FINAL SUMMARY REPORT

OF

SITE INVESTIGATION

AND

INTERIM REMEDIAL ACTIVITIES

Performed on the "Perx Property"

located at

68 South Broadway
Village of Red Hook
Dutchess County, New York

April 2004

ESI File: DR99140.41F

Prepared By:

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The undersigned has reviewed this Report and certifies to the Dutchess County Department of Planning that the information provided in this document is accurate as of the date of issuance by this office.

Any and all questions or comments, including requests for additional information, should be submitted to the undersigned.

Paul H. Ciminello
President

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1.0 INTRODUCTION

1.1 Purpose

This Final Summary Report of Site Investigation and Interim Remedial Activities (Report) summarizes all fieldwork performed by Ecosystems Strategies, Inc. (ESI) on specified portions of the "Perx Property" (hereafter referred to as the "Site") located at 68 South Broadway in the Village of Red Hook, Dutchess County, New York. The work summarized in this Report was performed to address potential environmental liabilities resulting from historic industrial and commercial usage of the property (see Section 2.2, below).

The specific purpose of this Report is to further define the extent of known surface and subsurface soil contamination on the subject property. Investigative services were conducted consistent with the Workplan for Site Investigation and Interim Remedial Activities (Workplan) as reviewed and approved by the New York State Department of Environmental Conservation (NYSDEC). Any variations from this approved Workplan are described in this Report.

This Report describes all fieldwork methodology and soil and groundwater sampling procedures, includes discussions of the resulting analytical data from collected soil and groundwater samples, and provides conclusions and recommendations drawn from the fieldwork and analytical data.

1.2 Limitations

This written analysis is an assessment of the site characterization activities conducted on specified portions of the Perx Property, Village of Red Hook, Dutchess County, New York and is not relevant to other portions of this property or any other property. It is a representation of those portions of the property analyzed as of the respective dates of fieldwork. This Report cannot be held accountable for activities or events resulting in contamination after the dates of fieldwork.

Services summarized in this Report were performed in accordance with generally accepted practices and established NYSDEC protocols. Unless specifically noted, the findings and conclusions contained herein must be considered not as scientific certainties, but as probabilities based on professional judgment.

1.3 Investigative and Remedial Objectives

ESI conducted a subsurface investigation on selected portions of the subject property to achieve the following objectives:

1. To remove on-site underground and aboveground storage tanks and to document the presence or absence of soil contamination in the vicinity of the tanks;

2. To survey and, if possible, remove non-hazardous waste materials located within the on-site structures;

3. To identify all on-site, interior floor drains and determine their discharge points, if possible; and,

4. To further define residual contamination from pesticide usage on the Site, including additional soils, sediment and groundwater sampling.

2.0 SITE DESCRIPTION AND LOCATION

2.1 Site Location and Description

The Perx Property is located at 68 South Broadway in the Village of Red Hook, Dutchess County, New York (see Site Location Map, Appendix A). The property is approximately 20 acres in size. Frontage along the western side of South Broadway provides access to the property.

2.2 Previous Environmental Reports

Information obtained during the preparation of a previous Phase I ESA (conducted by ESI in September 1999) indicates that the on-site structures have been present on the subject property since the mid-1950s. The subject property had been used as an apple processing facility beginning in 1949 and was also a frozen-food processing and packaging plant from 1955 to some time after 1981. Apple orchards were located on the western portion of the subject property during the 1950s and 1960s. The Phase I ESA indicated that the subject property had been vacant for approximately 10 to 15 years. A Summary Report of Environmental Services (SRES) documenting the analysis of on-site soil and water samples, was issued by ESI in April 2001 (excerpts from the SRES are provided in Appendix B).

The Phase I ESA and the SRES documented environmental conditions of concern, including the following:

- The presence of at least three, unregistered underground storage tanks (USTs) on the Site for which no records of tank or soil integrity were available;
- Evidence of soil contamination in a former orchard area from arsenic-based pesticide usage. Soil arsenic concentrations exceeding NYSDEC guidance values have been documented; however, a comprehensive investigation of the entire, former orchard area had not been conducted and the extent of pesticide and related metals contamination had not been fully documented;
- The presence of three, manifolded aboveground storage tanks (ASTs) located near the maintenance garage and a fourth AST located in the basement crawlspace of the former office adjacent to the east entrance;
- The presence of drums and bags within the on-site structures containing undetermined liquids and solids;
- No groundwater contamination has been identified. However, the existing three water-supply wells are in close proximity to each other, and data from these wells is therefore not necessarily representative of conditions throughout the site. Additionally, the construction of the existing wells which were sampled is not known. Because the wells are supply wells, they are likely to be open boreholes and dilution of contaminated groundwater could have occurred;
- Floor drains throughout the main processing/warehouse facility may have received discharges of contaminants. The terminus of these drains and the integrity of surrounding soils and groundwater had not been documented; and,
- Two wastewater treatment systems (east and west), including a lagoon, may have received contaminants related to food and apple processing activities; the integrity of the soils in this area had not been documented.

3.0 SUBSURFACE INVESTIGATION

3.1 General

3.1.1 Utility Markout

Prior to the initiation of fieldwork, a request for a complete utility markout of the subject property was submitted by ESI as required by New York State Department of Labor regulations. Confirmation of underground utility locations was secured and a field check of the utility markout was conducted prior to the extension of soil cores.

3.1.2 Personnel

Fieldwork documented in this Report was performed, observed, and/or supervised by ESI personnel. The following subcontractors were retained to provide additional on-site services:

- Tank removal services were provided by S. J. Lore Contracting, Inc. ESI observed and documented all tank removal services, including the collection of confirmatory endpoint soil samples, and signing all relevant manifests;

- Well installation services were conducted by Todd J. Syska Inc. Well installation services were supervised by ESI personnel to document the condition of on-site soils during well installation; and,

- Laboratory services were subcontracted to York Analytical Laboratories, Inc., a New York State Department of Health certified laboratory (ELAP Certification Number 10854). Due to an error during chain-of-custody completion, New York State Department of Environmental Conservation (NYSDEC) requested methods (ASP-1 and ASP-2) were not used; rather, United States Environmental Protection Agency (USEPA) Methods 8260 and 8270 were used in the analysis of soil samples. The detection limits for all analyses performed are consistent with detection limits provided for in the ASP Methods; therefore, it is the opinion of ESI that this deviation from the Workplan does not invalidate the data.

3.1.3 Terminology

Background Levels

The term "background level", as defined in this Report, is the concentration of a particular metal that is known to naturally occur in Eastern United States soils. The overall objective of setting background levels for metals is to assess the concentrations of metals in on-site soils relative to those that are naturally occurring. On-site soils with metal concentrations exceeding these background levels are considered more likely to have been affected by anthropogenic contributions. Background levels do not exist for refined petroleum hydrocarbons and, therefore, no discussion of naturally occurring levels for these compounds is appropriate. The background levels provided in this Report for arsenic and lead are based on average concentrations detected in ten samples, collected from five locations on the subject property considered by ESI to represent undisturbed site soils (a summary of detected background metal concentrations is presented in Tables 1a and 1b, below).

Five background samples were collected from surface (0-4") and subsurface (20-24") soils in distinct areas on the property that were deemed unlikely to have been disrupted or influenced by site activity. All five samples were analyzed for total weight arsenic and lead. Soil samples BS-3 and BS-5 were also screened for chromium.

The average background concentrations of arsenic in surface soils (0-4") on the property was determined to be 11.1 parts per million [ppm] (peak value 22.6 ppm) and the average background concentration of arsenic in subsurface soils (20-24") is 5.41 ppm (peak value 8.17 ppm).

The average background concentration of lead in surface soils was determined to be 43.2 ppm (peak value 63.0 ppm) and the average background concentration of lead in subsurface soils is 31.2 ppm (peak value 104 ppm). [Note: background levels for lead are know to vary widely; average levels for lead in undeveloped rural areas may range from 4-61 ppm while average background levels in metropolitan or suburban areas or near highways are much higher and typically range from 200-500 ppm].

The average background concentration of chromium in surface soils (0-4") was determined to be 16.4 ppm (peak value 16.7 ppm) and the average subsurface (20-24") concentration of chromium is 17.5 ppm (peak value 18.4 ppm).

Table 1a: Background Concentrations of Metals (Surface Soils, 0-4") (All data provided in ppm)

Metals	BG-1	BG-2	BG-3	BS-4	BS-5	Average Value
Arsenic	6.69	5.92	10.1	10.2	22.6	11.1
Lead	20.4	38.2	51.6	43.0	63.0	43.2
Chromium	NA	NA	NA	16.1	16.7	16.4
Notes: NA = Not Analyzed						

Table 1b: Background Concentrations of Metals (Subsurface Soils, 20-24") (All data provided in ppm)

Metals	BG-1	BG-2	BG-3	BS-4	BS-5	Average Value
Arsenic	4.66	8.17	5.51	3.22	5.49	5.41
Lead	11.3	104	13.6	12.9	14.3	31.2
Chromium	NA	NA	NA	18.4	16.6	17.5
Notes: NA = Not Analyzed						

Guidance Levels

The term "guidance level" as defined in this Report, refers to the concentration of a particular contaminant above which remedial actions are considered more likely. The overall objective of setting guidance levels is to assess the integrity of on-site soils and groundwater relative to conditions that are likely to present a threat to public health, given the existing and probable future uses of the site. On-site soils and groundwater with contaminant levels exceeding these guidance levels are considered more likely to warrant remediation. No independent risk assessment was performed as part of this investigation.

Guidance levels for all compounds detected in soils are based on the NYSDEC's Technical and Administrative Guidance Memorandum #4046 (TAGM), dated January 24, 1994, as modified by subsequent NYSDEC memoranda. Guidance levels for all compounds detected in water are based on NYSDEC Water Quality Regulations, Surface Water and Groundwater Classifications and Standards, New York State Codes, Rules and Regulations, Title 6, Chapter X parts 700-706, including amendments through August 4, 1999. For the purposes of this Report, guidance levels for arsenic and chromium are set at the average site-specific background levels in surface soils (11.1 ppm and 16.4 ppm, respectively), and the guidance level for lead is set at 250 ppm, a value commonly accepted by the NYSDEC as appropriate for use in residential surface soils.

3.2 Data Validation

3.2.1 Scope of Data Validation

This Section summarizes data validation services conducted on select organic analyses as performed by York Analytical Laboratories, Inc. (York). This data validation relied upon the USEPA National Functional Guidelines for Organic Data Review as well as other relevant documents. To the extent that this review made recommendations for data to be modified, notations have been made on the data sheets provided in Appendix C (Laboratory Reports). Standard modifiers as expressed below may have been used in qualifying the supplied data: "J" for estimated value, "N" for presumptive evidence of a compound being present and "U" for presumptive evidence of a compound being absent. The complete Data Usability Summary Review by York Analytical Laboratories, Inc. is provided in Appendix D.

To assess the validity of these data, a review was conducted of chain of custody documents, method of shipment, laboratory provided quality control data (including holding time and surrogate recovery) and submitted field, trip or equipment blanks.

3.2.2 Chain of Custody

Chain of custody (COC) forms were reviewed for completeness and accuracy. For all COC forms, samples are noted as having been collected by ESI staff and all containers are noted as being picked up by courier for delivery directly to the laboratory. No samples are noted as being sent via overnight package delivery service (e.g., Federal Express) or by other means of transport.
COC forms identify each sample and the date of sample collection. The time of sampling is not noted. On several COC forms, the date of sample collection is noted on the top of the form for the first sample, but there is no notation (e.g., a line or ditto marks) indicating that the specified date extends to all samples on that COC form. This does not invalidate the data but is contrary to procedures. On certain COC forms the "Analyses Requested" section is completed with a notation "Analyses to be faxed". The analyses are included on a subsequent COC form, relating each sample ID number with the requested analysis.

3.2.3 Holding Times

A subset of 20 percent of all laboratory analyses was reviewed for conformance to NYSDEC holding time requirements. All analyses were completed within specified holding times. No violations of holding times were noted for both organic and inorganic analyses.

3.2.4 Surrogate Recovery

Documentation provided by York Laboratories was reviewed to assess compliance with NYSDOH - ELAP surrogate guidelines. For VOC analysis, three (3) surrogate compounds are recommended: 1, 2 Dichloroethane, Toluene d8, and Bromofluorobenzene. Comparisons of surrogate recovery rates (i.e., comparison of concentrations of each compound as introduced and recorded). Evaluation of surrogate recoveries indicate that the Quality Control criteria for all compounds were met.

3.2.5 Matrix Spike / Matrix Spike Duplicate

Matrix Spike / Matrix Spike Duplicate (MS / MSD) data are generated to determine the long-term precision and accuracy of the analytical method in various matrices and to demonstrate acceptable compound recovery. MS / MSD are used in conjunction with other Quality Control criteria for data qualifications. No site-specific MS / MSD analyses were performed for this data set.

3.2.6 GC / MS Calibration

Satisfactory instrument calibration is established to ensure that the equipment is capable of producing acceptable quantitative data. Calibration prior to initiating analyses provide a baseline documentation of equipment accuracy; continuing calibration documents on-going accuracy. Calibration considers response factors as well as percent relative standard deviation. Calibration data indicate that all response factor criteria were net in the initial calibration curve analysis, as well as the single continuing calibration analysis provided for this project.

3.3 Interim Remedial Activities

3.3.1 Tank Removal

All tank excavation activities (including off-site disposal of tanks) was conducted by S. J. Lore Contracting, Inc. during November and December, 2002. Pumping service and disposal of all liquid waste was performed by Advanced Oil Recycling prior to tank removal. These activities were observed and documented by ESI personnel. All confirmatory soil samples were collected by ESI personnel and analyzed for volatile organic compounds (VOCs) and/or polynuclear aromatic hydrocarbons (PAHs) as dictated by former tank contents and specified in the Workplan. A complete Summary Report of Tank Removal Services is provided as Appendix E.

Prior to tank removal, each tank was inspected for the presence of product and drained. Exterior surfaces of the tanks were visually inspected to determine the structural integrity of the tank. Visual inspection of the tanks indicated that the tanks were generally in satisfactory condition with only surface rusting and no obvious holes or pitting. Tank removals are summarized in Table 2, below.

3.3.1.1 Additional Tanks Encountered

In addition to the three USTs and four ASTs detected during prior investigative work, two additional tanks were located during fieldwork activities. A 550-gallon fuel-oil AST and a 300-gallon waste-oil UST were identified along the east exterior wall of the maintenance garage at the south center of the property. The tanks were discovered in an area of dense vegetation. There is also rumored to be at least one 10,000-gallon fuel-oil tank present under the building. No evidence of this tank was noted in the site inspections. A Fieldwork Map indicating tank locations is provided in Appendix A.

550-Gallon AST

A 550-gallon fuel-oil AST was identified adjacent to the maintenance garage. Measurement of the product level indicated that the tank contained approximately 400 gallons of product. There was no field evidence of petroleum-contaminated soils in the vicinity of the tank. A surface soil sample 3SS-1(550-AST) was collected from the uppermost six inches of soils beneath the eastern invert of the tank in order to confirm the presence or absence of petroleum contamination. Soil sample 3SS-1(550-AST) was analyzed for PAHs. No PAHs were detected in the sample.

300-Gallon UST

A 300-gallon waste-oil UST was identified adjacent to the maintenance garage. Measurement of the product level indicated the tank contained approximately 100 gallons of product. A test pit was excavated adjacent to the east wall of the tank to provide access to soils at the invert of the tank. There was no field evidence of petroleum-contaminated soils in the vicinity of the tank. Two soil samples, 5EP-N (300-UST) and 5EP-S (300-UST), were collected from the north and south invert of the tank, respectively, and were analyzed for PAHs and VOCs. No petroleum compounds were detected in the soil samples.

3.3.2 Waste Survey

ESI personnel conducted a comprehensive inventory of wastes, including drums and other waste containers, present inside the on-site structures. The inventory consisted of visual inspections and, where considered safe, field-testing of waste solids and liquids. No containers determined by ESI field personnel to represent an immediate danger to the Site or to the environment were identified during this inspection. All containers appeared to contain materials that can be disposed of by licensed haulers at a reasonable time in the future (i.e., immediate response is not warranted). Approximately five rusted 55-gallon metal drums (located near the fence perimeter surrounding the wastewater lagoon) were inspected. These barrels appeared empty and the original contents are unknown. An inventory of on-site wastes is provided in Table 3, below. Contrary to the workplan, these wastes were not removed, as coordination of ammonia treatment and removal could not be secured due to contractor unavailability.

Table 2: Summary of USTs/ASTs Removed from the Site

Tank	Location	Size	Contents	Observations
1	Approximately 30' west of the center of the main processing/warehouse	2000-gallon UST and pump	Gasoline	Tank was in satisfactory condition with no evidence of a release in adjacent soils
2	Adjacent to north wall of waste water block-house at north center of property	1000-gallon UST and pump	Diesel	Tank was in satisfactory condition with no evidence of a release in adjacent soils
3	East of wastewater treatment building at north central border of property	750-gallon UST	Fuel oil	Tank appeared to be in satisfactory condition, low-volume of soils in vicinity of tank exhibit petroleum contamination
4	Exterior of west wall of maintenance garage at south center of property	3 manifolded ASTs (one partially buried)	Fuel oil and/or waste Oil	Tanks appear to be in satisfactory condition with no evidence of a release in adjacent soils
5	Basement crawlspace of two-story frame office structure at east entrance of property	275-gallon AST	Fuel oil	Tank in satisfactory condition with no evidence of a release on adjacent slab surface

Table 3: Summary of Waste Survey

Waste	Container/Volume	Location	Observations
Sodium Hydroxide	1, 55-Gallon paper drum, full	Southeast mechanical room in main processing/warehouse	Paper barrel deteriorating with contents spread around base
Waste oils	4, 55-Gallon metal drums, full	2 drums in metal wastewater treatment building on north central property border and 2 drums in southeast mechanical room in main processing warehouse	Drums are open with some staining noted around base (drums in wastewater treatment building have released contents, with large overt area of oil-like staining on concrete floor in mechanical shop
Aluminum Sulfate	Approximately 50, 30 lb. Bags	White block shed at north central portion of property	Paper bags moist and in various stages of deterioration
Unknown	2, 55-gallon plastic drums	Southeast processing room of main processing warehouse	Substance is visible in open drum and appears to be a grease/oil-like substance
Ammonia Tank	300-gallon ammonia tank (content volume unknown)	Southwest cold-storage room	Heavy steel tank, contents unknown

3.3.3 Floor Drain Investigation

Sediment Sampling Floor Drains-Main Warehouse

Various grate covered, 12" floor drains were detected throughout portions of the main processing warehouse. Several drains were opened and inspected on April 18, 2003. The drains contained several inches of dark, soil-like sediment which was sampled at two distinct drain locations. Sample 2D-1 and 2D-2 were collected, respectively, from floor drains in the north and south portion of the building. The samples were analyzed for the presence of total weight pesticides utilizing USEPA method 8080, and total weight arsenic and lead.

Arsenic was detected in sample 2D-1 at 12.5 ppm, slightly above the site-specific background level of 11.1 ppm in surface soils. No arsenic was detected in sample 2D-2. Lead was detected in sample 2D-1 at 215 ppm and in sample 2D-2 at 6,880 ppm (significantly above the guidance level of 250 ppm). Both samples contained elevated concentrations of DDT and DDD, with peak concentrations of both compounds (22,000 parts per billion [ppb] of DDT and 7,600 ppb of DDD) occurring in sample 2D-2 (guidance levels for DDT and DDD are, respectively, 2,100 ppb and 2,900 ppb). (See Table 4 in Appendix F, Data Summary Tables).

Dye Test/ Floor Drain Terminus

On April 18, 2003 a floor drain in the northeast portion of the main processing warehouse was opened and inspected. Approximately half of the estimated 20 floor drains throughout the structure still had ice in the reservoirs. After sediment samples were obtained from the base of floor drain bottom (2D-1), a hose was inserted into the drain and freshwater was allowed to flow unobstructed into the drain reservoir. An outflow was noted at the drain bottom. A USEPA approved, non-toxic, biodegradable green liquid-dye was added to the running water in an attempt to visually identify the terminus of the drain. Approximately 75 to 100 gallons of water was injected into the floor drain. After approximately ½ hour had elapsed the dye stained water was detected flowing into the east end of the skimmer shed (western wastewater treatment complex) through a six-inch PVC influent pipe. The dye test confirms the connection of this floor drain (2D-1) to the skimmer shed located at the western wastewater treatment system (see Fieldwork Map for connection).

3.3.4 Test Pit Extensions

In January 2003 ESI extended seven (7) test pits to depths ranging from 6' to 12' below grade to assess subsurface conditions. Four (4) test pits were extended in the eastern, wastewater treatment portion of the site, where surface debris was previously noted and where, based on topographic features (including earthen mounds), it was suspected that buried wastes could be present. Three (3) test pits were extended in soil/debris mounds located in the western portion of the property. Demolition debris including concrete and steel screening was observed intermixed throughout the surface of these mounds.

In December 2003 ESI extended seven (7) additional test pits in the western portion of the property where anecdotal reports indicated possible burial of 30-gallon drums and surface debris had been noted. Miscellaneous construction and demolition debris was encountered to a maximum depth of 3' below surface grade.

3.3.4.1 Methodology

Test pits were extended using a standard rubber-tired backhoe. Soils were excavated and stockpiled next to the test pit to allow for more detailed observation of buried materials and to allow for screening of the soils with field instruments. A MiniRAE 2000 (Model PGM 7600) photo-ionization detector (PID) was utilized by ESI personnel to screen all encountered material for the

presence of any volatile organic vapors where appropriate. Prior to the initiation of fieldwork, this PID was properly calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene in accordance with protocols set forth by the equipment manufacturer. Calibration results were recorded in fieldwork logs by ESI personnel.

Composite soil samples were collected by ESI personnel from soils intermixed with debris or from the stratum exhibiting the most pronounced field indications (e.g., PID readings) of contamination. Samples were collected in laboratory-cleaned glassware using properly decontaminated equipment. Samples were stored in coolers in the field. Proper chain-of-custody procedures were followed.

3.3.4.2 Field Observations

In general, test pits TP-1 through TP-4, extended at the eastern portion of the site adjacent to soil mounds and the wastewater treatment system, documented a low-volume of buried material that did not represent hazardous wastes. Minimal quantities of putrescible materials were present in the subsurface. No drums or liquid-waste storage containers were encountered. No significant areas of stained soils were identified other than at TP-1, which exhibited a slight petroleum odor. Stained soils at TP-1 are likely to be associated with a low-volume release from a former 750-gallon UST. Grease-like substances in this excavation are most likely related to the proximity of the settling lagoon. Field evidence of petroleum contamination was not detected below 7 - 8'.

Test pits 2TP-5 through 2TP-7 were extended at soil mounds observed in the western portion of the site. Approximately 200 yards of debris consisting of steel-reinforced concrete rubble was observed intermixed within the surface soils in this area. A small volume of fiberglass insulation was observed in shallow soils at 2TP-5. In general, field observations at 2TP-5 through 2TP-7 documented a low-volume of buried material that did not represent hazardous wastes. Minimal quantities of putrescible materials were present in the subsurface. No drums or liquid-waste storage containers were encountered.

Test pits 3TP-10 through 3TP-16 were extended in the western portion of the subject property in an area where surface debris was observed and anecdotal reports suggested historic burial of 30-gallon drums. Field evidence indicated the presence of miscellaneous construction and demolition debris to a maximum depth of 3' below surface grade. Undisturbed native soils were encountered from approximately 3 to 8' below grade. No drums were drums were found and no field evidence of contamination encountered.

Fieldwork observation tables are presented in Appendix G and test pit locations are provided on the Fieldwork Map in Appendix A.

3.3.4.3 Laboratory Analysis and Findings

Samples were analyzed for VOCs using USEPA Method 8021 and/or 8260, PAHs using USEPA Method 8270, total weight RCRA metals, and pesticides using USEPA Method 8080.
Several laboratory analytes were detected at concentrations significantly below guidance levels in test pit samples: toluene was detected at TP-4; two pesticides (DDT and chlordane) were detected at 2TP-5; and DDT and four VOCs (1,2,4-trimethylbenzene, naphthalene, and xylenes) were detected at 3TP-10. Field observations of soil material at TP-4 did not indicate the presence of petroleum or chemical contaminants. No other VOCs or chlorinated pesticides were identified in soil samples, and no PAHs were identified in any soil sample. Data indicate no significantly elevated concentrations of metals in test pit soils; concentrations of metals were generally within ranges considered normal for soils in eastern New York and/or were consistent with metal concentrations found in the background samples (see Tables 5a and 5b in Appendix F).

3.4 Site Investigation Services: Soil and Sediment Testing

The Summary Report of Environmental Services identified elevated levels of arsenic in soil samples obtained from the suspected orchard area, as well as in material collected from drains in the main warehouse/processing structure. Arsenic was detected at concentrations from 11.3 ppm to 33.8 ppm in the former orchard area and from 36.0 ppm to 55.3 ppm in two drains screened in the main processing warehouse. Based on the presence of elevated arsenic concentrations, an additional sampling plan was recommended to address areas potentially impacted by the historic use of arsenic-based chemicals and pesticides.

Soil samples were collected from various locations throughout the Site to document current surface and subsurface conditions. ESI personnel coordinated and supervised the collection of multiple soil samples from the vicinity of the wastewater treatment system and lagoon area, the area formerly identified as an orchard, and the wetland area. Five additional soil samples were obtained from distinct locations in the northeast, southeast and northwest extremes of the property in order to provide background samples for comparison purposes. Soil samples were collected from both the uppermost 0-4 inches of soil and from a depth of 20-24 inches. Wetlands sediment samples were obtained from the uppermost four inches of material.

All wastewater/lagoon and orchard samples were analyzed for total weight arsenic and lead. Wetlands samples were analyzed for chlorinated pesticides (using USEPA Method 8080) and total weight arsenic. Background samples were analyzed for total weight arsenic and lead (two of the samples were additionally analyzed for chromium).

Fieldwork methodology and observations made during the collection of these samples is described below in Sections 3.3.1 and 3.3.2. The soil and sediment sample locations are shown on the Fieldwork Map in Appendix A.

3.4.1 Sample Collection Methodology

All soil and sediment samples were collected in a manner consistent with USEPA and NYSDEC sample collection protocols. Samples were collected in pre-cleaned jars provided by the laboratory. Decontaminated stainless steel trowels and dedicated gloves were used at each sample location to place the material into jars. After sample collection, the sample containers were placed in a cool (4°C), dry place prior to their transport to York Analytical Laboratories, Inc., a NYSDOH approved laboratory (ELAP Certification #10854) for analytical testing. Appropriate chain-of-custody procedures were followed. Soil samples were collected from a depth of 0-4 inches and 20-24 inches for all areas, excluding the wetlands samples which were sampled from the uppermost 0-4 inches of material.

Additional soil samples were obtained from the wastewater treatment system located on the east central border of the property. Two buried wastewater treatment tanks and related piping networks were discovered in a courtyard at the east central border of the property during fieldwork activity in this area. Soil samples were collected using a Geoprobe® hand-held direct-push sampling system. Two surface soil samples were also collected from the courtyard in this area.

3.4.2 Fieldwork Observations

An assessment of subsurface soil characteristics, including soil type, the presence of foreign materials, field indications of contamination (e.g., unusual coloration patterns or odors) was made during the collection of all soil samples. ESI personnel maintained field logs documenting field observations and measurements. Relevant information from ESI field notes for all sampling locations is presented in Appendix G.

3.4.3 Laboratory Analysis and Findings

West Wastewater Treatment/Lagoon Sampling

Soil samples were collected from the wastewater treatment/lagoon areas of the Site and analyzed for total weight arsenic and lead. Sixteen soil samples were collected (from two depths, 0-4" and 20-24") from eight distinct locations (see Tables 6a and 6b in Appendix F).

All sixteen soil samples exhibited concentrations of arsenic, ranging from 3.38 ppm to a peak of 10.6 ppm at LA-5 (20-24"). No surface soil samples contained arsenic above the site-specific background concentration of 11.1 ppm. Four subsurface samples contained arsenic concentrations slightly exceeding the site-specific background concentration of 5.41 ppm.

All sixteen samples exhibited concentrations of lead, ranging from 14.0 ppm to a peak of 489 ppm at LA-8 (0-4"). Five surface soil samples contained lead above the site-specific background concentration of 43.2 ppm and one subsurface sample contained lead concentrations above the site-specific background concentration of 31.2 ppm. Soil sample LA-1 (0-4") and LA-8 (0-4") exhibited concentrations of lead in excess of the 250 ppm guidance level.

During the final phase of the initial round of investigative fieldwork, two additional subsurface wastewater discharge points and associated piping (not identified in previous investigative reports) were encountered on the Site. A suspected concrete-block drywell was identified approximately 30-feet west of the west wall of the maintenance garage structure at the south-central portion of the property, and a large corrugated-metal drywell was identified at the exterior southwest corner of the main processing/warehouse structure.

Subsequent investigation conducted on April 7, 2003 correctly identified the suspected drywell adjacent to the maintenance garage as a water main valve-housing. The dry well immediately south of the main processing warehouse was confirmed and investigated. The well is constructed of a 36-inch diameter corrugated pipe imbedded to approximately six' in the ground and acting as a drywell or catch basin. A six-inch plastic pipe was observed running beneath the corrugated drywell at a depth of approximately 6-7'. The origin and course of this pipe is unknown. The interior walls of the well are stained with a grease-like residue. A 2-inch diameter hole was observed on the building wall adjacent to the drain and exhibited similar staining. It is probable that this served as an outflow or discharge point from the warehouse to the well.

Soil at the base of the drain was sampled (see Table 8 in Appendix F). Field observations of this material indicated a grease-like residue; however, instrument readings and field observations did not provide evidence of a petroleum release. Sample DW-1 (0-12") was analyzed for VOCs, chlorinated pesticides and RCRA metals. No VOCs or chlorinated pesticides were detected in the sample. Cadmium (8.22 ppm), chromium (68.6 ppm), and mercury (0.23 ppm) were detected above guidance levels (1 ppm, 16.4 ppm, and 0.1 ppm, respectively). Lead (68.6 ppm) was detected at a concentration marginally above the site-specific background level for surface soil (43.2 ppm). Arsenic (4.45 ppm) was detected at a concentration below background. Selenium and silver were not detected.

Additional Sampling at West Wastewater Treatment Complex

Skimmer Shed

During the dye test conducted on April 18, 2003 the terminus of at least one of the floor drains in the northeast portion of the main warehouse was determined to be a six inch PVC pipe in the southeast corner of the skimmer shed (see Fieldwork Map). Three soil samples were collected from distinct locations throughout the skimmer shed structure. Soil samples Skimshed-1 (0-4"), Skimshed-2 (0-4") and Skimshed-3-outflow (0-4") were collected and analyzed for pesticides

utilizing USEPA method 8080 (see Table 8 in Appendix F). All three samples contained chlordane (266 ppm to 500 ppm) at concentrations below the guidance level of 540 ppm. DDT and/or its daughter products (DDE and DDD) were detected at concentrations significantly below guidance levels. No other pesticides were detected in these samples.

West Wastewater Tanks/Sumps

During the April 18, 2003 fieldwork event three 24-inch diameter manhole covers were discovered in the ground immediately south of the skimmer shed structure. These covers concealed subsurface tanks or sump like features. The tanks or sumps appeared to be full of water and were approximately 5-6' deep. Two hand borings were extended in the immediate vicinity of the manhole covers. Samples WW-HB-1(5-7') and WW-HB-2(5-7') were collected from the presumed invert of the tanks/sumps and were submitted for analysis of pesticides utilizing USEPA method 8080. Soil sample WW-HB-2 (5-7') was also analyzed for VOCs utilizing USEPA method 8021. No pesticides or VOCs were detected in the soil samples above minimum detection limits (see Table 8, Appendix F).

East Wastewater Treatment Tanks Sampling

Two underground wastewater storage/treatment tanks were discovered during fieldwork activity in a courtyard near the eastern central border of the property. The two steel tanks have an approximate capacity of 4,000 gallons. On April 7, 2003 two soil samples, WT-HB-1 (10-12') and WT-HB-2 (10-12'), were collected from near the east and west inverts of the tanks and analyzed for VOC's utilizing USEPA method 8260, chlorinated pesticides utilizing USEPA method 8080 and RCRA metals (see Table 9 in Appendix F). No VOCs were detected in either of the samples analyzed. Sample WT-HB-2 (10-12') contained chlordane (458 ppm) below the guidance level of 540 ppm, and sample WT-HB-1 (10-12') contained endrin-aldehyde at 12.2 ppm (guidance level not established). No other pesticides were detected in these samples. Low-level exceedences for mercury were recorded for both soil samples. All other RCRA metals concentrations, however, were generally within ranges considered normal for soils in eastern New York and/or were consistent with metal concentrations found in the background samples.

Two surface soil samples were also collected from distinct locations within the courtyard. Soil samples WT-SS-1 and WT-SS-2 were collected from a depth of 10-12". Both samples were analyzed for VOC's utilizing USEPA method 8260, chlorinated pesticides utilizing USEPA method 8080 and RCRA metals (see Table 9 in Appendix F). No VOCs were detected in the soil samples. Low-level exceedences for mercury and chromium were recorded for both soil samples, and lead was detected at a peak concentration of 150 ppm. All other RCRA metals concentrations were generally within ranges considered normal for soils in eastern New York, and/or were consistent with metal concentrations found in the background samples. Two pesticides (DDT and chlordane) were detected in both soil samples. Chlordane was detected at 8,000 ppb in sample WT-SS-1 (guidance level for chlordane is 540 ppb). DDT was detected at concentrations below its guidance level.

Former Orchard-Area Sampling

Soil samples were collected from the former orchard area and were analyzed for total weight arsenic and lead (see Tables 7a and 7b in Appendix F). Sixteen soil samples were collected at two depths (0-4" and 20-24") from eight distinct locations.

All sixteen soil samples exhibited concentrations of arsenic, ranging from 4.76 ppm to 25.4 ppm. Nine soil samples (seven surface and two subsurface samples) contained arsenic at concentrations above the site-specific average background concentration (11.1 and 5.41 ppm, respectively). Three of the surface soil samples (OR-1, OR-2, and OR-4) contained arsenic at concentrations above 20 ppm.

All sixteen samples exhibited concentrations of lead, ranging from 12.2 ppm to a peak of 82.5 ppm. Five surface soil samples contained lead at concentrations above the site-specific average background concentration of 43.2 ppm, but no samples exceeded the 250 ppm guidance level. No subsurface soil samples contained lead concentrations above the site-specific average background concentration of 31.2 ppm.

Wetlands Sampling

Surface soil/sediment samples were collected from the wetlands area and were analyzed for total weight arsenic and chlorinated pesticides using USEPA Method 8080 (see Table 10 in Appendix F). Six soil/sediment samples were collected from six distinct locations. Four soil samples contained pesticides (DTT, DDE, DDD, and/or chlordane) at concentrations below guidance levels. One sample (WL-6, 15 ppm) contained arsenic at concentrations above the site-specific average background concentration (11.1 ppm).

Pesticide Sampling - Main Warehouse Exterior

Additional soil samples were collected adjacent to the exterior of the main processing warehouse and were analyzed for pesticides utilizing USEPA method 8080. Ten soil samples were collected from five distinct locations (from 0-4" and 20-24" in depth). These samples were deemed necessary by Michael McCabe of the NYSDEC subsequent to the discovery of elevated concentrations of chlordane in sample WT-SS-1, collected from the eastern wastewater treatment area. Soil samples 5SS-1 through 5SS-4, collected from both depths, did not exhibit concentrations of pesticides above minimum detection limits. Soil sample 5SS-5 (0-4"), collected near the northeastern corner of the main facility, contained DTT, DDE, DDD, and chlordane at concentrations below guidance levels (see Table 4 in Appendix F).

Soil sample 5EFL-1(0-4") was an additional surface soil sample collected from the southeast exterior of the main warehouse building beneath two capped effluent pipes. Soil sample 5EFL-1 was submitted for analysis of pesticides and VOC's utilizing USEPA method 8080 and 8021, respectively. No VOC's or pesticides were detected in the soil sample above minimum detection limits (see Table 4 in Appendix F).

3.5 Site Investigation Services: Groundwater Testing

3.5.1 Groundwater Monitoring Well Installation

Three former supply wells are located on the western wooded portion of the Site. Although the wells were previously sampled and found to be free of contamination, the wells are in close proximity to each other, and data from these wells is therefore not necessarily representative of conditions throughout the site. Additionally, the construction of these previously sampled wells is not known. Because the wells are supply wells, they are likely to be open boreholes and dilution of contaminated groundwater could have occurred.

Based upon field observations and laboratory data compiled from soil samples collected in 2001, four (4) groundwater monitoring wells (TMW-1, TMW-2, TMW-3 and TMW-4) were installed throughout the wastewater/lagoon portion of the Site on January 2003 in order to determine the impact to groundwater, if any, from contaminants identified in soils, or from compounds suspected of having been used on the Site.

During well installation, soil bore spoils were monitored with the PID and soil characteristics were documented. No field evidence of contamination was encountered at any of the well installation locations. Soil samples were collected from the groundwater interface (groundwater was detected at depths of 8-14' below grade). Soil samples from all well locations were analyzed for

VOCs using USEPA Method 8260. Due to evidence of a petroleum release from the adjacent former 750-gallon UST, and the proximity of the wastewater-settling pond, soil collected from TMW-1 was additionally analyzed for chlorinated pesticides (USEPA Method 8080), PAHs (USEPA Method 8270) and total weight RCRA Metals (see Table 11 in Appendix F).

No VOCs were detected in soils at any well location. No PAHs or chlorinated pesticides were detected in soil sampled during the installation of TMW-1. Six RCRA metals were detected at TMW-1; concentrations of three metals (chromium, selenium and mercury) were slightly above guidance levels.

Wells were installed by Todd J Syska Inc. ESI personnel supervised the driller and documented all well installation procedures. Each well was constructed utilizing one-inch PVC casing and 0.01-inch slotted PVC well screening with raised casings. All four (4) wells were initially secured with lock-ties.

Wells were constructed such that a minimum of two feet of well screen extended above the static water table as encountered on the day of installation and the remaining eight feet of well screen extended below the water table. The annular space between the PVC casing and the borehole was filled with clean silica sand.

The location of all wells is provided on the Fieldwork Map, Appendix A.

3.5.2 Monitoring Well Development

On January 21, 2003 all four monitoring wells were developed. Development was performed in order to clear fine-grained material that might have settled around the well screen and to enhance the natural hydraulic connection between the well screen and the surrounding soils. Prior to development, each monitoring well casing was opened and the well column immediately screened with a PID to document the presence of any volatile organic vapors. Each monitoring well was developed manually with dedicated, disposable polyethylene bailers (used to avoid cross-contamination of the wells). Water removed from each monitoring well was visually inspected for indications of petroleum contamination.

3.5.3 Site Hydrogeology

Mean Groundwater Elevations

Information gathered during the fieldwork conducted by this office in January 2003 indicates that groundwater is present on the site between 10.69 feet (recorded at TMW-2) and 14.46 feet (recorded at TMW-1) below surface grade (see the Direction Of Groundwater Flow Map for elevation data).

Direction of Groundwater Flow

All on-site groundwater-monitoring wells were plotted on a site survey by ESI personnel using a fixed on-site marker with an arbitrary benchmark elevation of 200 feet above mean sea level (msl). Well elevations were surveyed to the nearest 0.01-foot in relation to this benchmark. The direction of groundwater flow was determined based on elevations of static groundwater, measured prior to water quality sample collection. Measurements were collected with an electronic depth meter accurate to the nearest 0.01-foot. Data were recorded in field logs for use in generating a Direction of Groundwater Flow Map (included in Appendix A). The direction of groundwater flow was determined to be in a north-northeasterly direction. The rate of groundwater flow is not known at this time. (The elevations of the three former supply wells were not determined and were not utilized in the creation of the Direction Of Groundwater Flow Map).

3.5.4 Groundwater Sampling Procedures

Each groundwater monitoring well was properly purged of at least three well volumes using dedicated, disposable polyethylene bailers. Samples were then collected from each well using new, dedicated disposable polyethylene bailers to avoid cross-contamination of the wells. Each groundwater sample was collected in sample vials or bottles pre-cleaned at the laboratory. No groundwater samples were filtered prior to analysis. After sample collection, the containers were placed in a cooler prior to transport via overnight courier delivery to York Analytical laboratories. All samples were accompanied by proper chain of custody documentation.

3.5.5 Laboratory Analysis and Findings

Groundwater samples were submitted to the laboratory and analyzed for chlorinated pesticides using USEPA Method 8080 and RCRA metals using USEPA Method 6010B. Monitoring well TMW-1 was also sampled for VOCs and PAHs using USEPA Methods 8260 and 8270, respectively (see Table 12 in Appendix F). No pesticides were detected in any monitoring wells, and no VOCs or PAHs were detected in samples from TMW-1. The absence of petroleum compounds in TMW-1 is an indicator that groundwater integrity has not been influenced by the low-volume petroleum release from the adjacent 750-gallon UST.

Concentrations of five RCRA metals were detected in groundwater samples. All monitoring wells exhibited exceedences of NYSDEC Groundwater Protection Standards for total lead (peak concentration of 223 ppb). In addition, groundwater samples obtained from TMW-3 and TMW-4 exhibited NYSDEC Groundwater Protection Standards exceedences for barium (peak concentration of 2,670 ppb). Low levels of chromium were detected in all monitoring wells, low levels of arsenic were detected in monitoring well TMW-2, and low levels of mercury were detected in TMW-4.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This office has completed the services summarized in Section 3.0 on specified portions of the approximately 0.65-acre "Perx Property" located at 68 South Broadway in the Village of Red Hook, Dutchess County, New York. The following remedial and investigative tasks were completed to address environmental conditions identified in section 2.2 of this Report. Environmental services documented in this Report are intended to augment previous investigative and remedial efforts performed on the Site by ESI , as documented in the previously issued Phase I ESA (September 1999) and the Summary Report of Environmental Services (April 2001).

4.1 Conclusions

1. ESI coordinated and supervised the removal of three underground storage tanks (USTs) and four aboveground storage tanks (ASTs) from various locations throughout the subject property, and collected confirmatory samples from all tank graves and tank inverts, according to NYSDEC regulations. A Summary Report of Tank Removal Services is included as Appendix E.

   All confirmatory soil samples related to the USTs and ASTs were petroleum free, with the exception of soils obtained from the north end of the 750-gallon fuel oil UST located at the northern central portion of the site. A small volume of contaminated soil was observed at the north invert of this tank, and a spill event was reported to the NYSDEC (Spill File number 0210253). The source of this contamination, the UST, has been removed.

   Samples from a test pit located adjacent to the tank (TP-1) exhibited no evidence of petroleum contamination beneath the north invert of the tank to a depth of 12 feet. A ground water monitoring well (TMW-1) was installed adjacent and down-gradient of the tank grave. No VOCs or PAHs were detected in water samples obtained from this monitoring well.

   Field evidence supports the conclusion that the total volume of contaminated soil in the vicinity of the former 750-gallon UST is less than 50 cubic yards.

2. Two additional storage tanks were identified adjacent to the east exterior wall of the maintenance garage at the southern central portion of the property during the final phase of field investigative and remedial activity. An initial analysis of soil material obtained from the tank inverts indicates the absence of petroleum contamination. Recent communications with people knowledgeable of this Site identified the possible presence of a fuel-oil tank (possibly as large as 10,000-gallons) under the building. No field evidence of this UST has been encountered during various site inspections.

3. Four temporary monitoring wells were installed in the vicinity of the former wastewater treatment system at the center of the property in order to document potential impacts to groundwater quality from the on-site use of chlorinated pesticides and other chemicals. No VOCs, PAHs or chlorinated pesticides were detected in any of the groundwater samples obtained from the monitoring wells.

   Low levels of arsenic were detected in groundwater samples from TMW-2. Samples from all monitoring wells exhibited low level guidance level exceedences for lead. All groundwater samples exhibited concentrations of barium, including TMW-3 and TMW-4, which exceeded NYSDEC guidance levels. The nature of the low-level exceedences for metals, including arsenic in TMW-2, coupled with the absence of VOCs and chlorinated pesticides in groundwater samples, is an indicator that groundwater has not been affected by former activity on the site.

4. Lead was detected at concentrations in excess of guidance levels in two surface samples (LA-1 and LA-8) in the west wastewater treatment area, including the purported downgradient lagoon area. Floor drains within the main processing warehouse which terminate in the skimmer shed (west wastewater treatment area) exhibit high concentrations of pesticides and lead in sediment samples obtained from the drain bottoms. Additional samples collected from the base of the skimmer shed, to which the floor drains connect, indicate concentrations of pesticides below guidance levels. Data support the conclusion that soils in the vicinity of the floor drains warrant response actions (e.g., soil removal).

5. Two additional subsurface wastewater treatment tanks and related piping were observed in a courtyard located on the east central border of the site. Soil samples obtained from the invert of two tanks related to the east wastewater treatment system exhibit concentrations of pesticides below guidance levels. Surface soil samples located in the east wastewater treatment system courtyard exhibited elevated concentrations of chlordane above guidance levels.

6. Limited volumes of liquid and solid wastes were noted at various locations throughout the main on-site building. The waste is contained in metal and paper barrels and bags. In addition to the non-hazardous waste identified throughout the property, a potential ammonia tank related to on-site refrigeration was identified in a freezer within the main processing warehouse.

7. Additional soil samples collected in the former orchard and wetlands portion of the site exhibit concentrations of arsenic in excess of NYSDEC guidance levels. The soils/sediments exhibiting exceedences of NYSDEC guidance levels were collected from a depth of 0-4". The exceedences recorded for surface soils in the former orchard areas, and in sediment material from the wetlands, are low-level marginal exceedences and support the conclusion that historic arsenic-based pesticide use has not adversely impacted soils in this area. Additionally, low levels of pesticides (DDD, DDE, DDT and Chlordane) were detected in sediment samples (0-4") collected from the wetlands area. The concentrations of pesticides were far below NYSDEC recommended guidance levels. Based on the projected volume and square footage of soils impacted in this area, and the densely wooded character of this portion of the parcel, a soil removal effort is not deemed appropriate. The potential for human contact with affected soils on this portion of the property is minimal

8. Test pits extended throughout the wastewater treatment portion of the site did not reveal the presence of significant volumes of subsurface debris. Analysis of composite soil samples collected from these test pits indicated the absence of VOCs, PAHs and chlorinated pesticides, with the exception of low levels of toluene (11 ppb, guidance level of 1,500 ppb). Concentrations of metals were detected in the soil samples at levels considered substantially consistent with background levels for the property. Test pits extended in the western portion of the subject property to investigate surface debris and the potential for buried 30-gallon drums encountered miscellaneous construction and demolition debris to a maximum depth of 36" below surface grade. Undisturbed native soils were encountered

4.2 Recommendations

This section provides a general discussion of the remedial actions that are warranted at this Site, based on the findings summarized in this Report and in previous environmental reports on this property. A detailed discussion of remedial actions will be provided in the Remedial Alternatives Report and the Remedial Action Workplan.

The following response actions are warranted at this Site:

1. The on-site structure should be demolished, including the proper removal of non-hazardous regulated wastes, including the interior ammonia tank. Documentation of proper disposition should be provided to the NYSDEC in a final report.

2. Internal drains contain sediment exhibiting elevated concentrations of lead and chlorinated pesticides. Material present in these drains should be removed and properly containerized for off-site disposition (removal should include any impacted surrounding soils). For budgetary and project planning purposes, all interior drains should be managed in this manner.

3. It is recommended that the east wastewater treatment system located at the courtyard area near the east central border of the site be properly decommissioned and confirmatory sampling be conducted in the vicinity of the tanks and piping system to provide a profile of soil conditions as they relate to impacts from the wastewater treatment system. Soils throughout the courtyard exhibiting high concentrations of chlordane should be removed and disposed of at the proper off-site repository.

4. It is recommended that the contaminated soil present near the former 750-gallon UST be removed. Field evidence suggests that the volume of contaminated soil is less than 50 cubic yards. Following removal, confirmatory sampling and proper documentation of remedial activities (including waste disposal manifests and laboratory data) should be provided to the NYSDEC in support of closure of Spill File number 0210253.

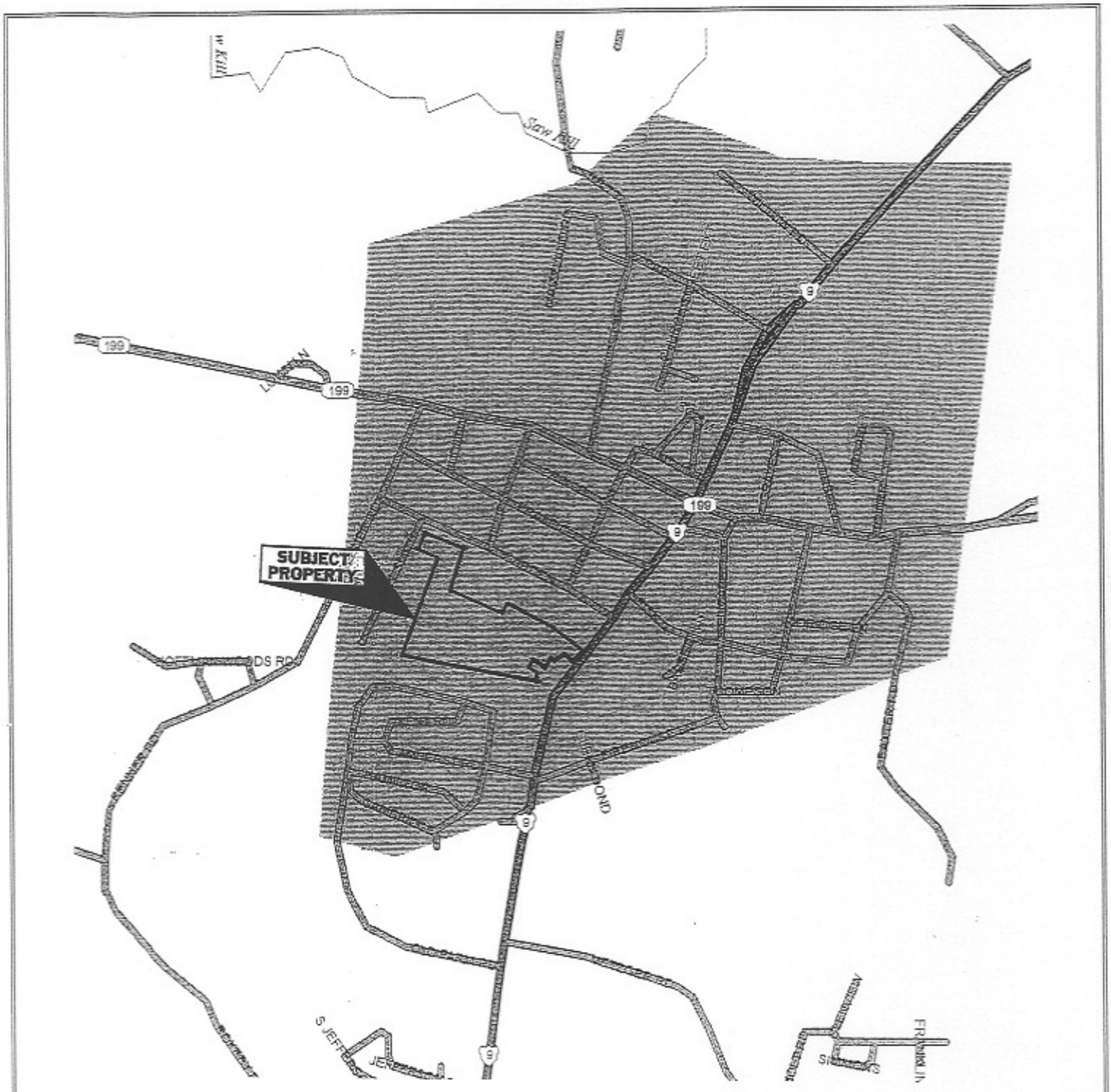
   A comprehensive Tank Closure Report will be completed as an addendum to this document at the conclusion of all tank removal activity. Upon completion of all removal efforts the former on-site USTs should be registered with the NYSDEC as being closed.

5. No further investigation of the former orchard and wetlands areas is recommended. Surface soils in these areas should remain undisturbed if proposed site utility will not include direct contact with affected soil material. Areas where disturbance of soils is proposed should have surface soils removed and disposed of off-site. Appropriate deed documentation and posting of the area should be completed to reduce the potential for human contact with affected soil material.

6. No groundwater remediation is recommended at this time. Groundwater monitoring wells should be sampled for dissolved metals (both filtered and unfiltered) on a quarterly basis over the next year to document any change in lead and barium concentrations.

APPENDIX A

Maps



Source: DeLorme Street Atlas USA, Version 6.0

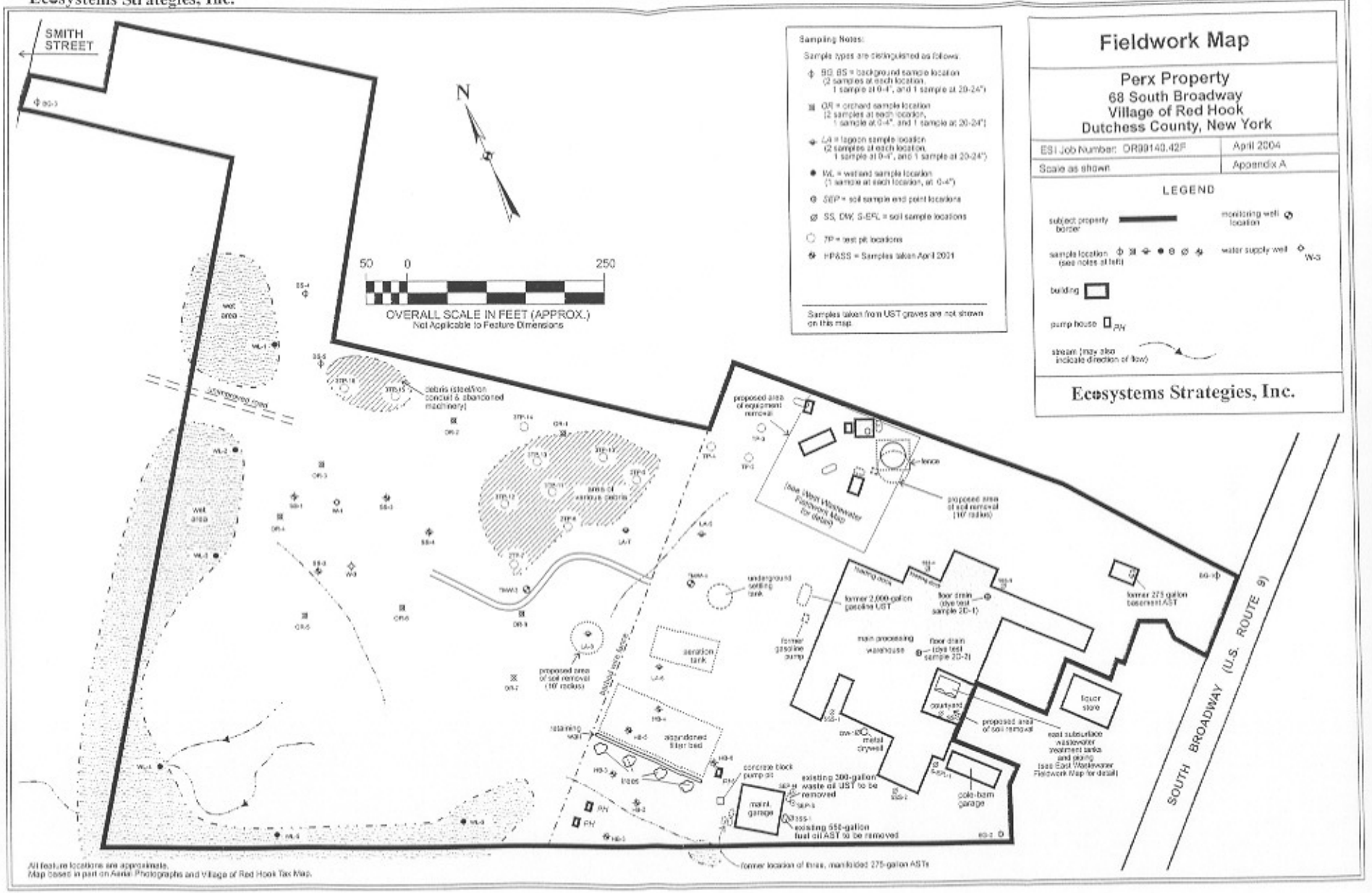
Site Location Map
Perx Property
68 South Broadway,
Village of Red Hook
Dutchess County, New York

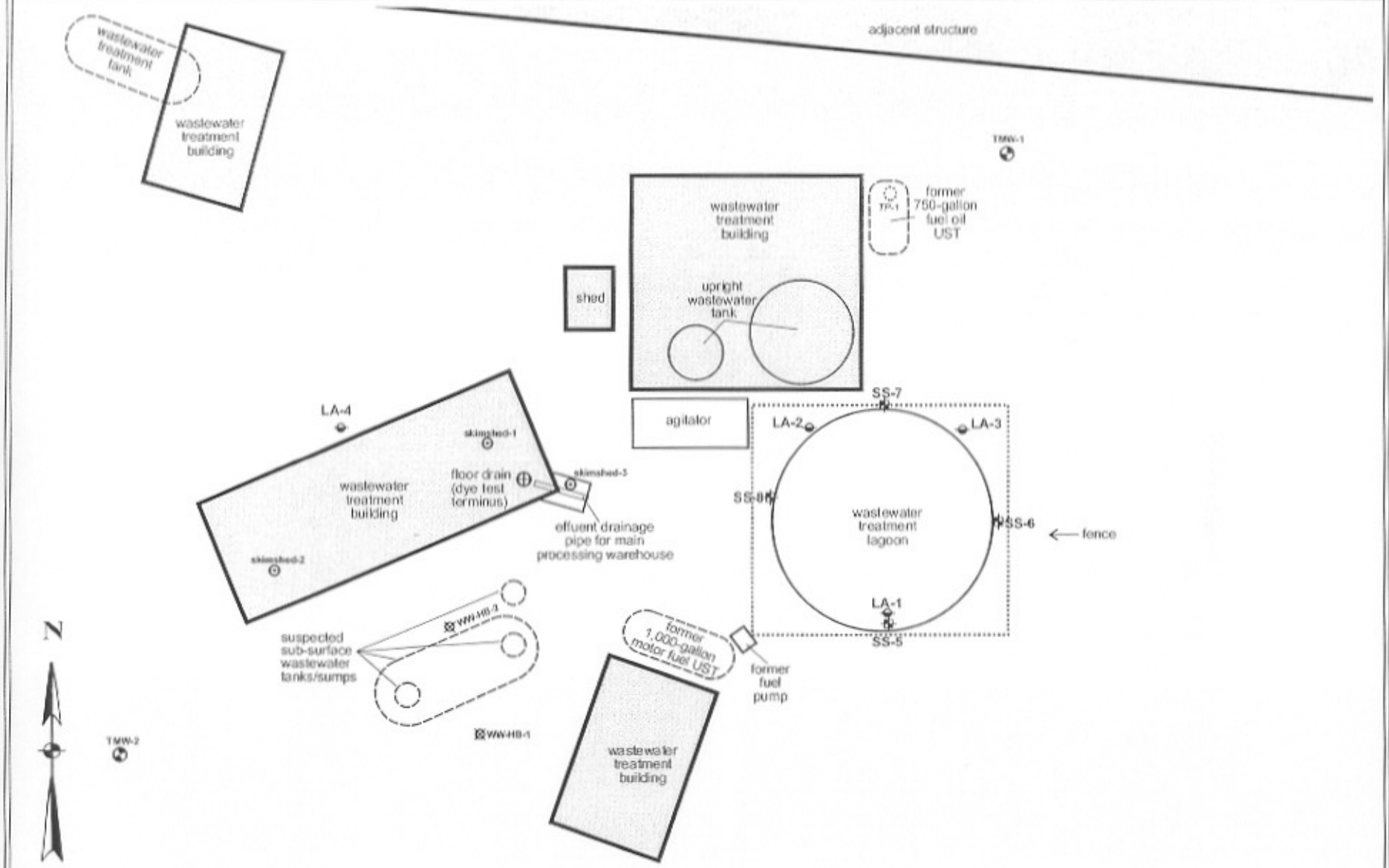
N

ESI File: DR99140.41F

April 2004

Appendix A


SMITH STREET
N
50 0 250
OVERALL SCALE IN FEET (APPROX.)
Not Applicable to Feature Dimensions
Sampling Notes:
Sample types are distinguished as follows:
BG, BS = background sample location (2 samples at each location: 1 sample at 0-4", and 1 sample at 20-24")
OR = orchard sample location (2 samples at each location, 1 sample at 0-4", and 1 sample at 20-24")
LA = lagoon sample location (2 samples at each location, 1 sample at 0-4", and 1 sample at 20-24")
WL = wetland sample location (1 sample at each location, at 0-4")
SEP = soil sample end point locations
SS, DW, S-EFL = soil sample locations
TP = test pit locations
HPASS = Samples taken April 2001
Samples taken from UST graves are not shown on this map.
Fieldwork Map
Perx Property
68 South Broadway
Village of Red Hook
Dutchess County, New York
ESI Job Number: OR99140.42F
April 2004
Scale as shown
Appendix A
LEGEND
subject property border
monitoring well location
sample location (see notes at left)
water supply well
building
pump house
stream (may also indicate direction of flow)
Ecosystems Strategies, Inc.
wet area
debris (steel/iron, concrete & abandoned machinery)
intermittent creek
area of concrete debris
proposed area of equipment removal
fence
proposed area of soil removal (10' radius)
former 2,000-gallon gasoline UST
floor drain (dye test sample 2D-1)
former 275 gallon basement AST
former gasoline pump
main processing warehouse
floor drain (dye test sample 2D-2)
liquor store
courtyard
proposed area of soil removal
metal drywall
east subsurface wastewater treatment tanks and piping (see East Wastewater Fieldwork Map for detail)
cold-barn garage
SOUTH BROADWAY (U.S. ROUTE 9)
underground settling tank
aeration tank
retaining wall
abandoned filter bed
concrete block pump pit
existing 300-gallon waste oil UST to be removed
maint. garage
existing 550-gallon fuel oil AST to be removed
former location of three, manifolded 275-gallon ASTs
All feature locations are approximate.
Map based in part on Aerial Photographs and Village of Red Hook Tax Map.



Feature locations are approximate.

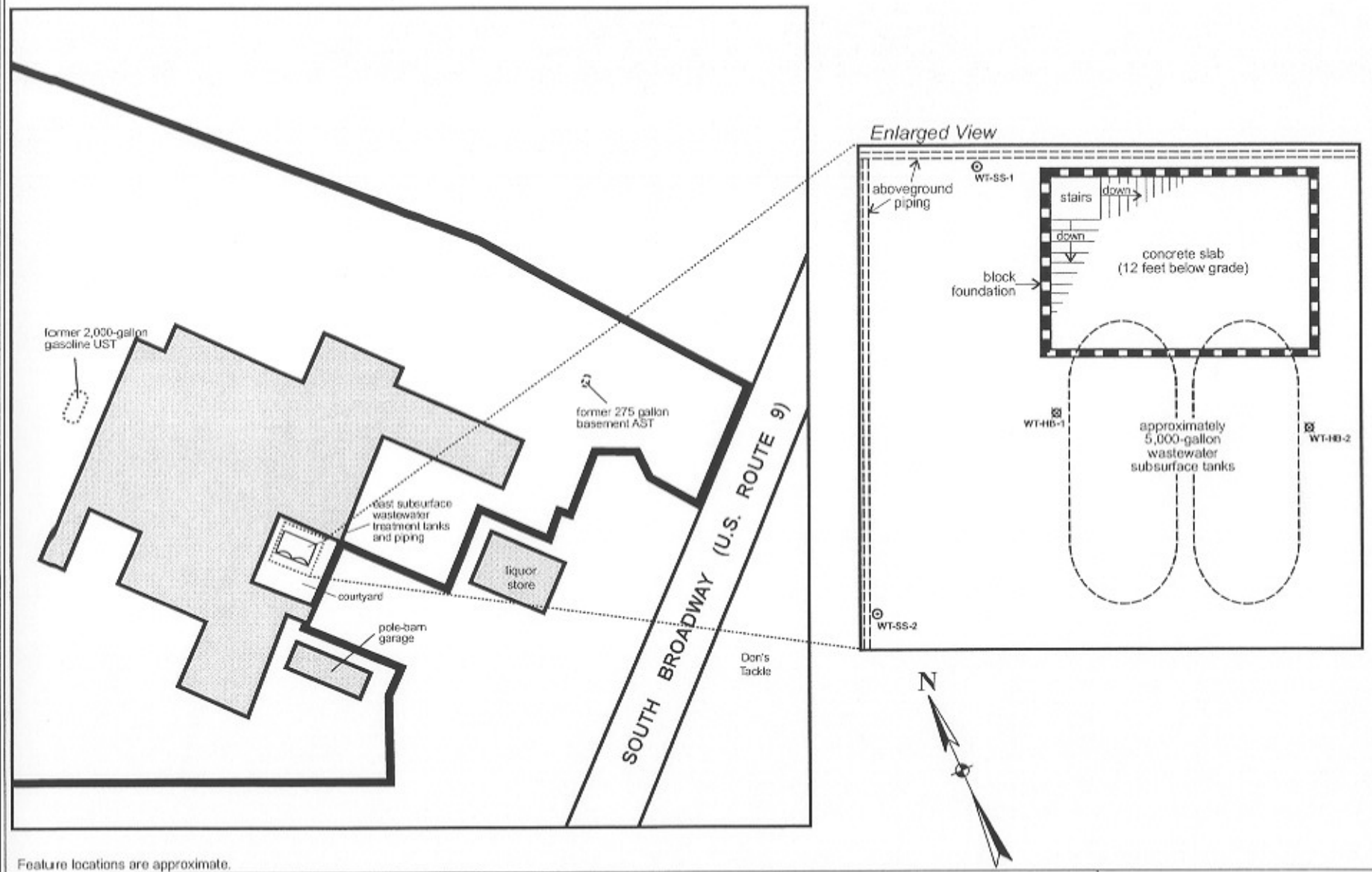
West Wastewater Fieldwork Map

Perk Property
68 South Broadway
Village of Red Hook
Dutchess County, New York

Legend:

- structure
- temporary monitoring well (TM-1)
- test pit (TP-1)
- lagoon sample (LA-1)
- soil sample taken April 2001 (SS-6)
- wastewater hand-boring sample (WW-HB-2)
- surface soil sample (skimshed -1)

ESI File: DR99140.41F
April 2004
Not to Scale
Appendix A



Feature locations are approximate.

East Wastewater Fieldwork Map

Perx Property
68 South Broadway
Village of Red Hook
Dutchess County, New York

Legend:

WT-HB-1 wastewater treatment hand-boring samples (April 2003)

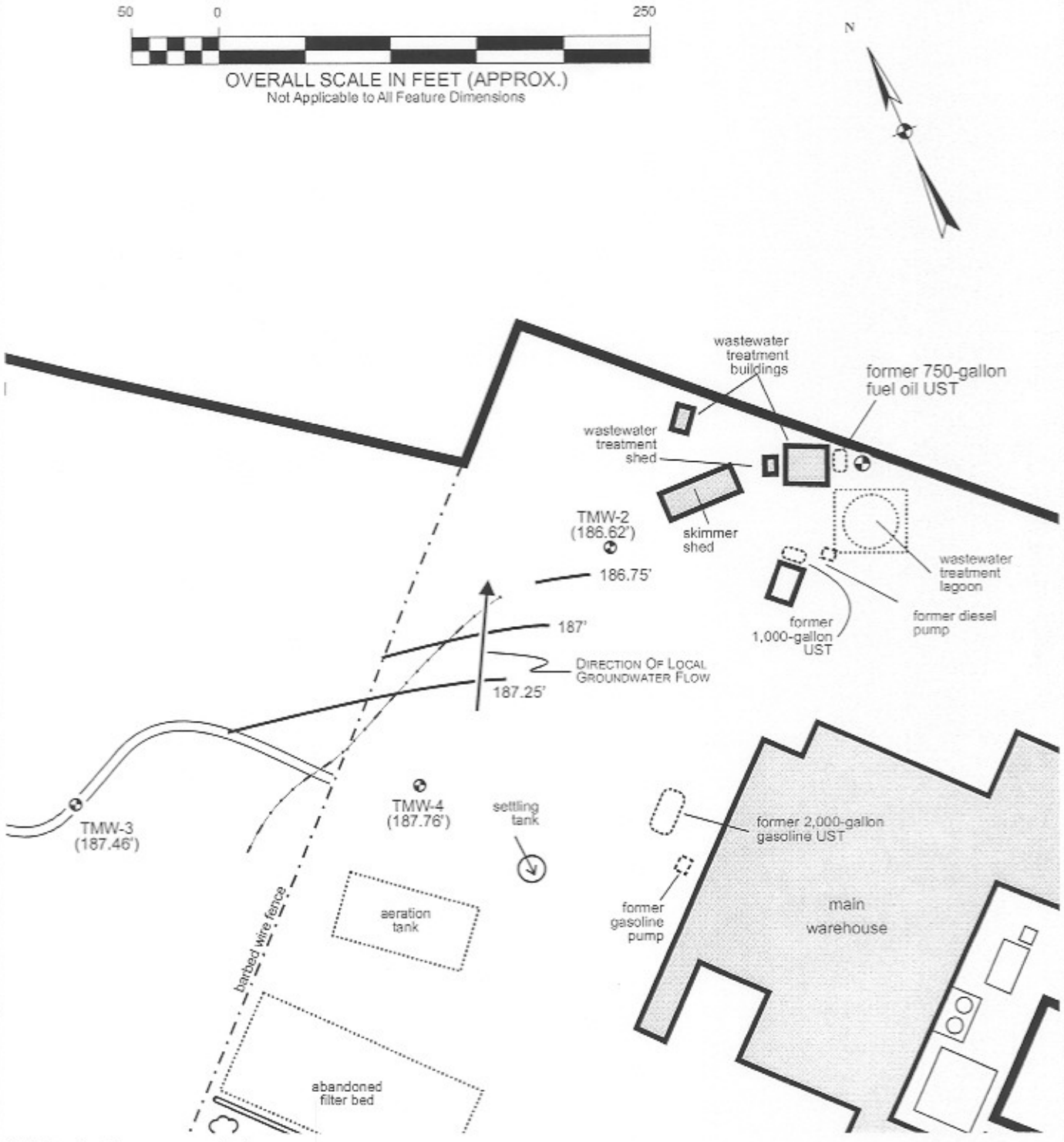
WT-SS-1 wastewater treatment sediment samples (April 2003)

ESI File: DR99140.41F

April 2004

Not to Scale

Appendix A



All feature locations are approximate.

Direction of Groundwater Flow
January 2003

Perx Property
68 South Broadway
Village of Red Hook, Dutchess County, New York

Legend:
187.5' isopleth, line of equal groundwater elevation, noted in feet above mean sea level, based on 200' benchmark
TMW-4 (187.76') groundwater monitoring well (elevation noted)

ESI File: DR99140.41F
April 2004
Scale as Shown
Appendix A

APPENDIX B

Excerpts from
Summary Report of Environmental Services
(April 2001)

2.0 INVESTIGATION

2.1 Summary of Services

In order to achieve the objective specified in Section 1.5, above, the following services were conducted by ESI on selected portions of the Site. Soil samples were analyzed for PAHs using USEPA Method 8270. Samples analyzed for VOCs were tested using USEPA Method 8021 + MTBE. Analyses for pesticides were conducted via USEPA Method 8080. Samples analyzed for arsenic and lead were tested using USEPA Methods SW6010 and SW846-6010, respectively.

- Four surface soil samples were taken in the vicinity of the former orchard and analyzed for the presence or absence of pesticides, arsenic, lead, and polychlorinated biphenyls (PCBs): SS-1 (0-8"), SS-2 (0-8"), SS-3 (0-8"), and SS-4 (0-8").

- Six hand borings were extended in the area of the former wastewater aeration pool, and samples obtained from the borings were analyzed to determine the presence or absence of arsenic, lead, and pesticides: (HB-1 (6-8'), HB-2 (4-6'), HB-3 (2-3'), HB-4 (6-7'), HB-5 (5-6'), and HB-6 (5-6').

- Ten hand borings were extended in the vicinity of underground fuel storage tanks located centrally on the site, and samples obtained from the borings were analyzed to determine the presence or absence of volatile organic compounds (VOCs), MTBE, and polynuclear aromatic hydrocarbons (PAHs). Samples obtained near the southernmost gasoline tank with an associated pump are HB-7 (11-12'), HB-8 (7-8'), HB-9 (7-9'), and HB-10 (11-13'). Samples obtained near the northernmost tank with an associated pump are HB-11 (9-11'), HB-12 (7-9'), HB-13 (6-8'), and HB-14 (8-10'). Samples obtained near the presumed fuel oil tank located east of the wastewater treatment building on the northern end of the site are HB-15 (6-8') and HB-16 (7-9'), which were analyzed for PAHs.

- One hand boring (HB-17) was extended in the area near three aboveground fuel tanks located west of the maintenance garage on the southern end of the site. A sample obtained from the 4-6 foot depth at this boring was analyzed to determine the presence or absence of PAHs.

- Three grab samples were taken from drains and areas of concern within the warehouse building. These samples were collected from two drains and a motor platform and were analyzed to determine the presence or absence of PCBs (using USEPA Method SW846-3550B/8082), arsenic, lead, pesticides, and PAHs. These samples are referred to as P-1 (motor platform) and D-1 (2-4") and D-2 (0-4") (for the drain samples).

- Four surface samples were taken along the edges of the wastewater treatment lagoon. These samples were analyzed for pesticides, arsenic, and lead are referred to as SS-5 (0-4"), SS-6 (0-4"), SS-7 (0-4"), and SS-8 (0-4").

- Three water samples obtained from the water supply wells located on the western portion of the site were collected and analyzed for the presence or absence of volatile organic compounds using Method 524.2 for pesticides and dissolved arsenic and lead.

- Adelaide Environmental Health Associates, Inc. conducted a limited inspection for asbestos-containing materials.

- Samples of painted materials were collected from the buildings and analyzed for leachable concentrations of lead to determine the proper disposition of any generated demolition debris.

2.2 Soil and Water Sampling Methodology

2.2.1 Site Preparation Services

Prior to the initiation of field work, a request for a complete utility markout of the Site was submitted by ESI, as required by New York State Department of Labor regulations. Confirmation of underground utility locations was secured, and a field check of the utility markout was conducted prior to the extension of soil cores.

2.2.2 Equipment

Soil coring operations were performed using a hand-held, direct push sampling spoon equipped with a slide hammer. Sampling was conducted at each coring location at two-foot intervals to a maximum depth of 10 feet below grade or until refusal was encountered (see sample descriptions indicated in the Field Work Observations Table included on Page 7 of this Report). The sampling spoon was equipped with 1½ -inch outer diameter disposable acetate sleeves to prevent the cross-contamination of soil samples.

A Thermal Instruments 580B photo-ionization detector (PID) was utilized by ESI personnel to screen all encountered material for the presence of any volatile organic vapors where appropriate. Prior to the initiation of field work, this PID was properly calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene in accordance set forth by the equipment manufacturer.

2.2.3 Sample Collection

All soil and water samples were collected in a manner consistent with NYSDEC sample collection protocols (see Soil and Water sections, below). Subsequent to sample collection, the sample containers were placed in a cooler prior to transport to a NYSDOH-approved laboratory for analysis. Appropriate chain of custody procedures were followed.

Notations were made regarding the sampled material's physical characteristics (e.g., color, odor, viscosity). At each sample location and for each sample type (soil, liquid, and sludge), a sufficient volume of material was collected for the known required analyses and for any potential additional analyses.

ESI personnel maintained field logs documenting the physical characteristics, PID readings, and any field indications of contamination for all encountered material at each sampling location. Relevant information from ESI logs for each coring location is summarized in Section 2.3, below.

Soil

All soil samples were collected in a manner consistent with NYSDEC sample collection protocols. Decontaminated stainless steel trowels and dedicated gloves were used at each sample location to place the material into jars pre-cleaned at the laboratory. Prior to and after the collection of each material sample the sample collection instrument was decontaminated to avoid cross-contamination between samples.

The soil samples were transported via overnight delivery to York Analytical Laboratories, Inc., a New York State Department of Health-certified laboratory (ELAP Certification Number 10854) for chemical analyses.

Water

The water samples from the three water supply wells were collected in a manner consistent with NYSDEC sample collection protocols for low flow sampling. Well water was purged for approximately 15 minutes to ensure that the water sample was derived from the aquifer without increasing the turbidity. This low flow sampling method ensures that a direct connection between the water table and the sampling point is achieved.

After sample collection, the sample containers were placed in a cooler prior to transport to the laboratory. The water samples were transported via courier to York Analytical Laboratories, Inc., a New York State Department of Health-certified laboratory (ELAP Certification Number 10854) for chemical analyses. Appropriate chain of custody procedures were followed.

2.3 Soil and Water Field Work Observations

2.3.1 Soil Sampling Observations

Four separate soil sampling events were conducted during March of 2001. During these sampling events, 27 surface and subsurface soil samples were collected and subsequently analyzed to determine the presence or absence of multiple contaminants on the site (see Section 2.4, below for laboratory analysis information). The specific locations of the sampling points, the depths to which the boring was extended, and the samples collection depth were dependent on observations made by field personnel and other known factors (e.g., the presumed invert of an underground petroleum storage tank dictated the depth at which the soil sample was collected). A Field Work Map indicating the sampling locations and associated selected site features is provided in Appendix A of this Report.

Six manual soil borings (HB-1 through HB-6) were extended in the area of the former wastewater aeration pool located on the southern portion of the eastern developed portion of the property. Ten hand borings (HB-7 through HB-16) were extended in the vicinity of underground fuel storage tanks located to the north and west of the warehouse. One hand boring (HB-17) was extended in the area near three aboveground fuel tanks located west of the one-story maintenance garage on the southern end of the site.

In addition to the soil borings, a total of eight surface soil samples were collected on the property. Four surface soil samples (SS-1 through SS-4) were collected in the vicinity of the former orchard area located in the western portion of the property. Four additional surface soil samples (SS-5 through SS-8) were collected from along the edges of the wastewater treatment lagoon. Three grab samples were also taken from two interior drains (D-1 and D-2) and a motor platform (P-1) within the warehouse building

Subsurface soils encountered on the Site during the extension of the soil borings generally consisted of coarse to medium brown sandy soil layers with traces of clay and silt and varying degrees of wetness. Surface samples were generally organic, with sand and gravel intermixed. More detailed field observations for all soil sample collection work are described in detail in Table 1, below. Groundwater was not encountered during the extension of the soil borings.

Table 1: Field Observations

Sample	Location	Sampling Depth	Soil Characteristics	PID Reading	Field Observations
HB-1	Southeast of small pump-house south of former aeration pool	6-8'	Medium brown sand and clay	0.0	No visual or olfactory evidence of contamination
HB-2	Immediately east of larger pump-house, north of HB-1	4-6'	Medium brown sand and clay	0.0	No visual or olfactory evidence of contamination
HB-3	Northeast of larger pump-house, south of large pine trees	2-3'	Medium brown sand and clay, wood mixed in	0.0	No visual or olfactory evidence of contamination
HB-4	South of former aeration tank within abandoned filter bed	6-7'	Medium brown sand and clay, shale fragments	0.0	No visual or olfactory evidence of contamination
HB-5	Approximately 30' south of HB-4 within former filter bed	5-6'	Medium brown sandy soil with grey clay and gravel	0.0	No visual or olfactory evidence of contamination
HB-6	Northwest of pump-house east of filter bed, north of large pine trees	5-6'	Medium brown soil with gravel and shale	0.0	No visual or olfactory evidence of contamination
HB-7	Northwest of southernmost presumed gasoline UST with associated pump	11-12'	Fine grain sand, medium brown soil (possible fill material)	0.0	No visual or olfactory evidence of contamination
HB-8	Southeast of HB-7, northwest of presumed gasoline UST	7-8'	Fine grain sand, medium brown soil (possible fill material)	0.0	No visual or olfactory evidence of contamination
HB-9	Approximately 10' north of HB-8 near USTs	7-9'	Fine grain sand, medium brown soil (possible fill material)	0.0	No visual or olfactory evidence of contamination
HB-10	Approximately 5' east of HB-9 near USTs	11-13'	Fine grain sand, medium brown soil (possible fill material)	0.0	No visual or olfactory evidence of contamination
HB-11	Southwest of northernmost UST with associated pump	9-11'	Medium to light brown sandy soil (fill material)	0.0	No visual or olfactory evidence of contamination
HB-12	Approximately 15' north of HB-11 near UST	7-9'	Medium to light brown sandy soil (fill material)	0.0	No visual or olfactory evidence of contamination
HB-13	Southeast of northernmost UST with associated pump	6-8'	Medium to light brown sandy soil (fill material)	0.0	No visual or olfactory evidence of contamination
HB-14	Approximately 15' north of HB-13	8-10'	Medium to light brown sandy soil (fill material)	0.0	No visual or olfactory evidence of contamination
HB-15	East of fuel oil UST located east of waste water treatment building	6-8'	Medium brown soil, with gravel	0.0	No visual or olfactory evidence of contamination

Table continued on next page

Sample	Location	Sampling Depth	Soil Characteristics	PID Reading	Field Observations
HB-16	Southeast of fuel oil UST located east of waste water treatment building	7-9'	Medium brown soil, with gravel	0.0	No visual or olfactory evidence of contamination
HB-17	West of the three ASTs located west of the maintenance garage	4-6'	Medium brown, medium grain soil	0.0	No visual or olfactory evidence of contamination
SS-1	Wooded, western portion of the site	0-8"	Dark brown, medium grain soil, organic mostly	0.0	No visual or olfactory evidence of contamination
SS-2	Wooded, western portion of the site	0-8"	Dark brown, medium grain soil, organic mostly	0.0	No visual or olfactory evidence of contamination
SS-3	Wooded, western portion of the site	0-8"	Dark brown, medium grain soil, organic mostly	0.0	No visual or olfactory evidence of contamination
SS-4	Wooded, western portion of the site	0-8"	Dark brown, medium grain soil, organic mostly	0.0	No visual or olfactory evidence of contamination
SS-5	Wastewater treatment lagoon, northern portion of the site, south wall	0-4"	Dark brown to black moist, organic soil	0.0	No visual or olfactory evidence of contamination
SS-6	Wastewater treatment lagoon, northern portion of the site, east wall	0-4"	Dark brown to black moist, organic soil	0.0	No visual or olfactory evidence of contamination
SS-7	Wastewater treatment lagoon, northern portion of the site, west wall	0-4"	Dark brown to black moist, organic soil	0.0	No visual or olfactory evidence of contamination
SS-8	Wastewater treatment lagoon, northern portion of the site, north wall	0-4"	Dark brown to black moist, organic soil	0.0	No visual or olfactory evidence of contamination
D-1	Residual sample taken from drain in warehouse, southeast portion of building	2-4"	Loose dusty soil and dark, fine particles	0.0	No visual or olfactory evidence of contamination
D-2	Residual sample from interior floor drain within warehouse, southeast of D-1	0-4"	Brownish black particles not organic in nature	0.0	No visual or olfactory evidence of contamination
P-1	On motor platform inside warehouse, west of D-1, near area of staining	0-1"	Black soil and oxidized metal	0.0	Slight petroleum odor

2.3.2 Water Sampling Observations

During the sampling of the three wells located on the western portion of the property, the water obtained from the wells appeared to be greyish brown and high in turbidity. Depth to water in the three wells was as follows: at MW-1, approximately 8.4 feet; at MW-2, approximately 4.5 feet; and at MW-3, approximately 12 feet. No field indications of unusual odor or coloration patterns were noted during the collection of these samples. The three water samples collected (W-1, W-2, and W-3) were submitted for laboratory analysis for VOCs using USEPA Method 524.2, pesticides using method 8080, and dissolved lead and arsenic using method SW846-6010.

2.4 Laboratory Analysis and Findings

2.4.1 Terminology

Action Levels

The term "action level," as defined in this Report, refers to the concentration of a particular contaminant above which remedial actions are considered more likely. The overall objective of setting action levels is to assess the integrity of on-site soils and water relative to conditions which are likely to present a threat to public health, given the existing and probable future uses of the site. On-site soils with contaminant levels exceeding these action levels are considered more likely to warrant remediation. No independent risk assessment was performed as part of this investigation.

The action levels identified in this Report for petroleum hydrocarbons in soils are determined based on the NYSDEC Spill Technology and Remediation Series (STARS) Memo #1: Petroleum-Contaminated Soil Guidance Policy (reprinted July 1993) and the NYSDEC's Technical and Administrative Guidance Memorandum (TAGM) (January 24, 1994) as modified by subsequent, relevant NYSDEC Records of Decision (RODs).

Action levels for metals are based on the NYSDEC Division Technical and Administrative Guidance Memorandum (TAGM) on Determination of Soil Cleanup Objectives and Cleanup Levels (January 24, 1994) as modified by subsequent, relevant, NYSDEC RODs.

Action levels for groundwater are based on the NYSDEC's Water Quality Regulations for Surface Waters and Groundwaters, 6 NYCRR Parts 700-705, effective August 4,1999.

All data have been analyzed in accordance with applicable standards contained in the aforementioned documents. All detected compounds with their respective action levels are provided in the data summary tables.

Background Levels

The term "background level", as defined in this Report, is the concentration of a particular metal which is known to naturally occur in Eastern United States soils. The overall objective of setting background levels for metals is to assess the concentrations of metals in on-site soils relative to those that are naturally occurring.

On-site soils with metal concentrations exceeding these background levels are considered more likely to have been affected by anthropogenic contributions. The background levels for metals provided in this Report are based on the NYSDECs TAGM (January 24, 1994).

Refined petroleum hydrocarbons and pesticides are not naturally occurring and therefore, no discussion of background levels for these compounds is appropriate.

2.4.2 Analysis

Samples of soil material were collected from each of the soil borings where appropriate. Sampling for laboratory analysis was based on observations made by ESI personnel during the extension of the soil cores, including the presence or absence of elevated PID readings, unusual odors, discoloration, or any other unusual patterns. A sufficient number of samples were submitted for analysis to provide adequate data to address the concerns outlined in the Phase I ESA, and the Proposal for Investigative Services.

Complete copies of the Laboratory Reports are included as Appendix B. Recommendations regarding detected contaminants are located in Section 3.0, Conclusions and Recommendations, of this Report.

Soil

As discussed previously in section 2.1, 27 samples were taken to document the presence or absence of contaminants on the site in multiple locations. Provided below is a summary of the analytical results obtained from the laboratory analysis of these samples.

Pesticides

The following soil samples were analyzed to determine the presence or absence of pesticides using USEPA Method 8080: SS-1, SS-2, SS-4, HB-3 (2-3'), HB-4 (6-7'), HB-5 (5-6'), HB-6 (5-6'), SS-7 (0-4"), and SS-8 (0-4"). With two exceptions (SS-1 and SS-7), all samples were non-detectable for pesticides. Laboratory data indicate that the pesticides DDT and DDE were present in SS-1 at 0.17 ppm and 0.36 ppm, respectively. This sample was taken in the former orchard area. DDT was also found to be in SS-7 at a concentration of 0.011 ppm. This sample was taken from the wastewater treatment lagoon. These concentrations are well below NYSDEC action levels (2.1 ppm for both DDT and DDE) and, therefore, do not warrant remediation.

Metals and PCBs

The following samples were analyzed for total arsenic and total lead: SS-1 through SS-8, HB-1 (6-8'), HB-2 (4-6'), HB-3 (2-3'), HB-4 (6-7'), HB-5 (5-6'), HB-6 (5-6'), D-1 (2-4"), and D-2 (0-4").

Lead was present in all surface and subsurface samples, as could be expected due to natural occurrence. None of the detected concentrations were above NYSDEC action levels. The highest lead concentration in a soil sample was 182 ppm in sample D-2, which was obtained from inside a drain within the main warehouse. This concentration in a soil sample is below the NYSDEC action level of 250 ppm.

Arsenic was detected above the State action level of 7.5 in the following five samples: SS-1 (33.8 ppm), SS-2 (29.6 ppm), SS-4 (11.3 ppm), D-1 (36.0 ppm), and D-2 (55.3 ppm). The aforementioned surface samples were taken from the former orchard area, and the drain samples were taken from inside the main warehouse.

Sample P-1 was obtained from a motor platform located inside the warehouse and was found to have a level of .81 ppm PCB 1254. This level of PCB is below the NYSDEC action level of 10.0 ppm.

VOCs

Soil samples HB-7 (11-12'), HB-8 (7-8'), HB-9 (7-9'), HB-10 (11-13'), HB-11 (9-11'), HB-12 (7-9'), HB-13 (6-8'), and HB-14 (8-10') were analyzed to determine the presence or absence of volatile organic compounds (VOCs) using USEPA Method 8021 plus MTBE. These samples had been obtained from the vicinity of the underground gasoline tanks located in the central and northern central portions of the property. None of the aforementioned soil samples had levels of VOCs above laboratory detection limits, which were below NYSDEC action levels.

PAHs

Soil samples HB-15 (6-8'), HB-16 (7-9'), and HB-17 (4-6') obtained from the vicinity of PBS tanks located near the maintenance garage and a fuel oil UST near the wastewater treatment building on the northern portion of the property were analyzed to determine the presence or absence of polynuclear aromatic hydrocarbons. None of the aforementioned soil samples had levels of PAHs above laboratory detection limits, which were below NYSDEC action levels.

Water

One water sample (W-1, W-2, and W-3) was collected from each of the three water supply wells located on the western portion of the site. Each of these samples was analyzed for VOCs, dissolved lead and arsenic and chlorinated pesticides. Laboratory analysis indicates that the water samples collected were devoid of any of these contaminants at concentrations above NYSDEC action levels. The only detected contaminant found in any of the three wells, was lead found at a concentration of 0.005 mg/l, which is below the NYSDEC's action level of .025 mg/l for class GA fresh groundwaters.

2.5 Limited Inspection for Asbestos-Containing Materials

For the structures located on the Perx property, Adelaide Associates, LLC ("Adelaide") personnel conducted a limited asbestos survey to determine the presence or absence of asbestos-containing materials (ACMs) and, if present, the quantity, condition, and cost estimates for the removal of all identified ACMs. The information gathered during the survey, including laboratory results for sampled materials, is summarized in Adelaide's Limited Inspection for Asbestos Containing Materials ("Limited Asbestos Survey") dated March 31, 2001. A copy of this report is included in Appendix C of this Report. The following is a summary of information contained in Adelaide's Limited Asbestos Survey.

2.5.1 Asbestos Survey Methodology

The inspection of the subject property's on-site structures for ACMs was conducted by a New York State Certified Asbestos Inspector (New York Department of Labor Certificate Number: AH91-0127) using guidelines established by the U.S. Environmental Protection Agency and 40 CFR Part 763. The ACM survey performed by Adelaide consisted of the following:

- The inspection of the on-site structures for the presence of suspect ACMs;
- The collection of representative samples of identified suspect ACMs;
- The laboratory analysis of the representative samples to determine the percent asbestos content;
- The development of ACM abatement/monitoring program costs (based on the quantity of ACMs determined to be present).

All asbestos samples were collected in a manner consistent with established guidelines. Each of the samples was collected in a sealed plastic bag. After sample collection, the samples were transported to Scientific Laboratories, Inc. for analysis of asbestos content using the polarized light microscopy (PLM) method.

2.5.2 Asbestos Survey Observations and Findings

Adelaide performed a visual Asbestos Survey with limited bulk sampling on the structures located at the site. Adelaide collected three (3) bulk samples of two different types of pipe insulation and transite paneling from throughout the main warehouse building. No sampling or analysis was performed on the roof due to unstable conditions. Adelaide assumes that the roofing material on the building is all positive. Laboratory analysis of the three samples indicated that all were considered to be asbestos (i.e., those materials which contain more than 1% of asbestos). Based on the observations made by Adelaide personnel and the laboratory analysis, it has been estimated that there are 7,500 linear feet of pipe insulation, 10,000 square feet of transite panels, and 100,000 square feet of roofing materials present on the site.

2.6 Lead Pre-Demolition Survey

ESI personnel conducted a pre-demolition lead assessment of the on-site structures. This assessment was performed by collecting representative samples of painted surfaces from seven buildings located on the site where samples could be obtained from structures. Metal and concrete surfaces could not be sampled, and, therefore, three of the on-site structures were excluded.

2.6.1 Lead Survey Methodology

The collection of representative samples of building materials was conducted by ESI personnel was performed by obtaining samples of representative building construction materials from those buildings which had painted materials. Samples were submitted as four separate groups (walls, warehouse, trim/roof, and pump-house) for analysis of Toxicity Characteristic Leaching Procedure (TCLP) lead using the TCLP Method SW846. An extracted level of lead 5.0 mg/liter or greater is considered in New York State to be a hazardous waste; any material with a lead level exceeding 5.0 mg/liter would require disposal as a hazardous rather than a solid waste material.

2.6.2 Lead Survey Observations and Findings

Four composite samples consisting of various building materials were submitted by ESI for laboratory analysis of TCLP lead. TCLP-1 was a composite sample collected from the walls of the fire-damaged house, two small sheds near the abandoned filter bed, and the maintenance garage. TCLP-2 was a composite sample collected from the main warehouse building. TCLP-3 was a sample obtained from painted trim and roof material from the fire-damaged house and one of the small sheds near the abandoned filter bed. Composite sample TCLP-4 was obtained from the pump house near the main warehouse associated with one of the USTs with a pump. A copy of the complete laboratory data is provided in Appendix D of this Report.

Laboratory analysis of the four TCLP samples identified 0.59 mg/liter for TCLP-1, below detection limits (BDL) for sample TCLP-2, 6.09 mg/liter for TCLP 3, and below detection limits (BDL) for sample TCLP-4. Although the lead concentration of sample TCLP-2 is above the USEPA's hazardous waste value of 5.0 mg/l, this sample represented only the painted trim materials of two structures, which is only a small percentage of the total quantity of potential demolition debris. Taken as a whole, the demolition debris which would be generated by the demolition of all on-site structures would be considered non-hazardous.

3.0 CONCLUSIONS AND RECOMMENDATIONS

This office has completed the services summarized in Section 2.0 on specified portions of the Perx property located at 68 South Broadway, Village of Red Hook, Dutchess County, New York. Services conducted by ESI included the collection of twenty-seven (27) surface and subsurface soil samples and the collection of three (3) water samples from the water supply wells. Sampling locations were determined to provide a characterization of soils and groundwater in areas potentially impacted by the historic usage of the property and concerns identified by the Phase 1 ESA.

Based on the services provided and data generated, the following conclusions and recommendations (in **bold**) have been made. To the extent feasible from existing information, preliminary cost estimates for additional investigative work or remediation actions are provided in italics.

1. Multiple soil samples obtained from various locations on the property, including the vicinity of the wastewater treatment systems and the former orchard areas, were analyzed for pesticides, given the historic usage of the property. With only two exceptions, all were non-detectable for pesticides. Low concentrations of two pesticides (DDT and DDE) below NYSDEC action levels were found in samples SS-1 and SS-7. These samples had been obtained from the former orchard area and the wastewater treatment lagoon areas. Likewise, no detectable concentrations of pesticides were found in the three water supply well samples (see also Item #4, below).

   No further investigation is required with respect to pesticides in this area.

2. Soil samples collected on the western portion of the site in the former orchard (SS-1, SS-2, and SS-4) and within the drains inside the warehouse on the eastern portion of the site (D-1 and D-2) showed elevated levels of arsenic above NYSDEC action levels. Soil samples obtained from the vicinity of the wastewater treatment plant's abandoned filter bed had arsenic concentrations below NYSDEC action levels. The concentrations of arsenic exhibited by five samples with elevated concentrations, however, would not be high enough to trigger the USEPA's hazardous waste level.

   It is recommended that additional samples be obtained from the western orchard area to further delineate the extent of arsenic contamination in surface soils. Solid material present within the warehouse's interior drains should be removed and disposed of properly.

   Estimated cost for additional testing: $2,500

   Estimated cost for removal of drain sediment: $4,000

3. Laboratory data document levels of both lead and PCBs at concentrations below NYSDEC action levels. Data document levels in a relatively narrow range, supporting the conclusion that no "hot spot" is present on this site.

   No further investigation is recommended.

4. Laboratory analysis of soil samples obtained from the vicinity of on-site petroleum bulk storage tanks did not indicate the presence or any petroleum hydrocarbons, indicating that soils in the vicinity of these tanks have not been impacted.

   No further investigation is recommended with respect to soils investigations in these tank areas. However, it is recommended that all on-site PBS tanks be removed and disposed of in accordance with NYSDEC PBS regulations 6 NYCRR, Parts 612-614.

   Estimated cost of tank removal: $15,000 - $20,000

5. According to the analytical results for the water samples obtained from the three on-site water supply well, no VOCs, pesticides, or concentrations of dissolved arsenic and lead above NYSDEC action levels is present. The only detected contaminant found in any of the three wells was lead found at a concentration of 0.005 mg/l, which is below the NYSDEC's action level of 0.025 mg/l for class GA groundwaters.

   No further investigation is recommended.

6. The Limited Inspection for Asbestos-Containing Materials conducted by Adelaide indicates that there are asbestos-containing materials present in the structures located on the site. Specifically, it is estimated that there are 7,500 linear feet of pipe insulation, 10,000 square feet of transite panels, and 100,000 square feet of roofing materials present on the site.

   Prior to the initiation of any demolition work, the collection of additional samples for conformance to New York State Regulations NYS Code Rule 56 and Federal Regulations 40 CFR, Parts 763-80 is required. All ACMs encountered during building demolition activities should be removed prior to demolition work and disposed of in accordance with applicable regulations.

   Estimated cost of ACM abatement and air/project monitoring: $511,500 - $770,500

7. Laboratory analysis of representative building materials for leachable lead indicates that three of the four samples have leachable concentrations of lead below the USEPA's hazardous waste level of 5.0 mg/liter. The concentration of one sample consisting of painted trim materials was found to have a concentration (6.09 mg/liter) minimally above this level. Given that this one sample represents only a very small fraction of the total volume of material which would be generated by the demolition of the on-site structures, disposal of demolition materials as a hazardous waste is not required.

   No further investigation is recommended.

8. Noted during the work conducted on the site were multiple drums of unknown content. Several of the drums located in the main warehouse and water treatment building appeared to be leaking their contents onto the concrete floors and potentially into nearby soils.

   It is recommended that all on-site drums be removed and disposed of in accordance with applicable regulations.

   Estimated cost of drum removal: $1,500 - $2,500

APPENDIX D

Data Usability Summary Review

Ecosystems Strategies, Inc.
Environmental Services and Solutions
24 Davis Avenue, Poughkeepsie, NY 12603 Tel: 845-452-1658 • Fax: 845-485-7083 • Email: mail@ecosystemsstrategies.com

MEMORANDUM

TO: PAUL H. CIMINELLO

FROM: KATHERINE J. BEINKAFNER, PHD, CPG

DATE: AUGUST 19, 2003

RE: PERX PROPERTY
68 SOUTH BROADWAY
VILLAGE OF RED HOOK
DUTCHESS COUNTY, NEW YORK

ESI FILE: DR99140.41

This memo and the attached detailed review (Attachment A), constitutes a review of quality control data provided by the laboratory, York Analytical Laboratory, Inc. (York). York is a New York State Department of Health ELAP-certified facility (# 10854). I have reviewed their information at your request and am completing this assessment, based on my qualifications as an environmental scientist and hydrogeologist. My resume is attached to this memo (Attachment B) in support of my qualifications to render this opinion.

York completed a detailed review of the analyses they performed and the equipment they utilized in generating data for the Perx site. Reviews were conducted for both organic and inorganic analyses and considered both sample handling and equipment maintenance issues.

Based on my review, the following conclusions are reached:

- All organic and inorganic data are valid and can be relied upon in your assessment of site conditions.
- All equipment utilized in the analysis of your data was functioning properly and was being maintained within acceptable quality control limits.
- Sample handling procedures were complete and appropriate.

Please review this memo and the attachment (Data Usability Summary Review) and contact me at 845-452-1658.

BK:ada

Attachments

cc: File

ATTACHMENT A

Data Usability Summary Review

York Project No. 03010413

This project consisted of four soil samples. Parameters requested included volatiles (8260), semi-volatiles (8270), pesticides (8081) and metals (6010 and 7471)

Chain-of-Custody

The field chain of custody and laboratory chains of custody were found to be complete and reflective of the samples and their handling from field through the analysis process.

Holding Times

The holding times for extraction. digestion and analysis were met for all samples and all fractions in this sample delivery group (SDG).

Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (BFB), RSD and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (BFB), %Diff and Rf criteria

Laboratory Control Samples (LCS) were within acceptance limits

Method Blanks were found to be in compliance

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Semi-Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (DFTPP), RSD and Rf requirements.

GC/MS Continuing Calibrations were found to be in compliance with tuning (DFTPP), %Diff and Rf criteria

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

York Project No. 03010413 – continued

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Pesticides

GC Initial Calibration was found to be in compliance with DDT/Endrin Breakdown and RSD requirements

GC Continuing Calibrations were found to be in compliance with DDT/Endrin Breakdown and RSD requirements.

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges after dilution where necessary

Metals

ICP initial calibration was performed and verified by ICY data

ICB Data were within requirements

CCY Data were within method limits

CCB Data were acceptable

CRI (detection limits) were within requirements

Interelement correction standards verified system performance as acceptable (ICS A and ICS AB)

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

All samples exhibited target metals within the linear range of the ICP

Serial dilutions recovered within method limits

York Project No. 03010413- continued

All ending QC (CCV ,CCB, CRI, ICSA, and ICSAB) were within criteria

Mercury

Initial calibration was performed and verified by ICV data ICB Data were within requirements

CCV Data were within method limits

CCB Data were acceptable

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

York Project No. 03010574

This project consisted of four water samples. Parameters requested included volatiles (8260), semi-volatiles (8270-BN only), pesticides (8081) and metals (6010 and 7471)

Chain-of-Custody

The field chain of custody and laboratory chains of custody were found to be complete and reflective of the samples and their handling from field through the analysis process.

Holding Times

The holding times for extraction, digestion and analysis were met for all samples and all fractions in this sample delivery group (SDG)

Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (BFB), RSD, and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (BFB), %Diff and Rf criteria

Laboratory Control Samples (LCS) were within acceptance limits

Method Blanks were found to be in compliance

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

York Project No. 03010574 - continued

Sample results for target compounds were within calibration ranges

Semi-Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (DFTPP), RSD and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (DFTPP), %Diff and Rf criteria

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Pesticides

GC Initial Calibration was found to be in compliance with DDT/Endrin Breakdown and RSD requirements

GC Continuing Calibrations were found to be in compliance with DDT/Endrin Breakdown and RSD requirements

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD, with the exception of DDT, whose RPD was slightly above acceptance limits. The sample data are not affected.

Sample results for target compounds were within calibration ranges after dilution where necessary

Metals

ICP initial calibration was performed and verified by ICV data

ICB Data were within requirements

York Project No. 03010574 – continued

CCV Data were within method limits

CCB Data were acceptable

CRI (detection limits) were within requirements

Interelement correction standards verified system performance as acceptable (ICS A and ICS AB)

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

All samples exhibited target metals within the linear range of the ICP

Serial dilutions recovered within method limits

All ending QC (CCV, CCB, CRI, ICSA, and ICSAB) were within criteria

Mercury

Initial calibration was performed and verified by ICV data

ICB Data were within requirements

CCV Data were within method limits

CCB Data were acceptable

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

York Project No. 03020039

This project consisted of twelve soil samples. Parameters requested included pesticides (8081) and metals (6010).

Chain-of-Custody

The field chain of custody and laboratory chains of custody were found to be complete and reflective of the samples and their handling from field through the analysis process.

York Project No. 03020039- continued

Holding Times

The holding times for extraction, digestion and analysis were met for all samples and all fractions in this sample delivery group (SDG).

Pesticides

GC Initial Calibration was found to be in compliance with DDT/Endrin Breakdown and RSD requirements

GC Continuing Calibrations were found to be in compliance with DDT/Endrin Breakdown and RSD requirements

Method Blanks were found to be in compliance

York Project No. 03020065 R

This project consisted of 35 soil samples. Parameters requested included volatiles(8260), semi-volatiles(8270-BN only), and metals (6010).

Chain-of-Custody

The field chain of custody and laboratory chains of custody were found to be complete and reflective of the samples and their handling from field through the .analysis process.

Holding Times

The holding times for extraction, digestion and analysis were met for all samples and all fractions in this sample delivery group (SDG).

Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (BFB), RSD and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (BFB), %Diff and Rf criteria

Laboratory Control Samples (LCS) were within acceptance limits

Method Blanks were found to be in compliance

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Semi-Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (DFTPP), RSD and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (DFTPP), %Diff and Rf criteria

Method Blanks were found to be in compliance

York Project No. 03020065 R- continued

Laboratory Control Samples (LCS) were within acceptance limits

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Metals

ICP initial calibration was performed and verified by ICV data

ICB Data were within requirements

CCV Data were within method limits

CCB Data were acceptable

CRI (detection limits) were within requirements

Interelement correction standards verified system performance as acceptable (ICS A and ICS AB)

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

All samples exhibited target metals within the linear range of the ICP

Serial dilutions recovered within method limits

All ending QC (CCY, CCB, CRI, ICSA, and ICSAB) were within criteria

York Project No. 03040207

This project consisted of twelve soil samples. Parameters requested included volatiles (8260), semi-volatiles (8270-BN only), pesticides (8081) and metals (6010 and 7471).

Chain-of-Custody

The field chain of custody and laboratory chains of custody were found to be complete and reflective of the samples and their handling from field through the analysis process.

York Project No. 03040207 - continued

Holding Times

The holding times for extraction, digestion and analysis were met for all samples and all fractions in this sample delivery group (SDG).

Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (BFB), RSD and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (BFB), %Diff and Rf criteria

Laboratory Control Samples (LCS) were within acceptance limits

Method Blanks were found to be in compliance

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Semi-Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (DFTPP), RSD and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (DFTPP), %Diff and Rf criteria

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Internal Standards were found to be in compliance with criteria

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Pesticides

GC Initial Calibration was found to be in compliance with DDT/Endrin Breakdown and RSD requirements

York Project No. 03040207- continued

GC Continuing Calibrations were found to be in compliance with DDT/Endrin Breakdown and RSD requirements

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD, with the exception of Heptachlor, whose RPD was slightly above acceptance limits. The sample data are not affected.

Sample results for target compounds were within calibration ranges after dilution where necessary

Metals

ICP initial calibration was performed and verified by ICV data

ICB Data were within requirements

CCV Data were within method limits

CCB Data were acceptable

CRI (detection limits) were within requirements

Interelement correction standards verified system performance as acceptable (ICS A and ICS AB)

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

All samples exhibited target metals within the linear range of the ICP

Serial dilutions recovered within method limits

All ending QC (CCV, CCB, CRI, ICSA, and ICSAB) were within criteria

Mercury

Initial calibration was performed and verified by ICV data

York Project No. 03040207- continued

ICB Data were within requirements

CCV Data were within method limits

CCB Data were acceptable

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

York Project No. 03040539

This project consisted of two soil samples. Parameters requested included Pesticides (8081) and metals (6010).

Chain-of-Custody

The field chain of custody and laboratory chains of custody were found to be complete and reflective of the samples and their handling from field through the analysis process.

Holding Times

The holding times for extraction, digestion and analysis were met for all samples and all fractions in this sample delivery group (SDG).

Pesticides

GC Initial Calibration was found to be in compliance with DDT/Endrin Breakdown and RSD requirements.

GC Continuing Calibrations were found to be in compliance with DDT/Endrin Breakdown and RSD requirements.

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges after dilution where necessary

Metals

ICP initial calibration was performed and verified by ICV data

ICB Data were within requirements

York Project No. 03040539 – continued

CCV Data were within method limits

CCB Data were acceptable

CRI (detection limits) were within requirements

Interelement correction standards verified system performance as acceptable (ICS A and ICS AB)

Laboratory Control Samples (LCS) were within acceptance limits

Matrix spikes and duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

All samples exhibited target metals within the linear range of the ICP

Serial dilutions recovered within method limits
All ending QC (CCV, CCB, CRI, ICSA, and ICSAB) were within criteria

York Project No. 03050031

This project consisted of fifteen soil samples. Parameters requested included Volatiles (8260) and pesticides (8081).

Chain-of-Custody

The field chain of custody and laboratory chains of custody were found to be complete and reflective of the samples and their handling from field through the analysis process.

Holding Times

The holding times for extraction, digestion and analysis were met for all samples and all fractions in this sample delivery group (SDG)

Volatiles

GC/MS Initial Calibration was found to be in compliance with tuning (BFB), RSD and Rf requirements

GC/MS Continuing Calibrations were found to be in compliance with tuning (BFB), %Diff and Rf criteria

Laboratory Control Samples (LCS) were within acceptance limits

Method Blanks were found to be in compliance

Internal Standards were found to be in compliance with criteria

York Project No. 03050031 - continued

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD

Sample results for target compounds were within calibration ranges

Pesticides

GC Initial Calibration was found to be in compliance with DDT/Endrin Breakdown and RSD requirements

GC Continuing Calibrations were found to be in compliance with DDT/Endrin Breakdown and RSD requirements

Method Blanks were found to be in compliance

Laboratory Control Samples (LCS) were within acceptance limits

Surrogate recoveries were found to be within control limits

Matrix spike/matrix spike duplicates were non site specific batch QC and were within acceptance limits for recovery and RPD, with the exception of Heptachlor, whose RPD was slightly above acceptance limits. The sample data are not affected.

Sample results for target compounds were within calibration ranges after dilution where necessary

ATTACHMENT B

Resume

Katherine J. Beinkafner, Ph.D., CPG
Senior Hydrogeologist
rockdoctor@optonline.net

EDUCATION

Bachelor of Arts (Geology), Master of Arts (Geology) 1961-1965
S.U.N.Y. at New Paltz, New Paltz, New York

Geophysics, 1965-1966
Rensselaer Polytechnic Institute, Troy, New York

Master of Science (Physics), 1968-1969
University of Pennsylvania, Philadelphia, Pennsylvania

Ph.D. (Geology), 1977-1980
Syracuse University, Syracuse, New York

CERTIFICATIONS AND TRAINING

- Petroleum Geologist Number 2683 by American Association of Petroleum Geologists
- Professional Geological Scientist Number 6611 by American Institute of Professional Geologists

- Environmental Regulatory Compliance, HazMat
- QA, Senior Review, Expert Testimony
- Surface and Borehole Geophysics
- Groundwater, Hydrology, and Wetland Studies
- Computer Modeling of Groundwater Systems
- Risk Assessment of Subsurface Contaminants

PROFESSIONAL EXPERIENCE

Sr. Hydrogeologist, Ecosystems Strategies, Inc.,Poughkeepsie, New York *1994-present*
Sr. Hydrogeologist, EA Engineering, Newburgh, New York *1991-1993*
Sr. Hydrogeologist, Dames & Moore, Pearl River, New York *1989-1991*
Adjunct Professor, Rutgers, The State University of New Jersey, Newark, New Jersey *Fall 1987*
Senior Consulting Hydrogeologist, Milton Chazen Engineering Assoc., Poughkeepsie, NY *1986-1987*
Senior Reservoir Geologist, Lawrence-Allison West, Casper, Wyoming *1984-1986*
Dipmeter Consultant, Terrasciences, Inc., Lakewood, Colorado *1985*
Senior Development Geologist, Sohio Petroleum Company, San Francisco, California *1980-1984*
Summer Geologist, ARCO Oil and Gas Company, Midland, Texas *1979*
Consulting Petroleum Geologist, Kirby Exploration Co., Houston, Texas *1979*
Adjunct Teaching Geologist, College of St. Rose, Albany, New York *1975*
Scientist (Oil & Gas Geology), Geological Survey, New York State Museum & Science Service State Education Dept., Albany, New York *1972-1979*
Junior Scientist (Oil & Gas Geology), Geological Survey, New York State Museum & Science Service State Education Dept., Albany, New York *1969-1972*
Physics Teacher, Franklin D. Roosevelt High School *1966-1968*

SELECTED PROJECT EXPERIENCE

LANDFILLS

- Youmans Flats Landfill, Bear Mountain State Park: Conducted hydrogeological investigation and prepared Closure Investigation Report. Field work involved installation of monitoring wells, aquifer testing, explosive gas survey, gas vent sampling, vector investigation, and sampling of monitoring wells, leachate seeps, and surface waters.

- Prepared maps and cross sections showing groundwater quality contravening New York State Groundwater standards.

- Hydrogeologic Investigations for Town of New Paltz and Lumberland Landfills: Conducted similar investigations for compliance with Part 360 regulations.

- Town of New Windsor Landfill: Based on hydrogeologic data, prepared load calculations for leachate collection system for Part 360 closure of landfill with hazardous waste.

HAZARDOUS WASTE

- Senior review for Remedial Investigation of a chemical plant (Superfund Site) in Skaneatales Falls, New York. Hydrogeologic setting is carbonate bedrock with contaminants migrating offsite from a chemical waste landfill. Designed and reviewed seismic refraction survey to define buried valleys in bedrock surface. Researched literature for Feasibility Study and alternate remedial actions.

- Several NYS Superfund Sites including IBM, East Fishkill; Fair Rite Products, Wallkill; and InterCeram/Ceramix near Middletown: Supervising Field Geologist, drilling and installation of 40 monitoring wells at a manufacturing plant with volatile organics in the overburden and bedrock, C and D levels of protection. Aquifer testing and analysis.

- Preparation of Remedial Investigation Reports.

PETROLEUM SPILLS

- Expert witness, preparation of testimony for lawsuits involving oil spills and groundwater contamination, remediation of Superfund sites, and environmental reviews for construction projects.

- Senior review of remedial design of a combination air sparging and vacuum extraction system for removal of hydrocarbon contaminants at a large petroleum terminal in Brooklyn. Site is a demonstration project for EPA.

- For one gas station in a cluster of stations in proximity to MTBE contamination of public water supply wells in Liberty, NY; conducted hydrogeologic investigation and prepared testimony for public hearings and potential legal proceedings.

RADIOACTIVE WASTE

- West Valley Demonstration Project, DOE & NYS Radioactive Waste Storage Facilities: Sr. Project Geologist, development of groundwater monitoring plan for ten solid waste management units and three water-bearing stratigraphic units for RCRA and DOE compliance. Also preparation of bid specification documents for monitoring well installation.

- For Martinsville, Illinois Proposed Site: Task Manager, preparation of site characterization chapters of license application for Low Level Radioactive Waste Disposal Facility encompassing topics of geomorphology, stratigraphy, structural geology, seismicity, groundwater, hydrology, and geotechnical evaluation.

COMPUTER MAPPING & GROUNDWATER FLOW MODELS

- Groundwater modeler, development of computer model of three dimensional groundwater flow system at Sharkey Landfill, New Jersey, a Superfund Site, for remedial design.

- Task Manager, groundwater modeling of radionuclide transport in support of pathway analysis and dose calculations for a Low Level Radioactive Waste Disposal Facility, proposed Martinsville, Illinois site.

- IBM, East Fishkill: Project Manager, aquifer characterization and contaminant flow at a Research and Facility involving collection and compilation of stratigraphic, structural geology, water level, and water quality data (from borings, monitoring wells, supply wells, outcrops, and water samples) using dBASE 3. Software to allow input of database into AutoCAD for mapping, cross sections, and flow model development. Interpretation of flow systems in imbricate thrust sheets with fracture zones and incorporation into a 3-D model of contaminant flow.

- Naval Petroleum Reserve #3 (Teapot Dome) Wyoming: Development of 3-D numerical computer models for petroleum production in sandstone and fractured reservoirs.

- Integrated geophysical well log analysis and mapping packages with custom software to generate data arrays for porosity, permeability, net pay, geologic structures, fluids, and phases. Taught in-house courses in use of computer programs for interpretation and analysis of geophysical borehole logs and three-dimensional mapping of petroleum-trapping geologic structures.

- New York State Geological Survey, Staff Geologist: Responsible for petroleum exploration well data. Conducted subsurface stratigraphic studies using well logs and computer mapping.

TEACHING

- Adjunct Professor, taught groundwater hydrology course at Rutgers University at Newark, for undergraduate and graduate students.

- Naval Petroleum Reserve #3: Taught in-house courses in use of computer programs for interpretation and analysis of geophysical borehole logs and three dimensional mapping of petroleum-trapping geologic structures.
- Development of geologic software for computer processing and graphic interpretation of dipmeter well logs for exploratory wells. Training course development and presentation to groups of petroleum engineers and geologists (one and two week classes). Dipmeter allows the interpretation of three-dimensional structures by extrapolating changes in bedding orientation detected in microresistivity logging of boreholes.

- At EA Engineering, senior hydrogeologist in Waste Management Division. Taught in-house courses in slug testing, use of simple computer flow models, sampling at hazardous waste sites.

- Conducted seminars on landfill sitting and closure requirements for local governments.

WATER RESOURCE DEVELOPMENT

- Town of Wallkill: Senior review for geophysical investigation of potential municipal water supply along the Wallkill River in Orange County, NY. Supervised field installation, pump testing, and sampling of 12 inch diameter wells. Provided senior review for final report recommending usage of a one million gallon per day well with backup well.

- Field supervision, testing, reporting, quality assurance review for numerous water supply projects in Ulster, Dutchess, and Orange County. Familiar with several computer programs and analog techniques for aquifer analysis of pumping tests in confined and unconfined aquifers.

BOREHOLE GEOPHYSICS

- For two PCB contaminated sites at Fort Edward and Hudson Falls, NY: Dr. Beinkafner provided borehole geophysics logging services in monitoring wells and production wells.

- Log interpretation indicated the presence of several imbricate thrust sheets and hydraulic conductive fracture zones.

PUBLICATIONS AND ABSTRACTS

Beinkafner, K. J. (1984) Decollement Tectonics of the Allegheny Plateau in Southern New York State: Geol. Soc. Amer. Abstr. Programs, v. 16, no. 1, p. 2.

Beinkafner, K. J. (1984) Computer Processing of Dipmeter Log Data: Enhancement of a Subsurface Exploration Tool: Proceedings of the 27th International Geological Congress, Moscow, USSR, August 1984.

Beinkafner, K. J. (1984) Mapping of Seismic Reflectors in Southern New York: Compensation for Velocity Anomalies in Glacial Overburden: Amer. Assn. of Petrol. Geol. Bull., v. 68

Beinkafner, K. J. (1983) Tracing the Sole of a Thrust through Thick and Thin of the Salina Group (Upper Silurian): Decollement Tectonics of the Southern Tier: New York: Amer. Assn. Petrol. Geol. Bull., v. 67, p. 1452.

Beinkafner, K. J. (1983) Deformation of the Silurian and Devonian Rocks of the Southern Tier, New York State: Syracuse University unpublished Ph.D. dissertation, 333 pages, 12 plates.

Beinkafner, K. J. (1983) Terminal Expression of Decollement in Chautauqua County, New York: Northeastern Geology, v. 4, no. 3, p. 1-12.

Beinkafner, K. J. (1983) Southern Tier, New York: Compendium of Subsurface Geology: edition, privately published and distributed, 350 pages, 12 plates, 30 tables, 127 figures.

Beinkafner, K. J. (1982) Structural Revelations from Seismic Interpretations, Southern Tier, New York: Amer. Assn. Petrol. Geol. Bull., v. 66, p. 1164-1165.

Beinkafner, K. J. (1981) Quantitative Analyses of the Herkimer Formation (Upper Silurian) in the Subsurface of Central New York State: New York State Museum and Science Service Bulletin 437, 31

Beinkafner, K. J. (1980) Quantitative Biostratigraphy of the Trenton Group (Middle Ordovician) using Conodont Occurrences in New York, Ontario, and Quebec: Proceedings of the Second Northeastern Women's Geoscientist Conference, St. Lawrence University, Canton, NY, p. 10-31.

Beinkafner, K. J. (1975) Statistical Probability of Finding Gas-Bearing Reefs in the Onondaga Formation Edgecliff Member in New York State: Amer. Assn. Petrol. Geol. Bull., v. 59, no. 5, p. 1734.

Connola, D. P. and Beinkafner, K. J. (1976) Large Outdoor Cage Tests with Eastern White Pine being Tested in Field Plots for White Pine Weevil Resistance: 23rd Northeastern Forest Tree Improvement Conference, Rutgers University, New Brunswick, New Jersey, p. 56-64.

Kreidler, W. L., Van Tyne, A. M., and Jorgensen, K. M. (1972) Deep Wells in New York State: New York State Museum and Science Service Bulletin 418A, 335 p., 3 plates.

Van Tyne, A. M., Beinkafner, K. J. and Knapp, S. M. (1980) Deep Wells of New York State: New York State Museum and Science Service Bulletin 418B, 237 p., 3 plates.

PROFESSIONAL AFFILIATIONS

American Association of Petroleum Geologists
American Institute of Professional Geologists
Association for Women Geoscientists
Computer Oriented Geological Society
Geological Society of America
International Association for Mathematical Geology
National Water Well Association
Society of Economic Paleontologists and Mineralogists
Society of Professional Well Log Analysts

PROFESSIONAL HONORS

Fellow of Geological Society of America

APPENDIX E

Summary Report of Tank Removal Services
(February 2003)

SUMMARY REPORT

OF

TANK REMOVAL SERVICES

Performed on the Perx Property
located at
68 South Broadway
Village of Red Hook
Dutchess County, New York 12571

February 2003

NYSDEC Spill File: 0210253

ESI File: DR99140.42

Prepared by:

ECOSYSTEMS STRATEGIES, INC.
24 Davis Avenue
Poughkeepsie, New York 12603
(845) 452-1658

SUMMARY REPORT

OF

TANK REMOVAL SERVICES

Performed on the Perx Property
located at
68 South Broadway
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Dutchess County, New York 12571

February 2003

NYSDEC Spill File: 0210253

ESI File: DR99140.42

Prepared By:

Ecosystems Strategies, Inc.
24 Davis Avenue
Poughkeepsie, New York 12603

Prepared For:

Dutchess County Department of Planning
27 High Street
Poughkeepsie, New York 12601

The undersigned has reviewed this Report and certifies to the Dutchess County Department of Planning that the information provided in this document is accurate as of the date of issuance by this office.

Any and all questions or comments, including requests for additional information, should be submitted to the undersigned.

Paul H. Ciminello
President

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1.0 INTRODUCTION

1.1 Purpose

This Summary Report of Tank Removal Services (Report) summarizes all fieldwork performed by Ecosystems Strategies, Inc. (ESI) on the Perx Property located at 68 South Broadway, Village of Red Hook, New York. This Report summarizes specific portions of investigative and remedial tasks as outlined in the Workplan For Site Investigation and Interim Remedial Activities (Workplan), dated September 4, 2002. The specific services performed by ESI were conducted to achieve the following objectives:

- To remove three underground petroleum storage tanks (USTs) and four aboveground petroleum storage tanks (ASTs) from the above referenced property in accordance with New York State Department of Environmental Conservation (NYSDEC) regulations (Workplan Section 2.2, Part 2.2.1);
- To document the post-excavation integrity of remaining on-site soils at the tank graves and locations;
- To install a temporary monitoring well point, adjacent to any UST which exhibited evidence of a petroleum release;
- To collect and analyze a groundwater sample to provide a profile of current groundwater conditions as they relate to a potential petroleum release;
- To suggest, if appropriate, further investigative and/or remedial options regarding identified subsurface or surface contamination relating to the presence of these tanks; and,
- To provide documentation to the NYSDEC in support of closure of Spill File Number: 0210253.

This Report describes all environmental services provided by ESI (fieldwork methodology, and material sampling procedures), includes discussions of the resulting analytical data from collected material samples, and provides conclusions and recommendations drawn from the fieldwork and analytical data.

1.2 Limitations

This written analysis is a summary of fieldwork activities conducted on specified portions of the Perx Property located at 68 South Broadway, Village of Red Hook, New York and is not relevant to other portions of this property or any other property. It is a representation of those portions of the property analyzed as of the respective dates of fieldwork. This Report cannot be held accountable for activities or events resulting in contamination after the dates of fieldwork.

Services summarized in this Report were performed in accordance with generally accepted practices and established NYSDEC protocols. Unless specifically noted, the findings and conclusions contained herein must be considered not as scientific certainties but as probabilities based on professional judgement.

1.3 Site Location and Description

The subject property as defined in this Report consists of the 20.8-acre property and structures located at 68 South Broadway, Village of Red Hook, Dutchess County, New York. Frontage along the western side of South Broadway provides access to the property. Ten structures, including a large processing warehouse, are located on the eastern half of the property. Various structures on the northeastern portion of the property contain the remnants of a former wastewater treatment facility. Areas that are not occupied by buildings are covered with asphalt on the majority of the eastern half of the site; the western half of the property is comprised of undeveloped land containing overgrown fields, wetlands, and woodland.

The specific portions of the property in which environmental services outlined in this Report were conducted (hereafter referenced as the "Site") include various areas adjacent to several outbuildings, including the maintenance garage and the two-story former office building. A map depicting the location of the subject property is provided in Attachment A of this Report.

1.3.1 Site Hydrogeology

Tasks performed in accordance with the Workplan For Site Investigation and Interim Remedial Activities (September 2002) included the installation and investigation of on-site groundwater monitoring wells. During the course of this work the direction of groundwater flow was determined to be in a northeasterly direction. The rate of groundwater flow is not known at this time.

1.3.2 Site Topography

Information on the subject property's topography was obtained from the review of the United States Geological Survey (USGS) Topographic Map of the Kingston East, New York Quadrangle (dated 1973), and observations made by this office during the November/December 2002 fieldwork.

According to the above-referenced topographic map and observations made during the fieldwork events, the topography of the area in which the subject property is located has a gentle downward slope to the southwest, towards the Hudson River. The topography of the subject property has surface elevations ranging from approximately 220 feet above mean sea level (msl) on the eastern portion of the property to 200 feet above msl on the western portion of the subject property. Observations made during the successive fieldwork events confirm that the topography of the subject property is relatively level on the eastern portion and has a gentle downward slope to the west on the western portion of the property.

A review of the above-referenced topographic map did not indicate the presence of any soil/gravel mining operations or unusual topographic patterns indicative of landfilling activities on the subject property.

1.4 Site History and Environmental Conditions of Concern

Information obtained during the preparation of a previous Phase I ESA conducted by ESI in September 1999 indicates that the on-site structures have been present on the subject property since the mid-1950s. The subject property had been used as an apple processing facility beginning in 1949 and was also a frozen-food processing and packaging plant from 1955 to some time after 1981.

The Phase I ESA and a subsurface investigation of the Perx property in April 2001 (included in a Summary of Environmental Services Report) identified the on-site presence of three unregistered petroleum USTs and four petroleum ASTs. Soil data generated by ESI during the April 2001 subsurface investigation indicated the absence of petroleum-contaminated soils in the vicinity of these tanks.

2.0 TANK CLOSURE SERVICES

2.1 Overview of Services

Remedial work documented in this Report was performed by ESI personnel and designated subcontractors on various dates throughout November and December 2002. Specifically, the following work was conducted by this office:

- Coordinated and supervised the excavation, removal and off-site disposal of the seven (7) on-site petroleum storage tanks, including one, 2,000-gallon gasoline UST, one, 1,000-gallon motor-fuel UST, one, 750-gallon fuel-oil UST, and four, 275-gallon fuel-oil ASTs;
- Coordinated the pumping and cleaning of all tanks and the off-site disposal of all liquid wastes;
- Inspected surrounding soils and the tank graves for visual evidence of petroleum releases, and screened soils in excavated areas with a photo-ionization detector (PID);
- Extended one test pit in the vicinity of the 750-gallon UST to a depth of approximately 12 feet; and,
- Collected confirmatory soil samples from tank graves and areas adjacent to AST's for laboratory analysis of petroleum hydrocarbons.

This Report is divided into individual sections that document all fieldwork services (Sections 2.2), laboratory results (Section 2.3), and conclusions and recommendations (Section 3.0).

2.2 Fieldwork Services

2.2.1 Fieldwork Preparation

A request for a complete utility markout of the subject property was submitted by ESI, as required by New York State Department of Labor regulations. Confirmation of underground utility locations was secured, and a field check of the utility markout was conducted prior to tank excavation.

A MiniRae 2000 (Model PGM 7600) photo-ionization detector (PID) was utilized by ESI personnel to screen all encountered material for the presence of any volatile organic vapors where appropriate. Prior to the initiation of fieldwork, this PID was properly calibrated to read parts per million calibration gas equivalents (ppm-cge) of isobutylene in accordance with protocols set forth by the equipment manufacturer.

2.2.2 Tank Removal

Tank removal (and all associated services) were preformed by S.J. Lore Contracting, Inc. under the direction of ESI personnel. During the course of the tank removal work, ESI maintained field logs and a photographic journal documenting the physical characteristics of encountered materials (e.g., soil and tanks), PID readings, and field indications of contamination.

Prior to removal, all tanks were pumped of remaining product by Advanced Oil Recycling on November 6 and November 11, 2002. Approximately 1,150-gallons of liquid (fuel-water mix) were pumped from seven on-site tanks prior to excavation (see Attachment C for liquid/sludge disposal manifests). S.J Lore Contracting cut, cleaned, and rendered all tanks petroleum free prior to disposal. All tanks were delivered to B. Millens Sons, Inc. on November 21 and December 12, 2002 for proper disposal as scrap. See Attachment C for tank disposal receipt.

2.2.3 Sample Collection

Confirmatory sampling was conducted in tank graves and in the vicinity of all ASTs at the conclusion of tank removal and excavation activities. Samples were collected from the walls and bases of the USTs and beneath the ASTs. All soil samples were collected in a manner consistent with NYSDEC sample collection protocols. Decontaminated stainless steel trowels and dedicated gloves were used at each sample location to place the material into jars pre-cleaned at the laboratory. All sample collection equipment was properly decontaminated prior to the initiation of sampling and between sample locations to avoid cross-contamination.

After sample collection, the sample containers were placed in a cooler prior to transport to the laboratory. The soil samples were transported via courier to York Analytical Laboratories, Inc., a New York State Department of Health-certified laboratory (ELAP Certification Number 10854) for chemical analyses. Appropriate chain-of-custody procedures were followed.

2.2.4 Field Observations

2000-Gallon Gasoline UST

On November 7, 2002 ESI directed the removal of a 2,000-gallon gasoline UST, fuel pump, and all related piping from an area adjacent to, and west of, the center of the former on-site processing warehouse. Prior to removal, approximately 100 gallons of a fuel/water mix was pumped from the tank. An inspection of the tank revealed that it appeared to be in sound condition with no rusting or obvious holes or pitting. Field screening of soils at the tank, piping and pump inverts did not reveal the presence of contamination indicating a release. After tank removal confirmatory samples were obtained from the walls and base of the tank grave and the pump invert.

Table 1: Field Observations of 2,000-Gallon Gasoline UST

ID#	Location	Soil Characteristics	Groundwater Encountered	PID Reading	Field Observations
EP-NW (6.5')	Center north wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
EP-EW (9')	Center east wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
EP-SW (7')	Center south wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
EP-WW (6.5')	Center west wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
B-N (8')	North invert of tank	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
B-S (8')	South invert of tank	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
PSS-1 (24")	Invert of pump fuel lines	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination

1,000-Gallon Motor-Fuel UST

On November 8, 2002 ESI directed the removal of a 1,000-gallon motor-fuel UST, fuel pump and all related piping adjacent to the north wall of a block structure (south of the settling pond) in the eastern central portion of the Site. Prior to removal, approximately 200 gallons of a fuel/water mix was pumped from the tank. An inspection of the tank revealed that it appeared to be in sound condition with no rusting or obvious holes or pitting. Field screening of soils at the tank and pump invert did not reveal the presence of contamination indicating a release. After tank removal confirmatory samples were obtained from the walls and base of the tank grave as well as the invert of the pump.

Table 2: Field Observations of 1,000-Gallon Motor-Fuel UST

ID#	Location	Soil Characteristics	Groundwater Encountered	PID Reading	Field Observations
2EP(UST)-N (9')	Center north wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
2EP-E (7.5')	Center east wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
2EP(UST)-S (7.5')	Center south wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
2EP-W (6')	Center west wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
2B-E (11')	East invert of tank	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
2B-W (11')	West invert of tank	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
PSS-2 (24")	Invert of pump and fuel lines	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination

750-Gallon Fuel-Oil UST

On November 22, 2002 ESI directed the removal of a 750-gallon fuel-oil UST buried adjacent to the east wall of the large steel wastewater treatment building, located on the north central border of the Site. Prior to removal, approximately 475 gallons of a fuel/water mix was pumped from the tank. An inspection of the tank revealed that it appeared to be in sound condition with no rusting or obvious holes or pitting. Field screening of soils at the tank invert indicated the presence of less than one cubic yard of petroleum-contaminated soil near the north end of the tank. Stained soils and a slight petroleum odor were noted at this location (PID reading of approximately 98.9 ppm). After tank removal confirmatory samples were obtained from the walls and base of the tank grave.

Table 3: Field Observations of 750-Gallon Fuel-Oil UST

ID#	Location	Soil Characteristics	Groundwater Encountered	PID Reading	Field Observations
3EP-N (5')	Center north wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
3EP-E (5')	Center east wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
3EP-S (5')	Center south wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
3EP-W (5')	Center west wall of tank grave	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination
3B-N (6.5')	North invert of tank	Medium brown, coarse sandy soil, moist	No	98.9 ppm	Small volume (less than one cubic yard) petroleum stained soil exhibiting slight petroleum odor
3B-S (6.5')	South invert of tank	Medium brown, coarse sandy soil, moist	No	0.0 ppm	No evidence of contamination

Four, 275-Gallon Fuel Oil AST's

On November 8, 2002 ESI directed the removal of four ASTs located at two distinct locations on the property. Three manifolded ASTs were located adjacent to the west exterior wall of the maintenance garage, located in the south central portion of the property. Two of these tanks were located above ground while the third was partially buried. A total of approximately 100 gallons of fuel-oil was pumped from these three tanks. Four soil samples were collected from the vicinity of the three ASTs. Soil samples 2EP(AST)-N(3') and 2EP(AST)-S(3') represent soils obtained from the north and south invert of the partially buried AST. Soil samples SS-1 and SS-2 represent surface soil samples obtained from the uppermost four inches of soil beneath the manifolded ASTs.

One, 275-gallon AST was located in the basement area of the former frame house at the east entrance of the property. This tank was pumped of approximately 275 gallons of product. The tank was located in the northeast corner of the basement on a partial slab floor. No evidence of a release was observed beneath or adjacent to this tank. The tank was inspected and appeared to be in satisfactory condition, with only minimal surface rusting. Due to the lack of field evidence of a release, the low headroom in the basement crawl space, and the presence of a slab floor beneath the tank, sampling was deemed unnecessary.

Table 4: Field Observations of Three Manifolded 275-Gallon Fuel-Oil ASTs

ID#	Location	Soil Characteristics	Groundwater Encountered	PID Reading	Field Observations
2EP(AST)-N (3')	North invert of partially buried AST located adjacent to exterior west wall of maintenance garage	Medium brown, coarse sandy soil	No	0.4 ppm	No evidence of contamination
2EP(AST)-S (3')	South invert of partially buried AST located adjacent to exterior west wall of maintenance garage	Medium brown, coarse sandy soil	No	0.0 ppm	No evidence of contamination
SS-1	Surface soils beneath east manifolded AST at exterior west wall of maintenance garage	Medium brown, dry, dusty soil, gravel to ¼"	No	0.0 ppm	No evidence of contamination
SS-2	Surface soils beneath west manifolded AST at exterior west wall of maintenance garage	Medium brown, dry, dusty soil, gravel to ¼"	No	0.0 ppm	No evidence of contamination

2.3 Laboratory Analysis and Findings

2.3.1 Terminology

The term "action level", as defined in this Report, refers to the concentration of a particular contaminant level above which remedial actions are considered more likely. The overall objective of setting action levels is to assess the integrity of on-site soils relative to conditions which are likely to present a threat to public health, given the existing and probable future uses of the site. On-site soils with contaminant levels exceeding these action levels are considered more likely to warrant remediation. No independent risk Report was performed as part of this investigation.

The action levels identified in this Report for petroleum hydrocarbons in soils are determined based on the NYSDEC's Technical and Administrative Guidance Memorandum #4046 (TAGM), dated January 24, 1994, as modified by subsequent, relevant NYSDEC Records of Decision (ROD). All data have been analyzed in accordance with applicable TAGM standards.

2.3.2 Sample Analysis

2000-Gallon Gasoline UST

Soil samples EP-NW (6.5'), EP-SW (7"), EP-WW (6.5'), EP-EW (9'), B-N (8') and BS-(8') were collected from the walls and invert of the 2000-gallon gasoline UST . Soil sample PSS-1 (24") was collected from the invert of the pump and piping. All soil samples were submitted for analysis of volatile organic compounds (VOCs) utilizing USEPA Method 8260. No VOCs were detected in any of the confirmatory samples. Field observations confirm the absence of petroleum contamination (laboratory data is included as Attachment B).

1000-Gallon Motor-Fuel UST

Soil samples 2EP(UST)-N(9'), 2EP-E(7.5'), 2EP(UST)-S(7.5'), 2EP-W(6'), 2B-E (11') and 2B-W(11') were collected from the walls and invert of the 1000-gallon UST. Soil sample PSS-2 (24") was collected from the invert of the pump and piping network. All soil samples were submitted for analysis of VOCs utilizing USEPA Method 8260. No VOCs were detected in any of the confirmatory samples. Field observations confirm the absence of petroleum contamination.

750-Gallon UST

Soil samples 3EP-N(5'), 3EP-E(5'), 3EP-S(5'), 3EP-W(5'), 3B-N(6.5') and 3B-S(6.5') were collected from the walls and invert of the 750-gallon UST and submitted for analysis of the polynuclear aromatic hydrocarbon (PAH) fraction of the semi-volatile organic compounds (SVOCs) utilizing USEPA Method 8270. No PAHs were detected in soil samples 3EP-E(5'), 3EP-S(5'), 3EP-W(5') or 3B-S(6.5'). Soil samples 3EP-N and 3B-N, located at the north wall and north invert of the tank, exhibited concentrations of five PAHs including acenaphthene, fluorine, naphthalene, phenanthrene and pyrene. Soil sample 3B-N(6.5') exhibited concentrations of 70,000 μg/kg naphthalene and 150,000 μg/kg phenanthrene. The NYSDEC guidance levels for these compounds are 13,000 μg/kg and 50,000 μg/kg, respectively. Field observations confirm the presence of a small volume of petroleum-contaminated soil (less than one cubic yard) in this area. The presence of this low volume of soil contaminated resulted in the generation of NYSDEC Spill File Number: 0210253.

Table 5: Summary of Detected PAHs in Soil Samples – 750-Gallon UST
(All results measured in μg/kg-ppb. Results in **bold** exceed designated action levels.)

Compound (USEPA Method 8270)	Action Level[1]	Sample Identification					
		3EP-N (5')	3EP-E (5')	3EP-S (5')	3EP-W (5')	3B-N(6.5')	3B-S(6.5')
Acenaphthene	50,000	ND	ND	ND	ND	ND	ND
Acenaphthylene	50,000	ND	ND	ND	ND	ND	ND
Anthracene	50,000	ND	ND	ND	ND	ND	ND
Benzo (a) Anthracene	224	ND	ND	ND	ND	ND	ND
Benzo (a) Pyrene	61	ND	ND	ND	ND	ND	ND
Benzo (b) Fluoranthene	1,100	ND	ND	ND	ND	ND	ND
Benzo (g,h,I) Perylene	50,000	ND	ND	ND	ND	ND	ND
Benzo (k) Fluoranthene	1,100	ND	ND	ND	ND	ND	ND
Chrysene	400	ND	ND	ND	ND	ND	ND
Dibenz (a,h) Anthracene	14	ND	ND	ND	ND	ND	ND
Fluoranthene	50,000	ND	ND	ND	ND	ND	ND
Fluorene	50,000	13,000	ND	ND	ND	38,000	ND
Indeno (1,2,3-cd) Pyrene	3,200	ND	ND	ND	ND	ND	ND
Naphthalene	13,000	**18,000**	ND	ND	ND	**70,000**	ND
Phenanthrene	50,000	32,000	ND	ND	ND	**150,000**	ND
Pyrene	50,000	ND	ND	ND	ND	24,000	ND

Notes:
1. Source: NYSDEC Technical and Administrative Guidance Memorandum #4046 (TAGM) (January 24, 1994) as modified by subsequent, relevant NYSDEC Records of Decision (RODs).

ND = Not Detected

Test Pit Extension in 750-Gallon UST Grave

Due to the presence of a small volume of petroleum-contaminated soil at the north invert and north wall of the tank, a test pit (TP-1) was extended to provide an indication of the extent of petroleum contamination in this area. The test pit was extended at the approximate location of sample 3B-N (north invert of the tank) to a depth of approximately 12 feet and measured approximately six feet wide by six feet long. Field evidence of petroleum contamination was not detected below 7-8 feet in depth. A composite sample of soils was obtained from 7-8 feet and 12 feet in depth and was submitted for analysis of VOCs (USEPA Method 8260) and PAHs (USEPA Method 8270). No VOCs or PAHs were detected in any of the composite samples. See the Summary Report Of Site Investigation and Interim Remedial Activities (February 2003) for a detailed description of test pit excavation and analytical results.

Monitoring Well Installation/Sampling at 750-Gallon UST

A monitoring well (TMW-1) was installed approximately 15 feet east of the 750-gallon tank excavation to provide a profile of groundwater quality. Soils screened during the installation of this monitoring well did not exhibit any field evidence of petroleum contamination. Soil sample TMW-1 (12-14') was analyzed for VOCs (utilizing USEPA Method 8260) and PAHs (utilizing USEPA Method 8270) . No VOCs or PAHs were detected in the soil sample. See Summary Report Of Site Investigation and Interim Remedial Activities (February 2003) for a detailed description of monitoring well installation, soil screening and analytical results.

On January 21, 2003 ESI revisited TMW-1 and sampled the groundwater. Groundwater samples from TMW-1 did not exhibit any field evidence of petroleum contamination. The groundwater sample was analyzed for VOCs and PAHs. No VOCs or PAHs were detected in the groundwater sample.

Three Manifolded 275-Gallon Fuel Oil ASTs

Soil samples 2EP(AST)-N(3') and 2EP(AST)-S(3') represent soils obtained from the north and south invert of the partially buried AST. Soil samples SS-1 and SS-2 represent surface soil samples obtained from the uppermost four inches of soil beneath the manifolded ASTs. All soil samples were analyzed for PAHs (utilizing USEPA Method 8270). No PAHs were detected in the soil samples analyzed. Field observations confirm the absence of petroleum contamination in soil material.

3.0 CONCLUSIONS AND RECOMMENDATIONS

This office has completed the services summarized in Section 2.0 for the specified portion of the Perx Property located at 68 South Broadway, Village of Red Hook, New York. The tasks documented in this report represent a portion of the proposed remedial services outlined in the Workplan For Site Investigation and Interim Remedial Activities (September 2002). Environmental services conducted by this office included the following:

- Coordinated and supervised the excavation, removal and off-site disposal of the seven (7) on-site petroleum storage tanks, including one, 2,000-gallon gasoline underground storage tank (UST), one, 1,000-gallon diesel UST, one, 750-gallon fuel-oil UST and four, 275-gallon fuel-oil aboveground storage tanks (ASTs), in accordance with all NYDEC regulations;
- Coordinated the pumping and cleaning of all tanks and the proper off-site disposal of all liquid waste;
- Inspected and screened surrounding soils and the tank graves for evidence of petroleum releases;
- Extended one test pit in the vicinity of the 750-gallon UST; and,
- Collected confirmatory soil samples from tank graves and adjacent to ASTs for laboratory analysis of petroleum hydrocarbons.

Based on the services provided and data generated, the following conclusions and recommendations (in **bold**) have been made.

1. Laboratory analysis of soil samples obtained from the tank graves, and at or near tank inverts of the 2,000-gallon UST, 1,000-gallon UST, and from the vicinity of the three manifolded 275-gallon ASTs, exhibited no evidence of petroleum contamination. Field observations confirm the absence of petroleum contamination at these locations. Field observations made in the basement crawlspace containing the 275-gallon AST did not indicate evidence of a petroleum release.

   No further investigation recommended.

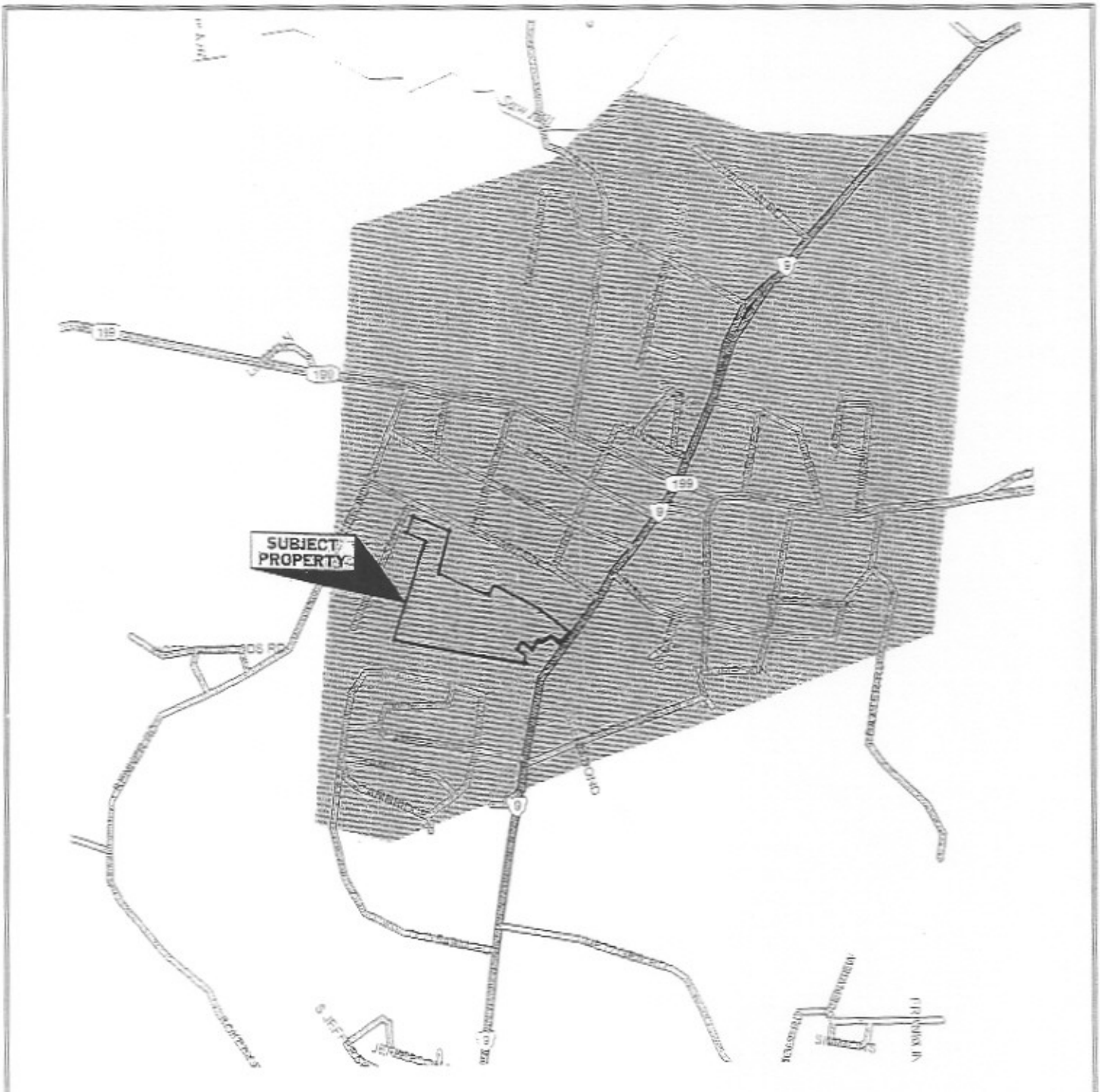
2. Soil samples 3EP-N and 3B-N located at the north wall and north invert of the 750-gallon UST exhibited concentrations of five PAHs. Soil sample 3B-N(6.5') exhibited concentrations of naphthalene and phenanthrene in excess of NYSDEC action levels. Field observations indicated that the volume of petroleum contamination was diminimus (less than one cubic yard) and undetectable in soils beneath 7 feet in depth. Composite samples of soil obtained from a test pit (TP-1) extended beneath the invert of the tank indicated the absence of petroleum contamination at depths of 7 and 12 feet. Groundwater samples obtained from a monitoring well (TMW-1) adjacent and downgradient of the tank indicated the absence of petroleum contamination.

   It is recommended that any petroleum-contaminated soil encountered during site construction/excavation activity be stockpiled for off-site disposal.

   It is recommended that this Report be submitted for review to the NYSDEC in anticipation of spill file closure status for NYSDEC File Number: 0210253.

ATTACHMENT A

Maps



Source: DeLorme Street Atlas USA, Version 6.0

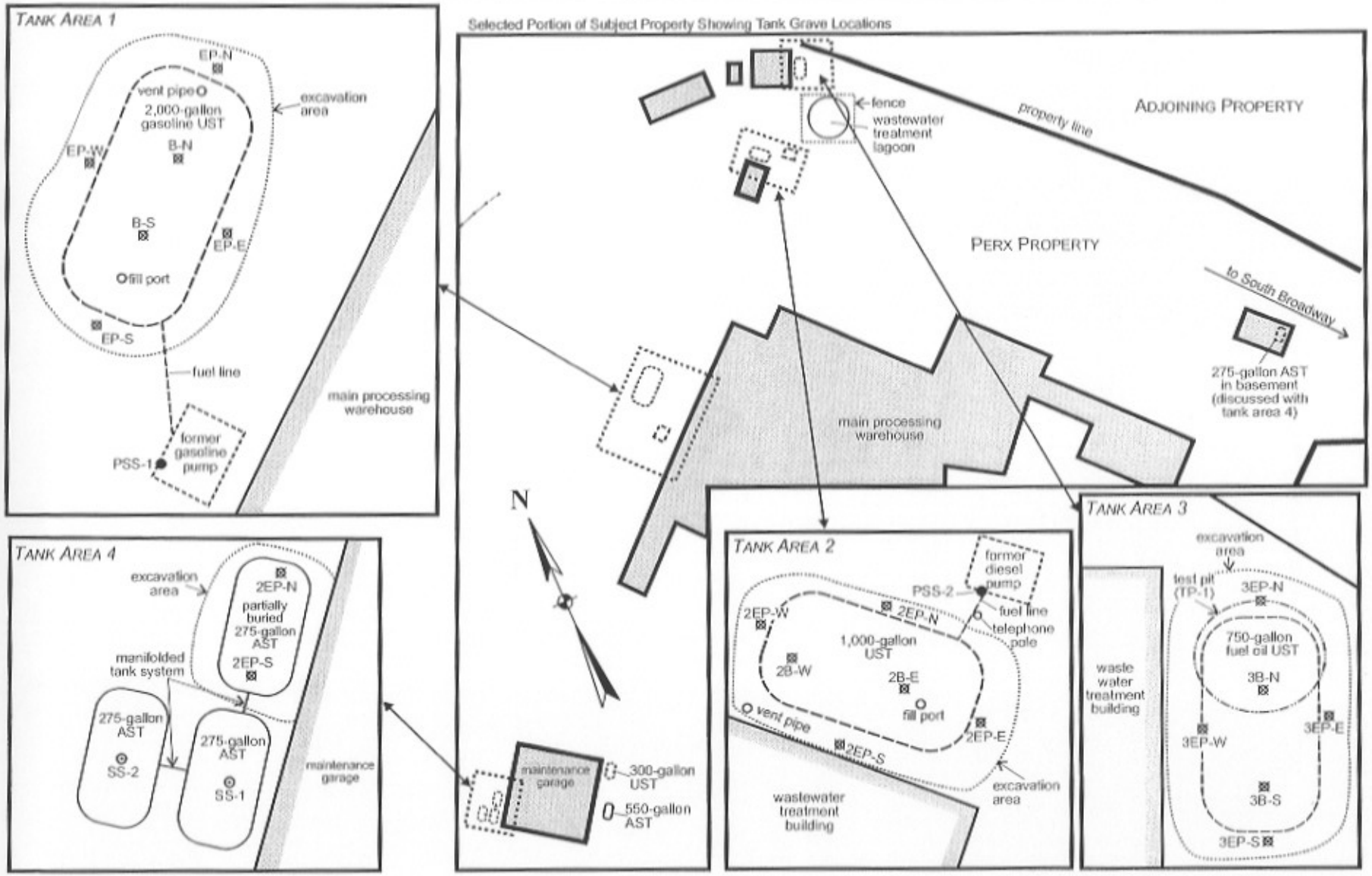
Site Location Map
Perx Property
68 South Broadway,
Village of Red Hook
Dutchess County, New York

N

ESI File: DR99140.42

February 2003

Attachment A



Feature locations are approximate.

Tank Excavation Map

Perx Property
68 South Broadway
Village of Red Hook
Dutchess County, New York

Legend:

- ⊠ EP - end point soil sample locations (north, south, east and west of tank)
- ⊠ B - end point soil sample locations at base of tank (north, south, east and west sides)
- ● PSS-1- pump soil-sample locations
- ⊙ SS-1 - soil sample locations

ESI File: DR99140.41
February 2003
Not to Scale
Attachment A

ATTACHMENT B

See Appendix C
(Final Summary Report Of Site Investigation and Interim Remedial Activities)
dated April 2004

For all Laboratory Reports

ATTACHMENT C

Tank and Waste Disposal Manifests

ADVANCED OIL RECYCLING

807 Avenue K, Matamoras, PA 18336

1-866-OLD-OILS

CUSTOMER

Name	Contact
Delivery Address	Phone
	Special Instr.

DESCRIPTION	QUANTITY	AMOUNT
Used Oil		
Anti-Freeze		
Waste Water		
Used Oil Filters		
Parts Washer Svc.		
Transportation		
Tank Cleaning		
Tank Removal		

PURCHASE ORDER # _____

MANIFEST # _____

Print Name

Signature Date

PAYMENT SECTION	
CASH ☐	Total Received
Check No.	
Print Name	
Signature	

ADVANCED OIL RECYCLING

807 Avenue K, Matamoras, PA 18336

1-866-OLD-OILS

CUSTOMER

Name	Contact
Delivery Address	Phone
	Special Instr.

DESCRIPTION	QUANTITY	AMOUNT
Used Oil		
Anti-Freeze		
Waste Water		
Used Oil Filters		
Parts Washer Svc.		
Transportation		
Tank Cleaning		
Tank Removal		

PURCHASE ORDER # _____

MANIFEST # _____

Print Name

Signature Date

PAYMENT SECTION	
CASH ☐	Total Received
Check No.	
Print Name	
Signature	

B. MILLENS SONS, INC.

CERTIFIED PUBLIC SCALES • SCRAP IRON & METAL
NYS 7002814SCP
PHONE (845) 331-7600
290 EAST STRAND KINGSTON, N.Y. 12401

Customer's Order No. _____ Date 12-12-02.

Name S.J. Lore.

Address South Broadway, Redhook, N.Y.

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	HOSE RETD	PAID OUT	

QUAN.	DESCRIPTION	PRICE	AMOUNT
4	Scrap UST for Disposal		150-
2-	275		
1-	2000		
1-	750 TAX		
	TOTAL		

M228639 Rec'd by

All claims and returned goods MUST be accompanied by this bill.

05-0012 PRINTED IN U.S.A. Thank You

B. MILLENS SONS, INC.

CERTIFIED PUBLIC SCALES • SCRAP IRON & METAL
NYS 7002814SCP
PHONE (845) 331-7600
290 EAST STRAND KINGSTON, N.Y. 12401

Customer's Order No. _____ Date 11/21

Name S. Lore

Address Red Hook

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	HOSE RETD	PAID OUT	

QUAN.	DESCRIPTION	PRICE	AMOUNT
3	Tanks		100-
2 - 275 Gal			
1 - 1000 Gal	TAX		
	TOTAL		

M227622 Rec'd by

All claims and returned goods MUST be accompanied by this bill.

05-0012 PRINTED IN U.S.A.

APPENDIX F

Data Summary Tables

Table 4: Summary of Laboratory Data from Floor Drain Sediment and Soil Near Main Facility
(Data provided in ppb for pesticides and ppm for metals. Concentrations in **bold** exceed guidance levels).

		Sample Identification								
Pesticides	**Guidance Level**	**2D-1**	**2D-2**	**5SS-1**	**5SS-2**	**5SS-3**	**5SS-4**	**5SS-5**	**5EFL-1**	**DW-1**
Aldrin	41	ND	ND	ND	ND	ND	ND	ND	ND	ND
alpha-BHC	11.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
beta-BHC	200	ND	ND	ND	ND	ND	ND	ND	ND	ND
delta-BHC	300	ND	ND	ND	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	60	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlordane	540	ND	142	ND	ND	ND	ND	71.1	ND	ND
2.4-D	500	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	2,900	**3,000**	**4,800**	ND	ND	ND	ND	38.6	ND	ND
4,4'-DDE	2,100	ND	ND	ND	ND	ND	ND	25.6	ND	ND
4,4'-DDT	2,100	**7,600**	**22,000**	ND	ND	ND	ND	63.0	ND	ND
Dieldrin	44	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	900	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	900	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	100	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	100	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	20	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND
VOCs	Varies	NA	NA	NA	NA	NA	NA	NA	NA	ND
Metals: Arsenic	11.1	12.5	ND	NA	NA	NA	NA	NA	NA	4.45
Barium	300	NA	NA	NA	NA	NA	NA	NA	NA	54.1
Cadmium	1.0	NA	NA	NA	NA	NA	NA	NA	NA	**8.22**
Chromium	16.4	NA	NA	NA	NA	NA	NA	NA	NA	**68.6**
Lead	250	215	**6,880**	NA	NA	NA	NA	NA	NA	43.6
Selenium	2.0	NA	NA	NA	NA	NA	NA	NA	NA	ND
Silver	NE	NA	NA	NA	NA	NA	NA	NA	NA	ND
Mercury	0.1	NA	NA	NA	NA	NA	NA	NA	NA	**0.23**

Notes:
ND = Not Detected
NE = Not Established
NA= Not Analyzed

Table 5a: Summary of Laboratory Data from Test Pits (TP-1 through 2TP-7)
(Data provided in ppb for VOCs and PAHs and ppm for metals. Concentrations in **bold** exceed guidance levels).

Analyte	Guidance Level	TP-1 (7'-8')	TP-1 (12')	TP-2 (0-4')	TP-2 (6')	TP-3 (Comp)	TP-4 (0-3')	TP-4 (7')	2TP-5 (Comp)	2TP-6 (Comp)	2TP-7 (Comp)
VOCs: Toluene	1,500	ND	ND	ND	ND	ND	ND	11	ND	ND	ND
VOCs: (all other)	Varies	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PAHs: (all)	Varies	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides: (all)	Varies	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals: Arsenic	11.1	6.44	5.85	6.15	5.57	6.63	4.57	2.49	6.32	4.79	5.02
Barium	300	43.6	50.0	53.2	54.4	60.6	64.6	138	43.5	39.3	45.6
Cadmium	1.0	**3.65**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	16.4	13.9	14.3	15.3	14.7	15.9	**16.5**	**65.3**	15.2	12.8	15.9
Lead	250	41.5	22.6	24.0	24.6	21.6	30.0	12.5	46.7	13.3	19.0
Selenium	2.0	ND	ND	1.18	ND	1.27	1.61	**3.76**	ND	ND	ND
Silver	NE	ND	ND	ND	ND	ND	ND	ND	0.59	ND	0.67
Mercury	0.1	ND	ND	ND	ND	ND	ND	**0.15**	**0.24**	**0.20**	**0.18**

Notes:
ND = Not Detected
NE = Not Established

Table 5b: Summary of Laboratory Data from Test Pits (3TP-10 through 3TP-16)
(Data provided in ppb for VOCs and PAHs and ppm for metals. Concentrations in **bold** exceed guidance levels).

Analyte	Guidance Level	3TP-10 (Comp)	3TP-11 (Comp)	3TP-12 (Comp)	3TP-13 (Comp)	3TP-14 (Comp)	2TP-15 (Comp)	3TP-16 (Comp)
VOCs:								
1,2,4 trimethylbenzene	10,000	17	NA	ND	ND	NA	ND	NA
naphthalene	13,000	58	NA	ND	ND	NA	ND	NA
o-xylene	1,200	6	NA	ND	ND	NA	ND	NA
p- & m- xylenes	1,200	17	NA	ND	ND	NA	ND	NA
VOCs: (all others)	Varies	ND	NA	ND	ND	NA	ND	NA
PAHs: (all)	Varies	ND	NA	ND	ND	NA	ND	NA
Pesticides : 4,4-DDT	2,100	17.7	NA	ND	NA	NA	ND	NA
Pesticides: (all)	Varies	ND	NA	ND	NA	NA	ND	NA
Metals: Arsenic	11.1	4.61	NA	4.63	4.7	NA	4.97	NA
Barium	300	35.0	NA	36.2	39.0	NA	46.3	NA
Cadmium	1.0	ND	NA	ND	ND	NA	ND	NA
Chromium	16.4	8.33	NA	10.6	10.4	NA	13.6	NA
Lead	250	10.4	NA	12.7	10.2	NA	18.3	NA
Selenium	2.0	**2.35**	NA	**2.02**	1.46	NA	1.76	NA
Silver	NE	ND	NA	ND	ND	NA	ND	NA
Mercury	0.1	0.1	NA	**0.12**	ND	NA	ND	NA

Notes:
ND = Not Detected
NE = Not Established
NA = Not Analyzed

Table 6a: Summary of Lead/Arsenic in West Wastewater Treatment/Lagoon Soil Samples (0-4")
(All data provided in ppm. Concentrations in **bold** exceed guidance levels).

		Sample Identification							
Metals	Guidance Level	LA-1	LA-2	LA-3	LA-4	LA-5	LA-6	LA-7	LA-8
Arsenic	11.1	7.88	6.91	6.79	7.75	8.16	10.5	7.74	10.5
Lead	250	**293**	153	76.5	31.1	38.0	38.6	91.5	**489**

Table 6b: Summary of Lead/Arsenic in West Wastewater Treatment/Lagoon Soil Samples (20-24")
(All data provided in ppm. Concentrations in **bold** exceed guidance levels).

		Sample Identification							
Metals	Guidance Level	LA-1	LA-2	LA-3	LA-4	LA-5	LA-6	LA-7	LA-8
Arsenic	11.1	8.11	6.25	4.69	7.25	10.6	5.09	3.43	3.38
Lead	250	23.4	64.7	24.9	22.6	28.8	15.2	14.0	24.5

Table 7a: Summary of Lead/Arsenic in Orchard Soil Samples (0-4")
(All data provided in ppm. Concentrations in **bold** exceed guidance levels).

		Sample Identification							
Metals	Guidance Level	OR-1	OR-2	OR-3	OR-4	OR-5	OR-6	OR-7	OR-8
Arsenic	11.1	**25.4**	**22.4**	7.58	**24.0**	**12.7**	**15.7**	**11.6**	**11.6**
Lead	250	82.5	70.1	22.6	70.1	52.2	65.9	39.7	37.6

Table 7b: Summary of Lead/Arsenic in Orchard Soil Samples (20-24")
(All data provided in ppm. Concentrations in **bold** exceed guidance levels).

		Sample Identification							
Metals	Guidance Level	OR-1	OR-2	OR-3	OR-4	OR-5	OR-6	OR-7	OR-8
Arsenic	11.1	5.34	6.69	5.17	4.89	6.41	5.33	4.90	4.76
Lead	250	14.4	15.2	14.5	12.7	14.6	12.2	12.3	14.2

Table 8: Laboratory Analysis of West Wastewater Treatment Complex Soil Samples
(All data provided in ppb. Concentrations in **bold** exceed guidance levels).

		Sample Identification				
Pesticides	**Guidance Level**	**Skimshed-1 (0-4")**	**Skimshed-2 (0-4")**	**Skimshed-3 (0-4")**	**WW-HB-1 (5-7')**	**WW-HB-2 (5-7')**
Aldrin	41	ND	ND	ND	ND	ND
alpha-BHC	11.0	ND	ND	ND	ND	ND
beta-BHC	200	ND	ND	ND	ND	ND
delta-BHC	300	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	60	ND	ND	ND	ND	ND
Chlordane	540	356	266	ND	ND	ND
2,4-D	500	ND	ND	ND	ND	ND
4,4'-DDD	2,900	46.4	51.9	144	ND	ND
4,4'-DDE	2,100	ND	12.4	ND	ND	ND
4,4'-DDT	2,100	39.9	ND	29.8	ND	ND
Dieldrin	44	ND	ND	ND	ND	ND
Endosulfan I	900	ND	ND	ND	ND	ND
Endosulfan II	900	ND	ND	ND	ND	ND
Endosulfan sulfate	1,000	ND	ND	ND	ND	ND
Endrin	100	ND	ND	ND	ND	ND
Endrin aldehyde	NE	ND	ND	ND	ND	ND
Heptachlor	100	ND	ND	ND	ND	ND
Heptachlor epoxide	20	ND	ND	ND	ND	ND
Methoxychlor	NE	ND	ND	ND	ND	ND
Toxaphene	NE	ND	ND	ND	ND	ND
VOCs	Varies	NA	NA	NA	NA	ND

Notes:
ND = Not Detected
NE = Not Established
NA = Not Analyzed

Table 9: Laboratory Analysis of Soils Near East Wastewater Treatment Tanks
(Data provided in ppb for pesticides and ppm for metals. Concentrations in **bold** exceed guidance levels).

		Sample Identification			
Analyte	**Guidance Level**	**WT-HB-1 (10-12')**	**WT-HB-2 (10-12')**	**WT-SS-1 (0-12")**	**WT-SS-2 (0-12")**
Pesticides: Aldrin	41	ND	ND	ND	ND
alpha-BHC	11.0	ND	ND	ND	ND
beta-BHC	200	ND	ND	ND	ND
delta-BHC	300	ND	ND	ND	ND
Gamma-BHC (Lindane)	60	ND	ND	ND	ND
Chlordane	540	ND	458	**8,000**	142
2,4-D	500	ND	ND	ND	ND
4,4'-DDD	2,900	ND	ND	ND	ND
4,4'-DDE	2,100	ND	ND	ND	ND
4,4'-DDT	2,100	ND	ND	1,000	21.0
Dieldrin	44	ND	ND	ND	ND
Endosulfan I	900	ND	ND	ND	ND
Endosulfan II	900	ND	ND	ND	ND
Endosulfan sulfate	1,000	ND	ND	ND	ND
Endrin	100	ND	ND	ND	ND
Endrin aldehyde	NE	12.2	ND	ND	ND
Heptachlor	100	ND	ND	ND	ND
Heptachlor epoxide	20	ND	ND	ND	ND
Methoxychlor	NE	ND	ND	ND	ND
Toxaphene	NE	ND	ND	ND	ND
Metals: Arsenic	11.1	5.82	5.72	5.75	9.82
Barium	300	67.4	60.	92.8	96.7
Cadmium	1.0	ND	ND	0.88	ND
Chromium	16.4	16.0	12.8	**27.2**	**17.7**
Lead	250	15.2	17.2	150	142
Selenium	2.0	ND	ND	ND	1.45
Silver	NE	0.68	0.61	0.64	ND
Mercury	0.1	**0.15**	**1.77**	**0.49**	**0.25**
VOCs: All	Varies	ND	ND	ND	ND

Notes:
ND = Not Detected
NE = Not Established

Table 10: Summary of Pesticides/Arsenic in Wetland Soil/Sediment Samples.
(Data provided in ppb for pesticides and ppm for metals. Concentrations in **bold** exceed guidance levels).

		Sample Identification					
Pesticides	**Guidance Level**	**WL-1 (0-4")**	**WL-2 (0-4")**	**WL-3 (0-4")**	**WL-4 (0-4")**	**WL-5 (0-4")**	**WL-6 (0-4")**
Aldrin	41	ND	ND	ND	ND	ND	ND
alpha-BHC	11.0	ND	ND	ND	ND	ND	ND
beta-BHC	200	ND	ND	ND	ND	ND	ND
delta-BHC	300	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	60	ND	ND	ND	ND	ND	ND
Chlordane	540	ND	ND	ND	ND	ND	77.8
2,4-D	500	ND	ND	ND	ND	ND	ND
4,4'-DDD	2,900	13.4	18.9	157	ND	ND	ND
4,4'-DDE	2,100	10.2	92.8	57.7	ND	ND	ND
4,4'-DDT	2,100	ND	31.1	27.1	ND	ND	ND
Dieldrin	44	ND	ND	ND	ND	ND	ND
Endosulfan I	900	ND	ND	ND	ND	ND	ND
Endosulfan II	900	ND	ND	ND	ND	ND	ND
Endosulfan sulfate	1,000	ND	ND	ND	ND	ND	ND
Endrin	100	ND	ND	ND	ND	ND	ND
Endrin aldehyde	NE	ND	ND	ND	ND	ND	ND
Heptachlor	100	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	20	ND	ND	ND	ND	ND	ND
Methoxychlor	NE	ND	ND	ND	ND	ND	ND
Toxaphene	NE	ND	ND	ND	ND	ND	ND
Arsenic	11.1	8.11	7.74	5.63	8.42	8.53	**15.0**

Notes:
ND = Not Detected
NE = Not Established

Table 11: Summary of Laboratory Data from Monitoring Well Soil Samples
(Data provided in ppm for metals. Concentrations in **bold** exceed guidance levels).

		Sample Identification			
Analyte	**Guidance Level**	**TMW-1 (12-14')**	**TMW-2 (8-12')**	**TMW-3 (8-10')**	**TMW-4 (10-12')**
VOCs (all)	Varies	ND	ND	ND	ND
PAHs (all)	Varies	ND	NA	NA	NA
Pesticides (all)	Varies	ND	NA	NA	NA
Metals: Arsenic	11.1	5.62	NA	NA	NA
Barium	300	56.3	NA	NA	NA
Cadmium	1.0	ND	NA	NA	NA
Chromium	16.4	**18.1**	NA	NA	NA
Lead	250	16.4	NA	NA	NA
Selenium	2.0	**2.11**	NA	NA	NA
Silver	NE	ND	NA	NA	NA
Mercury	0.1	**0.69**	NA	NA	NA

Notes:
ND = Not Detected
NE = Not Established
NA = Not Analyzed

Table 12: Summary of Laboratory Data from Monitoring Well Water Samples
(Data provided in ppb. Concentrations in **bold** exceed guidance levels).

		Monitoring Well Samples			
Analyte	**Guidance Level**	**TMW-1**	**TMW-2**	**TMW-3**	**TMW-4**
VOCs (all)	Varies	ND	NA	NA	NA
PAHs (all)	Varies	ND	NA	NA	NA
Pesticides (all)	Varies	ND	ND	ND	ND
Metals: Arsenic	25	ND	12	ND	ND
Barium	1,000	868	873	**1,280**	**2,670**
Cadmium	5	ND	ND	ND	ND
Chromium	50	23	41	31	8
Lead	25	**128**	**223**	**118**	**84**
Selenium	10	ND	ND	ND	ND
Silver	50	ND	ND	ND	ND
Mercury	0.7	ND	ND	ND	0.4

Notes:
ND = Not Detected
NA = Not Analyzed

APPENDIX G

Fieldwork Observation Tables

Table 13a: Field Observations - Test Pits TP-1 through 2TP-7 (January 2003)

Test Pit	Location	Depth (feet)	PID Reading (ppm)	Observations
TP-1	Tank grave near treatment shed, and lagoon	0-7	0.0	(7') petroleum odor and staining at north end of excavation
		7-8	20	Sewer odor in soil, minor brick debris, glass bottles, grease-like deposits
		8-12	3.5	Sewer odor decreases, coarse sands, no debris, no evidence of petroleum contamination
TP-2	Earth mound, east side of site	0-4	3.2	Traces of asphalt, brick, concrete
		4-6	0.4	Pipe at 5', no debris at base, no evidence of contamination
TP-3	Earth mound, east side of site	0-4	0.0	Minor debris – brick and concrete
		4-9	0.0	6-inch concrete pipe fragment, no evidence of contamination
TP-4	Earth mound, east side of site	0-4	0.0	No significant debris, medium-brown soil, trace of gravel
		4-6	0.0	Same as above
		6-8	0.0	Clay-like soils, no evidence of contamination
2TP-5	Earth mound, west side of site	0-4	0.0	Steel reinforced concrete rubble, plastic sheeting fragments, ceramic tile fragments, foul, musty odor
		4-6	0.0	No significant debris, medium-brown soil, trace of gravel and sand
		6-8	0.0	Same as above
2TP-6	Earth mound, west side of site	0-4	0.0	Steel reinforced concrete rubble
		4-6	0.0	No significant debris, medium-brown sandy soil
		6-8	0.0	Same as above
2TP-7	Earth mound, west side of site	0-4	0.0	No significant debris, medium-brown sandy soil
		4-6	0.0	Same as above
		6-8	0.0	Same as above

Table 13b: Field Observations - Test Pits 3TP-10 through 3TP-16 (December 2003)

Test Pit	Location	Depth (feet)	PID Reading (ppm)	Observations
3TP-10	North center border of disturbed, mounded and filled area	0-3'	0.0	Concrete debris at surface, small volume of rusted metal pipes to 4", plastic 12" tiles, bricks, concrete blocks, fiberglass insulation
		3-8'	0.0	Soil appears undisturbed, no evidence of contamination
3TP-11	Center of mounded and filled area	0-2'	0.0	Concrete debris at surface, small volume of rusted metal pipes to 4", plastic 12" tiles, bricks, concrete blocks
		2-8'	0.0	Soil appears undisturbed, no evidence of contamination
3TP-12	Southwest corner of disturbed, mounded and filled area	0-2'	0.0	Concrete debris at surface, small volume of rusted metal pipes to 4", plastic 12" tiles, bricks, concrete blocks
		2-4'	0.0	Soil appears undisturbed, no evidence of contamination
3TP-13	Northwest corner of disturbed, mounded and filled area	0-2'	0.0	Metal light shroud, chicken wire, rotted 6x6 posts, concrete debris
		2-8'	0.0'	Soil appears undisturbed, no evidence of contamination
3TP-14	West of mounded and filled area, upgradient	0-8'	0.0	Soil appears undisturbed, no evidence of contamination
3TP-15	Amongst debris and machinery contributed from adjacent property	0-8'	0.0	Soil appears undisturbed, no evidence of contamination
3TP-16	Amongst debris and machinery contributed from adjacent property	0-8'	0.0	Soil appears undisturbed, no evidence of contamination

Table 14: Field Observations – Soil Sampling – Western Wastewater Complex

Boring	Location	Soil Characteristics	PID Readings	Observations
LA-1	South wall of wastewater treatment lagoon	(0-2") medium-brown, coarse sandy soil material, gravel to ¼" (20-24") mostly coarse sandy soil, moist	0.0 ppm	No evidence of contamination
LA-2	West wall of wastewater treatment lagoon	(0-2") medium to dark-brown, dense soil material, some decaying leaf litter (20-24") medium to dark-brown, dense soil material, some decaying leaf litter, concrete fragments to 1"	0.0 ppm	No evidence of contamination
LA-3	East wall of wastewater treatment lagoon	(0-2") medium to dark-brown, coarse sandy soil, some organic decaying matter, concrete and root fragments to 1" (20-24") medium to dark-brown, coarse sandy soil, some organic matter, concrete fragments to 1"	0.0 ppm	No evidence of contamination
LA-4	Approximately 15' north of wastewater skimmer shed	(0-4") medium-brown soil material, some organic decaying material, moist, gravel to ¼" (20-24") medium-brown soil material, some organic decaying material, moist, gravel to ¼"	NA	No evidence of contamination
LA-5	Between aeration tank and skimmer shed	(0-2") medium-brown soil material, some organic decaying material, moist, gravel to ¼" (20-24") medium-brown soil material, some organic decaying material, moist, gravel to ¼"	NA	No evidence of contamination
LA-6	Between filter bed and aeration tank	(0-4") medium-brown moist soil material, gravel to ½" (20-24") fine to coarse sand and gravel mix, moist	NA	No evidence of contamination
LA-7	North of fence gate in wetland area	(0-4") medium to dark-gray, dense silty material, decaying wood, organic matter (20-24") medium to dark-gray, dense silty material, decaying wood, organic matter	NA	No evidence of contamination
LA-8	South of fence gate in wetland area	(0-4") medium to dark-gray, dense silty material, decaying wood, organic matter (20-24") medium to dark-gray, dense silty material, decaying wood, organic matter	NA	No evidence of contamination
WW-HB-1	North of wastewater treatment tanks (UST)	Medium brown, coarse to fine sandy soil	NA	No evidence of contamination
WW-HB-2	South of wastewater treatment tanks (UST)	Medium brown, coarse to fine sandy soil	NA	No evidence of contamination
Skim Shed-1	East end of skimmer shed, at effluent of floor drain	Medium brown moist soil material	NA	No evidence of contamination
Skim Shed-2	Southwest end of skimmer shed	Dark brown, moist, decaying leaf litter	NA	No evidence of contamination, slight chemical odor noted
Skim Shed-3	East end of skimmer shed, outside shed in sluiceway-pre skimmer shed	Dark brown, decaying leaf litter, humus like material	NA	No evidence of contamination

Table 15: Field Observations – Soil Sampling – East Wastewater Treatment Courtyard

Boring	Location	Soil Characteristics	PID Readings	Observations
WT-HB-1 (10-12')	West center invert of wastewater tanks	Medium brown, dense, clay-like soil material	0.0	No evidence of contamination
WT-HB-2 (10-12')	East center invert of wastewater tanks	Medium brown, dense, clay-like soil material	0.0	No evidence of contamination
WT-SSB-1 (0-12")	Northwest corner of courtyard	Dark brown, moist organic soil	0.0	No evidence of contamination
WT-SS-2 (0-12")	Southwest corner of courtyard	Dark brown, moist organic soil	0.0	No evidence of contamination

Table 16: Field Observations – Soil Sampling – Vicinity of Former Orchard

Boring	Location	Soil Characteristics	PID Readings	Observations
OR-1	North-central portion of former orchard	(0-4") medium brown, moist soil , gravel to ½" (20-24") light-brown soil material, gravel to ¼"	NA	No evidence of contamination
OR-2	North-central portion of former orchard	(0-4") medium to dark-brown, dense, moist (20-24") light-brown with gravel to ¼"	NA	No evidence of contamination
OR-3	Northwestern portion of former orchard	(0-4") medium to dark-brown, dense, moist (20-24") fine to coarse, medium brown, moist sand and gravel mix	NA	No evidence of contamination
OR-4	Northwestern portion of former orchard	(0-4") medium to dark-brown with some organic matter and gravel to ¼" (20-24") light-brown, dense, moist	NA	No evidence of contamination
OR-5	West-central portion of former orchard	(0-4") medium to dark-brown with some organic matter and gravel to ¼" (20-24") light-brown, dense, moist	NA	No evidence of contamination
OR-6	Central portion of former orchard	(0-4") medium to dark-brown with some organic matter and gravel to ¼" (20-24") light-brown, dense, moist	NA	No evidence of contamination
OR-7	Eastern portion of former orchard	(0-4") medium to dark-brown with some organic matter and gravel to ¼" (20-24") light-brown, dense, moist material	NA	No evidence of contamination
OR-8	Central portion of former orchard	(0-4") medium to dark-brown with some organic matter and gravel to ¼" (20-24") light-brown, dense, moist	NA	No evidence of contamination

Table 17: Field Observations – Sediment Sampling – Wetlands Area

Boring	Location	Soil Characteristics	PID Readings	Observations
WL-1	Northwestern portion of wetland	(0-4") dark-brown, saturated, organic soil with humus, root material and odor of decay	NA	No evidence of contamination
WL-2	Northwestern portion of wetland	(0-4") dark-brown, moist, organic soil with humus and root material	NA	No evidence of contamination
WL-3	West-central portion of wetland	(0-4") dark-brown, moist, organic soil with humus, root material and odor of decay	NA	No evidence of contamination
WL-4	Southwestern portion of wetland	(0-4") light to medium-dark gray, silty, clay-like	NA	No evidence of contamination
WL-5	Northeast end of wetland	(0-4") saturated medium to dark-brown with organic matter	NA	No evidence of contamination
WL-6	Easternmost end of wetland	(0-4") saturated medium to dark- brown with organic matter	NA	No evidence of contamination