion, Contamination Reduction, and Support Zones. Indicate Evacuation and Reassembly Points*



Investigative derived waste will be stored outside, at the back of the site building.
Exculsion zones are ten (10) feet around the wells/vapor points and contamination reduction zones are located 10 feet around the exclusion zone.

HISTORY: *Summarize conditions that relate to hazard. Include citizen complaints, spills, previous investigations or agency actions, known injuries, etc.*

Bowe occupied the site from 1990 until 1991. The company vacated the facility in 1991 before returning again in 1994. Bowe sold automated mail processing equipment. American Permac, a subsidiary of Bowe, imported, assembled and tested dry cleaning machinery at the site during the late 1980s. American Permac ceased operations in 1990. During the testing of dry cleaning machinery, PCE was used. During routine operation and testing, PCE was not discharged at the site. However, in 1989, a spill of approximately 10 - 15 gallons of PCE occurred into the floor drain system which discharged into an onsite leaching pool system.

WASTE TYPES: ( ) Liquid ( ) Solid ( ) Sludge ( ) Gas ( ) Unknown (X) Other, specify: contaminated groundwater

Check as many as applicable.

( ) Corrosive
( ) Toxic
( ) Inert Gas
( ) Flammable
( ) Volatile
( ) Unknown
( ) Radioactive
( ) Reactive
(x) Other, specify: TCE and PCE in groundwater

WORK ZONES: *Describe the Exclusion, Contamination Reduction, and Support Zones in terms on-site personnel will recognize*

Exclusion Zone: Perimeter area approximately 10 feet from sampling.

Contamination Reduction: 10 ft from temporary probe location.

Support Zone: 20 feet from well.

HAZARDS OF CONCERN:

(X) Heat Stress
( ) Cold Stress
( ) Explosive/Flammable
( ) Oxygen Deficient
( ) Radiological
( ) Biological
( ) Other
( ) Noise
( ) Inorganic Chemicals
(X) Organic Chemicals
(X) Motorized Traffic
( ) Heavy Machinery
(X) Slips, Trips, & Falls

FACILITY'S PAST AND PRESENT DISPOSAL METHODS AND PRACTICES:

Drill cuttings and purge water will be drummed, labeled, and covered on-site prior to sampling and off-site disposal.

HEALTH AND SAFETY PLAN FORM
CDM Health and Safety Program

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CAMP DRESSER & McKEE INC.
PROJECT DOCUMENT #:

HAZARDOUS MATERIAL SUMMARY: *Circle waste type and estimate amounts by category.*

CHEMICALS:
Amount/Units:

Acids

Pickling Liquors

Caustics

Pesticides

Dyes/Inks

Phenols

Halogens

Metals

Dioxins

Other
specify:

SOLIDS:
Amount/Units:

Flyash

Mill or Mine Tailings

Asbestos

Ferrous Smelter

Non-Ferrous Smelter

Metals

Other
specify:

SLUDGES:
Amount/Units:

Paints

Pigments

Metals Sludges

POTW Sludge

Aluminum

Distillation Bottoms

Other
specify:

SOLVENTS:
Amount/Units:

Halogenated (chloro, bromo) [✓ Solvents]

Hydrocarbons

Alcohols

Ketones

Esters

Ethers

Other
specify:
10 gallons of purge water, low levels

OILS:
Amount/Units:

Oily Wastes

Gasoline

Diesel Oil

Lubricants

PCBs

Polynuclear Aromatics

Other
specify:

10 gallons of purge water, low levels

OTHER:
Amount/Units:

Laboratory

Pharmaceutical

Hospital

Radiological

Municipal

Construction

Munitions

Other
specify:

OVERALL HAZARD EVALUATION: ( ) High () Medium (x) Low ( ) Unknown *(Where tasks have different hazards, evaluate each.)*
JUSTIFICATION:

FIRE/EXPLOSION POTENTIAL: ( ) High ( ) Medium (x) Low ( ) Unknown

BACKGROUND REVIEW: (X) Complete ( ) Incomplete

KNOWN CONTAMINANTS	**ODOR THRESHOLD** *ppm*	**PEL/TLV** *ppm or mg/m3 (specify)*	**IDLH** *ppm or mg/m3 (specify)*	**STEL** *(in ppm)*	**SYMPTOMS & EFFECTS OF ACUTE EXPOSURE**	**PHOTO IONIZATION POTENTIAL**
TCE/PCE	None	100 ppm TWA (PEL) 25 ppm TWA (TLV)	500 PPM	100 ppm	Irritatating to eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness and skin erythema (skin redness).	N/A

Chemicals which detected concentrations at estimated levels are not presented.

NA = Not Available **NE = None Established** **U = Unknown**

Attach, to this plan, an MSDS for each chemical you will use at the site.

S = Soil
A = Air
SW = Surface Water
GW = Ground Water
T = Tailings
SL = Sludge
W = Waste
D = Drums
TK = Tanks
L = Lagoons
SD = Sediment
OFF = Off-Site

HEALTH AND SAFETY PLAN FORM

CDM Health and Safety Program

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CAMP DRESSER & McKEE INC.

PROJECT DOCUMENT #:

TASK DESCRIPTION/SPECIFIC TECHNIQUE/SITE LOCATION *(attach additional sheets as necessary)*	**Type**	**Primary**	**Contingency**	**HAZARD & SCHEDULE**
1. Collect soil vapor, groundwater, and soil samples	[✓ **Intrusive**] Non-intrusive	A B C [✓ D] Modified	A B C D [✓ Exit Area]	Hi Med [✓ Low] July 2006
2. Sample Location	Intrusive [✓ **Non-intrusive**]	A B C [✓ D] Modified	A B C D [✓ Exit Area]	Hi Med [✓ Low] July 2006
	Intrusive Non-intrusive	A B C D Modified	A B C D Exit Area	Hi Med Low
	Intrusive Non-intrusive	A B C D Modified	A B C D Exit Area	Hi Med Low

PERSONNEL AND RESPONSIBILITIES

NAME	**FIRM/DIVISION**	**CDM HEALTH CLEARANCE**	**RESPONSIBILITIES**	**On Site?**
Melissa Koberle	CDM/EMP	B-S	H & S Coordinator/Field Manager	[✓ 1]-2-3-4-5
Maria D. Watt	CDM/EMP	B-S	Alt. H & S Coordinator/PM	[✓ 1]-2-3-4-5
Chris Marlowe	CDM/EMP	C	H&S Manager	1-2-3-4-5
				1-2-3-4-5

PROTECTIVE EQUIPMENT: *Specify by task. Indicate type and/or material, as necessary. Group tasks if possible. Use copies of this sheet if needed.*

BLOCK A - Sampling

TASKS: [✓ 1] - 2 - 3 - 4 - 5 - 6 - 7 - 8
LEVEL: A - [✓ B] - C - D - Modified
(x) Primary ( ) Contingency

Respiratory: (x) Not needed
( ) SCBA, Airline
( ) APR
( ) Cartridge
( ) Escape Mask
( ) Other:

Head and Eye: ( ) Not needed
(x) Safety Glasses:
( ) Face Shield:
( ) Goggles:
(x) Hard Hat:
( ) Other:

Boots: ( ) Not needed
(x) Steel-Toe
( ) Rubber
( ) Overboots: Latex (optional)

Prot. Clothing: (x) Not needed
( ) Encapsulated Suit
( ) Splash Suit
( ) Apron
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall
( ) Other: insulated coverall

Gloves: ( ) Not needed
(x) Undergloves: latex
( ) Gloves: Cotton
( ) Overgloves: Nitrile

Other: specify below
( ) Tick Spray
( ) Flotation Device
( ) Heating Protection
( ) Sun Screen

BLOCK B

TASKS: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10
LEVEL: A - B - C - D - Modified
( ) Primary (x) Contingency

Respiratory: ( ) Not needed
( ) SCBA, Airline
( ) APR
( ) Cartridge: Combination
( ) Escape Mask
( ) Other:

Head and Eye: ( ) Not needed
( ) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other:

Boots: ( ) Not needed
( ) Steel-Toe ( ) Steel Shank
( ) Rubber ( ) Leather
( ) Overboots: Latex

Prot. Clothing: ( ) Not needed
( ) Encapsulated Suit
( ) Splash Suit
( ) Apron:
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves: PVC
( ) Gloves: Cotton
( ) Overgloves: Nitrile

Other: specify below
( ) Tick Spray
( ) Flotation Device
( ) Heating Protection
( ) Sun Screen

BLOCK C

TASKS: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10
LEVEL: A - B - C - D - Modified
(x) Primary ( ) Contingency

Respiratory: ( ) Not needed
( ) SCBA, Airline:
( ) APR:
( ) Cartridge:
( ) Escape Mask:
( ) Other:

Head and Eye: ( ) Not needed
( ) Safety Glasses:
( ) Face Shield:
( ) Goggles:
( ) Hard Hat:
( ) Other:

Boots: ( ) Not needed
( ) Steel-Toe ( ) Steel Shank
( ) Rubber ( ) Leather
( ) Overboots:

Prot. Clothing: ( ) Not needed
( ) Encapsulated Suit:
( ) Splash Suit
( ) Apron:
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall:
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves:
( ) Gloves:
( ) Overgloves:

Other: specify below
( ) Tick Spray
( ) Flotation Device
( ) Heating Protection
( ) Sun Screen

BLOCK D

TASKS: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10
LEVEL: A - B - C - D - Modified
( ) Primary (x) Contingency

Respiratory: ( ) Not needed
( ) SCBA, Airline
( ) APR
( ) Cartridge
( ) Escape Mask
( ) Other:

Head and Eye: ( ) Not needed
( ) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other:

Boots: ( ) Not needed
( ) Steel-Toe ( ) Steel Shank
( ) Rubber ( ) Leather
( ) Overboots

Prot. Clothing: ( ) Not needed
( ) Encapsulated Suit
( ) Splash Suit
( ) Apron
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Cloth Coverall
( ) Other:

Gloves: ( ) Not needed
( ) Undergloves
( ) Gloves
( ) Overgloves

Other: specify below
( ) Tick Spray
( ) Flotation Device
( ) Heating Protection
( ) Sun Screen

HEALTH AND SAFETY PLAN FORM	*This document is for the exclusive*	**CAMP DRESSER & McKEE INC.**
CDM Health and Safety Program	*use of CDM and its subcontractors*	**PROJECT DOCUMENT #:**

MONITORING EQUIPMENT: *Specify by task. Indicate type as necessary. Attach additional sheets if needed.*

INSTRUMENT	**TASK**	**ACTION GUIDELINES**		**COMMENTS** *(When and how will you use the monitor?)*
Combustible Gas Indicator	1-2-3-4-5-6-7-8	0-10% LEL 10-25% LEL >25% LEL 21.0% O2 <21.0% O2 <19.5% O2	*No explosion hazard* *Potential explosion hazard; notify SHSC* *Explosion hazard; interrupt task/evacuate* *Oxygen normal* *Oxygen deficient; notify SHSC* *Interrupt task/evacuate*	(x) Not Needed
Radiation Survey Meter	1-2-3-4-5-6-7-8	3 x Background: >2mR/hr:	*Notify HSM* *Establish REZ*	(X) Not Needed
Photoionization Detector 10.6eV Lamp Type OVM	[✓ 1-2]-3-4-5-6-7-8	*Specify:* Total VOCs greater than 10 ppm - level C respirator		( ) Not Needed
Flame Ionization Detector Type____________	1-2-3-4-5-6-7-8	*Specify:*		(X) Not Needed
Detector Tubes/ Monitox Type: Benzene	1-2-3-4-5-6-7-8	*Specify:*		(X) Not Needed
Respirable Dust Monitor Type____________	1-2-3-4-5-6-7-8	*Specify:*		(X) Not Needed
Other *Specify:*	1-2-3-4-5-6-7-8	*Specify:*		

HEALTH AND SAFETY PLAN FORM **CDM Health and Safety Program**	*This document is for the exclusive use of CDM and its subcontractors*	**CAMP DRESSER & McKEE INC.** **PROJECT DOCUMENT #:**

DECONTAMINATION PROCEDURES

ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES AS PAGE TWO

Personnel Decontamination *Summarize below or attach diagram;* CDM will wear protective gloves during sampling and purge water management.	**Sampling Equipment Decontamination** *Summarize below or attach diagram;* Sampling equipment will be decontaminated, or properly containerized/encapsulated, prior to leaving the site.	**Heavy Equipment Decontamination** *Summarize below or attach diagram;* Decontaminate Drill Rig auger at each well location
Containment and Disposal Method Disposable protective equipment will be containerized and disposed of off site.	**Containment and Disposal Method** Sampling equipment cleaning water solutions be will containerized and disposed of off site.	**Containment and Disposal Method** Contain decon water, store in 55 gallon drums, and dispose off-site following sampling

HEALTH AND SAFETY PLAN FORM

CDM Health and Safety Program

This document is for the exclusive use of CDM and its subcontractors

CAMP DRESSER & McKEE INC.

PROJECT DOCUMENT #:

EMERGENCY CONTACTS	**NAME**	**PHONE**
Fire Department		911
Police Department		911
Ambulance		911
NYSDEC Spill Number	NYSDEC	800-457-7362
USEPA Release Report #:		800-424-8802
CDM 24-Hour Emergency #:		800-313-5593
Poison Control Center		800-562-8736
Underground Utility	UFPO	800-962-7962

EMERGENCY CONTACTS	**NAME**	**PHONE**
CDM Health and Safety Manager	Chris Marlowe	cell 732-539-8128
CDM Field Manager	Melissa Koberle	212-785-9160
CDM Site Safety Coordinator	Melissa Koberle	212-785-9160
Client Contact	Brian Jankauskas	518-402-9620

CONTINGENCY PLANS: *Summarize below*

If CDM work team observes hazards for which they have not prepared, they will withdraw from the area and call the NG Site Contact, Ms. Lisa Fredericks.

SHSC will designate evacuation routes. Teams will cease work if they see lightning or thunder storms in the area.

CDM may rely on instruments operated by contractor personnel only upon HSM approval. If contractor directs a higher level of protection than this plan does, CDM personnel will wear that level. CDM personnel may choose to wear more potection than directed by this plan.
Contractor will be expected to inspect its equipment and certify its suitability for the project to the CDM site health and safety coordinator.

HOSPITAL INFORMATION **PHONE**

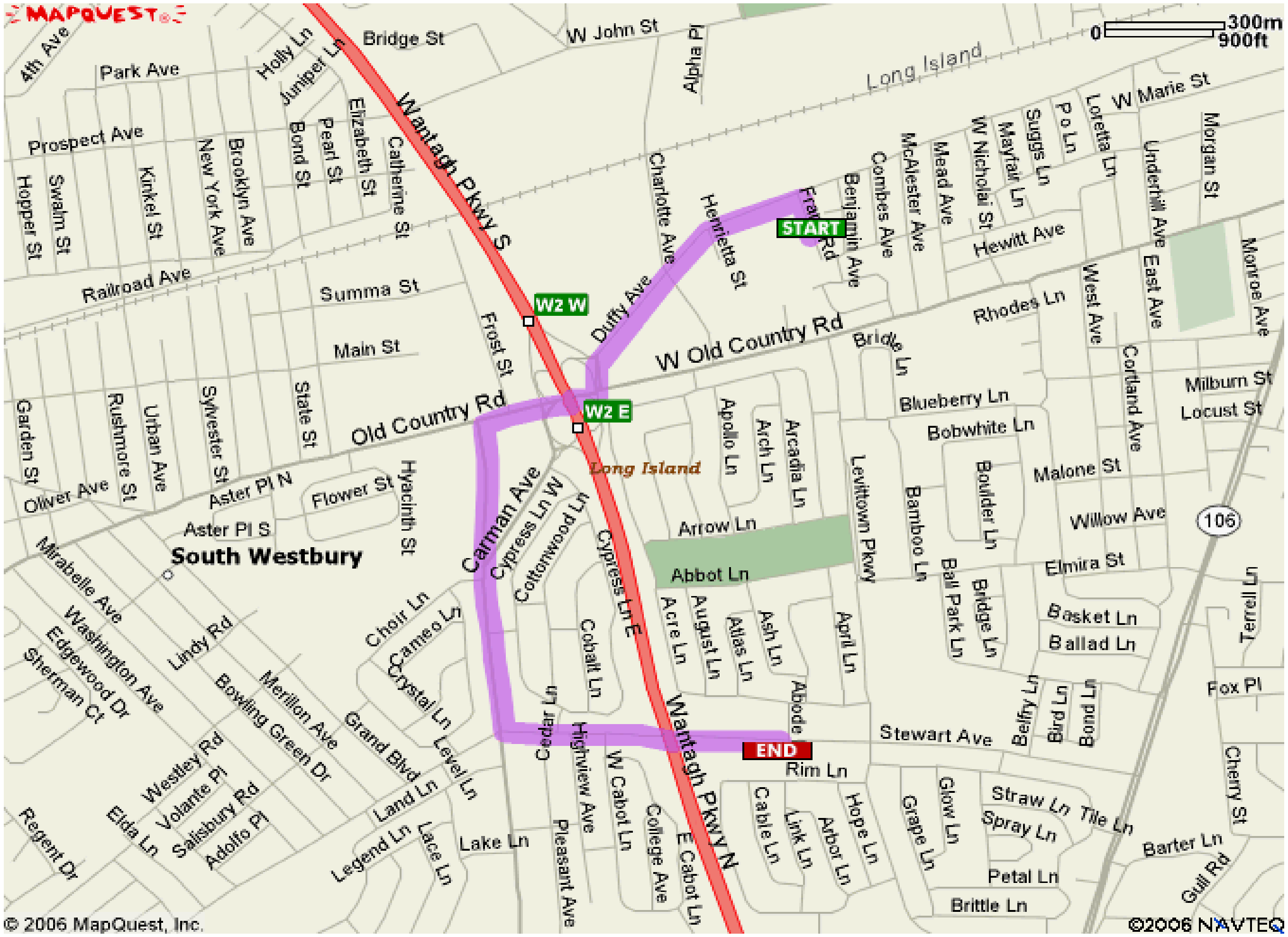
Name: Jamaica Hospital

Address: 111 Steward Ave, Hicksville, NY 11801
Route: Start out going NORTH on FRANK RD toward DUFFY AVE.
Turn LEFT onto DUFFY AVE. Turn RIGHT onto OLD COUNTRY RD.
Turn LEFT onto CARMAN AVE EXT / CARMAN AVE.
Continue to follow CARMAN AVE. Turn LEFT onto STEWART AVE.

HEALTH AND SAFETY PLAN APPROVALS

Prepared by Christine Julias Date 6/16/2006
DHSC Signature ______________ Date ________
HSM Signature ______________ Date ________

ROUTE TO HOSPITAL MAP:



HEALTH AND SAFETY PLAN SIGNATURE FORM

CDM Health and Safety Program

All site personnel must sign this form indicating receipt of the HASP. Keep this original on site or with the field manager. It becomes part of the permanent project files. Send a copy to the Health and Safety Manager (HSM).

SITE NAME/NUMBER: Bowe Systems and Machinery (Site No.: 1-30-048)

DIVISION/LOCATION: Hicksville, New York

CERTIFICATION:

I understand, and agree to comply with, the provisions of the above referenced HASP for work activities on this project. I agree to report any injuries, illnesses or exposure incidents to the site Health and Safety Coordinator (SHSC). I agree to inform the SHSC about any drugs (legal and illegal) that I take within three days of site work.

PRINTED NAME	SIGNATURE	DATE

November 2005

Appendix C

Schedule 2.11

Schedule 2.11(a)

Summary of Work Assignment Price

Work Assignment Number <u>D004437-2</u>

1) Direct Salary Costs (Schedules 2.10(a) and 2.11(b)) $7,861

2) Indirect Costs (Schedule 2.10(g)) $13,199

3) Direct Non-Salary Costs (Schedules 2.10(b)(c)(d) and 2.11(c)(d)) $3,202

4) Subcontract Costs

Cost-Plus-Fixed-Fee Subcontracts (Schedule 2.10(e) and 2.11(e))

	Name of Subcontractor	**Services To Be Performed**	**Subcontract Price**
i)	Ken Schider Consulting	W/MBE Reporting	$300
ii)			
iii)			
vi)			
iv)			

A) Total Cost-Plus-Fixed-Fee Subcontracts $300

Unit Price Subcontracts (Schedule 2.10 (f) and 2.11 (f))

	Name of Subcontractor	**Services To Be Performed**	**Subcontract Price**
i)	Zebra	Driller	$7,395
ii)	Chemtech Laboratories	MBE Laboratory	$6,728
iii)	Data Validation Services	WBE Data Validator	$940
iv)			

B) Total Unit Price Subcontracts $15,063

5) Subcontract Management Fee $383

6) Total Subcontract Costs (lines 4A + 4B + 5) $15,746

7) Fixed Fee (Schedule 2.10(h)) $1,474

8) Total Work Assignment Price (Lines 1 + 2 + 3 + 6 + 7) $41,483

Engineer/Contract # D004437
Project Name Bowe System
Work Assignment No. D004437-2

Date Prepared: ___________

Schedule 2.11(b)
Direct Labor Hours Budgeted

Labor Classification	***IX***		***VIII***		***VII***		***VI***		***III***		***II***		***I***		***Admin Support***		***Total No. of Direct Labor Hours and Costs Budgeted***	
*Av. Salary Rate ($)_______ Year 2006	$61.60		$56.10		$49.18		$43.39		$27.02		$24.10		$19.94		$19.94		0	
Description	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Task Work Plan Development	2	$123	16	$898	2	$98	2	$87	48	$1,297		$0	2	$40	6	$120	78	$2,662
Task Soil Vapor Investigation		$0	8	$449		$0		$0	8	$216	76	$1,832	2	$40	6	$120	100	$2,656
Task Field Documentation and Reporting	2	$123	16	$898	2	$98	2	$87	40	$1,081	4	$96	2	$40	6	$120	74	$2,543
Total Hours	4		40		4		4		96		80		6		18		252	
Total Direct Labor Cost ($) **Year 2006**		$246		$2,244		$197		$174		$2,594		$1,928		$120		$359		$7,861

* For multiple years use one average salary rate row for each year and each years subtotal Labor Cost.

Engineer/Contract # D004437
Project Name Bowe Systems
Work Assignment No. D004437-2

Date Prepared: ____________

Schedule 2.11(b-1)
Direct Administrative Labor Hours Budgeted

Labor Classification	*IX*	*VIII*	*VII*	*VI*	*IV*	*III*	*II*	*I*	*Admin. Support*	*Total No. of Direct Labor Hrs.*
Task 1 Work Plan Development	2	0	0	0	0	0	0	2	6	10
Task 2 Soil Vapor Investigation	0	0	0	0	0	0	0	2	6	8
Task 3 Field Documentation and Reporting	2	0	0	0	0	0	0	2	6	10
TOTAL HOURS	4	0	0	0	0	0	0	6	18	28

Contract/Project administrative hours would include (subject to contract allowability) but not necessarily be limited to the following activities:

1) Work Plan Budget Development
> Conflict of Interest Check
> Budget schedules & supporting documentation

2) Review work assignment (WA) progress
> Conduct progress reviews
> Prepare monthly project report
> Update WA progress schedule
> Prepare M/WBE Utilization Report

3) Contractor Application for Payment (CAP)
> Oversee and prepare monthly CAP

4) Program Management
> Prepare monthly cost control report
> Cost control reviews
<> Staffing Plans
>Manage subcontracts
> NSPE list update
> Equipment inventory

5) Miscellaneous
> Conduct Health and Safety Reviews
> Word processing and graphic artists
> Report editing

Contract/Project Administration hours would **not** include:

1) QA/QC reviews
2) Techincal oversight by management
3) Develop subcontracts
4) Work plan development
5) Review of deliverables

Schedule 2.11 (c)

Direct Non-Salary Costs
Work Assignment Number **D004437-2**

		Item	**Max. Reimbursement * Rate (Specify Unit)**	**Est. No. of Units**	**Total Estimated Cost**
A)	Other				
	1)	Shipping	LS	1	$500
	2)	Outside Printing	LS	1	$100
B)	Miscellaneous				
	1)	Meals (per day)	$64	6	$384
	2)	Lodging (per day)	$162	4	$648
	3)	Mileage (per mile)	$0.45	0	$0
	4)	PPE (level D) (per day)	$15	6	$90
	5)	Tolls	$15	3	$45
	6)	LVE	$1	92	$92
				Total Direct Non-Salary Costs	$1,632

Work Assignment No. D004437-2

Schedule 2.11(d) 3

Maximum Reimbursement Rate for Vendor Rented Equipment

Item	**Max Reimbursement Rate ($)***	**Est. Usage (unit of time)**	**Est. Rental Cost ($) (Col. 2 x 3)**
GPS	$400	1	$400
Helium Meter (per day)	$75	3	$225
Multi-meter (per day)	$100	3	$300
PID (per day)	$100	3	$300
Truck (per day)	$95	3	$285
Helium Gas	$60	1	$60
		TOTAL:	**$1,570**

* Reimbursement will be made at the Maximum Reimbursement rate or the actual rental rate, whichever is less.

Schedule 2.11 (e)

Cost-Plus-Fixed-Fee Subcontracts
Work Assignment Number D004437-2

Name of Subcontractor	**Services to be Performed**	**Subcontract Price**
Ken Schider Consulting	**M/WBE Reporting**	**$300**

A) Direct Salary Costs

Professional Responsibility Level	Labor Classification	Ave. Reimbursement Rate ($/Hr.)	Max. Reimbursement Rate ($/Hr.)	Est. No. of Hours	Total Est Direct Salary Cost (Ave. Reimb. Rate x Est. # of Hrs.)
IV	Eng/Scientist 4	$32.60	$36.78	4	$130

Total Direct Salary Costs **$130**

Footnotes:

1) The labor rate averages and maximums shall be adjusted by a rate equal to the increase in the CPI index CUURA101SAO-"All Urban Consumers-New York-Northern N.J.-Long Island" for the previous year. This index is published by the U.S. Department of Labor's Bureau of Labor Statistics. The adjustment will be calculated every January and will be effective for subsequent work assignment billing and budgeting purposes.
2) Schedule 2.11(e) may be re-negotiated after four (4) years at the request of either party. Any revision as a result of re-negotiation will be subject to the approval of the Office of the State Comptroller.
3) The maximum annual escalation is limited to 5%.
4) Reimbursement will be limited to the lesser of either the individual's actual hourly rate or the maximum rate for each labor
5) Reimbursement will be limited to the maximum reimbursement rate for the professional responsibility level of the actual work
6) Only those labor classifications indicated with an asterisk will be entitled to overtime.
7) Reimbursement for technical time of principals, owners, and officers will be limited to the maximum reimbursement rate of that category, the actual hourly labor rate paid, or the State M-6 rate, whichever is lower.
8) Maximum reimbursement rates may be exceeded for work assignment activities that are under the jurisdiction of the Schedule of Prevailing Wage Rates set by the New York State Department of Labor.

B) Indirect Costs

Indirect costs shall be paid based on a percentage of direct salary costs incurred which shall not exceed a maximum of 115 % or the actual rate calculated in accordance with 48 CFR Federal Acquisition Regulation, whichever is lower.

Amount budgeted for indirect costs is: **$150**

C) Maximum Reimbursement Rates for Direct Non-Salary Costs

Item	Max Reimbursement Rate (Specify Unit)	Est. No. of Units	Total Est. Cost
1) Travel	See Schedule 2.10 (d) for rates		
2) Supplies			

Total Direct Non-Salary Costs **$0**

D) Fixed Fee

The fixed fee is: 7% **$20**

See Schedule 2.10 (h) for how the fixed fee should be claimed.

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number D004437-2

Name of Subcontractor	**Services to be Performed**	**Subcontract Price**	**Management Fee**
Data Validation Services	**WBE Data Validator**	**$987**	**$47**

Item	**Max. Reimbursement Rate (Specify Unit)**	**Est. No. of Units**	**Total Est. Cost**
DATA VALIDATION			
TCL VOCs 8260	$23 /Sample	30	$690
TAL Metals 7000	$25 /Sample	5	$125
SVOCs-TCL BNA 8270	$25 /Sample	5	$125
		Subtotal	$940

Subtotal-Subcontract Price	**$940**
Subcontract Management Fee*	**$47**
TOTAL	**$987**

* A subcontract management fee of 5% has been included for M/WBE subcontracts.

Schedule 2.11 (f)

Unit Price Subcontracts

Work Assignment Number **DOO4437-2**

Name of Subcontractor	Services to be Performed	Subcontract Price	Management Fee
Zebra	**WBE Driller**	**$7,395**	**$0**

Item	Max. Reimbursement Rate (Specify Unit)	Est. No. of Units	Total Est. Cost
MOB/DEMOB			
Mob/Demob	$495 ls	1	$495
Vactron	$1,265 ls	1	$1,265
Steam Cleaner	$675 ls	1	$675
		Subtotal	$2,435
DRILL RIG AND CREW			
Truck Drill Rig and Crew	$4,275 ls	1	$4,275
Soil Vapor Samples	$550 ls	1	$550
Groundwater and Soil Samples	$135 ls	1	$135
		Subtotal	$4,960
Subtotal-Subcontract Price			**$7,395**
Subcontract Management Fee*			**$0**
TOTAL			**$7,395**

Schedule 2.11 (f)

Unit Price Subcontracts
Work Assignment Number D004437-2

Name of Subcontractor	**Chemtech**
Services to be Performed	**MBE Laboratory**
Subcontract Price	**$7,064**
Management Fee	**$336**

Item	**Max. Reimbursement Rate**	**Specify Unit**	**Est. No. of Units**	**Total Est. Cost**
SAMPLING EQUIPMENT				
Summa Cannisters/Regulators	$27.00	Sample	16	$432
			Subtotal	**$432**
LABORATORY ANALYSIS				
TCL VOCs 8260 Water	$92.00	Sample	11	$1,012
TAL Metals 7471 Solids	$113.00	Sample	5	$565
SVOCs-TCL BNA 8270 Solids	$205.00	Sample	5	$1,025
TCL VOCs 8260 Solids	$92.00	Sample	5	$460
TO-15 Air	$231.00	Sample	14	$3,234
			Subtotal	**$6,296**
			Subtotal-Subcontract Price	**$6,728**
			Subcontract Management Fee*	**$336**
			TOTAL	**$7,064**

* A subcontract management fee of 5% has been included for W/MBE subcontracts.

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Bowe Systems
Work Assignment No. D004437-2
Task #/Name Task 1 - Work Plan Development
Complete 0%

Page 1 of 4
Date Prepared 8/3/06
Billing Period ____________
Invoice No. ____________

	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*
Expenditure Category	*Costs Claimed This Period*	*Paid to Date*	*Total Disallowed to Date*	*Total Costs Incurred to Date (A+B+C)*	*Estimated Costs to Completion*	*Estimated Total Work Assignment Price (A+B+E)*	*Approved Budget*	*Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$2,662	$2,662	$2,662	$0
2. Indirect Costs - '167.9%	$0	$0	$0	$0	$4,470	$4,470	$4,470	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$7,133	$7,133	$7,133	$0
4. Travel	$0	$0	$0	$0	$0	$0	$0	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$0	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$0	$0
7. Subcontractors	$0	$0	$0	$0	$300	$300	$300	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$0	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$7,433	$7,433	$7,433	$0
9. Fixed Fee	$0	$0	$0	$0	$499	$499	$499	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$7,932	$7,932	$7,932	$0

Project Manager (Engineer) Maria Watt

Date 8/3/06

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Bowe System
Work Assignment No. D004437-2
Task #/Name Task 2 - Soil Vapor Investigation
Complete 0%

Page 2 of 4
Date Prepared 8/3/06
Billing Period ___________
Invoice No. ___________

Expenditure Category	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*
	Costs Claimed This Period	*Paid to Date*	*Total Disallowed to Date*	*Total Costs Incurred to Date (A+B+C)*	*Estimated Costs to Completion*	*Estimated Total Work Assignment Price (A+B+E)*	*Approved Budget*	*Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$2,656	$2,656	$2,656	$0
2. Indirect Costs 167.9%	$0	$0	$0	$0	$4,460	$4,460	$4,460	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$7,116	$7,116	$7,116	$0
4. Travel	$0	$0	$0	$0	$1,077	$1,077	$1,077	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$2,125	$2,125	$2,125	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$3,202	$3,202	$3,202	$0
7. Subcontractors	$0	$0	$0	$0	$15,063	$15,063	$15,063	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$383	$383	$383	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$25,764	$25,764	$25,764	$0
9. Fixed Fee	$0	$0	$0	$0	$498	$498	$498	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$26,262	$26,262	$26,262	$0

Project Manager (Engineer) **Maria Watt**

Date 8/3/06

Schedule 2.11 (g)

Monthly Cost Control Report
Summary of Fiscal Information

Engineer Camp Dresser & McKee
Contract No. D004437
Project Name Bowe System
Work Assignment No. D004437-2
Task #/Name Task 3 - Field Documentation and Reporting
Complete 0%

Page 3 of 4
Date Prepared 8/3/06
Billing Period ____
Invoice No. ____

	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*
Expenditure Category	*Costs Claimed This Period*	*Paid to Date*	*Total Disallowed to Date*	*Total Costs Incurred to Date (A+B+C)*	*Estimated Costs to Completion*	*Estimated Total Work Assignment Price (A+B+E)*	*Approved Budget*	*Estimated Under/Over (G-F)*
1. Direct Salary Costs	$0	$0	$0	$0	$2,543	$2,543	$2,543	$0
2. Indirect Costs 167.9%	$0	$0	$0	$0	$4,269	$4,269	$4,269	$0
3. Subtotal Direct Salary Costs and Indirect Costs	$0	$0	$0	$0	$6,812	$6,812	$6,812	$0
4. Travel	$0	$0	$0	$0	$0	$0	$0	$0
5. Other Non-Salary Costs	$0	$0	$0	$0	$0	$0	$0	$0
6. Subtotal Direct Non-Salary Costs	$0	$0	$0	$0	$0	$0	$0	$0
7. Subcontractors	$0	$0	$0	$0	$0	$0	$0	$0
7a. Subcontract Mgt. Fee	$0	$0	$0	$0	$0	$0	$0	$0
8. Total Work Assignment Cost	$0	$0	$0	$0	$6,812	$6,812	$6,812	$0
9. Fixed Fee	$0	$0	$0	$0	$477	$477	$477	$0
10. Total Work Assignment Price	$0	$0	$0	$0	$7,289	$7,289	$7,289	$0

Project Manager (Engineer) **Maria Watt**

Date 8/3/06

Schedule 2.11 (g) - Supplemental

Cost Control Report for Subcontracts

Engineer **Camp Dresser & McKee**
Contract No. **D004437**
Project Name **Bowe Systems**
Work Assignment No. **D004437-2**

Page 4 of 4
Date Prepared 8/3/06
Billing Period ____
Invoice No. ____

	A	B	C	D	E	F	G
Subcontract Name	***Subcontract Costs Claimed this Application Inc. Resubmittals***	***Subcontract Costs Approved for Payment on Previous Applications***	***Total Subcontract Costs to Date (A plus B)***	***Subcontract Approved Budget***	***Management Fee Budget***	***Management Fee Paid***	***Total Costs to Date (C plus F)***
1. Zebra	$0	$0	$0	$7,395	$0	$0	$0
2. Chemtech (MBE Lab)	$0	$0	$0	$6,728	$336	$0	$0
3. Data Validation Services (WBE)	$0	$0	$0	$940	$47	$0	$0
5. Ken Shider Consulting (MBE)	$0	$0	$0	$300	$0	$0	$0
11. **TOTALS**	$0	$0	$0	$15,363	$383	$0	$0

Project Manager (Engineer) **Maria Watt**

Date 8/3/2006

NOTES:

1) Costs listed in Columns A, B, C & D do not include any management fee costs.
2) Management fee is applicable to only properly procured, satisfactorily completed, unit price subcontracts over $10,000.
3) Line 11, Cloumn G should equal Line 7 (Subcontractors), Column D of Summary Cost Control Report.

Schedule 2.11(h)
Monthly Cost Control Report
Summary of Labor Hours
Number of Direct Labor Hours Expended to Date/Estimated Number of Direct Labor Hours to Completion

Engineer/Contract # **D004437**
Project Name **Bowe System**
Work Assignment No. **D004437-2**

Date Prepared ____________________
Billing Period ____________________
Invoice No. ____________________

NSPE Labor Classification	*IX Exp/Est*	*VIII Exp/Est*	*VII Exp/Est*	*VI Exp/Est*	*III Exp/Est*	*II Exp/Est*	*I Exp/Est*	*Admin.*	*Total No. of Direct Labor Hrs. Exp/Est*
Task 1	0 / 2	0 / 16	0 / 2	0 / 2	0 / 48	0 / 0	0 / 2	0 / 6	0 / 78
Task 2	0 / 0	0 / 8	0 / 0	0 / 0	0 / 8	0 / 76	0 / 2	0 / 6	0 / 100
Task 3	0 / 2	0 / 16	0 / 2	0 / 2	0 / 40	0 / 4	0 / 2	0 / 6	0 / 74
Total Hours	0 / 4	0 / 40	0 / 4	0 / 4	0 / 96	0 / 80	0 / 6	0 / 18	0 / 252

* Expended/Estimated

M/WBE-EEO WORKPLAN
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Grantee/Consultant/Contractor Camp Dresser & McKee			Project Number
Address 100 Crosswick Park		City Woodbury	Zip Code 11797
Authorized Representative Michael Memoli			Authorized Signature
Address 100 Crosswick Park	City Woodbury	Zip Code 11797	Phone No. 516 496 8400
Minority Business Enterprise Officer Kenneth Shider			Fax No. 516 996 8864

Project Description (list separate contracts & estimates)

Contract No.	Description	Estimate
D004437	WA-2 Bowe Systems & Machinery (1-30-048)	$41,483

PROJECTED M/WBE AND EEO CONTRACT SUMMARY

	%	Amount		%	No./Employ
1. Total Project Dollar Value	100	$41,483	5. Total Employees	100	10
2. MBE Project Goal	15	$6,222	6. Total Minority Employees/Goal	10	1
3. WBE Project Goal	5	$2,074	7. Total Female Employees/Goal	10	1
4. M/WBE Totals Combined	20	$8,297	8. EEO Total Combined	20	2

OFFICE OF MINORITY & WOMEN'S BUSINESS PROGRAMS USE ONLY

Proposed Goals		Date Approved	Date Disapproved	Initials
MBE (%)	EEO-Minorities (%)			
WBE (%)	EEO-Women (%)			

OMWBP May 25, 2004

Number Types of Contracts	Contract Breakdown	Amount
1. Laboratory	MBE Subcontractor Price	$6,728
	Subcontract Management Fee	$ 336
	Total	$7,064
2. M/WBE Reporting	MBE Subcontract Price	$ 300
	Subcontract Management Fee	$ 0
	Total	$ 300
3. Data Validation	WBE Subcontractor Price	$ 940
	Subcontract Management Fee	$ 47
	Total	$ 987

Attach

CONSULTANT/CONTRACTOR DETAILED M/WBE-EEO UTILIZATION PLAN
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

(THE M/WBE-EEO GOALS MUST BE PLACED ON THE ENTIRE PROJECT COST)

Municipality/Consultant/Contractor Name: Camp Dresser & McKee

Contract Type/Number: Standby Contract No. D00443 Investigation and Design Services

Contract Award Date: February 10, 2006

Address: 100 Crosswick Park

City: Woodbury

State: New York

Zip Code: 11797

Project Owner Name:

Project/Grant No.:

Address: 100 Crosswick Park

City: Woodbury

State: New York

Zip Code: 11797

Authorized Representative: Michael Memoli

Title: Partner

Authorized Signature:

EEO AND MBE/WBE CONTRACT SUMMARY(MUNICIPAL FORCE ACCOUNT N/A)

M/WBE CONTRACT SUMMARY	%	Amount	EEO CONTRACT SUMMARY	%	No./Emp.	Wk./Hrs.
1. Total Dollar Value of the Project	100	$41,483	6. Total for all Employees	100	10	252
2. Total Dollar Value of the Prime Contract			7. Total Goal for Minority Employees	10	1	25
3. MBE Goal/Amount	15	$6,222	8. Total Goal for Female Employees	10	1	25
4. WBE Goal/Amount	5	$2,074	9. EEO Combined Totals	20	2	50
5. MBE/WBE Combined Totals	20	$8,297				

Office of Minority & Women's Business Programs Use Only

Proposed Goals		Date Approved	Date Disapproved	Initials
MBE (%)	EEO-Minorities (%)			
WBE (%)	EEO-Minorities (%)			

SECTION I - MBE INFORMATION: In order to achieve the MBE Goals, New York State Certified MINORITY-OWNED firms are expected to participate in the following manner

MBE Firm	Projected MBE Contract Amount and Award Date	Description of Work MBE	Contract Schedule/Start Date(s)	Contract Payment Schedule	Project Completion Date
Name: Chemtech Address: 284 Sheffield Street City: Mountainside State/Zip Code: NJ 07092. Telephone No.:	$ 6,728 DATE: 7/17/06	Analysis of soil vapor, groundwater and soil	7/31/06	1 payment at completion	8/18/06
Name: Kenneth Shider Address: City: State/Zip Code: Telephone No.:	$ 300 DATE: 7/17/06	M/WBE Quarterly Reports	7/13/06	2 payments: Sept 30 Dec 31	12/31/06
Name: Address: City: State/Zip Code: Telephone No.:	$______ DATE: ______				

SECTION II - WBE INFORMATION: In order to achieve the WBE Goals, New York State Certified WOMEN-OWNED firms are expected to participate in the follow manner

WBE Firm	Projected WBE Contract Amount and Award Date	Description of Work WBE	Contract Schedule/Start Date(s)	Contract Payment Schedule	Project Completion Date
Name: Data Validation Address: 120 Cobble Creek City: North Creek State/Zip Code: NY 12853. Telephone No.:	$ 940 DATE: 7/17/06	Data Validation-DUSR Reports	9/11/06	1 payment at completion	10/11/06
Name: Address: City: State/Zip Code: Telephone No.:	$ DATE:				
Name: Address: City: State/Zip Code: Telephone No.:	$ DATE:				

SECTION III - EEO INFORMATION: In order to achieve the EEO Goals, Minorities and Females are expected to be employed in the following job categories for the specified amount of work hours.

		All Employees		Minority Employees			
Job Categories	Total Work Hours of Contract	Male	Female	African-American	Asian	Native American	Hispanic
Officials/ Managers	52	16	36	4			
Professionals	200	44	156		96		
Technicians							
Sales Workers							
Office/Clerical							
Craftsman							
Laborers							
Services/ Workers							
Totals	252						

Appendix D

Subcontractor Backup

Bowe System Project
Subcontractor Quote Comparison

Driller	Amount	Units	Zebra	ADT	LAWES
MOB/DEMOB					
MOB/DEMOB	1	Lump Sum	$495	$2,500	$300
Vactron	1	Lump Sum	$1,265	$1,500	$1,600
Steam Cleaner	1	Lump Sum	$675	$500	$500
DRILL RIG AND CREW					
Truck Drill Rig and Crew	1	Lump Sum	$4,275	$8,000	$8,000
Soil Vapor Samples	1	Lump Sum	$550	$300	$3,000
Groundwater and Soil Samples	1	Lump Sum	$135	$220	$500
		Totals	$7,395	$13,020	$13,900

Data Validator	Amount	Units	EDV	ChemWorld	Data Validation Services
TCL VOCs 8260	28	sample	$26	$22	$23
TAL Metals 7000	4	sample	$27	$19	$25
SVOCs-TCL BNA 8270	4	sample	$27	$23	$25
		Totals	$944	$784	$890

Lab	Amount	Units	Chemtech	H2M	Upstate Labs
Summa Canister	16	ea	$27	$150	$150
TCL VOCs 8260 Water	10	ea	$92	$80	$110
TAL Metals 7471 Solids	4	ea	$113	$113	$113
SVOCs-TCL BNA 8270 Solids	4	ea	$205	$145	$225
TCL VOCs 8260 Solids	4	ea	$92	$90	$125
TO-15 Air	14	ea	$231	$300	$245
Air-Helium Scan	14	ea	$50	$0	$0
		Totals	$6,926	$8,792	$8,782

Quote not provided by lab for this parameter