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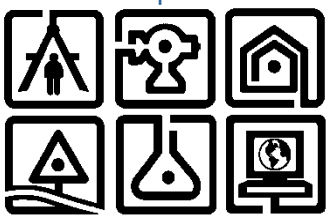
NYS Brownfield Cleanup Program



DRAFT Field Sampling Plan

Former Plesser Property Site
Paradies Lane
Town of New Paltz
Ulster County, New York
BCP Site No. C356053

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FIELD SAMPLING PLAN
FORMER PLESSER PROPERTY SITE
PARADIES LANE
TOWN OF NEW PALTZ
USLTER COUNTY, NEW YORK

TABLE OF CONTENTS

1.0 INTRODUCTION

This document is the Field Sampling Plan (FSP) for the planned Pre-Design Investigation and Remedial Action to be conducted at the Former Plesser Property Site ('the Site") located at on Paradies Lane in the Town of New Paltz, Ulster County, New York.

The proposed Remedial Investigation Work Plan the Site is detailed in the Remedial Investigation Work Plan (RAWP) as prepared herein by C.T. Male Associates. In general, the Remedial Investigation will include: shallow soil sampling, deeper soil sampling via test pits, the collection and analysis of groundwater samples via the installation of groundwater monitoring wells and the collection of sediment and surface water samples from adjacent wetland areas. .

The Remedial Investigation (RI) will be conducted as per the Department approved work plan. The intent of the RI is to collect sufficient information to determine the nature and extent of the impacts associated with historic use of the property and to aid in the development of an appropriate remedial alternative for the site that is protective of human health and the environment. This FSP is a supplement to the Remedial Investigation Work Plan and would be applicable to any future Remedial Action Work Plan that may be generated. T\he FSP presents the standard field sampling and data gathering procedures to be followed during implementation of the field activity portions of the scope of work. This plan addresses soil sampling, exploratory test pits; tank closures; field screening and testing procedures; sampling procedures; decontamination procedures; field instrumentation operating procedures; field measurements; sample handling; and chain of custody procedures. This FSP is intended to be applicable to field sampling activities conducted by C.T. Male Associates.

The FSP forms an integral part of the Quality Assurance Project Plan (QAPP) developed for the Site, which is presented under separate cover. The field sampling and data gathering procedures presented in the FSP are incorporated into the QAPP by reference. The FSP and the QAPP document the laboratory quality assurance/quality control procedures to be followed during analysis of samples collected in the field so that valid data of a known quality is generated.

The FSP has been prepared, in part, in general accordance with the following USEPA and NYSDEC guidance documents:

- Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, EPA/540/G-89/004, USEPA, October 1988.
- A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001, USEPA, December 1987.
- DER-10, Technical Guidance for Site Investigation and Remediation, NYSDEC, May 2010. (DER-10).
- 6 NYCRR Part 375 Environmental Remediation Programs Subparts 375-1 to 375-4 & 375-6, Effective December 14, 2006.
- 6NYCRR Part 612, Registration of Petroleum Bulk Storage Facilities, December 1985.
- CP-51, Soil Cleanup Policy, October 2010.

1.1 Site Overview

1.1.1 Site Description

The Site is an irregular-shaped parcel of undeveloped land comprised of two tax parcels in the Town of New Paltz, Ulster County, New York (Section 86.12, Block 5, Lots 13.310 and 13.320). The combined parcels are approximately 57.3 acres in size. The parcels that comprise the Site lack a physical address. The location of the Site is shown on Figure 1 – Site Location Map and an ortho-photograph depicting the Site boundaries and the surrounding areas is included as Figure 2 – Ortho-photographic Site Location Map. The tax lot boundaries of the Site and surrounding parcels are depicted on Figure 3 – Sketch Map.

The Site is currently vacant. Areas of the Site contain grassy fields and wooded lands, but have historically been developed. Remnants of foundations, concrete paved areas, an asphalt driveway, power lines and several trails exist. A small portion of the northernmost tax lot is landscaped. This portion of the Site is in close proximity to Paradies Lane. The central portion of the Site contains grassy fields. The southernmost portion of the Site is wooded with delineated wetlands. The remnant foundations, concrete paved areas, and an asphalt driveway are located in the northwestern section the Site. Several trails are present on western and central sections of the Site.

The northern section of the Site contains approximately 1,000 feet of frontage along the southern side of Paradies Lane and NYS Route 299 and 450 feet of frontage along the western side of South Ohioville Road.

The adjacent and surrounding land use is a mix of commercial and residential property. NYS Thruway Exit 18 lies to the west of property. Paradies Lane borders the northern and western corner of the Site; NYS State Route 299 borders the Site to the north; South Ohioville Road lies to the east of the Site and there are a number of commercial and residential properties along South Ohioville and vacant land lies to the south.

1.1.2 Site's Environmental Setting

The Site has historically been used for farming purposes; mainly as an orchard. Analytical results from previous environmental investigations show elevated levels of metals, mainly arsenic and lead, typical of lead arsenate pesticides that were commonly used in commercial orchard operations up to the 1950's and 60's. There is also some evidence of semi-volatile organic compounds associated with an oil spill (NYSDEC Spill No. 14-018290) near where the old barn was located.

Several environmental assessments were conducted at the property. The following summarizes the Site's environmental history.

2014 Chazen Phase I ESA

The Chazen report identified the following recognized environmental conditions:

- Historical uses of the central and northeastern sections of the Site included an apple orchard. The owner reported that pesticides exist in shallow soils in the area of the former orchard; however, supporting documentation and concentration information was not provided. It is also not known if pesticides were applied according to their labeled directions. Given the reported presence of pesticides in soil, but the limited associated information, this is considered a Significant Data Gap (SDG).

- Five structures (i.e., one barn, one garage and three unidentified structures), constructed circa 1949, were previously located on the Site. The three unidentified structures were demolished circa 1978-1994, while the remaining barn and garage were demolished in 2003. Records searched could not confirm if

any of the five structures contained heating systems and the usage of the three unidentified structures. This lack of information represents an SDG.

- A waste pile was noted in the southwestern section of the Site (area of one demolished unidentified structure) and included empty containers of raw product (e.g., approximately twenty 1-gallon buckets for oil/grease, one 5-gallon fuel container, two 15-gallon drums with unknown contents). No staining and/or odors were noted on surfaces underneath these containers; however, it is unknown if containers were empty when placed in this area and what were the contents of these containers. Therefore, this waste storage is considered an SDG.

- A Shell gasoline station is located adjacent to the Site, is associated with one open NYSDEC spill, and identified as a Petroleum Bulk Storage (PBS) facility. Four underground storage tanks (USTs) exist on-site: 8,000-gallon gasoline, 6,000-gallon gasoline, 4,000-gallon diesel, and 1,500-gallon petroleum. One spill incident (No. 9814530) was reported for discovery of soil contamination during tank removal and has not been granted closure by the NYSDEC. Presumed groundwater flow direction in this area is away from the Site (southeast); however, this could not be confirmed so the Spill represents an SDG for the Site. In addition, this Spill incident indicates that potential vapor intrusion issue cannot be ruled out for the Site ~~but it should be noted that the NYSDOH does not currently regulate petroleum compounds when considering vapor intrusion concerns~~.

- A rusted empty and unlabeled 55-gallon container was noted in front of the auto-repair garage property encroachment but still on-site. No staining and/or leakage were noted in the area; however, the historical drum contents are unknown and therefore considered an SDG.

- A small clearing is noted in the extreme southwest corner of the Site in the 1994 aerial photograph but appears subsequently wooded. The reason for a temporary clearing is unknown; however, there was no evidence of material storage or stressed vegetation; therefore it is not a REC.

- An adjacent auto repair facility's overflow parking area encroaches onto the central eastern section of the Site. A close-up inspection of the encroachment

could not be conducted as it was incorporated in the neighboring property. This is considered an SDG, although, evidence of releases was not observed in this area.

2014 Phase II ESA Findings

Based on the results of the Phase I ESA, a Phase II ESA was performed. A total of forty-two soil borings were advanced on the Plesser Property, Paradies Lane, New Paltz, New York property.

- Laboratory data for soil samples was obtained from the UST area, located within the northeastern portion of the Site (SB-7) revealed low level concentrations for several targeted VOCs at depths between 8 and 12 feet bgs.

- Surficial soil samples were obtained from within the historical orchard areas (central and north–northeastern portions of the property). These samples indicated elevated concentrations of arsenic and lead, exceeding unrestricted and restricted residential NYSDEC Subpart 375-6: Remedial Program Soil Cleanup Objectives, December 2006.

DTCS concluded subsurface soil impacts exceeding soil guidance standards were encountered within eleven soil borings (SB-19, 25, 30 31, 32 - 34, 36, 39 and SB-42) in that portion of the property historically utilized as an orchard. The two compounds of concern within these samples are arsenic and lead. The site was evaluated in 2012 and 2013 through completion of a Phase I environmental site assessment, two (2) environmental investigations, and a geotechnical evaluation. Results of the investigations revealed that a gasoline station occupied northwestern portions of the site between 1931 and 1978; a two (2) to 10-foot thick layer of fill material containing cinders and ash, glass, brick, asphalt, wood, concrete, tires, metal and garbage overlies the entirety of the site; the existence of at least four (4) petroleum underground storage tanks; native soils in the vicinity of the former fueling dispensing island subjectively impacted by petroleum; and the detection of metals in fill/soil at concentrations exceeding soil cleanup levels for Unrestricted Use of the site.

2.0 SAMPLING LOCATIONS AND FREQUENCY

Sampling will be conducted during the Remedial Investigation. The number and types of sampling are documented on Figure 4 attached to the FSP.

Shallow soil samples will be obtained using a manual hand shovel, hand auger and/or trowel and will be obtained in the upper zero to two inches of soil, deeper soil samples will be obtained using an excavator to aid in the collection of discrete surface, near-surface and/or subsurface fill/soil samples; groundwater wells will be installed to obtain shallow water quality samples and samples will be obtained manually from the sediment and surface water from the adjacent wetlands. The frequency and required laboratory analysis for the fill/soil samples will be dictated by the conditions observed in the field. Sufficient samples will be obtained so that an appropriate remedy can be developed.

The samples will be analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs and Pesticides, and Target Analyte List (TAL) Metals, and cyanide. Shallow soil samples will be collected at the frequency of one (1) sample per every 200 square feet, or an alternative frequency with pre-approval by the DEC Project Manager. Test pits will be installed at approximate 400 foot centers; however, the test pit locations are intended to be variable based on the results of the surface sampling and field observations. Groundwater monitoring wells are intended to be installed at both upgradient and downgradient locations to adequately characterize potential impacts to groundwater associated with historic use of the property. The wells will focus on the unconsolidated aquifer formation since this is the most likely sensitive receptor for the types of contaminants observed during the previous Phase II ESA

The sampling frequency will be in accordance with DER -10 and is documented in Figure 4.

3.0 INVESTIGATION SAMPLING OVERVIEW

3.1 General

Media sampling and laboratory analysis is a necessary component of the Remedial Investigation. Investigation sampling requirements are based in part on the analytical results from the previous investigations conducted in 2014.

3.2 Investigation Sampling

It is anticipated that surface, near-surface and/or subsurface soil samples will be collected via advancement of manual collection and test pits within the confines of the Site.

3.2.1 Surface Fill/Soil Sampling

The soil samples will be manually collected utilizing a hand shovel and/or hand auger. Laboratory analysis of the samples will vary but at least 20 percent of the samples will be analyzed for the full TCL and TAL suites of compounds and analytes. The shallow soil samples will also be analyzed for pesticides.

The hand shovel and/or hand auger will be decontaminated prior to the commencement of sampling, between each sampling location, and at the conclusion of sampling. The equipment will be decontaminated utilizing a non-phosphate detergent such as Alconox and rinsed with copious amounts of tap water. The decontamination water will be discharged to the ground surface near one (1) of the surface fill/soil sampling locations.

3.2.2 Near-Surface & Subsurface Soil Sampling

The subsurface soil samples will be collected utilizing the bucket of an excavator. The samples will only be collected from soil that is not in contact with the excavator bucket. Laboratory analysis of the samples will be the same as the shallow soil samples except that only 10 percent of the samples will be analyzed for pesticides.

The excavator bucket will be decontaminated prior to the commencement of sampling, between each sampling location, and at the conclusion of sampling. The excavator

bucket will be decontaminated utilizing a non-phosphate detergent such as Alconox and rinsed with copious amounts of tap water. The decontamination water will be discharged to the ground surface near one (1) of the subsurface fill/soil sampling locations.

3.3.3 Groundwater Sampling

Aqueous samples will be collected from the new monitoring wells installed during the course of the RI. The samples will be analyzed for the full suite of TCL and TAL compounds and analytes in accordance with the requirements outlined in DER-10. All of the groundwater samples will also be analyzed for pesticides.

3.4 Observation of Field Activities

All soil sampling, well installation and sampling and sediment sampling will be observed by a full-time, on-site, C.T. Male representative. This representative will be responsible for the collection of samples; field screening of samples; recording of test pits, impacted fill/soil excavation and groundwater treatment system sampling data; collection of aqueous samples from the groundwater treatment system; and monitoring the decontamination procedures.

Field system audits will be conducted and field reports will be prepared that document the daily field activities. A copy of the forms to be utilized by the applicable field team personnel as part of the field quality assurance/quality control (QA/QC) procedures are presented in Appendix A of this FSP.

The C.T. Male Project Manager will be kept informed of the progress of work and any problems encountered during the Remedial Investigation so that the appropriate corrective action can be implemented NYSDEC can be notified.

3.4.1 Shallow Soil Sampling and Sampling of Test Pits

A track mounted or tire mounted excavator will be utilized to complete the test pits as part of the sampling activities. Excavated fill/soil will be visually classified and subjectively assessed via organoleptic perception (sight and smell), and with a photo ionization detector (PID). Fill/soil samples will be collected for analysis as required by the disposal facility for waste characterization purposes. The samples submitted for

laboratory analysis will be skewed to those samples exhibiting evidence of contamination employing the above subjective methods.

Fill/soil from the test pits will be visually classified in the field in general accordance with the Unified Soil Classification System and ASTM D 2488, Standard Practice for Description and Identification of Soils. The soil descriptions may include matrix and clast descriptions, moisture content, color, appearance, odor, behavior of the material and other pertinent observations. This information will be recorded on a test pit log form along with the test pit identification, date started and completed, sampling intervals, and depth of first groundwater encountered, if present. A blank copy of a Test Pit Log Form is enclosed in Appendix A.

The test pit excavations will be managed in accordance with Section 3.3(e)4 of DER-10 so as not to contaminant the Site. Excavated fill/soil will be temporarily placed on plastic while performing the test pits. ~~If the excavated material is not considered to be impacted based on subjective observation it will be placed back in the excavation following completion of the test pit. If the excavated fill/soil is subjectively assessed to be impacted (i.e. petrochemical odors, staining, etc.) and groundwater has not been intercepted within the depths explored, the open excavation will be lined with plastic sheeting on top of which the excavated fill/soil will be placed. If the excavated fill/soil are subjectively impacted and groundwater is encountered within the test pits, the groundwater saturated portion of the test pit will first be backfilled with clean materials to at least one foot above the depth of groundwater saturation. The test pit will then be lined with plastic sheeting on which the subjectively impacted fill/soil will be placed to backfill the remaining portions of the test pit.~~

3.4.2 Sampling of Groundwater Wells

The sampling necessary for the groundwater wells will be used to gauge groundwater contaminant levels and document conformance to applicable water quality limits. Samples will be collected from the wells using low flow sampling methods in accordance with the protocols outlined in DER-10.

3.5 Fill/Soil Sampling and Soil Field Screening Procedures

Fill/soil sampling procedures that will be followed for collection of samples from Remedial Investigation as follows:

1. A decontaminated (per Section 3.6) hand shovel and/or hand auger will be used by the on-site sampling personnel. Clean disposable gloves will be worn when handling the equipment.

2. A discrete fill/soil sample will be collected by advancing the bucket of the excavator, hand shovel and/or hand auger to a pre-determined depth, based on conditions found at each location. The surface sample will be collected utilizing a decontaminated hand shovel and/or hand auger or a new pair of disposable gloves. Sampling personnel will collect the test pit and post-excavation fill/soil sample from the approximate center of the excavator bucket donning clean, nitrile gloves.

3. For samples to be collected for laboratory analysis, the sample container label will be completed with the sample location (surface soil/test pit/excavation bottom or sidewall), sample interval, sampler's initials, date, and time. The client, project name, Site location, matrix, sample type (grab/composite) and laboratory analyses to be performed will also be recorded on the sample label.

4. Immediately upon collecting the sample, the sample will be put directly into pre-cleaned laboratory supplied glass jars donning new, nitrile gloves, and the jars will be sealed. Sampling personnel will wear a new pair of disposable gloves for each sample interval retrieved. A portion of the remaining soil will be placed in a new plastic zip lock bag, not more than one-half full, and sealed. This bag sample will be for head space analysis screening in the field for volatile organic compounds (VOCs) using a PID meter.

5. The soil sample will be classified and the test pit log completed.

6. The sampling equipment will be decontaminated per Section 3.6.

3.6 Decontamination of Sampling Equipment

The sampling equipment including the excavator bucket, hand shovel and hand auger will be cleaned prior to use, in between each sampling location and at the completion of sampling using the following procedure:

1. Remove any excess soil remaining on the sampling equipment.

2. Prepare a solution of tap water and non-phosphate detergent (i.e., Alconox) in a wash bucket, and scrub the equipment with a brush to remove any adhering particles.

3. Rinse the equipment with copious amounts of tap water.

4. Place clean equipment on clean polyethylene sheeting.

5. New disposable gloves will be worn when cleaning and handling the equipment to avoid contamination.

7. The water in the wash and rinse buckets will be changed frequently to avoid cross contamination.

Decontamination rinse water generated during the Pre-Design Investigation sampling will be discharged to the ground surface in the vicinity of a corresponding sampling location.

Decontamination rinse water from decontamination of the excavator bucket during confirmatory post-excavation soil sample collection during the Remedial Action will be stored in DOT approved containers for waste characterization and off-site disposal and/or transferred to the groundwater treatment system and discharged to the POTW.

3.7 Decontamination of Excavation Equipment

The excavator bucket and any other part of the excavator (i.e., tracks) that comes in contact with impacted fill/soil will be decontaminated at the conclusion of the Remedial Action by pressure washing and/or steam cleaning over a decontamination pad of sufficient size and design to capture the wash water.

4.0 SOIL SAMPLING PROCEDURES

4.1 Headspace Analysis

The soil samples collected from the Investigation will be screened for the presence of petroleum/chemical related hydrocarbons by headspace analysis utilizing a photoionization detector (PID) to subjectively assess the recovered soil samples for evidence of petroleum/chemical contamination. The sample is transferred from the hand shovel, hand auger and/or excavator bucket into a zip lock bag, sealed, shaken and then allowed to sit for several minutes. Once the sample has had a chance to sit or "volatilize," the vapor space inside the bag will be analyzed by inserting the tip of the PID through the bag, as described in Section 3.5.

4.2 Analytical Soil Sampling

Select recovered soil samples will be subjected to laboratory analysis. The soil samples will be extracted from the sampling equipment in a timely fashion such that the soil sample has limited exposure to the outside air reducing the chance for volatilization. The interval chosen to be analyzed for soils from the excavations will be based, in part, on headspace analysis results and visual observations for staining and odor. Only new pre-cleaned laboratory provided sample containers and caps will be used for sample collection/analyses. All sample containers required to be fixed with a preservative will be prepared by the laboratory before each sampling event. The container type, cap type and preservative requirements for the analytical parameters (soil) to be analyzed are summarized in Table 1.

TABLE 1
Analytical Requirements for Containers and Preservatives for Soil Sampling

PARAMETER	CONTAINER	TOP	PRESERVATION	COMMENTS
TCL VOCs, CP-51 VOCs (Soil)	Three, 5 Gram Encore Vials	Teflon	One Vial = Methanol, Two vials = Bisulfate, Cool	NA
TCL SVOCs, CP-51 SVOCs, PCBs and Pesticides (Soil)	16 oz Glass	Teflon	Cool	NA
TAL Metals (Soil)	16 oz Glass	Teflon	Cool	NA
Cyanide	16 oz Glass	Teflon	Cool	NA

5.0 GROUNDWATER SAMPLING PROCEDURES

5.1 General

During groundwater treatment system sampling, it is important to follow strict acceptable protocol during the collection and transportation of groundwater samples. This minimizes the potential for sample variation due to sampling and transportation techniques.

5.2 Preparation for Sampling

Prior to groundwater sampling, the containers needed for sampling will be collected and prepared. Only new pre-cleaned laboratory provided sample containers and caps will be used for sample collection/analyses. All sample containers required to be fixed with a preservative, will be prepared by the laboratory before each sampling event. The container type, cap type and preservative requirements for the analytical parameters (water) to be analyzed are summarized in Table 2 below.

TABLE 2
Analytical Requirements for Containers and Preservatives for Water Sampling

PARAMETER	CONTAINER	TOP	PRESERVATION	COMMENTS
TCL VOCs, CP-51 VOCs (Water)	3-40 ml vials (preserved)	Septum	HCl to pH<2 Cool, 4°C	NA
TCL Semi-VOCs, CP-51 SVOCs, PCBs and Pesticides (Water)	3-1L amber Glass	Teflon	0.008% $Na_2S_2O_3$ Cool, 4°C	Store in dark.
TAL Metals (Water)	500 ml Plastic	Poly	HNO_3 to pH <2 Cool, 2°C- 4°C	NA
Cyanide (Water)	500 ml amber Glass	Teflon	NaOH > 12 Cool, 2°C- 4°C	NA

Sample labels will be prepared prior to sampling and affixed to the sample containers. The client, project name, Site location, matrix, sample type (grab/composite),

preservative and laboratory analyses to be performed will be recorded on the sample labels by the laboratory. The sample location (i.e., influent or effluent), date, sampler's initials and time will be filled out on the sample label at the time of sampling.

5.3 Sample Collection

A new pair of disposable nitrile gloves will be used to handle the bailer and/or Teflon tubing used to collect the samples sampling ports and containers at each sampling location. Only non-powdered sampling gloves will be used during sampling for metal analytes.

In order to insure the integrity of samples, sample containers must be filled properly. The following sections contain general procedures for sampling and specific procedures for sampling volatile organic compounds. Care shall be taken in sampling to assure that analytical results represent the actual sample composition.

A. General Sampling

1. Don't remove caps until the actual sampling time and only long enough to fill the container.
2. Identify every container by filling out the label with all the required data.
3. Fill all containers completely.
4. Some bottles may contain a fixative which should not be rinsed out of the bottle. Read the sample label treatment and fixative section to determine if a preservative/fixative has been added. Be careful not to contact fixatives with skin or clothing. If this should occur, rinse liberally with water.
5. After the sample is taken, wipe the container with a paper towel and place the container in a cooler with ice packs, to maintain the cooler at 4°C.
6. Complete Chain of Custody Record form.
7. Deliver or ship samples to the laboratory within 48 hours.

B. Sampling for Volatile Organic Compounds

1. Samples are to be collected in glass containers having a total volume in excess of 40 ml with open-top screw caps with Teflon-faced silicone septa. Sample

containers will have hydrochloric acid (HCL) added to them as a preservative. This preservative must not be rinsed out.

2. A transport blank should be prepared from organic-free water and carried through the sampling and handling procedure. It will serve as a check for transport and container contamination.

3. Fill sample container slowly to minimize aeration of the sample, until a curved meniscus is observed over the bottle rim.

4. Float the septa, Teflon™ side down on the liquid meniscus. The Teflon™ side is the thin layer observed when viewing the septum from the side horizontally.

5. Carefully set on septum, expelling excess sample and being careful to exclude air. Then screw open-top cap down.

6. Check for a good seal by inverting bottle and tapping and checking for visible air bubbles.

7. If air bubbles are visible or there is a bad seal, remove cap and add additional sample and repeat steps 4 to 6.

8. Groundwater treatment system samples for volatile analysis will be taken in triplicate.

6.0 QUALITY CONTROL DURING SAMPLING IN THE FIELD

Quality control samples will be taken during the Remedial Investigation sampling to monitor sampling technique, sampling equipment cleanliness, sample variability, sample handling and laboratory performance (analytical reproducibility). The quality control samples will include replicate samples, equipment/field blanks and transport blanks. Quality control samples will only be taken in tandem with confirmatory post-excavation soil samples collected during the Remedial Action. Quality control samples will not be taken in tandem with Pre-Design Investigation and groundwater treatment system sampling.

6.1 Replicate Samples

Replicate (duplicate) samples are samples taken from the same location with the same sampling device. Replicate samples are used to check on laboratory reproducibility, sampling technique and sample variability. The replicate samples will be coded so that the laboratory is not biased in performing the analyses. The code that is used will be identified in the field notes and on the sampling logs, but not on laboratory correspondence.

One replicate soil sample will be taken for every twenty (20) samples submitted to the laboratory for analysis. The replicate soil samples will be collected after the desired sampling interval is thoroughly mixed in a stainless steel bowl to achieve a homogeneous sample and then equally split into the various analytical containers.

6.2 Equipment/Field Blanks

Equipment/field blanks are samples taken to monitor sampling equipment cleanliness and decontamination procedures during field sampling. One equipment/field blank will be taken during confirmatory post-excavation soil sampling for every twenty (20) samples submitted for laboratory analysis. The equipment/field blanks will be taken as follows:

Soil Sampling - After the excavator bucket has been decontaminated and is ready for sampling, pour deionized water through and/or over the sampling equipment and collect it in the sample container(s).

The equipment field blanks will be identified as such and by the location to be sampled (i.e., equipment blank before Excavation Bottom-1).

6.3 Transport Blanks

Transport blanks are prepared when VOCs analysis is to be performed, and they are prepared in the laboratory when the sample containers are prepared. Transport blanks will be prepared in triplicate by filling 40 ml glass containers (with Teflon™ lined septum) with deionized water. These containers will travel unopened with the sample containers and be analyzed for the same volatile constituents as the samples being submitted. The transport blanks are taken to monitor whether the samples have been contaminated during transport, as a result of handling in the field, during shipment or during storage in the laboratory. One transport blank will accompany each set of samples (soil or water) that are shipped/delivered to the laboratory for VOCs analysis.

7.0 FIELD INSTRUMENTATION OPERATING PROCEDURES

7.1 General

The field instruments that will be utilized during implementation of the Remedial Investigation are: a photo-ionization detector (PID) meter for air monitoring of the total VOCs during test pitting, soil excavations and for headspace analysis of soil samples for total VOCs. The field instruments used will be calibrated and operated in accordance with the manufacturer's instructions and the procedures identified in the following sections.

7.2 Photo-ionization Detector Meter

A MiniRae 3000 PID meter and data logger with a 10.6 eV lamp will be utilized to measure total VOCs. The instrument is calibrated at the factory upon purchase and annually thereafter using certified service shops who utilize standards of benzene and isobutylene. Prior to use in the field, the instrument will be calibrated in accordance with the manufacturer's instructions using a disposable cylinder containing isobutylene obtained from a reputable supplier. The calibration value varies by the manufacturer, however, 100 parts per million is commonly utilized by C.T. Male Associates. During use the PID meter will be calibrated at least once every 8 hours. The calibration procedure is contained in the User's Manual.

Care will be taken when handling and using the PID meter to prevent any debris from entering the sample line which will affect the instrument's operation. If this occurs, field personnel will clean the unit or replace it with a functional PID meter.

8.0 SAMPLE HANDLING AND CHAIN OF CUSTODY PROCEDURES

Just prior to sampling and filling the sample containers, the label on the container will be completed with the required information. After filling the sample containers they will be wiped with a paper towel, and placed in a protective bubble or foam wrap to protect it during transport. The container(s) will be placed in a cooler with double bagged ice packs, to maintain a temperature of 4°C.

A Chain of Custody Record will be completed by the sampler in the field after securing analytical samples. The sampler will be responsible for retaining possession of the samples until they are delivered to the laboratory or until they are delivered to a courier or common carrier for shipment to the laboratory. When the samples are released from the custody of the sampling personnel, the Chain of Custody Record will be signed by both relinquishing and receiving parties with the date and time indicated. A copy of the form will be retained by the sampler for inclusion in the project files and the original form will accompany the shipment. The Chain of Custody Record will then be signed by the relinquishing party and receiving laboratory personnel when the samples are ultimately received at the laboratory.

If samples are shipped, a bill of lading or an air bill will be used and retained in the project files as documentation of sample transportation. Prior to shipment, the cooler will be securely wrapped with clear tape to protect it from tampering. A separate additional Chain of Custody Record will be completed for each cooler of samples. This form will be placed in a plastic bag and taped to the underside of the cooler lid. This form will be used by the laboratory personnel as a check to verify that the containers listed on the form are present in the cooler when they are received at the laboratory. A copy of the signed Chain of Custody Record will accompany the laboratory analysis reports.

APPENDIX A

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) FORMS and FIELD REPORT FORMS

APPENDIX B

SECTION 5.5 of DER-10