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Associates, P.C.

Engineering
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Environmental

Final Remedial Investigation Work Plan: BCP Site# C8281324

Location:

3865 West Henrietta Road
Henrietta, New York 14623

Prepared for:

Dorschel Automotive Group
3817 West Henrietta Road
Rochester, New York 14623

LaBella Project No. 206139

August 2006

Relationships. Resources. Results.

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300 State Street
Rochester, New York 14614

Table of Contents

1.0 Introduction and Purpose

LaBella Associates, P.C. (LaBella) is pleased to submit this Final Remedial Investigation & Interim Remedial Measure Work Plan (Work Plan) to further characterize soil and groundwater conditions at 3865 West Henrietta Road, Town of Henrietta, Monroe County, New York, herein after referred to as the "Site". An active New York State Department of Environmental Conservation (NYSDEC) Spill (#9701554) is associated with the Site. Previous environmental investigation work at the Site (refer to Section 2.0) identified soil and groundwater impacted with petroleum products in the area of a former pump island.

The Site was recently purchased by the RJ Dorschel Group (Dorschel). Dorschel plans to remediate the Site and then redevelop the property as a commercial business. Due to the existence of known contamination in the soil and groundwater at the Site, Dorschel proposes to enter the Site into the Brownfield Cleanup Program (BCP) to conduct the Final Remedial Investigation and remediation work. As such, this Work Plan is being submitted in conjunction with a BCP Application. A pre-application meeting was held on February 22, 2006 with NYSDEC representatives, Dorschel, LaBella and Shaw & Knauf, LLP. During that meeting the general additional scope of work was discussed.

2.0 Site History and Description

The Site consists of approximately 1.1 acres of land improved by an approximate 3,750 square foot building which is currently vacant. [*Note: Currently, Dorschel anticipates using the existing building with potentially adding a service bay related addition to the building.*] The Site is in a commercial area, surrounded by various other commercial properties. A Site Location Map is included as Figure 1.

The following previous environmental reports have been completed for the Site:

- *Site Assessment Report, Steve Joy's Sunoco, 3865 West Henrietta Road, Rochester, Monroe County, NY* dated April 1997 prepared by Environmental Assessment and Remediation (EAR). EAR advanced seven soil borings at the Site and the report identified petroleum related soil and groundwater contamination at the Site in the area of underground storage tanks (USTs) and gasoline pump islands. Specifically, the volatile organic compounds (VOCs) benzene, toluene, ethylbenzene and xylenes (BTEX) were detected in soil samples at concentrations up to 495,100 parts per billion (ppb) and total BTEX in groundwater samples at concentrations up to 66,500 ppb. The recommended soil cleanup objective (RSCO) referenced in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 dated January 24, 1994 as amended by supplemental tables dated August 22, 2001 for total VOCs is 10,000 ppb. The NYSDEC Division of Water June 1998 *Technical Operation and Guidance Series 1.1.1* Ambient Groundwater Standards and Guidance Values (TOGS 1.1.1) lists standards for benzene at 1 ppb and toluene, ethylbenzene, and xylenes at 5 ppb. EAR indicated that groundwater was encountered at depths between approximately 1 to 2-feet below the ground surface. The approximate location of the EAR soil borings are shown on Figure 2.

- *Tank Closure Report, 3865 West Henrietta Road, Rochester, NY* dated March 31, 1998 prepared by Rowan Environmental Services, Inc. (Rowan). This report provides documentation on the removal of five (5) USTs from the Site in 1998; however, it does not appear that remediation of impacted soil and/or groundwater was conducted.

- *Soil Gas Survey and Soil Sampling Report for the Hazardous Waste Assessment of New York Route 15, Town of Henrietta, New York* dated March 1998 prepared by URS Greiner Consultants, Inc. (URS). URS conducted this work on behalf of the New York State Department of Transportation (NYSDOT), which consisted of advancing seven soil borings along the eastern edge of the property line in a right-of-way taking area. One of the soil borings advanced along the eastern property line encountered petroleum impacted soil. A sample of the impacted soil was submitted to a laboratory for a Toxicity Characteristic Leachate Procedure (TCLP) extraction and analyzed for VOCs. Six petroleum related VOCs exceeded TCLP extraction guidance values referenced in the NYSDEC Spill Technology and Remediation Series (STARS) memo #1.

- *Remedial Investigation Work Plan, NYSDEC Spill #9701554, 3865 West Henrietta Road, Henrietta, New York 14623* dated August 2005 prepared by LaBella. LaBella was retained to conduct an environmental investigation as part of a potential real estate transaction. As part of the work, LaBella met with the NYSDEC (Spills Group) on August 3, 2005 to discuss NYSDEC requirements for investigation of Spill #9701554. Based on this meeting, the following areas of concern required additional investigation:

  1. Two Former 1,000-gallon USTs
  2. Three Former 6,000-gallon USTs
  3. Former Gasoline Pump Islands
  4. Septic Tank/Leachfield

  As such, LaBella submitted a Remedial Investigation (RI) Work Plan dated August 2005 that provided the anticipated soil and groundwater investigation activities for the Site. The NYSDEC (Spills Group) approved the RI Work Plan in an August 30, 2005 letter.

- *Remedial Investigation Report: NYSDEC Spill #9701554, 3865 West Henrietta Road, Henrietta, New York 14623* dated October 2005 prepared by LaBella. This report documents the work completed as part of the RI completed through the NYSDEC (Spills Group). As part of this work, twenty-six (26) soil borings were advanced (designated TB-3 through TB-28) in the areas of concern identified in the RI Work Plan. The approximate locations of the test borings are shown on Figure 2. [*Note: Initially two test borings (TB-1 and TB-2) were advanced on the property to the south and these borings have are not included on Figure 2.*] Five (5) of these test borings were converted into 1-inch diameter polyvinyl chloride (PVC) groundwater monitoring wells. A summary of the RI findings for each area of concern is below.

Two Former 1,000-Gallon USTs

Evidence of impairment was not encountered in the three test borings advanced in this area. Although a soil sample was not submitted from this area, a groundwater sample from MW-3 did not detect concentrations of VOCs or Semi-VOCs (SVOCs) above the NYSDEC TOGS 1.1.1 standards or guidance values. As such, it was concluded that this area does not appear to represent a remedial concern.

Three Former 6,000-Gallon USTs

Evidence of impairment was not encountered in the three test borings advanced in this area. A soil sample from this area did not detect concentrations of VOCs or SVOCs above the reported laboratory detection limits. As such, it was concluded that this area does not appear to represent a remedial concern. [*Note: A monitoring well was installed in this area; however, at the time of sampling, this monitoring well (MW-5) was observed to be dry.*]

Former Gasoline Pump Islands

Significant evidence of impairment was encountered in seven of the test borings (TB-3, TB-4, TB-5, TB-6, TB-20, TB-21, and TB-28) advanced in the area of the former gasoline pump islands. Two soil samples (from borings TB-21 and TB-28) and a groundwater sample (from MW-1) collected from this area detected VOCs and one SVOC (naphthalene) at concentrations above applicable NYSDEC cleanup criteria. In addition two soil samples (from borings TB-19 and TB-26) and a groundwater sample (from MW-4) were collected from anticipated 'clean' areas to evaluate the extent of contamination. Based on these findings, there appears to be a significant remedial concern in the area of the former gasoline pump islands. The inferred extent of soil and groundwater impairment is shown on Figure 3. It was recommended that the report be provided to the NYSDEC and subsequently, a meeting with the NYSDEC be held in order to determine remedial objectives for the Site.

Septic Tank/Leachfield

Four test borings advanced in the area of the septic tank and leachfield did not encounter evidence of impairment. A soil sample and groundwater sample from this area did not detect concentrations of VOCs or SVOCs above the reported laboratory detection limits. [*Note: The groundwater sample (MW-2) was also tested for chlorinated VOCs, which were also not detected above the reported laboratory detection limits.*] As such, it does not appear that the septic tank/leachfield area represents a remedial concern at this time.

In addition to the above reports, LaBella also completed a Phase II Environmental Site Assessment (ESA) at 3875 West Henrietta Road (the property directly to the south of the Site), herein after referred to as the "southern adjacent property". This Phase II ESA was conducted in order to evaluate potential impacts from operations at that Site; however, some investigation work was also conducted along the property line of these parcels in order to evaluate potential impacts from the Site to the property to the south. The *Phase II Environmental Site Assessment: Preliminary Site Characterization, 3875 West Henrietta Road, Henrietta New York* report dated November 2005 was submitted to the NYSDEC (Spills Group) in order to request closure of a Spill File (Spill #9970099) associated with contamination in the right-of-way (ROW). A summary of the information from this Phase II ESA that is pertinent to the Site is provided below.

The Phase II ESA conducted at the southern adjacent property consisted of advancing twenty test borings and converting three of these test borings into 1-inch diameter groundwater monitoring wells. Nine of these twenty test borings were completed within approximately 20-feet of the northern property line (i.e., the southern property line of the Site) and two of these borings were converted into monitoring wells. The borings and wells completed within about 20-feet of the property line are shown on Figure 2 and have been designated as OS-TB-5, OS-TB-6, OS-TB-7, OS-TB-10 (OS-MW-1), OS-TB-11, OS-TB-12, OS-TB-18, OS-TB-19 (OS-MW-3), and OS-TB-20. Although slight petroleum odors were noted in four of the nine test borings advanced within twenty feet of the property line, two soil samples (from OS-TB-12 and OS-TB-20) were analyzed from these borings (samples with the highest photo-ionization detector [PID] readings) and these samples did not detect concentrations of VOCs or SVOCs with the exception of one VOC (sec-butylbenzene), which was below the NYSDEC TAGM RSCO. In addition, the two groundwater samples collected from the wells within 20-feet of the property line did not detect concentrations of VOCs or SVOCs above the laboratory detection limits, with the exception of one VOC in OS-MW-3. The concentration of the VOC detected (benzene – 1.81 part per billion [ppb]) is only slightly above the NYSDEC TOGS 1.1.1 standard of 1 ppb. [*Note: These slight detections of VOCs in soil and groundwater were in areas of historic petroleum use (i.e., an oil/water separator and former USTs) on the adjacent southern property.*]

Based on the findings from the Phase II ESA for the southern adjacent property, it does not appear that contaminants from the Site have migrated to the south.

3.0 Summary of Geologic and Hydrogeologic Conditions

Site geologic features are based primarily on information obtained from the advancement of the 28 test borings completed as part of the RI.

- Underneath the asphalt pavement, a layer consisting primarily of sand and gravel was encountered to depths generally ranging between 1-foot and 5.5-feet below the ground surface.
- Two soil borings encountered sand and gravel to approximately 10-feet below the ground surface.

- One test boring encountered sand and gravel to 6-feet below the ground surface where equipment refusal was encountered.
- Underlying the sand and gravel, the soil consisted primarily of silt and clay.
- Apparent groundwater was generally encountered in each test boring at approximately 4 feet below the ground surface. Static water levels were collected at the time of groundwater sampling and noted groundwater at depths ranging between approximately 1.7-feet and 5-feet below the ground surface. [*Note: A groundwater contour map has not been developed to date.*]

4.0 Objectives, Scope and Rationale

The objectives of this Work Plan are to further define the extent of contamination at the Site, including at the property boundaries, conduct a qualitative exposure assessment for actual or potential exposures to contaminants emanating from the Site, and to produce data that will support the development of an acceptable Remedial Work Plan.

The Scope of Work for the Work Plan will be performed on a phased basis with each Task providing data to guide remaining Tasks. The scope of work is based on discussions with the NYSDEC, previously gathered analytical data, information previously gathered regarding current and historical processes and activities conducted at the Site and the project objectives. In addition, this work plan was revised base don a July 21, 2006 comment letter from NYSDEC and subsequent discussions with NYSDEC.

The Final Remedial Investigation work will be completed in general accordance with NYSDEC Division of Environmental Remediation: *Draft Technical Guidance for Site Investigation and Remediation* dated December 2002 (DER-10).

5.0 Final Remedial Investigation Work

The remedial investigation work is provided in this section.

5.1 Field Activities Plan

The field activities to be completed as part of the work plan have been separated into five tasks and are presented below. [*Note: Select tasks will be completed subsequent to the planned Interim Remedial Measure (IRM) at the Site.*] A list with contact information of the personnel involved with the project is included in Appendix 1. Qualifications for the personnel are also included.

During all ground intrusive work conducted at the Site, air monitoring will be conducted in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP). A copy of this plan is included as Appendix 2.

Task 1. Septic Tank and Leachfield Evaluation

Previous environmental reports completed for the Site included mapping on the general location of the septic tank and leachfield; however, the mapping does not provide the specific location (i.e., not to scale).

Although soil and groundwater samples were collected previously from the apparent leachfield area as part of the previous RI work, NYSDEC has requested some additional evaluation of the septic tank and leachfield areas. The requested tasks area listed below:

1.1 Initially, LaBella will attempt to obtain additional information on the location of the septic tank and leachfield. The additional research will include contacting the previous Site owner for any design or as-built drawings; contacting the Town of Henrietta Engineer; and, Monroe County Department of Health (MCDOH).

1.2 Subsequently, LaBella will attempt to locate the septic tank in the field and if located access the septic tank. If accessible and contents are observed in the septic tank, a sample of the liquid and sediment will be collected and tested for the following parameters.

- United States Environmental Protection Agency (USEPA) Target Compound List (TCL) and NYSDEC Spill Technology and Remediation Series (STARS) List VOCs including up to 30 Tentatively Identified Compounds (TICs) using USEPA Method 8260;
- USEPA TCL Semi-Volatile Organic Compounds (SVOCs) including up to 30 TICs using USEPA Method 8270;
- Polychlorinated Biphenyls (PCBs) using USEPA Method 8082; and,
- Target Analyte List (TAL) Metals using USEPA Methods 6010 and 7471.

The samples will be submitted under chain of custody control for testing to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory and the results will be submitted in an ASP Category B Deliverables data package. [*Note: Based on the results of the septic tank contents sampling, the soil and groundwater sampling parameters may be varied.*]

Task 2. Surface Soil Sampling

Two areas of surface soil are located within the property boundaries of the Site. Specifically, a thin strip of surface soil (grass covered) is located along the northern property boundary and is about 10 ft. wide and 100 ft. in length. The second area of surface soil is also a thin strip located along the eastern property boundary and is also about 10 ft. wide and 100 ft. in length. As requested by NYSDEC, surface soil samples will be collected from the 0 to 2-inch depth. Specifically, two surface soil samples will be collected, one from northern strip of surface soils and one from the eastern strip of surface soils. The surface soil samples will be collected using new sterile sampling spoons to prevent cross-contamination of the samples. The samples will be submitted to a NYSDOH ELAP-certfied laboratory and tested for the following parameters:

- USEPA TCL and NYSDEC STARS-List VOCs including up to 30 TICs using USEPA Method 8260;
- USEPA TCL SVOCs including up to 30 TICs using USEPA Method 8270;
- PCBs using USEPA Method 8082;

- Pesticides using USEPA Method8081; and,
- TAL Metals using USEPA Methods 6010 and 7471.

The analytical test result of the surface soil samples will be provided in an ASP Category B Deliverables package.

Task 3. Overburden Soil Boring Investigation, Sampling and Analysis

Under this Task, LaBella will implement a Direct Push "Geo-Probe" Overburden Soil Boring Investigation, Sampling and Analysis Study at the Site in order to further characterize the Site. This Task will include advancing approximately thirteen soil borings at the Site. The locations for these borings have been selected based on existing geologic and analytical data that is currently available. [*Note: Three of the test borings will be converted into groundwater monitoring wells (refer to Task 4).*] The locations for these borings are depicted on Figure 2.

This phase of the investigation is designed to satisfy the following objectives:

- Provide further characterization of the Site for other potential contaminants not initially evaluated for in previous investigations.
- Further delineate the extent of the petroleum impacted soil in the pump island area.
- Evaluate soil and groundwater conditions along the eastern property line (i.e., the apparent downgradient direction), the northern property line, and to the east of the Site in the ROW across West Henrietta Road.

To complete these objectives the following scope of work will be implemented:

3.1 An Underground Facilities Protection Organization (UFPO) stakeout will be conducted at the Site to locate any subsurface utilities in the areas where the subsurface assessment and delineation will take place.

3.2 LaBella Associates will retain the services of a specialized contractor to implement a direct push "geoprobe" soil boring and sampling program at the Site. It is anticipated that one day of borings will be conducted at the Site.

3.3 Each boring implemented at the Site will be advanced to approximately twelve feet in depth or to equipment refusal. Final soil boring locations will be selected based on the information provided by the UFPO stakeout.

3.4 The drilling equipment will be required to be decontaminated prior to use, including an alconox and potable water wash followed by a potable water rinse. In between each boring, decontamination procedures will be repeated.

3.5 Soils from the borings will be screened in the field for visible impairment, olfactory indications of impairment, evidence of non-aqueous phase liquids (NAPLs), and/or indication of detectable VOCs with a photo-ionization detector (PID) collectively referred to as "evidence of impairment."

3.6 Soil samples will be collected from the borings based on evidence of impairment. The anticipated sampling plan is provided below and with the anticipated locations; however, the actual locations may vary depending on field observations.

Soil Sampling Plan

Area of Concern	Test Parameters / Number of Samples				
	TCL VOCs	**TCL SVOCs**	**Pesticides**	**TAL Metals**	**PCBs**
Pump Islands	4	1	1	3	1
Septic Tank	1	1	1	1	1
Leachfield	1	1	1	1	1
Beneath the Building	2	2	1	2	1
Off-Site (to East)	1	1	0	0	0
Area of MW-8	1	1	1	1	1
Total	**10**	**7**	**5**	**8**	**5**

- TCL VOC analysis by USEPA Method 8260 (including 30 TICs)
- SVOC analysis by USEPA Method 8270 (including 30 TICs)
- PCBs analysis by USEPA Method 8082
- Pesticides analysis by USEPA Method 8081
- TAL Metals analysis by USEPA Methods 6010 and 7471

The soil samples will be collected from the apparent 'worst-case' locations within the soil borings advanced in that area. In the event that evidence of impairment is not encountered, the soil samples will be collected from the soil-groundwater interface. In the event that two apparently discrete sources are identified within the same boring, sample of each 'worst-case' source will be collected/analyzed.

Laboratory Quality Assurance/Quality Control (QA/QC) will include analysis of sample blanks as follows: one trip blank, one field blank, and one method blank for soil samples. The soil samples will be delivered under Chain of Custody procedures to Severn Trent Laboratories of Buffalo New York for analysis. Severn Trent will provide a NYSDEC ASP Category B Deliverables data package. [*Note: Based on the results of the septic tank contents sampling (Task 1 above), the testing parameters for the soil samples from in proximity to the septic tank and leachfield may be varied.*]

3.7 Soil cuttings and decontamination water generated during advancement of the test borings will be containerized. It is anticipated that the soil cuttings and decon water will remain on-site and addressed as part of the IRM (refer to Section 6.0).

Task 4. Overburden Groundwater Investigation, Sampling, and Analysis

Under this Task LaBella Associates will implement a Direct Push "Geo-Probe" Overburden Groundwater Investigation, Sampling, and Analysis Study at the Site. This Task will include installing three (3) shallow overburden groundwater monitoring wells at the Site (designated MW-6, MW-7, and MW-8). [*Note: This task will be completed in conjunction with Task 3.*] The locations for these groundwater monitoring wells have been selected based on data that is currently available. The locations may be adjusted with concurrence of the NYSDEC based on the field observations of the soil borings in Task 3. The locations for these proposed groundwater monitoring wells are depicted on Figure 2.

This phase of the investigation is designed to satisfy the following objectives:

- Provide characterization of the contaminant plume in the shallow overburden groundwater at the down-gradient and cross-gradient property lines. This analytical data will assist in determining if an off-site transport issue exists in regard to the release identified at the Site.
- Provide characterization of the up-gradient groundwater quality entering the Site.
- Determine localized groundwater flow directions and shallow overburden aquifer characteristics.

To complete these objectives the following scope of work will be implemented:

4.1 At this time, it is anticipated that the three (3) shallow overburden groundwater monitoring wells will be installed in the following locations:

- Two shallow overburden groundwater monitoring wells will be advanced along the eastern property line to evaluate potential off-site impacts due to the petroleum contamination in the pump island area (MW-6 and MW-7).
- One shallow overburden groundwater monitoring well will be advanced in the southwest portion of the Site to evaluate this area and potential up gradient groundwater conditions (MW-8).

Final well locations will be selected based on the information provided by Tasks 1 and 3 and the location of underground utilities.

4.2 The overburden wells will be set to intersect the top of the shallow groundwater table. Each well will be completed with 5 to10-feet of 1-inch Schedule 40 0.010-slot well screen connected to an appropriate length of schedule 40 PVC well riser to complete the well. The annulus will be sand packed with quartz sand to approximately 1 to 2-feet above the screen section. The remaining annulus will be bentonite sealed to approximately 1 to 2-feet below ground surface, and then grouted to ground surface. Each well will be completed with a flush mount well cover.

4.3 The three new groundwater monitoring wells will be developed and then allowed to equilibrate for at least 48 hours prior to purging and sampling. Well development will include removing at least 5 well volumes or to dryness.

4.4 Subsequent to developing the three new monitoring wells, groundwater samples will be collected from these monitoring wells and from select existing monitoring wells at the Site. Prior to sample purging, each well will be checked with an interface probe to evaluate for potential NAPL in the wells. The wells will then be purged and sampled using disposable bailers. Field measurements of indicator parameters such as temperature, pH, specific conductance, etc. will be utilized to determine the amount of water to purge and when to sample the wells. These parameters will be measured in the purge water until they stabilize.

The following samples are anticipated to be collected from the three new monitoring wells and the existing monitoring wells:

Groundwater Sampling Plan

Area of Concern	**Test Parameters / Number of Samples**				
	TCL VOCs	**TCL SVOCs**	**Pesticides**	**TAL Metals**	**PCBs**
MW-1	1	0	1	1	1
MW-2	1	1	1	1	1
MW-3	1	1	0	1	0
MW-4	1	1	0	1	0
MW-5	1	1	0	0	0
MW-6	1	1	0	0	0
MW-7	1	1	0	0	0
MW-8	1	1	1	1	1
Total	**8**	**8**	**3**	**6**	**3**

- TCL VOC analysis by USEPA Method 8260 (including 30 TICs)
- SVOC analysis by USEPA Method 8270 (including 30 TICs)
- PCBs analysis by USEPA Method 8082
- Pesticides analysis by USEPA Method 8081
- TAL Metals analysis by USEPA Methods 6010 and 7471

[*Note: Based on the results of the septic tank contents sampling (Task 1) and the soil sampling (Tasks 2 & 3), the testing parameters for the groundwater samples may be varied.*]

4.5 A second round of groundwater samples will be collected from each well at the Site (i.e., all 8 monitoring wells). At this time it is expected that the second round of groundwater samples will be limited to sampling for NYSDEC STARS-List VOCs and this sampling will be conducted after completing the IRM (i.e., to evaluate post-IRM contaminant concentrations in groundwater). [*Note: In the event that contaminants other than VOCs are detected in the soil sampling program or the first round of groundwater samples then additional parameters will be added to the groundwater samples as warranted. The NYSDEC will be contacted prior to conducting each round of groundwater sampling in order to confirm sampling parameters.*]

Laboratory QA/QC will include analysis of sample blanks as follows: one trip, one field, and one method blank will be analyzed for each round of groundwater samples. Severn Trent will provide a NYSDEC ASP Category B Deliverables data package.

4.6 Soil and groundwater generated during well installation, development and purging activities will be containerized in 55-gallon drums and staged on-site temporarily until it can be addressed during the planned IRM for the Site.

4.7 Each of the monitoring wells will be surveyed for elevation and located using a Global Positioning System (GPS) GeoXT with GeoBeacon. Each of the monitoring wells will be used for developing groundwater contour maps for the Site (to be included in the Final RI Report). The wells may also be used for evaluating hydraulic conductivity.

Task 5. Soil Gas Investigation

The purpose of this investigation activity will be to determine if the impacted subsurface soils and groundwater have the potential to adversely affect indoor air quality via the vapor intrusion pathway to the on-site building and potentially off-site. [*Note: This task will not be conducted until Tasks 1,2, 3 and 4 and the IRM are completed. This staged approach appears warranted since the downgradient direction will not be determined until after Task 3 and 4 are completed. In addition, since it is already known that the pump island area requires remediation then the potential downgradient concentrations should change subsequent to the IRM. As such, the potential off-site impacts may change depending on the effectiveness of the IRM.*]

This phase of the investigation is designed to satisfy the following objectives:

- Evaluate the potential vapor intrusion pathway for the building at the Site.
- Evaluate the downgradient vapor intrusion pathway.
- Evaluate potential off-site impacts to the east of the property (i.e., apparent downgradient direction) and along the northern property line.

To complete this Task the following scope of work will be implemented:

5.1 To evaluate these potential pathways/impacts, five (5) soil gas samples are proposed. At this time, it is expected that two soil sub-slab soil gas sampling points will be installed within the building at the Site; one soil gas sampling point will be installed along the eastern property line; one soil gas sampling point will be installed in the eastern portion of the West Henrietta Road ROW; and, one soil gas sampling point will be installed along the northern property line. In the event that findings from Tasks 1 through 4 or the IRM indicate that alternative locations appear warranted, the NYSDEC will be contacted to discuss.

5.2 The installation and sampling of the soil gas points will be completed in general accordance with the procedures provided in the *Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated February 2005. The applicable procedures to be implemented as part of this investigation are summarized below:

5.3 Soil gas sampling points will be installed using direct push technology to approximately 4 to 5 feet in-depth. A porous backfill material (e.g., glass beads or coarse sand) will be used to create a sampling zone of 1 to 2 feet in length. The soil gas sampling points will be constructed of 1-inch PVC well screen connected to a riser pipe or inert tubing (e.g., polyethylene, stainless steel, or Teflon®) of the appropriate size (typically 1/8 inch to 1/4 inch diameter) and of laboratory or food grade quality to the surface. The soil vapor probes will be sealed above the sampling zone with a minimum 1-foot bentonite slurry. In addition, the sampling zone will be a minimum of 3-feet below the ground surface in order to minimize outdoor air infiltration. The remainder of the borehole will be backfilled with clean material. Soil gas sampling points will be finished with protective casings that are grouted in place to minimize infiltration of water or outdoor air and to prevent damage to the soil gas point.

5.4 Sequent to installation, the probes will be allowed to equilibrate at least 24 hours prior to purging and sampling. Prior to sampling, one to three probe volumes (i.e., the volume of the sample probe and tube/riser pipe) will be purged in order to ensure that the samples collected are representative of soil gas conditions. The flow rate during purging will not exceed 0.2 liters per minute (L/min) to minimize outdoor air infiltration.

5.5 During purging of the sample point, a tracer gas evaluation may also be conducted to verify the integrity of the soil gas probe seal. An appropriate tracer gas will be used (e.g., sulfur hexafluoride (SF6), helium, etc.) An enclosure will be constructed around the soil gas sampling point (e.g., plastic bag, plastic bucket, etc.) and sealed to the sample point casing. Subsequently, the enclosure will be enriched with the tracer gas. The purged soil gas will then be tested for the tracer gas by an appropriate meter (i.e., a meter capable of measuring the concentration of the tracer gas in at least percentage increments). In the event that the tracer gas is detected at a concentration of 20% or greater, the sample point will be resealed prior to sampling.

5.6 Soil gas samples will be collected over the same general time period and in the same manner at all locations to minimize possible discrepancies. Soil gas samples will be collected using Summa Canisters® equipped with flow control regulators. The regulators will be calibrated by the laboratory for a sampling time of 6-hours. The Summa Canister will be connected to the soil gas sampling point via inert tubing (e.g., polyethylene, stainless steel, or Teflon®).

5.7 Subsequent to completing soil gas sampling, the samples will be sent under chain of custody control to the laboratory for testing. The samples will be tested for VOCs using USEPA Method TO-15. A minimum detection limit of 1 $\mu g/m^3$ should be achievable based on the sample volume and analytical method.

5.8 At the time of sampling, the following information will be documented that could influence interpretation of the results:

- inventory of volatile chemicals used at the Site during normal operations of the facility;
- a sketch of the Site and sampling locations relative to area streets, neighboring properties and structures (with estimated distance to the site), outdoor ambient air sample location(s), if applicable, and orientation (north arrow);

- weather conditions (e.g., precipitation, outdoor temperature, barometric pressure, wind speed and direction) should be noted for the past 24 to 48 hours; and,
- any pertinent observations should be recorded, such as odors and readings from field instrumentation.

In addition to the above information, a sample log sheet summarizing the following information for each sample will be documented:

- sample identification;
- date and time of sample collection;
- sampling depth;
- identity of sampler(s);
- sampling methods and devices;
- purge volumes;
- volume of soil vapor extracted;
- the vacuum before and after samples are collected;
- apparent moisture content (dry, moist, saturated, etc.) of the sampling zone; and,
- chain of custody protocols used to track samples from sampling point to analysis.

Task 6. Qualitative Exposure Assessment

The Qualitative Exposure Assessment will evaluate whether potential or completed exposure pathways exist. This assessment will be based on the data generated during previous work and as part of this Work Plan and will include the following areas of evaluation:

- Source Area – The potential source area (i.e., pump island area).
- Fate & Transport – The property boundary data will be evaluated for potential off-site migration via soil, groundwater, and/or soil gas.
- Route of Exposure – The results of site sampling will be interpreted to determine if contaminant concentrations are at levels that have the potential to be inhaled or injested.
- Receptor Population – The Site will be evaluated to determine the size and makeup of potential down-gradient receptors including residents, workers, and neighbors.

No Fish and Wildlife Resources Impact Analysis (FWRIA) will be completed for the Site based on the absence of fish and/or wildlife resources on or adjacent to the Site, per NYSDEC DER-10 Paragraph 3.10.1(b)1.

5.2 Quality Assurance/Quality Control Plan

Activities completed at the Site will be managed under LaBella's Quality Control Program, which is included in Appendix 3. Specific QA/QC sampling to be completed as part of this project is included in the Tasks described above. A Data Usability Summary Report (DUSR) will be completed on the sampling included as part of the Final Remedial Investigation work. In addition, a DUSR will also be completed on the previous analytical results obtained as part of the Remedial Investigation work completed by LaBella in 2005 as part of the NYSDEC Spills Program.

6.0 Health and Safety Plan

A Health and Safety Plan (HASP) has been developed for the Site and is included in Appendix 4.

7.0 Reporting and Schedule

Subsequent to completing the work outlined above a Final Remedial Investigation Report will be developed in general accordance with NYSDEC DER-10. The anticipated schedule for the work to be completed is included in Appendix 5. This schedule is dependent on NYSDEC approvals and does not account for potential delays due to public comments, weather conditions, etc.

8.0 Citizen Participation Activities

A citizen participation plan (CPP) will be developed for the project and submitted separately within 20-days of an executed Brownfield Cleanup Agreement (BCA). The CPP will include the following (at a minimum):

- Updates to the names and addresses on the BCP Application (if any);
- Identifies major issues related to the Site;
- A description of citizen participation activities already performed;
- Identifies the document repository; and,
- Includes a description and schedule of public participation activities.

Although the CPP will describe the activities and schedule of the citizen participation activities subsequent to signing of the BCA, until that time, it is understood that the following citizen participation activities will be completed, subsequent to the NYSDEC determining that the BCP application is complete.

- A newspaper notice will be published.
- The required notice will be mailed to the Site Contact List.
- A certification of mailing will be sent to the NYSDEC within 10-days of mailing.
- Proof of the newspaper notice will also be sent (i.e., receipt and/or copy of newspaper notice) within 10-days of receiving.
- The BCP application and this Work Plan will be placed in the document repository for a 45-day waiting period.

LaBella Associates, P.C.
300 State Street
Rochester, New York 14614

Figures

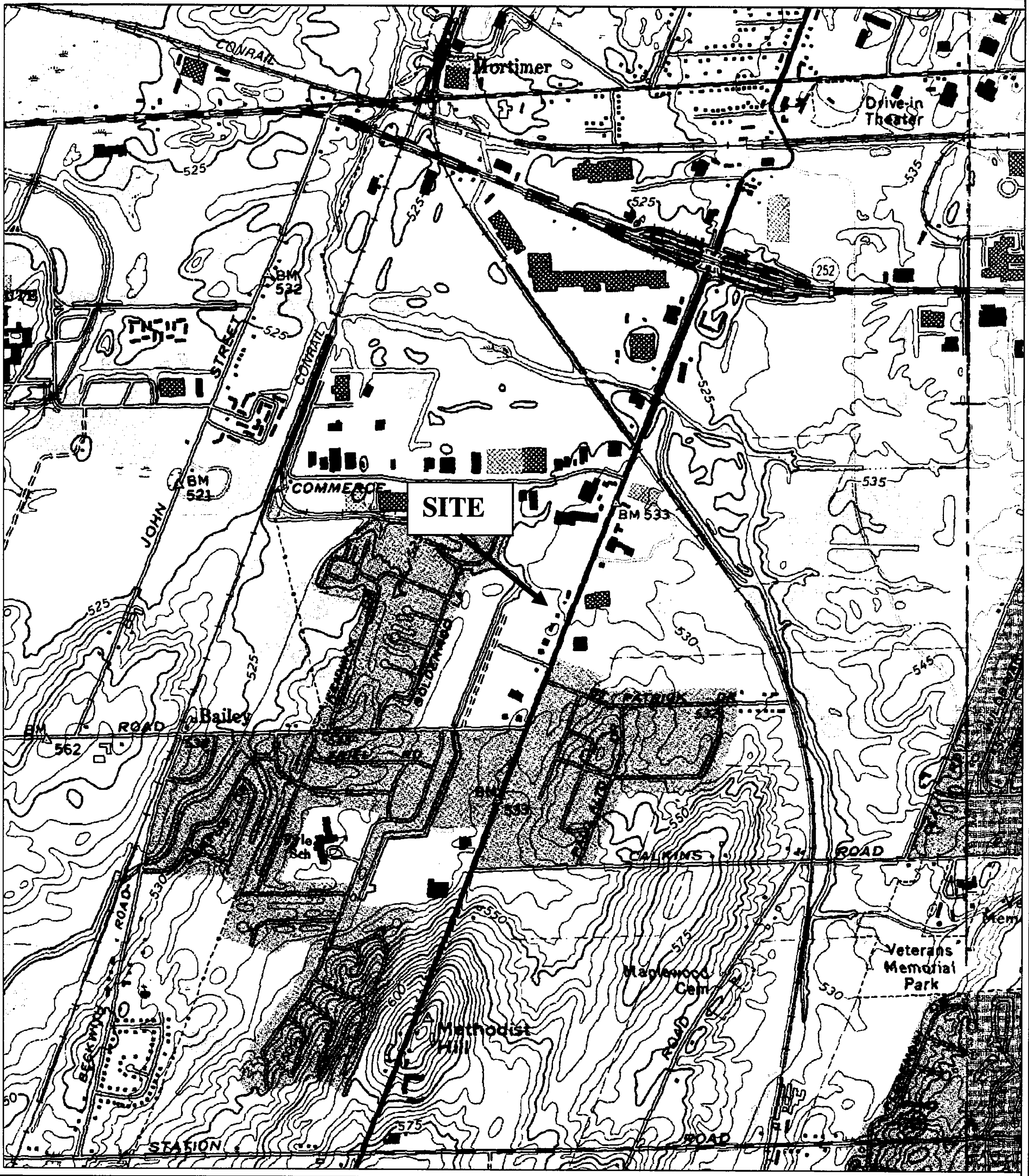

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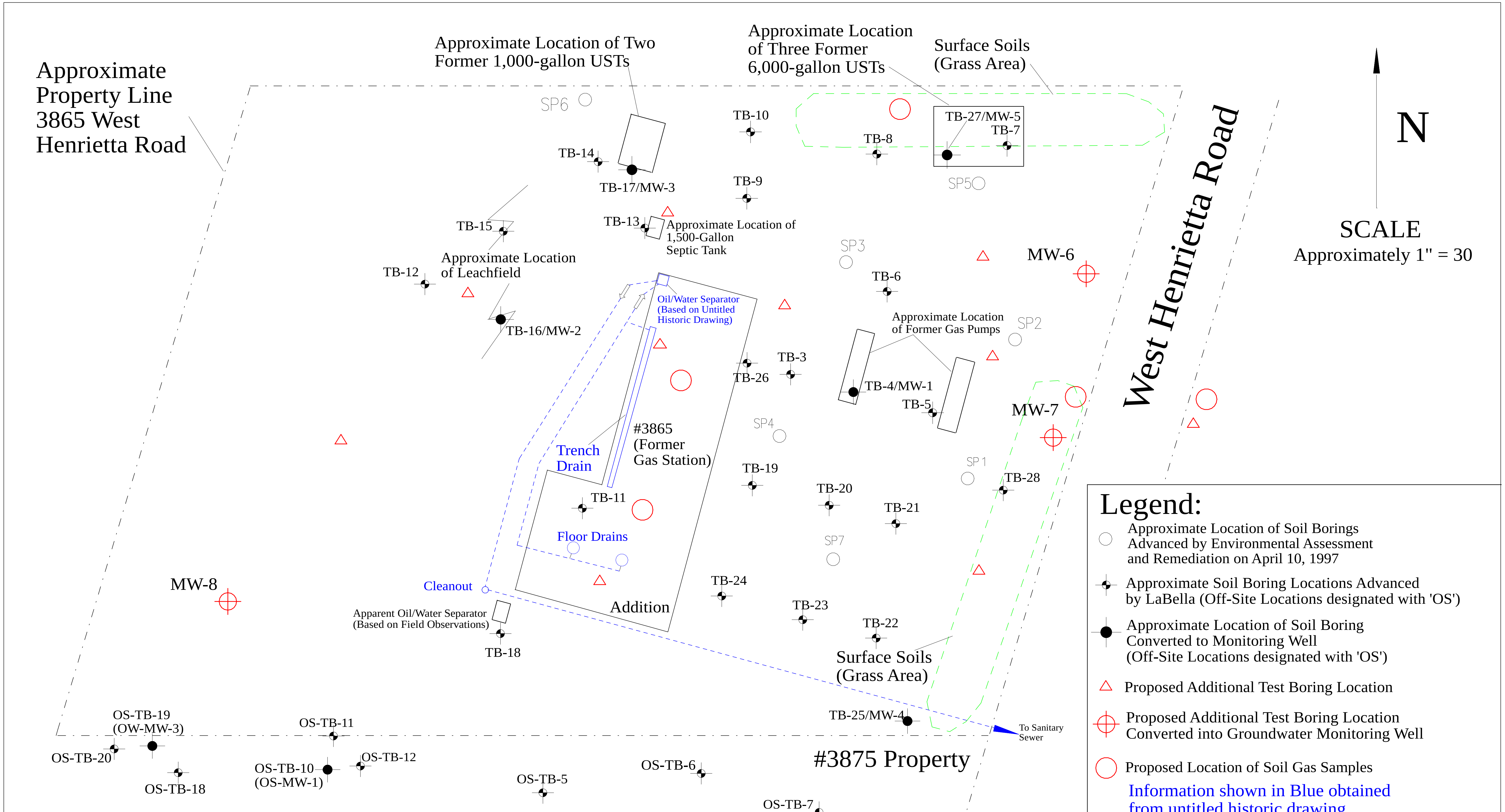
FIGURE 1
SITE LOCATION MAP

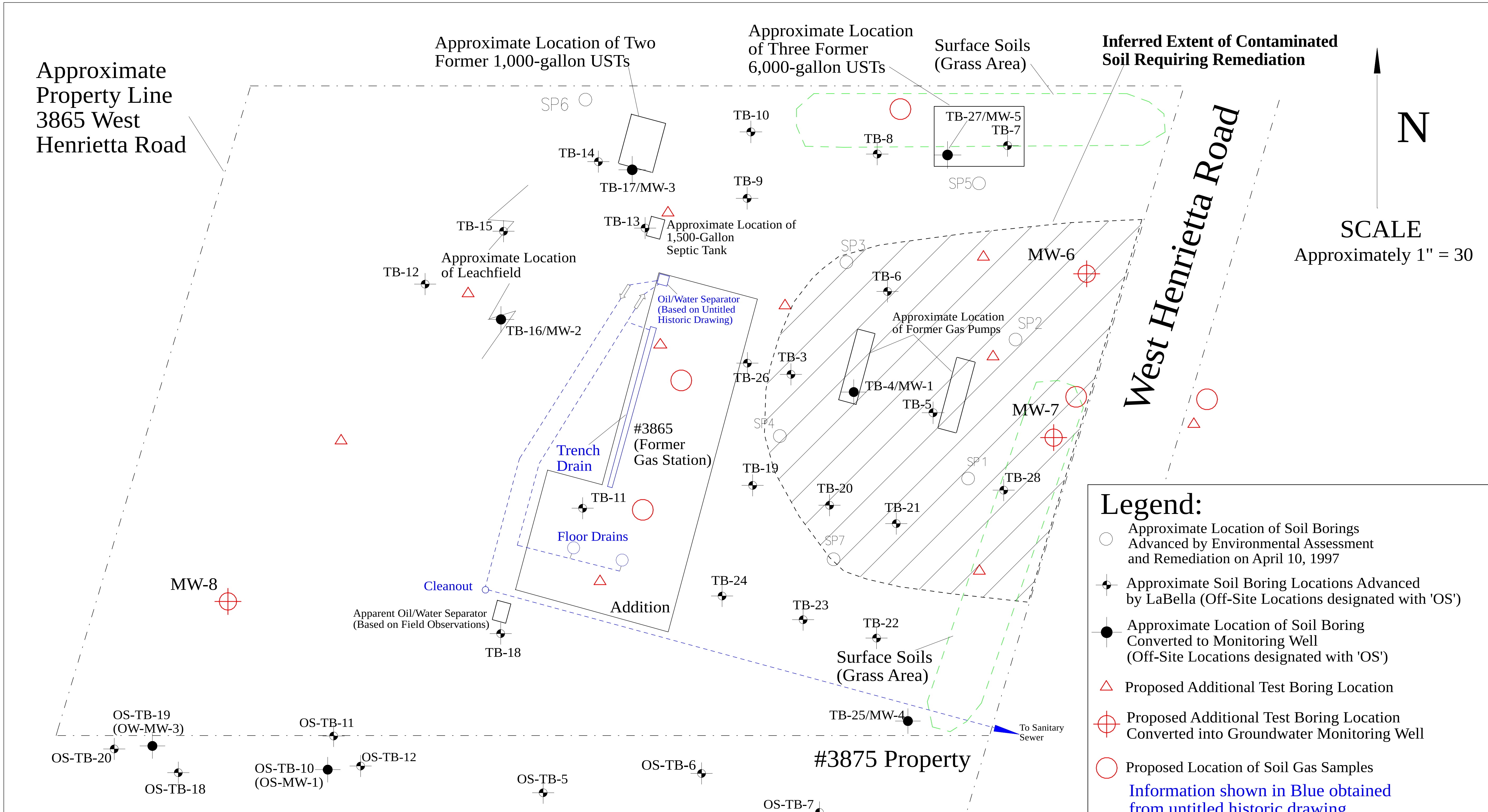
Final Remedial Investigation Work Plan
BCP Site #C8281324
3865 West Henrietta Road
Henrietta, New York 14623

LABELLA

PROJECT NO. 206139



PROJECT/DRAWING NO.	DRAWING TITLE	PROJECT/LOCATION	
[206139]	SITE PLAN WITH PREVIOUS ON-SITE/OFF-SITE AND PROPOSED TEST BORING LOCATIONS	FINAL REMEDIAL INVESTIGATION WORK PLAN	LABELLA Associates, P.C.
[FIGURE 2]	ISSUED FOR FINAL DATE: AUGUST 2006 DESIGNED BY: DPN DRAWN BY: DPN REVIEWED BY: GRS	BCP SITE #C8281324 NYSDEC SPILL #9701554 3865 WEST HENRIETTA RD ROCHESTER, NEW YORK	300 STATE STREET ROCHESTER, NY 14614 P: (585) 454-6110 F: (585) 454-3066



PROJECT/DRAWING NO.	DRAWING TITLE	PROJECT/LOCATION	
[206139]	SITE PLAN WITH PREVIOUS ON-SITE/OFF-SITE AND PROPOSED TEST BORING LOCATIONS	FINAL REMEDIAL INVESTIGATION WORK PLAN	LABELLA Associates, P.C.
[FIGURE 3]	ISSUED FOR FINAL DATE: AUGUST 2006 DESIGNED BY: DPN DRAWN BY: DPN REVIEWED BY: GRS	BCP SITE #C8281324 NYSDEC SPILL #9701554 3865 WEST HENRIETTA RD ROCHESTER, NEW YORK	300 STATE STREET ROCHESTER, NY 14614 P: (585) 454-6110 F: (585) 454-3066

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300 State Street
Rochester, New York 14614

Appendix 1

Contact List Information & Qualifications

Former Steve Joy's Sunoco
BPC Site #C8281324

3865 West Henrietta Road
Rochester, New York

Contact List Information

Environmental Professional: LaBella Associates

Project Manager	Dan Noll	ph. 585-295-6611
Environmental Director	Greg Senecal	ph. 585-295-6243 cell 585-752-6480
Site Safety Supervisor	Mike Pelychaty	ph. 585-295-6253 cell 585-451-6225
Quality Assurance Officer	Craig Stiles	ph. 585-295-6283 cell 585-747-8667
LaBella Safety Director	Richard Rote, CIH	ph. 585-295-6241

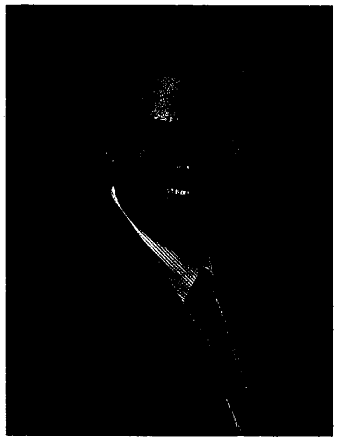
BCP Volunteer: RJ Dorschel Corporation

Contact: Al Baronas 585-241-2403

Drilling Contractor: Trec Environmental, Inc.

Contact: Keith Hambley 585-594-5545

Gregory R. Senecal, CHMM



Mr. Senecal is the Environmental Division Director and is a Certified Hazardous Materials Manager. Mr. Senecal is responsible for the direction of all environmental investigation related projects undertaken by the firm. Mr. Senecal has 16 years experience in designing, managing, and conducting numerous, remedial projects, Brownfield assessment and redevelopment projects groundwater monitoring well installations, test pit excavations, and underground petroleum storage tank removals and spill clean ups.

Education:

- SUNY Environmental Science and Forestry at Syracuse: BS, Environmental Science
- SUNY Cobleskill: AAS, Fisheries and Wildlife Technology

Certification/Registration:

- Certified Hazardous Materials Manager (CHMM)
- Certified Hazardous Waste Operations & Emergency Response (40 Hour OSHA Health and Safety Training 29)
- Advanced CPR and First Aid

Key Projects:

- **Foster Wheeler Plant Site Characterization, Dansville, NY**
  Project Manager for this due diligence investigation consisted of a complete Phase I Environmental Site Assessment and Phase II Site Characterization.

- **Environmental Term Agreement, City of Rochester, NY**
  Project Manager who directs all of the projects under the term. Projects range from Phase I Environmental Site Assessments to Site Characterizations, Remedial Cost Estimates, and Brownfield Cleanups.

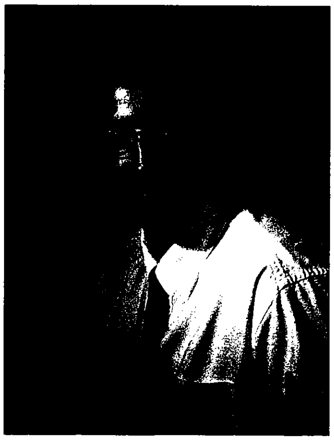
- **Port of Rochester Re-Development Project Phase II Site Characterization, Rochester, NY**
  Project Manager for complete Phase II Site Characterization, which involved sub surface characterization of approximately 38 acres. Mr. Senecal directed the environmental team who received a beneficial re-use determination to re use 80,000 cubic yards of iron foundry slag as on site fill.

- **Bureau of Water, Lighting, and Parking Meter Operations, Rochester, NY**
  Mr. Senecal served as Client Manager to remediate the Water Bureau site to obtain regulatory closure or inactivation. The project scope includes the redevelopment of the current site for reuse as a new facility for the operations center.

- **CSXT Train Derailment & Hazardous Materials Spill, Rochester, NY**
  Project Manager responsible for review of all delineation reports, implementation of additional delineation studies, review of remedial work plans, and oversight of all facets of the execution of IRM as it related to achieving a clean up that would limit long term liability for the City and allow for the planned redevelopment to occur.

- **Rochester Rhinos Stadium Brownfield Redevelopment, Rochester, NY**
  Mr. Senecal served as Project Manager of the NYSDEC Brownfield Cleanup of this prominent urban redevelopment site.

Daniel P. Noll, PE



Education:

- Clarkson University: BS, Chemical Engineering

Certification/Registration:

- Professional Engineer, NY
- 40 Hour OSHA Certified Hazardous Waste Site Worker Training
- 8 Hour OSHA Certified Hazardous Waste Site Worker Refresher Training

Mr. Noll has over eight years of experience in investigation and remediation of contaminated sites, and will be the Project Manager for the Project. Mr. Noll has conducted numerous Phase II Environmental Site Assessments including: groundwater monitoring programs, soil vapor investigations, test pit investigations, and geo-probe investigations. Mr. Noll has also conducted numerous underground storage tank removals, and remediation of soil and groundwater contamination at various sites.

Key Projects:

- **935 Broad Street, City of Rochester, NY**
  As Project Engineer, Mr. Noll developed a soil and groundwater study to investigate former underground storage tanks at a former gasoline/auto repair facility. A remedial alternatives analysis was conducted to evaluate several options for remediating soil and groundwater at the site including light non-aqueous phase liquid.

- **Barthelmes Manufacturing, Brownfield Cleanup, Rochester, NY**
  As Project Engineer, Mr. Noll completed a Remedial Investigation at an active manufacturing plant. This work was conducted through the NYSDEC Brownfield Cleanup Program. Soil and groundwater studies, including deep bedrock wells, were performed to determine the appropriate remedial actions. This project also included drain discharge evaluation to determine sources of contamination.

- **Carriage Cleaners, Brownfield Cleanup, Rochester, NY**
  As Project Manager, Mr. Noll completed a Brownfield Cleanup Program Application & Work Plan to conduct a Remedial Investigation at a former dry cleaning facility. A soil, groundwater, and soil gas study was undertaken to develop remedial costs and assist with the redevelopment of property. Mr. Noll attended Town Board Meetings regarding this project.

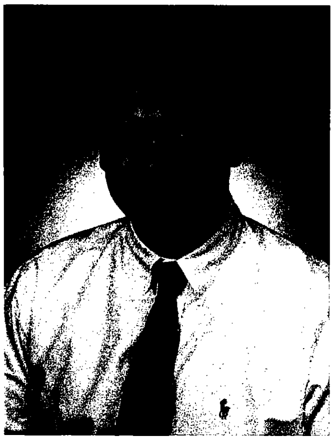
- **DeCarolis Truck Rental Petroleum Spill Site Remediation, Rochester, NY**
  Mr. Noll was Project Engineer for this site, responsible for the coordination of the removal/disposal of approximately 800 tons of petroleum impacted soil and developed a confirmatory soil sampling program. Mr. Noll also coordinated work with NYSDEC including potential additional requirements to close the spill file.

Completed under previous employment:

- **LNAPL Removal and Monitoring, Various Railroad Yards**
  Serving as a Project Engineer, Mr. Noll oversaw the delineation of LNAPL plumes at three railroad maintenance yards. Subsequent to delineating the extent of the plumes, LNAPL recharge testing was conducted, a removal system was designed and implemented.

- **PCB Remediation/Encapsulation, Railroad Yard**
  Serving as a Project Engineer, Mr. Noll prepared a remediation plan (approved by the NYSDEC) for decontaminating polychlorinated biphenyls (PCBs) in piping and encapsulating PCBs in concrete. A site-specific procedure was developed for decontamination of piping.

Michael F. Pelychaty



Education:

- SUNY Fredonia: BS, Geology
- Monroe Community College: AAS, Science

Certification/Registration:

- NYSDOL Project Monitor
- NYSDOL Air Sampling Technician

Mr. Pelychaty is a staff environmental geologist. He has over eight years of experience in the field of Environmental Management relating to Phase I and Phase II Environmental Site Assessments.

Current work includes numerous environmental site assessments and audits in New York and Pennsylvania. The site assessments include assessment of environmental liability associated with properties such as warehouses, gas stations, auto repair facilities, manufacturing facilities, farms, commercial properties, and residential homes. While conducting these investigations, Mr. Pelychaty has obtained a solid understanding of the many environmental issues facing property owners, municipalities, and developers.

Key Projects:

- **Bureau of Water, Lighting, and Parking Meter Operations, Rochester, NY**
  Mr. Pelychaty served as Environmental Geologist to remediate the Water Bureau site to obtain regulatory closure or inactivation. The project scope includes the redevelopment of the current site for reuse as a new facility for the operations center.

- **Port of Rochester Re-Development Project Phase II Site Characterization, Rochester, NY**
  Environmental Geologist for the complete Phase II Site Characterization, which involved sub surface characterization of approximately 38 acres. The site received a beneficial re-use determination to re use 80,000 cubic yards of iron foundry slag as on site fill.

- **CSXT Train Derailment & Hazardous Materials Spill, Rochester, NY**
  Environmental Geologist responsible for all delineation reports, additional delineation studies, remedial work plans, and assisted in the execution of IRM as it related to achieving a clean up that would limit long term liability for the City and allow for the planned redevelopment to occur.

- **Phase I and II ESA, Village of Clyde, NY**
  Environmental Geologist who performed a Phase I Environmental Site Assessment (ESA) that identified several potential areas of concern at a facility that contained petroleum bulk storage, drywells, and underground hydraulic lifts. Based on the findings of the Phase I ESA, Mr. Pelychaty oversaw the Phase II ESA that involved the advancement of test pits to investigate the identified areas of concern.

- **Phase I and II ESA, Village of Newark**
  Environmental Geologist who performed oversight of the removal and the construction of approximately 5,000 cubic yards of petroleum impacted soil into a bio-cell. Projects tasks involved continuously screening the excavation with a photo-ionization detector and for olfactory observations that would identify areas of soil impairment.

Craig A. Stiles

Education:

- SUNY Brockport: BS, Geology

Professional Affiliations:

- New York State Council of Professional Geologists
- Buffalo Association of Professional Geologists American Industrial Hygiene Association

Craig Stiles has over 17 years of experience in field geology including groundwater sampling, aquifer testing, downhole and surface geophysics, Phase I and II site assessments, well installation, development and abandonment, technical writing, and field team management.

Key Projects:

- **Bureau of Water, Lighting, and Parking Meter Operations, Rochester, NY**
  Environmental Geologist to remediate the Water Bureau site to obtain regulatory closure or inactivation. The project scope includes the redevelopment of the current site for reuse as a new facility for the operations center.

- **Foster Wheeler Plant Site Characterization, Dansville, NY**
  Environmental Geologist for this due diligence investigation consisted of a complete Phase I Environmental Site Assessment and Phase II Site Characterization.

- **935 Broad Street, City of Rochester, NY**
  Environmental Geologist for a Remedial Investigation, Remedial Alternatives Analysis, Site Re-use Concept Plan and a Corrective Action Plan for this former gasoline station.

PHASE I ENVIRONMENTAL SITE ASSESSMENTS

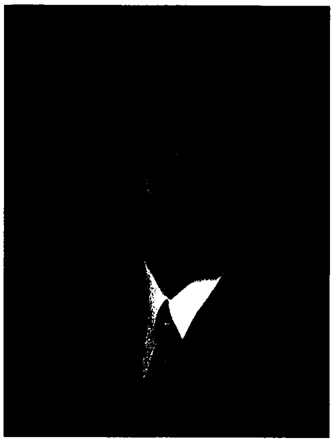
- Environmental Geologist for the following financial clients:
  - Canandaigua National Bank & Trust
  - Bank of Castile
  - Bank of Utica
  - Genesee Regional Bank
  - Bank of New England
  - Steuben Trust Company
  - Community Bank of N.A.
  - Northern Trust Bank
  - Citizen's Bank
  - Upstate National Bank

Completed under previous employment:

- **Torrey Landfill Inactive Hazardous Waste Site, Yates County**
  As Environmental Geologist, Mr. Stiles led a Pre-Remedial Design Field Investigation and assisted in the design of the final closure of a NYSDEC Inactive Hazardous Waste Site at a former municipal landfill

- **Ciba-Giegyus EPA Superfund Site, Toms River, NJ**
  As a Field Hydrogeologist and Field Team Leader, Mr. Stiles conducted Hydrogeologic investigations to delineate contaminated plumes and locate potential discharge sites within coastal beach and lagoonal sediments at a former industrial site.

Richard K. Rote, MS, CIH



Education:

- University of Rochester: MS, Industrial Hygiene
- St. Lawrence University: Bachelor of Science, Geology

Certification/Registration:

- Certified Industrial Hygienist
- NYSDOL Project Monitor
- Hazardous Waste Operations & Emergency Response

Professional Affiliations:

- American Industrial Hygiene Association
- American Board of Industrial Hygience
- Air & Waste Management Association Association
- American Society of Safety Engineers

Mr. Rote is a Certified Industrial Hygienist with a background in occupational and public safety. He brings to his projects an expertise in asbestos, lead, PCB and the management of other hazardous materials. Projects have included building surveys, hazard assessments, abatement project planning, and project inspection and monitoring. Mr. Rote manages our in-house laboratory for asbestos air and bulk samples, as well as managing air monitoring projects. His responsibility is to identify environmental impacts, and design and manage appropriate environmental responses for these projects.

Key Projects:

- **Asbestos Abatement and Inspection, Gates Chili Central School District, Gates, NY**
  Project Manager for asbestos and lead paint inspection, and abatement design related to improvements and modifications to 10 buildings. The project required coordination between the project team, school staff, and several architectural firms.

- **Hazardous Materials Management, Gates Chili High School, Gates, NY**
  Project Manager for comprehensive pre-renovation hazardous materials identification and abatement design services. Extensive renovations required the abatement of asbestos, PCBs and mercury prior to construction.

- **Inspection, Abatement, and Project Monitoring, Rush Henrietta Central School District, Rush, NY**
  Mr. Rote served as Project Manager for the asbestos inspection, PCB testing, abatement design and project monitoring services components of a several different renovation projects completed across the school district over 5 years.

- **Bureau of Water, Lighting, and Parking Meter Operations, Rochester, NY**
  Mr. Rote served as Project Manager, where preexisting asbestos inspection reports were field verified, and previously untested materials were sampled and submitted for analysis. The buildings were assessed for lead, mercury lamps and PCBs. A detailed cost estimate, abatement specifications, and drawings were prepared.

- **Port of Rochester Re-Development, Rochester, NY**
  Project Manager for the asbestos inspection, abatement design and project monitoring services were a component of a much larger project involving the design and construction of a new ferry and customs terminal at the Port of Rochester.

- **Asbestos Abatement, SUNY Brockport, Brockport, NY**
  Project Manager for asbestos and lead paint inspection, abatement design and Project Monitoring at lecture hall and two dorms at Brockport College. Responsible for coordination of team effort with outside architects and the State University Construction Fund.

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Rochester, New York 14614

Appendix 2

NYSDOH Generic Community
Air Monitoring Plan

APPENDIX 1A

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

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Rochester, New York 14614

Appendix 3

Quality Control Program

I. Introduction

LaBella's Quality Control (QC) Program is an integral part of its approach to phase II environmental investigations. By maintaining a rigorous QC program, our firm is able to provide accurate and reliable data for its clients. QC also provides safe working conditions for all on-site workers, thus decreasing potential client liability.

The Quality Control program contains procedures, which provide for collected data to be properly evaluated, and which document that quality control procedures have been followed in the collection of samples. The quality control program represents the methodology and measurement procedures used in collecting quality field data. This methodology includes the proper use of equipment, documentation of sample collection, and sample handling practices.

Procedures used in the firm's Quality Control program are compatible with federal, state, and local regulations, as well as, appropriate professional and technical standards.

This QC program has been organized into the following areas:

- QC Objectives and Checks
- Field Equipment, Handling, and Calibration
- Sampling Techniques
- Sample Handling and Packaging

II. Quality Control Objectives

The United States Environmental Protection Agency (EPA) has identified five general levels of analytical data quality as being potentially applicable to site investigations conducted under CERCLA. These levels are summarized below:

- **Level I -** Field screening. This level is characterized by the use of portable instruments, which can provide real-time data to assist in the optimization of sampling point locations and for health and safety support. Data can be generated regarding the presence or absence of certain contaminants (especially volatiles) at sampling locations.
- **Level II -** Field analysis. This level is characterized by the use of portable analytical instruments, which can be used on site or in mobile laboratories stationed near a site (close-support labs). Depending upon the types of contaminants, sample matrix, and personnel skills, qualitative and quantitative data can be obtained.
- **Level III -** Laboratory analysis using methods other than the Contract Laboratory Program (CLP) Routine Analytical Services (RAS). This level is used primarily in support of engineering studies using standard EPA-approved procedures. Some procedures may be equivalent to CLP RAS, without the CLP requirements for documentation.

- **Level IV -** CLP Routine Analytical Services. This level is characterized by rigorous QC protocols and documentation and provides qualitative and quantitative analytical data. Some regions have obtained similar support via their own regional laboratories, university laboratories, or other commercial laboratories.
- **Level V -** Non-standard methods. Analyses, which may require method modification and/or development. CLP Special Analytical Services (SAS) are considered Level V.

Unless stated otherwise, all data will be generated in accordance with Level IV. When CLP methodology is not available, federal and state approved methods will be utilized. Level III will be utilized, as necessary, for non-CLP RAS work which may include ignitability, corrosivity, reactivity, EP toxicity, and other state approved parameters for characterization. Level I will be used throughout the RI for health and safety monitoring activities.

All measurements will be made to provide that analytical results are representative of the media and conditions measured. Unless otherwise specified, all data will be calculated and reported in units consistent with other organizations reporting similar data to allow comparability of data bases among organizations. Data will be reported in ug/L and mg/L for aqueous samples, and ug/kg and mg/kg (dry weight) for soils, or otherwise as applicable.

The characteristics of major importance for the assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. Application of these characteristics to specific projects is addressed later in this document. The characteristics are defined below.

2.1. Accuracy

Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

2.2. Precision

Precision is the degree of mutual agreement among individual measurements of a given parameter.

2.3. Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

2.4. Representativeness

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition

Careful choice and use of appropriate methods in the field will ensure that samples are representative. This is relatively easy with water or air samples since these components are homogeneously dispersed. In soil and sediment, contaminants are unlikely to be evenly distributed, and thus it is important for the sampler and analyst to exercise good judgment when removing a sample.

2.5. Comparability

Comparability expresses the confidence with which one data set can be compared to another. The data sets may be inter- or intra- laboratory.

III. Measurement of Data Quality

3.1. Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" take the form of EPA standard reference materials, or laboratory prepared solutions of target analytes spiked into a pure water or sample matrix. In the case of GC or GC/MS analyses, solutions of surrogate compounds, which can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination, are used.

In each case the recovery of the analyte is measured as a percentage, correcting for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA supplied known solutions, this recovery is compared to the published data that accompany the solution.

For the firm's prepared solutions, the recovery is compared to EPA-developed data or the firm's historical data as available. For surrogate compounds, recoveries are compared to EPA CLP acceptable recovery tables.

If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate. The analyst or his supervisor must initiate an investigation of the cause of the problem and take corrective action. This can include recalibration of the instrument, reanalysis of the QC sample, reanalysis of the samples in the batch, or flagging the data as suspect if the problems cannot be resolved. For highly contaminated samples, recovery of the matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

3.2. Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is sometimes not known to ASC and usually not known to bench analysts, so their usefulness for monitoring analytical precision at bench level is limited. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantitation of precision is impossible. For EPA CLP analyses, replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD).

- Where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses.
- RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non homogeneity, analysis of check samples, etc. Follow-up action may include sample reanalysis or flagging of the data as suspect if problems cannot be resolved.
- During the data review and validation process (see Section 9), field duplicate RPDs are assessed as a measure of the total variability of both field sampling and laboratory analysis.

3.3. Completeness

Completeness for each parameter is calculated as follows:

- The firm's target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the site managers. In planning the field sample collection, the site manager will plan to collect field duplicates from identified critical areas. This procedure should assure 100% completeness for these areas.

3.4. Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the site and the specific area. Within the laboratory, precautions are taken to extract from the sample bottle an aliquot representative of the whole sample. This includes premixing the sample and discarding pebbles from soil samples.

IV. QC Targets

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and RPD of duplicates/replicates are included in the QCP, Analytical Procedures. Note that tabulated values are not always attainable. Instances may arise where high sample concentrations, non homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the firm will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

V. Sampling Procedures

This section describes the sampling procedures to be utilized for each environmental medium that will be collected and analyzed in accordance with appropriate state and federal requirements. All procedures described are consistent with EPA sampling procedures as described in SW-846, third edition, September 1986. All samples will be delivered to the laboratory within 24 to 28 hours of collection.

VI. Soil & Groundwater Investigation

The groundwater sampling plan outlined in this subsection has been prepared in general accordance with RCRA Groundwater Monitoring Technical Enforcement Guidance Document 9950.1 (September 1986), Office of Solid Waste and Emergency Response.

Prior to drilling, all drill sites will be cleared with appropriate utility companies to avoid potential accidents relating to underground utilities.

6.1. Test Borings and Well Installation

6.1.1. Drilling Equipment

<u>Direct Push "Geo-Probe" Soil Borings:</u>

Borings will be advanced with a "geo-probe" direct push sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The geo-probe utilizes a four-foot macro-core sampler, with disposable polyethylene sleeves. Soil cores will be retrieved in four-foot sections, and can be easily cut from the polyethylene sleeves for observation and sampling. The macro-core sampler will be decontaminated between samples and borings using an alconox and water solution.

<u>Drill Rig Advanced Soil Borings:</u>

The drilling and installation of monitoring wells will be performed using a rotary drill rig which will have sufficient capacity to perform 4 1/2-inch inside diameter (ID) hollow-stem auger drilling in the overburden, retrieve split-spoon samples, and perform necessary rock coring to provide a minimum 3-inch diameter core, known in the industry as "NX." The borehole may be reamed to 5 1/2-inch diameter prior to monitoring well installation as cased hole in the bedrock, or may be left as open hole, with NYSDEC concurrence.

6.1.2. Drilling Techniques

Direct Push "Geo-Probe" Advanced Borings:

Prior to initiating drilling activities, the Geo-probe, macro cores, drive rods, pertinent equipment, well pipe and screens will be steam cleaned or washed with an alconox and water solution followed by a clean water rinse. This cleaning procedure will also be used between each boring. These activities will be performed in a designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used. The drilling rig and all equipment will be steam cleaned upon completion of the investigation and prior to leaving the site.

Test borings will be advanced with 2-inch direct push macro-cores through overburden soils. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

It will be the responsibility of the consultant to arrange for the appropriate drilling equipment to be present at the site. Standby time to arrange for additional equipment or a water supply will not be allowed unless caused by unexpected site conditions.

During the drilling, a Photoionization detector (PID) will be used to monitor the gases exiting the hole. Macro-core cuttings will be contained if the PID meter readings are greater than 5 ppm above background or the cuttings show visible evidence of contamination.

Drill Rig Advanced Borings:

Prior to initiating drilling activities, the drilling rig, augers, rods, split spoons, pertinent equipment, well pipe and screens will be steam cleaned. This cleaning procedure will also be used between each boring. These activities will be performed in a designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used. The drilling rig and all equipment will be steam cleaned upon completion of the investigation and prior to leaving the site.

Test borings will be advanced with 4 1/2-inch (ID) hollow stem augers through overburden, and NX-sized diamond core barrels in competent rock, driven by truck-, track-, or trailer-mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for site-specific criteria, but must be approved by the NYSDEC. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from

NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative. One sample from each drilling water source may be analyzed for full TCL.

It will be the responsibility of the consultant to arrange for the appropriate drilling equipment to be present at the site. Standby time to arrange for additional equipment or a water supply will not be allowed unless caused by unexpected site conditions.

During the drilling, a photoionization detector (PID) will be used to monitor the gases exiting the hole. Auger cuttings will be contained if the PID meter readings are greater than 5 ppm above background or the cuttings show visible evidence of contamination.

Where bedrock wells are required, test borings shall be advanced into rock with NX coring tools. Only water from an approved source shall be used in rock coring. The consultant shall monitor and record the petrology, core recovery, fractures, rate of advance, water levels, and water lost or produced in each test boring. The Rock Quality Determination (RQD) value shall be calculated for each 5-foot core. Each core shall be screened with a PID upon extraction to determine proper handling procedure. All core samples shall be retained and stored by the consultant, for review by NYSDEC, in an approved wooden core box for a period of not less than one year.

Bedrock well installation will involve construction of a rock socket. The socket will be drilled into the top of rock at each bedrock well location to allow permanent 3-inch casing to be grouted securely in place prior to completion of the well. The purpose for this is to provide a seal at the overburden/bedrock interface and into the upper bedrock surface, to prevent the entrance of overburden water into the bedrock.

To construct the rock socket, a core hole will be reamed out to a minimum diameter of 3 7/8-inches and set into the first 5-feet of bedrock. This will allow the placement of permanent 3-inch diameter Polyvinyl chloride (PVC) well casing into the bedrock surface. The method selected may be percussion or rotary drilling at the option of the subcontractor. The method and equipment selected must be capable of penetrating the bedrock at each well location to a depth required by the work plan and will be selected based on the results of the rock coring performed.

While the augers are seated on top of bedrock, a cement grout will be tremied into the bedrock socket. Once sufficient grout has been place, the 3-inch PVC casing will be lowered into the bedrock socket. A PVC plug will be placed in the end of the 3-inch PVC casing, prior to insertion in the borehole, to prevent grout from entering the PVC casing. Once the 3-inch PVC casing is in place, the augers can be removed and the remaining grout should be added. After the grout and 3-inch PVC casing have set up for 24 hours, the remaining amount of bedrock can be NX cored through the 3-inch PVC casing to a depth determined by the work plan as shown in Figure 1.

6.1.3. Well Casing (Riser)

<u>Direct Push Geo-Probe Groundwater Monitoring Wells:</u>

Direct Push Geo-Probe advanced groundwater-monitoring wells utilized 1.25-inch threaded flush joint PVC pipe.

Drill Rig Advanced Groundwater Monitoring Wells:

The well riser shall consist of 2-inch or 4-inch diameter, threaded flush-joint PVC pipe. All well risers will conform to the requirements of ASTM-D 1785 Schedule 40 pipe, and shall bear markings that will identify the material as that which is specified. All materials used to construct the wells will be NSF/ASTM approved.

6.1.4. Well Screen

Direct Push Geo-Probe Groundwater Monitoring Wells:

Direct Push Geo-Probe advanced groundwater-monitoring wells utilized 1.25-inch well screen. Groundwater-monitoring wells will set to intersect the top of the shallow overburden groundwater table. Each geo-probe advanced well will be equipped with 10 feet of .010 inch slotted PVC screen connected to an appropriate length of PVC riser to complete the well installation.

Drill Rig Advanced Groundwater Monitoring Wells:

Generally, wells will be constructed with 10-foot machine-slotted screens, unless otherwise specified or dictated by field conditions (i.e., screens of less than 10-feet in length may be used, depending on the characteristics of the well). The well screen slot size will be selected based on the filter pack grain size and the ability to hold back 85 percent or more of the filter pack materials. Screen and riser sections shall be joined by flush-threaded coupling to form watertight unions that retain 100% of the strength of the casing. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well.

All risers and screens shall be set round, plumb, and true to line.

6.1.5. Artificial Sand Pack

Granular backfill will be chemically and texturally clean (as determined using a 10x hand lens), inert, siliceous, and of appropriate grain size for the screen slot size and the host environment. Sand pack grain size will be selected based on sieve analyses of formation samples. The sand pack will be installed using a tremie pipe and the casing will be equipped with centralizers (wells 15 ft. or deeper only) to minimize the tendency for particle separation and bridging... Prior to casing and screen insertion, a minimum of 1-foot of gravel-pack bedding will be placed in the bottom of the hole. The well screen and casing will be installed, and the sand pack placed around the screen and casing to a depth extending at least 25 percent of the screen length above the top of the screen.

6.1.6. Bentonite Seal

A minimum 2-foot thick seal of tamped bentonite pellets will be placed directly on top of the sand pack, and care will be taken to avoid bridging. The seal will be measured immediately after placement, without allowance for swelling.

6.1.7. Grout Mixture

Upon completion of the bentonite seal, the well will be grouted with a non-shrinking cement grout (e.g., Volclay®) mix to be placed from the top of the bentonite seal to the ground surface. The cement grout shall consist of a mixture of Portland cement (ASTM C 150) and water, in the proportion of not more than 7 gallons of clean water per bag of cement (1 cubic foot or 94 pounds). Additionally, 3% by weight of bentonite powder shall be added, if permitted.

6.1.8. Surface Protection

At all times during the progress of the work, precautions shall be used to prevent tampering with or the entrance of foreign material into the well. Upon completion of the well, a suitable lockable cap shall be installed to prevent material from entering the well. The PVC well riser shall be protected by a flush mounted road box set into a concrete pad. A concrete pad, sloped away from the well, shall be constructed around the flush mount road box at ground level.

Any well that is to be temporarily removed from service or left incomplete due to delay in construction shall be capped with a watertight cap and equipped with a "vandal-proof" cover, satisfying applicable NYSDEC regulations or recommendations.

6.1.9. Surveying

Coordinates and elevations will be established for each monitoring well and sampling location. Elevations to the closest 0.01 foot shall be used for the survey. These elevations shall be referenced to a regional, local, or project-specific datum. USGS benchmarks will be used whenever available. The location, identification, coordinates, and elevations of the wells will be plotted on maps with a scale large enough to show their location with reference to other structures at each site.

6.1.10. Well Development

After completion of the well, but not sooner than 24 hours after grouting is completed, development will be accomplished using pumping, bailing, or surge blocking. No dispersing agents, acids, disinfectants, or other additives will be used during development or introduced into the well at any other time. During development, water will be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

Well development will include washing the entire well cap and the interior of the well casing above the water table, using only water from the well itself. As a result of this operation, the well casing will be free of extraneous materials (grout, bentonite, and sand) inside the riser, well cap, and blank casing between top of the well casing and water table. This washing will be conducted before and/or during development; not after development. Development water will be either properly contained and treated as waste until the results of chemical analysis of samples are obtained or discharged on site as determined by the site-specific work plans and/or consultation with the NYSDEC representatives on site.

The development process will continue until a stabilization of pH, specific conductance, temperature, and clarity (goal of <50 NTUs) of the discharge is achieved or for a maximum of two hours.

After final development of the well, water levels will be recorded and approximately 1 liter of water from the well will be collected in a clear glass jar, labeled and photographed, and submitted as part of the well log. The photograph will be taken to show the relative clarity of the water. Visual identification of the physical characteristics of removed sediments will also be recorded.

VII. Geologic Logging and Sampling

At each investigative location, the boring will be advanced through overburden using either a drill rig and hollow-stem auger or direct push technology; soils will be visually inspected for stains and monitored with a FID to help determine potential for vertical migration of contaminants. Soil samples will be collected continuously in both the unsaturated soil zone and the saturated zone. Selected wells will be sampled continuously over the entire depth of the well. The sampling device will be decontaminated according to procedures outlined in the Decontamination section of this document. The split-spoon sampler will be driven into the soil using a 140-pound safety hammer and allowed to free-fall 30-inches, in accordance with ASTM-D 1586-84 specifications. The number of blows required to drive the sampler each 6-inches of penetration will be recorded. Soil samples will be screened in the field for volatile organic vapors using a FID, classified in accordance with Unified Soil Classification System (USCS) specifications, and logged. Samples will be stored in glass jars until they are needed for testing or the project is complete.

All samples will be screened with a PID during collection. The headspace of all samples taken in the field will be screened using USEPA method 3810.

Monitoring well borings will be advanced to maximum design depth below the ground surface, as indicated by the work plan for each site. If hard boulders or bedrock result in auger refusal, rock coring will be used to advance the hole to design depth. If hydrogeologic conditions are favorable for well installation at a depth less than design, the well will be installed at the boring or coring termination depth. In the event that maximum design depth is reached and hydrogeologic conditions are not suitable for well installation, the maximum drilling depth will be revised. Hydrogeologic suitability for well emplacement will be determined by the supervising geologist in consultation with NYSDEC, based on thickness and estimated hydraulic conductivity of the saturated zone encountered. If necessary, the borehole will be advanced to water or abandoned.

Boulders and bedrock encountered during well installation shall be cored by standard diamond-core drilling methods using an "NX" size core barrel. All rock cores recovered will be logged by a geologist, labeled, photographed, and stored in wooden core boxes. The photographs will be submitted as part of the completed boring logs. The cores will be stored by the firm until the project is completed or for at least one year. Drilling logs will be prepared by an experienced geologist or geotechnical engineer, who will be present during all drilling operations. One copy of each field boring and well construction log, including color photographs of the rock core, if encountered, and groundwater data, will be submitted as part of the RI report. The RQD value shall be calculated for each 5-foot section. Information provided in the logs shall include, but not be limited to, the following:

- Date, test hole identification, and project identification;
- Name of individual developing the log;
- Name of driller and assistant(s);
- Drill, make and model, auger size;
- Identification of alternative drilling methods used and justification thereof (e.g., rotary drilling with a specific bit type to remove material from within the hollow stem augers);
- Standard penetration test (ASTM D-1586) blow counts;
- Field diagram of each monitoring well installed with the depth to bottom of screen, top of screen, and pack, bentonite seal, etc.;
- Reference elevation for all depth measurements;
- Depth of each change of stratum;
- Thickness of each stratum;
- Identification of the material of which each stratum is composed, according to the USCS system or standard rock nomenclature, as appropriate;
- Depth interval from which each sample was taken;
- Depth at which hole diameters (bit sizes) change;
- Depth at which groundwater is encountered;
- Depth to static water level and changes in static water level with well depth;
- Total depth of completed well;
- Depth or location of any loss of tools or equipment;
- Location of any fractures, joints, faults, cavities, or weathered zones;
- Depth of any grouting or sealing;
- Nominal hole diameters;
- Amount of cement used for grouting or sealing;
- Depth and type of well casing;
- Description of well screen (to include depth, length, location, diameter, slot sizes, material, and manufacturer);
- Any sealing-off of water-bearing strata;
- Static water level upon completion of the well and after development;
- Drilling date or dates;
- Construction details of well; and
- An explanation of any variations from the work plan.

VIII. Hydraulic Conductivity Testing Procedures

If necessary, single-well, rising head tests will be performed in order to determine the in-place hydraulic conductivity of unconsolidated and/or consolidated geologic materials, which occur in the monitoring interval of newly, installed wells. The tests will be performed by a qualified hydrogeologist. These tests involve lowering the water level in the well and measuring the change in head with respect to time as the well is allowed to recover. In wells, which are slow to recover, the water level will be bailed down as described below. The measurements in these wells will be taken manually. Wells, which recover too quickly for this method, will be tested by removing one bailer of water and the recovery measured by means of a pressure transducer system.

The rising head tests for wells with rapid recovery rates will be conducted as follows:

- The static water level in the well to be tested is measured and recorded;
- The pressure transducer is placed in the well to a minimum depth of three feet below the static water level;
- Readings are made using the data logger until three consecutive readings are the same (equilibrium conditions);
- The data logger is then calibrated to read 0.00 feet at static conditions. A pre-cleaned bailer is then lowered into the well and placed just below the water surface.
- Water level measurements are made until the water level returns to static conditions following introduction of the bailer. If static conditions are not reached within 15 minutes following introduction of the bailer, the well will be tested using the procedures described below for slow recovery wells;
- Once static conditions are reestablished, the bailer is rapidly removed from the water column thereby creating an instantaneous decline of the water level in the well. Coincident with the withdrawal of the bailer, automatic logging of the water levels is initiated using the data logger. The primary goal in the recovery test is to "instantaneously" remove a volume of water that will result in a measurable head decline, the recovery of which (to static conditions) can be monitored over time. Such an instantaneous withdrawal results in recovery due to contributions of flow from the surrounding formation. This flow is controlled by its hydraulic conductivity and not by other factors such as storage effects;
- The water level measurements will continue until water levels recover to within a minimum of 10 percent of the original static water level (90 percent recovery), or an elapsed time of one hour. If the well has not recovered to static conditions after one hour at the discretion of the hydrogeologist, the transducer will be removed and the well will be tested at a later date using the procedures described below for slow recovery wells.
- Data stored in the data loggers will be "dumped" to a hard copy printout using a field printer or to a magnetic disk using a portable computer. If field printouts are used, they will be dated and signed by the hydrogeologist.

For wells with slow recovery rates, the following procedures will be used:

- The static water level is measured and recorded;
- The well is bailed by hand until the depth to water appears to stabilize based on the depth of travel of the bailer rope or to the top of the open or screened interval in wells which are screened below the standing water level;
- The bailer is then removed and water level measurements are collected by hand (measuring tape or electronic water level indicator) at a frequency, which will provide approximately 15 to 20 data, points during recovery (to within 10 percent of the total drawdown), if feasible. Water level measurements are recorded on the hydraulic conductivity testing report.
- A pre-cleaned bailer (one for each well) will be used in the rising head testing. All equipment entering the well, such as the transducer and transducer cable, will be cleaned prior to reuse in accordance with the Decontamination section below. All well water and rinse water generated by the tests will be collected in appropriate containers and disposed of in accordance with the Investigation Derived Materials section below.
- The data from both types of rising head tests will be reduces and evaluated.
- The following equation will be used to calculate the in-situ hydraulic conductivity of the formation opposite the interval of the piezometer (Hvorslev, 1951).

$$k = d^2 \ln \frac{\left[\frac{2mL}{D}\right]}{8L(t_2 - t_1)} \ln \frac{H_1}{H_2}$$

Where:

K = hydraulic conductivity (ft./min.)
d = casing diameter (ft.)
L = intake length (ft.)
D = intake diameter (ft.)
t_1 = time 1 from semilog graph (min.)
t_2 = time 2 from semilog graph (min.)
H_1 = residual head (ft.) corresponding to t_1
H_2 = residual head (ft.) corresponding to t_2
m = square root of the ratio of horizontal to vertical permeability (an estimated value)

IX. Groundwater Sampling Procedures

The groundwater in all new and existing monitoring wells will be allowed to stabilize for 7 days following development and permeability testing. Water levels will be measured to within 0.01 foot prior to purging and sampling. A temporary staff gauge or other surface water elevation measuring device will be established on any nearby surface water body, which may significantly influence groundwater movement. The surface elevation of these water bodies will be checked whenever groundwater elevations are measured. Purging and sampling of each well will be accomplished using precleaned dedicated PVC bailers on new polypropylene line. Purging will be less aggressive than development to avoid turbidity problems (e.g., avoid "free-falling" bailers). In general, wells will be purged until the pH, conductivity, temperature, and turbidity of the water being pumped from the well have stabilized. All wells will be purged of at least three well-bore volumes or to dryness.

Groundwater samples will be collected according to the following procedures and in the volumes specified in Table 5-1:

- Water clarity will be quantified during sampling with a turbidity meter;
- When transferring water from the bailer or pump line to sample containers, care will be taken to avoid agitating the sample, since agitation promotes the loss of volatile constituents;
- Any observable physical characteristics of the groundwater (e.g., color, sheen, odor, turbidity) at the time of sampling will be recorded; and
- Weather conditions (i.e., air temperature, sky condition, recent heavy rainfall, drought conditions) at the time of sampling will be recorded.

All groundwater samples and their accompanying QC samples will be run for volatile organic chemicals using NYSDEC ASP 91-1.

X. Geotechnical Sampling

A grain size analysis will be conducted by sieving for two non-cohesive units, and Atterberg limits for one cohesive unit, (ASTM methods D 4318-84 and D 422-63, respectively) in each borehole. Grain size analysis by hydrometer will be performed on soils where 20 percent of the sample is less than No. 200 sieve size (i.e., silt or clay). Site-specific work plans indicate specific sampling requirements for physical or geotechnical testing.

Remolded permeability samples will be analyzed in accordance with ASTM D-5084.

XI. Management of Investigative-Derived Waste

Purpose:

The purposes of these guidelines are to ensure the proper holding, storage, transportation, and disposal of materials that may contain hazardous wastes. Investigation-derived waste (IDW) included the following;

- Drill cuttings, discarded soil samples, drilling mud solids, and used sample containers;
- Well development and purge waters and discarded groundwater samples;
- Decontamination waters and associated solids;
- Soiled disposable personal protective equipment (PPE);
- Used disposable sampling equipment;
- Used plastic sheeting and aluminum foil;
- Other equipment or materials that either contain or have been in contact with potentially-impacted environmental media.

Because these materials may contain regulated chemical constituents, they must be managed as a solid waste. This management may be terminated id characterization analytical results indicate the absence of these constituents.

Procedure:

1. Contain all investigation-derived wastes in Department of Transpiration (DOT)-approved 55-gallon drums, roll-off boxes, or other containers suitable for the wastes.
2. Contain wastes from separate borings or wells in separate containers (i.e. do not combine wastes from several borings/wells in a single container, unless it is a container used specifically for transfer purposes, or unless specific permission to do so has been provided by the LaBella Project Manager. Unused samples from surface sample locations within a given area may be combined.
3. To the extent practicable, separate solids from drilling muds, decontamination waters, and similar liquids. Place solids within separate containers.
4. Transfer all waste containers to a staging area. Access to this area will be controlled. Waste containers must be transferred to the staging area as soon as practicable after the generating activity is complete.
5. Pending transfer, all containers will be covered and secured when not immediately attended,
6. Label all containers with regard to contents, origin, and date of generation. Use indelible ink for all labeling.
7. Collect samples for waste characterization purposes, use boring/well sample analytical data for characterization.

8. For wastes determined to be hazardous in character, be aware on accumulation time limitations. Coordinate the disposal of these wastes with the Owner and NYSDEC.

9. Dispose of investigation-derived wastes as follows;

- Soil, water, and other environmental media for which analysis does not detect organic constituents, and for which inorganic constituents are at levels consistent with background, may be spread on-site or otherwise treated as a non0-waste material.
- Soils, water, and other environmental media in which organic compounds are detected or metals are present above background will be disposed as industrial waste. Alternate disposition must be consistent with applicable State and Federal laws.
- Personal protective equipment, disposable bailers, and similar equipment may be disposed as municipal waste, unless waste characterization results mandate disposal as industrial wastes

XII. Decontamination

Sampling methods and equipment have been chosen to minimize decontamination requirements and to prevent the possibility of cross-contamination. Decontamination of equipment will be performed between discrete sampling locations. Equipment used to collect samples between composite sample locations will not require decontamination between collection of samples. All drilling equipment will be decontaminated prior to drilling, after drilling each monitoring well, and after the completion of all drilling. Special attention will be given to the drilling assembly, augers, and PVC casing and screens.

Drilling decontamination will consist of:

- Steam cleaning;
- Scrubbing with brushes, if soil remains on equipment; and
- Steam rinse.

Split spoons and other non-disposable equipment will be decontaminated between each sampling event. The sampler will be cleaned prior to each use, by one of the following procedures:

- Initially cleaned of all foreign matter;
- Sanitized with a steam cleaner;

OR

- Initially cleaned of all foreign matter;
- Scrubbed with brushes in trisodium phosphate or alconox solution;
- Rinsed with deionized water;
- Rinsed with pesticide grade methanol;
- Triple rinsed with deionized water; and
- Allowed to air dry.

XIII. Sample Containers

The volumes and containers required for the sampling activities are included in pre-washed sample containers will be ordered directly from a firm, which prepares the containers in accordance with EPA bottle washing procedures.

Table 1
Water Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
Purgeable (volatile) Organics	40-ml glass vial with Teflon-backed septum	Two (2); fill completely, no air space	Cool to 4° C (ice in cooler)	7 days

* Holding time is based on verified time of sample receipt at laboratory.

Note: All sample bottles will be prepared in accordance with USEPA bottle washing procedures. These procedures are incorporated in LaBella Associates Quality Control Procedures Manual, January, 1992

TABLE 2
Soil Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
Purgeable (volatile) Organics	8-oz, glass jar with Teflon-lined cap	Two (2), fill as completely as possible	Cool to 4° C (ice in cooler)	7 days
RCRA Characterization	8-oz. glass jar with Teflon-lined cap	One (1); fill completely	Cool to 4° C (ice in cooler)	Must be extracted within 10 days; analyzed with 30 days

* Holding time is based on the times from verified time of sample receipt at the laboratory.

Note: All sample bottles will be prepared in accordance with USEPA bottle washing procedures. These procedures are incorporated in LaBella Associates Quality Control Procedures Manual, January, 1992.

TABLE 3
List of Major Instruments to be used for Sampling and Analysis Program

- MSA 360 0_2 /Explosimeter
- Photovac Micro Tip FID or PID
- Organic Vapor Analyzer Foxboro (128)
- Hollige Series 963 Nephlometer (turbidity meter)
- EM-31 Geomics Electromagnetic Induction Device
- pH/Temperature/Conductivity Meter - Portable
- Hewlett Packard (HP) 1000 computer with RTE-6 operating system; and HP 9144 computer with RTE-4 operating system equipped with Aquarius software for control and data acquisition from gas chromatograph/mass spectrometer (GC/MS) systems; combined wiley and National Bureau of Standards (NBS) mass spectral library; and data archiving on magnetic tape
- Viriam 6000 and 37000 gas chromatrographs equipped with flame ionization, electron capture, photoionization and wall detectors as appropriate for various analyses,, and interfaced to Variam DS604 or D5634 data systems for processing data.
- Spectra-Physics Model SP 4100 and SP 4270 and Variam 4270 cam puting integrators
- Perkin Eimer (PE) 3000% and 3030% fully Automated Atomic Absorption Spectrophotometers (AAS) with Furnace Atomizer and background correction system
- PE Plasma II Inductively Coupled Argon Plasma (ICAP) Spectre meter with PE7500 laboratory computer
- Dionex 20001 ion chromatograph with conductivity detector for anion analysis, with integrating recorder

XIV. Sample Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be utilized for all Phase II field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during their collection, transportation, and storage through analysis. All chain-of-custody requirements comply with standard operating procedures indicated in EPA sample handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field notebooks,
- Sample label,
- Custody seals, and
- Chain-of-custody records.

XV. Chain-of-Custody

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses. A sample is in custody if it is:

- In someone's physical possession;
- In someone's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

14.1. Field Custody Procedures

- As few persons as possible should handle samples.
- Sample bottles will be obtained precleaned from a source such as I-Chem. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules.
- The sample collector will record sample data in the notebook.
- The site manager will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

14.2. Sample Tags

Sample tags attached to or affixed around the sample container must be used to properly identify all samples collected in the field. The sample tags are to be placed on the bottles so as not to obscure any QC lot numbers on the bottles; sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the logbook. For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

14.3. Transfer of Custody and Shipment

- The coolers in which the samples are packed must be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving them must sign, date, and note the time on the chain-of-custody record. This record documents sample custody transfer
- Shipping containers must be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information are entered in the "Remarks" section of the chain-of-custody record and traffic reports.
- All shipments must be accompanied by the chain-of-custody record identifying their contents. The original record accompanies the shipment. The other copies are distributed appropriately to the site manage.
- If sent by mail, the package is registered with return receipt requested. If sent by common carrier, a bill of lading is used. Freight bills, Postal Service receipts, and bill of lading are retained as part of the permanent documentation.

14.4. Chain-of-Custody Record

The chain-of-custody record must be fully completed in duplicate, using black carbon paper where possible, by the field technician who has been designated by the project manager as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the record.

14.5. Laboratory Custody Procedures

A designated sample custodian accepts custody of the shipped samples and verifies that the sample identification number matches that on the chain-of-custody record and traffic reports, if required. Pertinent information as to shipment, pickup, and courier is entered in the "Remarks" section.

14.6. Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. On receipt at the laboratory, the custodian must check (and certify, by completing the package receipt log and LABMIS entries) that seals on boxes and bottles are intact. Strapping tape should be placed over the seals to ensure that seals are not accidentally broken during shipment.

XVI. Documentation

15.1. Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container (labels are to be covered with Mylar tape):

XX-YY-O/D

- XX This set of initials indicates the specific Phase II sampling project
- YY These initials identify the sample location. Actual sample locations will be recorded in the task log.
- O/D An "O" designates an original sample; "D" identifies it as a duplicate.

Each sample will be labeled, chemically preserved, if required and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers and protected with Mylar tape. The sample label will give the following information:

- Name of sampler,
- Date and time of collection,
- Sample number,
- Analysis required,
- pH, and
- Preservation.

15.2. Daily Logs

Daily logs and data forms are necessary to provide sufficient data and observations to enable participants to reconstruct event that occurred during the project and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings. All daily logs will be kept in a bound waterproof notebook containing numbered pages. All entries will be made in waterproof ink, dated, and signed. No pages will be removed for any reason. Corrections will be made according to the procedures given at the end of this section. The daily logs will include a site log and task log.

The site log is the responsibility of the site manager and will include a complete summary of the day's activity at the site.

The **Task Log** will include:

- Name of person making entry (signature).
- Names of team members on-site.
- Levels of personnel protection:
  - Level of protection originally used;
  - Changes in protection, if required; and
  - Reasons for changes.

- Time spent collecting samples.
- Documentation on samples taken, including:
  - Sampling location and depth station numbers;
  - Sampling date and time, sampling personnel;
  - Type of sample (grab, composite, etc.); and
  - Sample matrix.
- On-site measurement data.
- Field observations and remarks.
- Weather conditions, wind direction, etc.
- Unusual circumstances or difficulties.
- Initials of person recording the information.

XVII. Corrections to Documentation

16.1. Notebook

As with any data logbooks, no pages will be removed for any reason. If corrections are necessary, these must be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

16.2. Sampling Forms

As previously stated, all sample identification tags, chain-of-custody records, and other forms must be written in waterproof ink. None of these documents are to be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document.

If an error is made on a document assigned to one individual, that individual may make corrections simply by crossing a line through the error and entering the corrected information. The incorrect information should not be obliterated. Any subsequent error discovered on a document should be corrected by the person who made the entry. All corrections must be initialed and dated.

16.3. Photographs

Photographs will be taken as directed by the site manager. Documentation of a photograph is crucial to its validity as a representation of an existing situation. The following information will be noted in the task log concerning photographs:

- Date, time, location photograph was taken;
- Photographer (signature);
- Weather conditions;
- Description of photograph taken;
- Reasons why photograph was taken;
- Sequential number of the photograph and the film roll number; and
- Camera lens system used.

After the photographs have been developed, the information recorded in the field notebook should be transferred to the back of the photographs

XVIII. Sample Handling, Packaging, and Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States Department of Transportation (DOT) in the Code of Federal Regulation, 49 CFR 171 through 177. All samples will be delivered to the laboratory with 24 to 48 hours from the day of collection.

All chain-of-custody requirements must comply with standard operating procedures in the EPA sample handling protocol. All sample control and chain-of-custody procedures applicable to the Consultant are presented in the Field Personnel Chain-of-Custody Documentation and Quality Control Procedures Manual, January 1992.

17.1. Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with the original containers.
- The sample volume level can be marked by placing the top of the label at the appropriate sample height, or with a grease pencil. This procedure will help the laboratory to determine if any leakage occurred during shipment. The label should not cover any bottle preparation QC lot numbers.
- All sample bottles are placed in a plastic bag to minimize the potential for vermiculite contamination.
- Shipping coolers must be partially filled with packing materials and ice when required, to prevent the bottles from moving during shipment.
- The sample bottles must be placed in the cooler in such a way as to ensure that they do not touch one another.
- The environmental samples are to be cooled. The use of "blue ice" or some other artificial icing material is preferred. If necessary, ice may be used, provided that it is placed in plastic bags. Ice is not to be used as a substitute for packing materials.
- Any remaining space in the cooler should be filled with inert packing material. Under no circumstances should material such as sawdust, sand, etc., be used.
- A duplicate custody record and traffic reports, if required must be placed in a plastic bag and taped to the bottom of the cooler lid. Custody seals are affixed to the sample cooler.

17.2. Shipping Containers

Shipping containers are to be custody-sealed for shipment as appropriate. The container custody seal will consist of filament tape wrapped around the package at least twice and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking a seal.

Field personnel will make arrangements for transportation of samples to the lab. When custody is relinquished to a shipper, field personnel will telephone the lab custodian to inform him of the expected time of arrival of the sample shipment and to advise him of any time constraints on sample analysis. The lab must be notified as early in the week as possible, and in no case later than 3 p.m. (EST) on Thursday, regarding samples intended for Saturday delivery.

17.3. Marking and Labeling

- Use abbreviations only where specified.
- The words "This End Up" or "This Side Up" must be clearly printed on the top of the outer package. Upward pointing arrows should be placed on the sides of the package. The words "Laboratory Samples" should also be printed on the top of the package.
- After a sample container has been sealed, two chain-of-custody seals are placed on the container, one on the front and one on the back. The seals are protected from accidental damage by placing strapping tape over then.
- If samples are designated as medium or high hazard, they must be sealed in metal paint cans, placed in the cooler with vermiculite and labeled and placarded in accordance with DOT regulations.
- In addition, the coolers must also be labeled and placarded in accordance with DOT regulations if shipping medium and high hazard samples.

XIX. Calibration Procedures and Frequency

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references. Operation, calibration, and maintenance will be performed by personnel properly trained in these procedures. Documentation of all routine and special maintenance and calibration information will be maintained in an appropriate logbook or reference file, and will be available on request. Table 7-1 lists the major instruments to be used for sampling and analysis. Brief descriptions of calibration procedures for major field and laboratory instruments follow.

XX. Field Instrumentation

19.1. Photovac Micro Tip Flameionizer (FID)

Standard operating procedures for the FID require that routine maintenance and calibration be performed every six months. Field calibration will be performed on a daily basis. The packages used for calibration are non-toxic analyzed gas mixtures available in pressurized containers.

19.2. Photovac/MiniRea Photoionization Detector (PID)

Standard operating procedures for the PID require that routine maintenance and calibration be performed every six months. Field calibration will be performed on a daily basis. The packages used for calibration are non-toxic analyzed gas mixtures available in pressurized containers.

19.3. Organic Vapor Analyzer

Organic vapor analyzers (OVAs) are calibrated and routine maintenance performed every six months when the units are not in use. Calibration is performed and the major system checks are performed prior to the instrument being released for field use.

Calibration of the OVA 128 GC must be performed by a factory-authorized service representative. The instrument is removed from its protective case and the probe is connected to the base unit. After checking for an airtight seal in the sample line (plugging the sample inlet to stop the pump), the hydrogen supply is turned on and the pressure is set to 10 psi. The electronics are turned on and the instrument is allowed to warm up for at least 5 minutes. After warm up, the instrument is zeroed on the "X10" scale using the adjust knob. The flame is then lit and a gas-tight sample bag is filled with a mixture of 100 ppm methane in air. The sample bag is then attached to the probe inlet and the internal pump is allowed to draw in as much sample as is needed. R32 on the control board is adjusted to read 100 ppm on the "X10" scale and then the hydrogen supply is shut down. The pump can now be turned off and the sample bag removed. Using the adjust knob, the meter is set to read 4 ppm on the "X1" scale. Switching back to the "X10" scale the adjust knob is again used to set the meter to 40 ppm. The scale is then set to "X100" and R33 is adjusted until the meter reads 40 ppm on the "X100" scale.

The OVA has a detection limit of 0.1 ppm in methane equivalents and a working range of 0 to 1,000 ppm. During daily field use, system checks are performed which involve calibration and maintenance of the pump systems, gases, and filters. Care is taken to check for and prevent clogging or leaks. Quad rings and the burner chamber are examined on a weekly basis. Routine biannual maintenance includes a thorough cleaning as well as a re-examination of the pump system for leaks and wear. Parts are replaced as necessary. Instrument operation is verified by calibrating and running the OVA for 4 to 6 hours. An instrument specific logbook is maintained with the OVA to document its use and maintenance.

19.4. Conductance, Temperature, and pH Tester

Temperature and conductance instruments are factory calibrated. Temperature accuracy can be checked against an NBS certified thermometer prior to field use if necessary. Conductance accuracy may be checked with a solution of known conductance and recalibration can be instituted, if necessary.

To recalibrate conductance, remove the black plug revealing the adjustment potentiometer screw. Add standard solution to cup, discard and refill. Repeat procedure until the digital display indicates the same value twice in a row. Adjust the potentiometer until the digital display indicates the known value of conductance. To increase the digital display reading, turn the adjustment potentiometer screw counter-clockwise (clockwise to decrease).

To standardize the pH electrode and meter, place the pH electrode in the 7.0 buffer bottle. Adjust the "ZERO" potentiometer on the face of the tester so that the digital display indicates 7.00.

Then place the pH electrode in the 4.0 or 10.0 buffer bottle (depending on where you expect the actual measurement to be). Adjust the "SLOPE" potentiometer on the face of the tester so that the digital display indicates the value of the buffer chosen.

Note: There is interaction between the "ZERO" and "SLOPE" adjustments, so the procedure should be repeated several times.

Do not subject the pH electrode to freezing temperatures.

It is good practice to rinse the electrode in distilled water when going from one buffer to another. When not in use the cap should be kept on the electrode. Keeping the cotton in the cap moist will keep the electrode ready to use. Moisten the cotton frequently (once a week, usually).

19.5. 0_2/Explosimeter

The primary maintenance item of the Model 260 is the rechargeable 2.4 volt (V) nickel cadmium battery. The battery is recharged by removing the screw cap covering receptacle and connecting one end of the charging cable to the instrument and the other end to a 115V AC outlet.

The battery can also be recharged using a 12V DC source. An accessory battery charging cable is available, one end of which plugs into the Model 260 while the other end is fitted with an automobile cigarette lighter plug.

Recommended charging time is 16 hours.

Before the calibration of the combustible gas indicator can be checked, the Model 260 must be in operating condition. Calibration check-adjustment is made as follows:

1. Attach the flow control to the recommended calibration gas tank.
2. Connect the adapter-hose to the flow control.
3. Open flow control valve.

4. Connect the adapter-hose fitting to the inlet of the instrument; after about 15 seconds the LEL meter pointer should be stable and within the range specified on the calibration sheet accompanying the calibration equipment. If the meter pointer is not in the correct range, stop the flow; remove the right hand side cover. Turn on the flow and adjust the "S" control with a small screwdriver to obtain a reading as specified on the calibration sheet.
5. Disconnect the adapter-hose fitting from the instrument.
6. Close the flow control valve.
7. Remove the adapter-hose from the flow control.
8. Remove the flow control from the calibration gas tank.
9. Replace the side cover on the Model 260.

CAUTION: Calibration gas tank contents are under pressure. Use no oil, grease, or flammable solvents on the flow control or the calibration gas tank. Do not store calibration gas tank near heat or fire or in rooms used for habitation. Do not throw in fire, incinerate, or puncture. Keep out of reach of children. It is illegal and hazardous to refill this tank. Do not attach the calibration gas tank to any other apparatus than described above. Do not attach any gas tank other than MSA calibration tanks to the regulator.

19.6. Nephelometer (Turbidity Meter)

The Series 95 nephelometer is calibrated before each use. Allow the instrument to warm up for approximately 2 hours. Using turbidity-free deionized water, zero the meter. Set the scale to 100, fill with a 40 NTU standard (AEPA-1 turbidity standard from Advanced Polymer Systems, Inc.), and insert into the instrument. Adjust the standardize control to give a readout of 200. Re-zero the instrument and repeat these steps with the scale set at 10 and 1 using 4.0 and 0.4 NTU standards, respectively. These standards are prepared by diluting aliquots of the 40 NTU standard.

XXI. Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of field equipment. Field-based QC will comprise at least 10% of each data set generated and will consist of standards, replicates, spikes, and blanks. Field duplicates and field blanks will be analyzed by the laboratory as samples and will not necessarily be identified to the laboratory as duplicates or blanks. For each matrix, field duplicates will be provided at a rate of one per 10 samples collected or one per shipment, whichever is greater. Field blanks which consist of trip, routine field, and rinsate blanks will be provided at a rate of one per 20 samples collected for each parameter group, or one per shipment, whichever is greater.

Calculations will be performed for recoveries and standard deviations along with review of retention times, response factors, chromatograms, calibration, tuning, and all other QC information generated. All QC data, including split samples, will be documented in the site logbook. QC records will be retained and results reported with sample data.

20.1. Blank Samples

Blank samples are analyzed in order to assess possible contamination from the field and/or laboratory so that corrective measures may be taken, if necessary. Field samples are discussed in the following subsection:

20.2. Field Blanks

Various types of blanks are used to check the cleanliness of field handling methods. The following types of blanks may be used: the trip blank, the routine field blank, and the field equipment blank. They are analyzed in the laboratory as samples, and their purpose is to assess the sampling and transport procedures as possible sources of sample contamination. Field staff may add blanks if field circumstances are such that they consider normal procedures are not sufficient to prevent or control sample contamination, or at the direction of the project manager. Rigorous documentation of all blanks in the site logbooks is mandatory.

- **Routine Field Blanks** or bottle blanks are blank samples prepared in the field to access ambient field conditions. They will be prepared by filling empty sample containers with deionized water and any necessary preservatives. They will be handled like a sample and shipped to the laboratory for analysis.
- **Trip Blanks** are similar to routine field blanks with the exception that they are **not** exposed to field conditions. Their analytical results give the overall level of contamination from everything except ambient field conditions. For the RI/FS, one trip blank will be collected with every batch of water samples for volatile organic analysis. Each trip blank will be prepared by filling a 40-ml vial with deionized water prior to the sampling trip, transported to the site, handled like a sample, and returned to the laboratory for analysis without being opened in the field.
- **Field Equipment Blanks** are blank samples (sometimes called transfer blanks or rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use, and that cleaning procedures between samples are sufficient to minimize cross contamination. If a sampling team is familiar with a particular site, they may be able to predict which areas or samples are likely to have the highest concentration of contaminants. Unless other constraints apply, these samples should be taken last to avoid excessive contamination of sampling equipment.

20.3. Field Duplicates

Field duplicate samples consist of a set of two samples collected independently at a sampling location during a single sampling event. In some instances the field duplicate can be a blind duplicate, i.e., indistinguishable from other analytical samples so that personnel performing the analyses are not able to determine which samples are field duplicates. Field duplicates are designed to assess the consistency of the overall sampling and analytical system.

20.4. Quality Control Check Samples

Inorganic and organic control check samples are available from EPA free of charge and are used as a means of evaluating analytical techniques of the analyst. Control check samples are subjected to the entire sample procedure, including extraction, digestion, etc., as appropriate for the analytical method utilized.

LABELLA

LaBella Associates, P.C.
300 State Street
Rochester, New York 14614

Appendix 4
Health & Safety Plan

Site Health and Safety Plan

Location:

3865 West Henrietta Road
Henrietta, New York

Prepared for:

Dorschel Automotive Group
3817 West Henrietta Road
Rochester, New York 14623

March 2006

LaBella Project No. 206139

Site Health and Safety Plan

Location:

3865 West Henrietta Road
Henrietta, New York

Prepared for:

Dorschel Automotive Group
3817 West Henrietta Road
Rochester, New York 14623

March 2006

LaBella Project No. 206139

Table of Contents

SITE HEALTH AND SAFETY PLAN

Project Title:	Former Joy Sunoco
Project Number:	206139
Project Location (Site):	3865 West Henrietta Road, Henrietta, New York 14623
Project Manager:	Daniel Noll, P.E.
Plan Approval Date:	______________________
Plan Review Date:	______________________
Site Safety Supervisor:	Michael Pelychaty
Site Contact	Michael Pelychaty
LaBella Safety Director	Richard Rote, CIH
Proposed Date(s) of Field Activities:	June 2006 through October 2008
Site Conditions:	Generally level, encompassing approximately 1.1 +/- acres
Site Environmental Information Provided By:	Prior Environmental Reports by Environmental Assessment and Remediation, Rowan Environmental Services, Inc. and LaBella Associates
Air Monitoring Provided By:	LaBella Associates
Site Control Provided By:	General Contractor

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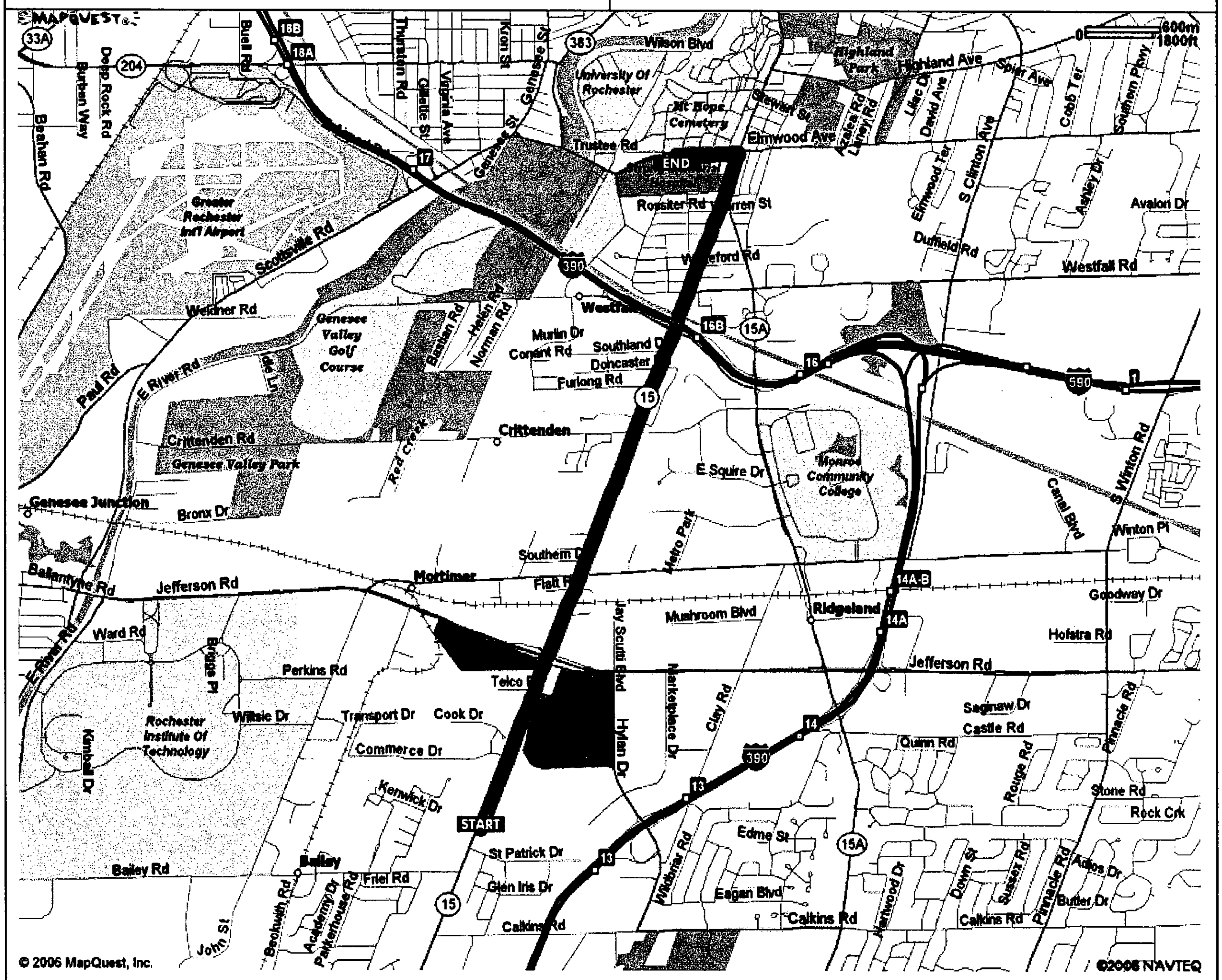
EMERGENCY CONTACTS

	Name	Phone Number
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Strong Memorial Hospital	585-275-2100
Poison Control Center:	Ruth A. Lawrence Poison and Drug Center	800-222-1222
Police (local, state):	Palmyra Police Deparment	911
Fire Department:	City of Rochester Fire Department	911
Site Contact:	Michael Pelychaty	585-451-6225
Agency Contact	NYSDEC – Matt Gillette MCDOH – Joseph Albert NYSDOH – Matthew Farcucci	585-226-5308 585-274-6904 716-847-4513
Project Manager	Daniel Noll, P.E. LaBella Associates, P.C.	Direct: 585-295-6611
LaBella Site Safety Officer	Michael Pelychaty LaBella Associates, P.C.	Direct: 585-295-6253 Cell: 585-451-6225
LaBella Associates Safety Director	Richard Rote, CIH	Direct: 585-295-6241

MAP AND DIRECTIONS TO THE MEDICAL FACILITY
STRONG MEMORIAL HOSPITAL

FROM:	TO:
3865 West Henrietta Road Henrietta, NY 14623	601 Elmwood Avenue Rochester, NY 14642

Directions:	Distance
1. Start out going NORTH (Left) on West Henrietta Road (Route 15)	3.6 mi
2. Turn WEST (Left) onto ELMWOOD AVENUE	0.3 mi
3. Turn SOUTH (Left) into Hospital Emergency Room Area	0.1 mi
Total Distance:	**4.0 mi**
Estimated Drive Time:	**9 minutes**



1.0 Introduction

The purpose of this Health and Safety Plan (HASP) it to provide guidelines for responding to potential health and safety issues that may be encountered during the investigation and remedial work at 3865 West Henrietta Road, Henrietta, New York herein after referred to as "the Site". The requirements of this HASP are applicable to all LaBella Associates personnel and their authorized visitors at the work site. This document's project specifications and the Supplemental Investigation Work Plan, are to be consulted for guidance in preventing and quickly abating any threat to human safety or the environment. The provisions of the HASP do not replace or supersede any regulatory requirements of the USEPA, NYSDEC, OSHA or other regulatory body.

2.0 Responsibilities

The HASP presents guidelines to minimize the risk of injury, to project personnel, and to provide rapid response in the event of injury. The LaBella Associates HASP is applicable only to activities of LaBella personnel and their authorized visitors. The LaBella Associates Project Manager shall implement the provisions of this HASP for the duration of the project. It is the responsibility of employees to follow the requirements of this HASP, and all applicable company safety procedures.

3.0 Activities Covered

The activities covered under this HASP are limited to the following:

- Observation and inspection of construction activities
- Environmental Monitoring
- Collection of samples
- Assistance with the on-Site management of excavated soil, fill, and groundwater.

4.0 Work Area Access and Site Control

The general contractor will have primary responsibility for work area access and site control.

5.0 Potential Health and Safety Hazards

This section lists some potential health and safety hazards that project personnel may encounter at the project site and some actions to be implemented by LaBella Associates personnel to control and reduce the associated risk to health and safety. This is not intended to be a complete listing of any and all potential health and safety hazards. New or different hazards may be encountered as site environmental and site work conditions change. The suggested actions to be taken under this plan are not to be substituted for good judgment on the part of project personnel. At all times the Site Safety Officer has responsibility for site safety and his or her instructions must be followed.

5.1 Hazards Due to Heavy Machinery

Potential Hazard:
Heavy machinery including trucks, excavators, backhoes, Geoprobe rigs, etc will be in operation at the site. The presence of such equipment presents the danger of being struck or crushed. Use caution when working near heavy machinery.

Protective Action:
Make sure that operators are aware of your activities, and heed operator's instructions and warnings. Wear bright colored clothing and walk safe distances from heavy equipment. A safety orange vest, hard hat, and steel toe shoes are required.

5.2 Excavation Hazards

Potential Hazard:
Excavations and trenches can collapse, causing injury or death. Edges of excavation can be unstable and collapse. Toxic and asphyxiant gases can accumulate in confined spaces and trenches.

Protective Action:
LaBella Associates personnel are not to enter excavations over 4 feet in depth unless excavations are adequately sloped. LaBella Associates personnel must receive approval from the LaBella Project Manager to enter an excavation for any reason. Subsequently, LaBella personnel are to receive authorization for entry from the Site Safety Officer.

LaBella Associates personnel should exercise caution near all excavations at the site as it is expected that excavation sidewalls will be unstable.

5.3 Cuts, Punctures and Other Injuries

Potential Hazard:
In any excavation or construction work site there is the potential for the presence of sharp or jagged edges on rock, metal materials, and other sharp objects. Serious cuts and punctures can result in loss of blood and infection.

Protective Action:
The LaBella Associates Project Manager is responsible for making First Aid supplies available at the work site to treat minor injuries. The First Aid supplies will be kept in the work trailer. The Site Safety Officer is responsible for arranging the transportation of authorized on-site personnel to medical facilities when First Aid treatment in not sufficient. Do not move seriously injured workers. All injuries requiring treatment are to be reported to the LaBella Project Manager. Serious injuries are to be reported immediately (see Section 9.0 - Emergency Action Plan).

5.4 *Injury Due to Exposure of Chemical Hazards*

Potential Hazards:
Volatile organic vapors from petroleum products and dust with semi-volatile compounds may be encountered during excavation activities at the project work site. Inhalation of high concentrations of organic vapors or dusts can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis.

Protective Action:
The presence of organic vapors may be detected by their odor and by monitoring instrumentation. LaBella Associates employees will not work in environments where hazardous concentrations of organic vapors or dusts are present. Air monitoring performed by LaBella Associates (see Section 8.0) of the work area will be performed at least every 120 minutes or more often using a Photoionization Detector (PID) or a Flame Ionization Detector (FID). LaBella Associates personnel are to leave the work area whenever PID or FID measurements of ambient air exceed 10 ppm consistently for a 10 minute period. In addition, during any mass excavation work, real time particulate monitoring will be conducted in the work area at least every 120 minutes or more often (e.g., visible dusts) utilizing DustTrak™ Model 8520 aerosol monitor (or equivalent). LaBella Associates personnel are to leave the work area whenever dust concentrations exceed the upwind concentration by 100 $\mu g/m^3$ (0.1 mg/m^3)consistently for a 10 minute period.

6.0 Decontamination Procedures

Upon leaving the work area, LaBella Associates personnel shall decontaminate footwear as needed. Under normal work conditions detailed personal decontamination procedures will not be necessary. Work clothing may become contaminated in the event of an unexpected splash or spill or contact with a contaminated substance. Minor splashes on clothing and footwear can be rinsed with clean water. Heavily contaminated clothing should be removed if it cannot be rinsed with water. LaBella Associates personnel should be prepared with a change of clothing whenever on site. LaBella will use the contractor's disposal container for disposal of PPE.

7.0 Personal Protective Equipment

Conditions requiring a level of protection greater than Level D are not expected at this work site. Typical safety equipment identified in company safety and health procedures is required, i.e., hard hat, safety glasses, orange vest, rubber nitrile sampling gloves, splash resistant coveralls, construction grade boots, etc. Additional site-specific personal protective equipment is not necessary when working under the conditions of this plan.

8.0 Air Monitoring

The LaBella Associates representative/Environmental Monitor will utilize a PID to screen the ambient air in the work areas (Geoprobe work, excavation, soil staging, and soil grading areas) for total Volatile Organic Compounds (VOCs) and a dust meter to monitor for fugitive dusts. Work area ambient air will generally be monitored downwind of the work area in the general breathing zone. In addition, ambient air upwind of the excavation areas should also be conducted in order to determine background concentrations of dust. [*Note: Dust monitoring will only be completed during excavation activities.*]

Air monitoring of the work areas will be performed at least every 120 minutes or more often using PID and dust meter (during excavation). LaBella Associates personnel are to leave the work area whenever PID measurements of ambient air exceed 10 ppm consistently for a 10 minute period and/or if dust concentrations exceed the upwind concentration by 100 $\mu g/m^3$ (0.1 mg/m^3) consistently for a 10 minute period.

LaBella personnel may re-enter the work areas wearing a ½ face respirator with organic vapor cartridges for an 8-hour duration when VOC concentrations average between 10-50 ppm. Organic vapor cartridges are to be changed after each 8-hour of use. If PID readings are sustained at levels above 50 ppm for a 10 minute average, work will be stopped immediately until safe levels of VOCs are encountered.

LaBella personnel may not re-enter the work area until dust concentrations in the work area decrease below 100 $\mu g/m^3$ (0.1 mg/m^3), which may be accomplished by the construction manager implementing dust control or suppression measures.

At all times, the Site Safety Officer has authority over actions of LaBella Associates personnel and their guests at the site and his or her requests for evacuation are to be heeded without delay. Skin and clothing should be rinsed with clean water if chemical exposure has occurred as a result of splash or spill. Contaminated clothing must be removed; LaBella personnel should bring a change of clothes to the site. Water repellant suits will be provided to help prevent contamination of clothing. Medical attention should be provided if skin irritation has occurred. Please refer to Table 1 outlining chemical compounds detected in soil, groundwater and soil gas samples collected at the Site.

9.0 Emergency Action Plan

In the event of an emergency, employees are to turn off and shut down all powered equipment and leave the work areas immediately. Employees are to walk or drive out of the Site as quickly as possible and wait at the assigned 'safe area'. Follow the instructions of the Site Safety Officer. [*Note: The 'safe area' should be determined prior to beginning work based on discussions with the Site Safety Officer and the construction manager. In the event that Site conditions change the designated 'safe area' may require reevaluation.*]

LaBella Associates employees are not authorized or trained to provide rescue and medical efforts. Rescue and medical efforts will be provided by local authorities. The Site Safety Officer will report all emergencies to the Project Manager as soon as possible.

10.0 Medical Surveillance

LaBella Associates will provide medical surveillance to all LaBella employees who are injured due to overexposure from an emergency incident involving hazardous substances at this site.

11.0 Employee Training

LaBella personnel who are not familiar with this site plan will receive training on its entire content and organization before working at the Site.

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Table 1
Exposure Limits and Recognition Qualities

Compound	PEL-TWA (ppm)(b)(d)	TLV-TWA (ppm)(c)(d)	LEL (%)(e)	UEL (%)(f)	IDLH (ppm)(g)(d)	Odor	Odor Threshold (ppm)	Ionization Potential
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	1(1)	10	1.3	7.9	Ca	Pleasant	4.7	9.24
Benzo (a) anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (a) pyrene (coal tar pitch volatiles)	0.2	0.2	NA	NA	700	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100	100	1.0	6.7	2,000	Ether	2.3	8.76
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Ideno (1,2,3-cd) pyrene	NA	NA	NA	NA	NA	Na	Na	Na
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Napthalene	10, Skin	10	0.9	5.9	250	Moth Balls	0.3	8.12
n-propylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA
p-Isopropyltoluene	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl Ether	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Tert-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	100	100	0.9	9.5	2,000	Sweet	2.1	8.82
1,2,4-Trimethylbenzene	NA	25	0.9	6.4	NA	Distinct	2.4	NA
1,3,5-Trimethylbenzene	NA	25	NA	NA	NA	Distinct	2.4	NA
Xylenes (o,m,p)	100	100	1.1	7.0	1,000	Sweet	1.1	8.56

(a) Skin = Skin Absorption
(b) OSHA-PEL Permissible Exposure Limit (flame weighted average, 8-hour): NIOSH Guide, June 1990
(c) ACGIH – 8 hour time weighted average from Threshold Limit Values and Biological Exposure Indices for 2003.
(d) Metal compounds in mg/m3
(e) Lower Exposure Limit (%)
(f) Upper Exposure Limit (%)
(g) Immediately Dangerous to Life or Health Level: NIOSH Guide, June 1990.

Notes:

1. All values are given in parts per million (PPM) unless otherwise indicated.

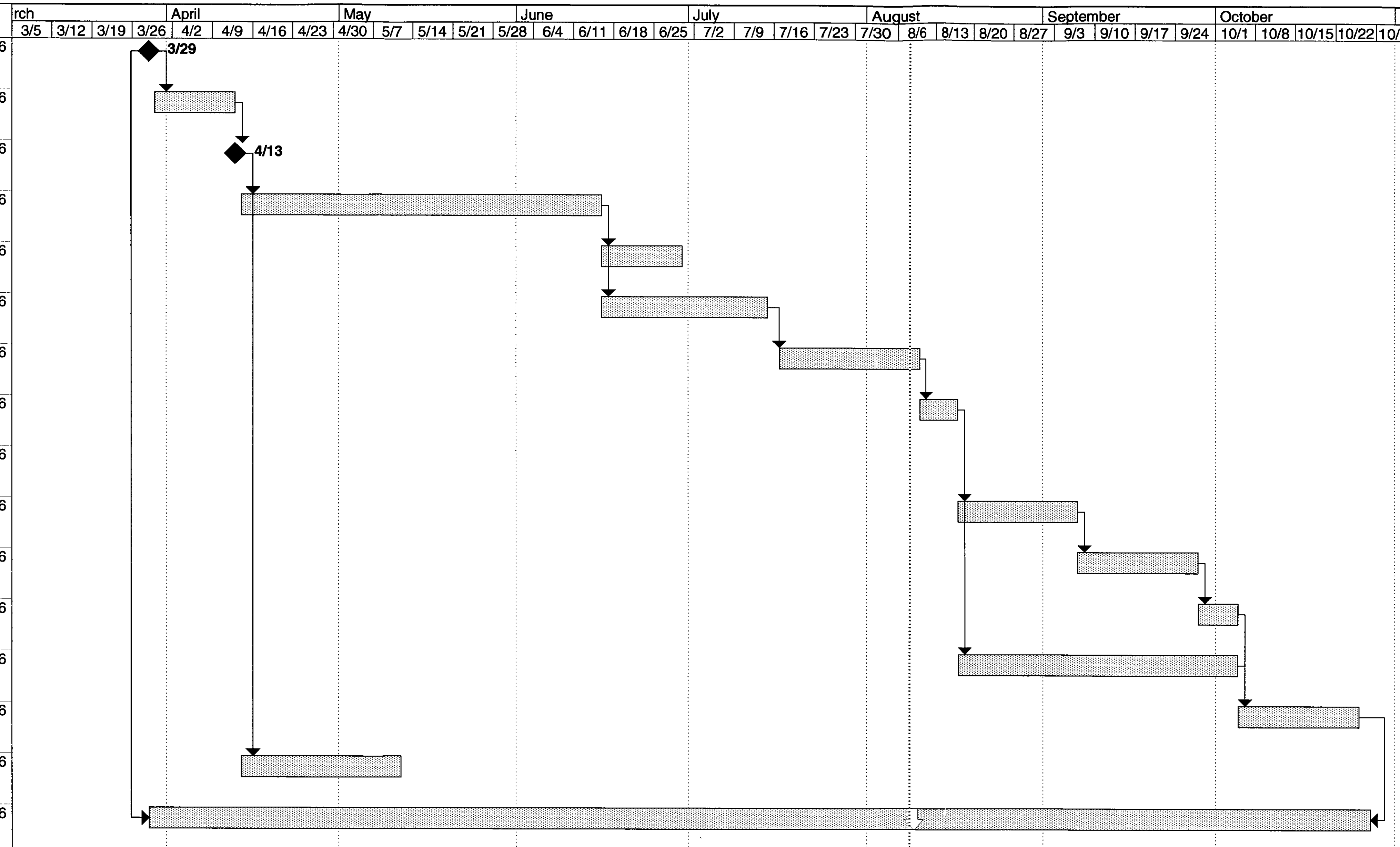
Ca = Possible Human Carcinogen, no IDLH information

LABELLA
LaBella Associates, P.C.
300 State Street
Rochester, New York 14614

Appendix 5
Anticipated Project Schedule

Brownfield Cleanup Program
Supplemental Investigation Work Plan
3865 West Henrietta Road
Henrietta, New York
Schedule

ID	Task Name	Duration	Start
1	Submit BCP Application (with Work Plan)	1 day	Wed 3/29/06
2	NYSDEC Determines Application Completeness	10 days	Thu 3/30/06
3	Letter of Completeness (for BCP Application)	1 day	Thu 4/13/06
4	Public Comment Period	45 days	Fri 4/14/06
5	Execute Brownfield Cleanup Agreement	10 days	Fri 6/16/06
6	NYSDEC Comments to Work Plan	21 days	Fri 6/16/06
7	Revisions to Supplemental RI Work Plan	18 days	Mon 7/17/06
8	Approval of Supplemental RI Work Plan	5 days	Thu 8/10/06
9	**Implement Supplemental RI Work Plan**	0 days	Mon 3/13/06
10	Soil Boring and Groundwater Investigation	15 days	Thu 8/17/06
11	IRM	15 days	Thu 9/7/06
12	Soil Gas Investigation	5 days	Thu 9/28/06
13	Qualitative Exposure Assessment	35 days	Thu 8/17/06
14	Final Remedial Investigation Report	15 days	Thu 10/5/06
15	Citizen Participation Plan	20 days	Fri 4/14/06
16	Citizen Participation Activities (Fact Sheets, etc.)	153 days	Wed 3/29/06



Project #206139 Date: Tue 8/8/06	Task		Progress		Summary		External Tasks		Deadline
	Split		Milestone		Project Summary		External Milestone		

Note: Dates are approximate and assume certain response times. Therefore actual dates may vary.

Revised Schedule (8-8-06).mpp