PARS
Environmental
Inc.

QUALITY ASSURANCE PROJECT PLAN/ SAMPLING PLAN

Remedial Investigation/Interim Remedial Action
Niagara Falls Armed Forces Reserve Center
Building 2 USTs & Former Fire Main
9400 Porter Road
Niagara Falls, New York

PREPARED FOR
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PARS PROJECT NO. 773-04

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1.0 INTRODUCTION

The United States Corps of Engineers (USACE), Louisville District has retained the services of PARS Environmental, Inc. (PARS) to conduct a remedial investigation, human health risk assessment (HHRA), feasibility study and interim remedial action (IRA) at the Niagara Falls Armed Forces Reserve Center (AFRC). The AFRC is located at 9400 Porter Road in Niagara Falls, NY, hereinafter the "Site." A Site Location Map and Site Plan are included as Figure 1 and Figure 2, respectively.

The Quality Assurance Project Plan (QAPP)/Sampling Plan has been prepared for the investigation of soil and groundwater in the vicinity of six former underground storage tanks (USTs), former vehicle fueling area and the cast iron fire protection main that discharges to a 24-inch corrugated metal storm sewer line on the eastern boundary of the Site.

The QAPP/Sampling Plan also includes an IRA in the area of the fire protection main. As part of a site inspection conducted in November and December 2010, residual product was observed within the fill material in an exploratory excavation (TP-12) installed adjacent to the 24-inch corrugated metal storm sewer line. A sample of impacted groundwater was collected and several compounds, including polychlorinated biphenyls (PCBs), were detected at concentrations exceeding the New York State Department of Environmental Conservation (NYSDEC) Class GA Objectives. The proposed IRA includes the removal of approximately 50 tons of soil and residual product and groundwater with a visible sheen.

This plan presents the project scope, objectives, organization, planned activities, sampling procedures, data quality objectives and quality assurance/quality control procedures. The QAPP/Sample Plan was developed in general accordance with the requirements of Section 2.4 of the NYSDEC DER-10/Technical Guidance for Site Investigation and Remediation (May 3, 2010).

Comments on this QAPP/Sampling Plan from the NYSDEC were received by email on September 2, 2011. NYSDEC comments have been addressed and incorporated into the QAPP/Sampling Plan. A copy of the NYSDEC comments is included in Appendix A.

1.1 PROJECT SCOPE AND OBJECTIVES

The purpose of the remedial investigation is to further evaluate impacts associated with the former USTs at Building 2 and the fire protection main. The investigation will focus on delineation of soil and groundwater impacts identified as part of the previous site inspection. Samples will be analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), PCBs and target analyte list (TAL) metals.

The proposed IRA will include excavation of impacted soils and removal of residual product found on the water table in the area of TP-12. The IRA is proposed because of the close proximately of residual petroleum product to the 24-inch corrugated metal storm sewer line.

In compliance with Section 120(h) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), a newspaper posting will be advertised in a local major newspaper notifying the public of the availability of administrative records. Relevant files will be provided to a local library to establish the administrative records. This will be completed prior to the start of field work at the Site.

A remedial investigation report and feasibility study will be prepared after the completion of field activities. Additionally, a HHRA will be performed to evaluate potential impacts to human health from exposure to soil and groundwater. The objective of the HHRA is to evaluate potential risk to human health under current and reasonably foreseeable future conditions at the Site.

1.2 KEY PERSONNEL AND CONTRACTORS

The following are key personnel and contractors that will be involved in the implementation of the QAPP/Sampling Plan.

Key Personnel	
Lenard Gunnell Senior Geologist (SME) United States Army Corps of Engineers 600 Dr. Martin Luther King, Jr. Place Louisville, KY 40202 502-315-6317	Laura Dell'Olio Installation Restoration Program Coordinator USAR 99th RSC, DPW ENV 5231 South Scott Plaza Fort Dix, NJ, 08640 609-562-7661
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Laboratory/Contractors	
TestAmerica Buffalo 10 Hazelwood Drive Amherst, New York, 14228	GZA GeoEnvironmental of New York 535 Washington Street, 11th Floor Buffalo, New York 14203
Matrix Environmental Technologies, Inc. 3730 California Road Orchard Park, New York 14127	

2.0 BACKGROUND

2.1 SITE SETTING

The Niagara Falls AFRC is an approximate 19.5 acre parcel located on the southern portion of Niagara Township, in Niagara Falls, Niagara County, New York. The Site is bound to the south by Porter Road and the property located immediately south of Porter Road is undeveloped forested land. Niagara Falls International Airport is located immediately north and east of the Site. Other properties in the vicinity of the Site are used primarily for commercial purposes.

2.2 TOPOGRAPHY AND DRAINAGE

The Site is located on the USGS 7.5-minute Tonawanda West topographic map. Topography at the Site is relatively flat with a slight gradient to the west/southwest. The elevation at the Site is approximately 575 feet above mean sea level.

Surface and storm water drainage is to Cayuga Creek located immediately west of the Site. Cayuga Creek is an intermittent tributary of the Niagara River. Storm sewer lines, drainage swales and outfalls are depicted in Figure 2.

2.3 GEOLOGY

The Site is located in the Erie-Ontario Lowlands Physiographic Province. The region is characterized by relatively flat topography and dissected by east-west trending escarpments. The Site is located about 5 miles south of the Niagara Escarpment (*Environmental Condition of Property Report*, CH2MHill, June 2007).

The Niagara Falls area is underlain by glacial sediment consisting mainly of till and lacustrine silt and clay, which is approximately 5 to 80 feet thick. The glacial deposits overlay weathered dolomite and limestone of the Lockport Group (Niagaran Series of Middle Silurian age). The Lockport Group is underlain by approximately 100 feet of shale and limestone (Clinton Group), which is underlain by 110 feet of sandstone and shale (Medina Group).

Soils encountered during the site inspection consisted of non-cohesive fill from 0 to 4 feet below ground surface (bgs). Fill material at some probe locations extended from 8 to 13 feet bgs. The fill material encountered was comprised of a coarse-grained mixture of sand and gravel with varying amounts of fine-grained silt and clay. Varying amounts of brick, slag, concrete, rebar, asphalt and wood were observed within this matrix. Native surficial soils are comprised of silty clay with trace fine sand. Borings were not advanced beyond 13 feet bgs as part of the inspection activities.

2.4 HYDROGEOLOGY

The Site is underlain by the Lakemont silty clay loam and the Fonda mucky silt loam. Both soil types are fine-to moderately fine-textured and have a low permeability. These soils are subject to ponding and the water table in the vicinity of the Site is at a depth of less than 4 feet bgs (*Environmental Condition of Property Report*, CH2MHill, June 2007).

The glacial deposits at the Site act as a confining unit for the weathered bedrock below. The hydraulic properties in the Lockport dolomite and limestone are related to secondary porosity and permeability owing to the presence of factures and solutioning. The main water-bearing zones in the Lockport Group are the weathered bedrock surface and horizontal fracture zones near stratigraphic contacts. The rock matrix transmits negligible amounts of groundwater because primary porosity is very low. The horizontal hydraulic conductivity of the weathered bedrock is estimated at 40 feet per day.

Groundwater was encountered at depths ranging from 2 to 6 feet bgs in soil probes and exploratory excavations during the site inspection. It is likely that the coarse-grained fill material overlying the less-permeable native fine-grained clay is creating the perched groundwater conditions at the Site.

2.5 HISTORY OF OPERATIONS

The United States Government acquired the Site in 1955 and the United States Navy used the Site to service helicopters and airplanes. Most of the buildings at the Site were constructed by 1956. The Army obtained the Site from the Navy in 1962. From 1970 to 1975, the Site was used to service Nike Missiles from missile batteries around the state of New York.

The Site is currently occupied by the 277th Quartermaster Company, the 865th Combat Support Hospital, the 1982nd Forward Surgical Unit and Area Maintenance Support Activity 76. A small presence is also maintained by personnel of the Department of Public Works (DPW), Fort Drum, New York (*Environmental Condition of Property Report*, CH2MHill, June 2007).

2.6 PREVIOUS INVESTIGATIONS

A yellow substance was observed discharging from the 24-inch diameter corrugated storm sewer at outfall (Outfall No. 5) into the drainage swale at the southeast corner of the Site. An investigation was performed by United States Army Reserve (USAR) in 2008.

The New York State Department of Environmental Conservation (NYSDEC) was notified on June 24, 2008 and Spill # 0803478 was assigned for the discharge. Product was observed discharging from the 6-inch diameter cast iron fire protection main into the 24-inch diameter corrugated storm sewer and the 6-inch line was capped. The drain valve for the 6-inch line was uncovered and dislodged in June 2008. After dislodging the valve, product was observed in the excavated hole. A sample was collected and the product was identified as diesel fuel. Low concentrations of PCBs also were detected in the sample.

As part of the investigation, a sediment sample was collected from the 24-inch diameter storm sewer adjacent to the cast iron pipe. A sample of the yellow substance was also collected from the drainage swale. The sample results revealed that the sediment in the pipe and the yellow substance present in the swale contained detectable levels of PCBs.

Storm Sewer and Drainage Swale Investigation/Remediation
The USACE and the USAR 99th Regional Support Command (99th RSC) retained the services of PARS to investigate and remediate the drainage swale at Outfall No. 5. The 24-inch diameter storm sewer was also cleaned as part of the remedial action. Additionally, approximately 134 tons of PCB impacted soil was excavated from the drainage swale.

PCB concentrations in the post-excavation soil samples from the drainage swale were below the maximum contaminant level of 1 milligram per kilogram (mg/kg) that was established by the New York State Department of Environmental Conservation (NYSDEC). Investigation and remediation activities are outlined in the *Remedial Action Report* (PARS, March 2010).

Site Inspection
Six USTs were reportedly present along the eastern and western sides of former Building 2. Additionally, a vehicle fueling area was located immediately west of the building. No documentation was available regarding the closure of these USTs and fueling area.

In November and December 2010, PARS conducted a site inspection to evaluate potential impacts associated with the former USTs at Building 2 and the fire protection main. Inspection activities consisted of a geophysical survey, exploratory excavations and soil and water sampling. The findings were outlined in the *Site Inspection Report* (PARS, June 2011).

The geophysical survey noted three anomalies identified as debris from former Building 2. An approximate 150-foot long linear anomaly was identified in the general vicinity of the fire protection main that terminates at the 24-inch diameter corrugated storm sewer line. No anomalies consistent with USTs were identified as part of the geophysical survey.

Twelve exploratory excavations (TP-1 through TP-12) were completed based on the findings of the geophysical survey, previous investigations and field observations. A soil sample for laboratory analysis was collected from TP-1. Several SVOCs were detected in the sample at concentrations exceeding the NYSDEC Unrestricted and Restricted Use Soil Cleanup Objectives.

The 6-inch diameter cast iron fire protection water main was encountered in six exploratory excavations (TP-2, TP-3, TP-4, TP-11 and TP-12). At TP-11, the 6-inch diameter pipe terminated at a concrete catch basin presumed to be the 500,000-gallon reservoir drain. A sample was collected from the water flowing from the 6-inch diameter line into the concrete catch basin. Several compounds including toluene, naphthalene, PCBs and chromium were detected in the water sample at concentrations exceeding the NYSDEC Class GA Objectives.

Petroleum product and a heavy sheen was observed within the fill material and on the groundwater surface in one of the exploratory excavations (TP-12). Several compounds, including PCBs, were detected in a water sample collected from TP-12 at concentrations exceeding the NYSDEC Class GA Objectives. A drum vacuum was used to remove petroleum impacted water from the excavation.

Twenty-one soil probes were completed as part of the site inspection. One soil sample was collected from each probe for laboratory analysis. Acetone, metals and PCBs were detected in several samples at concentrations exceeding the Unrestricted Use Soil Cleanup Objective.

PARS recommended conducting an investigation to further evaluate soil and groundwater impacts at the locations of the former USTs at Building 2 and in the vicinity of the fire protection main. Additionally, PARS recommended that the residual petroleum product observed within the fill material at TP-12 be removed as an IRA because of the close proximately of the product to the 24-inch corrugated metal storm sewer line.

3.0 REMEDIAL INVESTIGATION/INTERIM REMEDIAL ACTION

3.1 NEWSPAPER POSTING

A newspaper posting will be advertised in a local major newspaper notifying the public of the availability of administrative records prior to the start of field activities in compliance with Section 120(h) of CERCLA. Relevant files will be submitted to a local library to establish the administrative records.

3.2 SOIL SAMPLING

Soil sampling will be conducted using direct-push methods. Soil borings will be installed in the vicinity of the former USTs, vehicle fueling area and fire protection main. A total of 16 primary and 14 secondary soil borings will be performed as part of investigation. A field engineer/geologist will oversee the soil sampling and will field screen soils for VOCs using an organic vapor meter (OVM). The total depth of soil borings will be based on field observations. Borings will be advanced to a minimum depth of 12 feet below ground surface (bgs), which, based on previous investigation activities at the Site, is below the water table.

One surface soil sample and one subsurface soil sample will be collected from each soil boring location. Sample depths will be biased based on visual, olfactory, field screening (i.e., OVM readings) and professional judgment.

Primary soil boring samples will be submitted for TCL VOCs, SVOCs, PCBs and TAL metals analysis. Secondary soil boring samples will be submitted to the laboratory and placed on hold pending the results of the primary soil boring samples. Analysis of the secondary soil samples will be conducted if contaminants are detected in the primary samples at concentrations exceeding the NYSDEC Unrestricted and Restricted Use Soil Cleanup Objectives.

In addition ot the proposed soil borings, one soil sample will be collected from Outfall 4 and submitted to the laboratory for TCL VOCs, SVOCs, PCBs and TAL metals analysis. Outfalls 1, 2 and 3 will not be sampled due to accessibility issues caused by the Cayuga Creek and the outfalls position beneath the creek water line.

Proposed soil boring/sample locations were based upon previous investigation activities as well as to ensure adequate spatial distribution. Proposed soil boring/sample locations are depicted in Figure 4. The proposed number of samples to be collected and parameters to be tested are summarized in Table 1.

3.3 GROUNDWATER SAMPLING

1-inch diameter PVC temporary micro-wells will be installed at nine of the probe locations for the collection of groundwater samples.

Prior to sampling, the temporary micro-well will be purged using a peristaltic pump to remove sediment and to ensure collection of a representative groundwater sample. Groundwater samples will be collected from each micro-well and the samples will be analyzed for TCL VOCs, SVOCs, PCBs and TAL dissolved metals. Groundwater samples for VOC analysis will be collected using disposable Teflon micro-bailers. All other samples will be collected directly from the pump discharge.

Proposed micro-well locations are depicted in Figure 4. The proposed number of samples to be collected and parameters to be tested are summarized in Table 1.

The temporary micro-wells will be removed after sampling and soil cuttings will be returned to the boreholes. Purge water from groundwater sampling will be transferred to 55-gallon drums and the drums will be properly disposed as a non-hazardous waste stream.

3.4 INTERIM REMEDIAL ACTION (IRA)

The IRA will include the excavation of an area of approximately 100 square feet to a depth of 5 feet bgs (assume 50 tons of impacted soil) in the vicinity of the former exploratory excavation (TP-12). Soil excavation will be performed using a backhoe or excavator. Soil removed from the excavation will be placed on polyethylene sheeting next to the excavation. The soil pile will be covered using polyethylene sheeting and secured at the completion of excavation activities.

The portion of the 6-inch diameter cast iron fire protection main uncovered during excavation activities will be removed as part of the IRA. Additionally, impacted groundwater and residual product will be pumped from the excavation using a vacuum truck. It is assumed that 2,000 gallons of liquid will be removed from the excavation.

Post-excavation soil samples will be collected from the excavation and will be analyzed for TCL VOCs, SVOCs, PCBs and TAL metals. The excavation will be backfilled with clean soil that is similar to the excavated material that will be properly compacted and capped with approximately 4 to 6 inches of crushed stone.

A waste composite sample will be collected from the soil pile that is removed as part of the IRA. The composite sample will be analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs, metals and PCBs. The waste composite sample will also be analyzed for Resource Conservation Recovery Act (RCRA) characteristics. Based on the laboratory results, the soil will be properly disposed. For planning purposes, it is assumed that the soil will be a non-hazardous waste stream.

4.0 SOIL AND GROUNDWATER SAMPLING PROCEDURES

The soil and groundwater samples collected as part of this remedial investigation and IRA will be sent via standard chain-of-custody procedures to a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory (Test America, Amherst, New York). The samples collected and analyzed as part of the investigation will conform to the NYSDEC Contract Laboratory Protocols using SW-846 methodologies. An Analytical Services Protocol (ASP) Category B deliverable package will be provided by the laboratory. Electronic data deliverables will be provided using EQUIS.

Proposed soil and groundwater sampling procedures are described in the following sub-sections.

4.1 SOIL SAMPLING

Soil samples for laboratory analysis, soil screening and classification will be collected from the proposed 31 soil borings (17 primary and 14 secondary). Soil stratigraphy and sample recovery will be recorded on the boring log. Soil samples will be removed from the macro-core liners after opening with either a stainless steel spoon or trowel. The soil sample collected from Outfall 4 will be collected with a stainless steel spoon or trowel at a depth interval of 0.0 to 0.25 feet bgs.

Soil screening will be performed by holding the probe of the OVM directly over the core and by headspace screening. The OVM used for field screening will be calibrated daily in accordance with manufacturer requirements using a standard gas (isobutylene). The soil cores will be screened immediately after opening the acetate liner. For headspace screening, soils will be transferred to a bag, and the tip of the OVM will be placed into the bag. Peak response will be recorded on the boring log.

Soil samples for laboratory analysis, with the exception of those for VOCs, will be homogenized using a "coning and quartering" procedure. The soil will be transferred to a clean surface (metal foil, steel pan, bowl, etc.). The soil will be scraped from the sides, corners, and bottom of the clean surface, rolled to the middle, and thoroughly mixed until the material appears homogenous. An aliquot of this pile will then be transferred to the required sample containers, slightly tamped-down, filled to near the top of the container, and sealed with the appropriate cap. Any soil or sediment on the threads of the container will be wiped off prior to placing the cap on the sample container.

VOC samples will not be mixed, but will be placed directly into the vial sample container (4 oz. wide mouth jar), limiting headspace by compacting the soil into the container.

4.2 MICRO-WELL INSTALLATION/GROUNDWATER SAMPLING

Micro-wells will be installed at nine soil boring locations. The micro-wells will be constructed of 1-inch diameter flush coupled Schedule 40, PVC riser and screen. The actual installation depth of the screen will be selected based on the depth to groundwater. The screen will consist of a maximum 10-foot long section with approximately 2 to 3 feet of the screen extending above the water table. Well screens shall be 0.01-inch factory machine slotted. PVC riser and screen will be shipped to the Site in manufacturer supplied sealed containers or bags. New riser, screen and drive points will be installed at each location. These materials will be removed from the probe hole and properly disposed by the drilling contractor.

Water level measurements will be recorded in each micro-well. If possible, a minimum of three well volumes of water will be purged from the micro-well prior to sampling. Otherwise, the micro-wells will be purged dry and will be allowed to recover prior to sampling. Purging will be accomplished using a peristaltic pump to remove accumulated silt/sediment from the wells. Prior to removal of the first volume of water, and after each subsequent volume of water removed, field parameters (pH, turbidity, temperature and specific conductance) will be measured and recorded to document the presence of representative water in the well (i.e., equilibration to steady readings).

Groundwater samples for VOC analysis will be collected using a Teflon micro-bailer. All other samples will be collected from the pump discharge. Three 40-ml glass vials preserved with hydrochloric acid (HCL) will be used for VOC analysis. The vials will be filled until a convex meniscus is formed. The vial will then be capped, inverted and inspected for air pockets/bubbles that may be present on the inside surfaces of the vial. If any bubbles or aggregate of bubbles are observed, a new sample will be obtained using a new vial. Samples for SVOC and PCB analysis will be collected in 1 liter amber laboratory containers. Samples for metals analysis will also be collected in l liter amber containers and will be delivered to the laboratory for filtering of suspended particulates within 24 hours of sample collection. The filtered sample will be placed in a container preserved with nitric acid.

4.3 INTERIM REMEDIAL ACTION POST-EXCAVATION SAMPLING

An excavator or backhoe will be used to excavate impacted soils. Approximately 50 tons of impacted soils will be removed. Excavated soils will be screened using an OVM as per the procedures described in Section 4.1.

A post excavation soil sample will be collected from each sidewall and from the base of the excavation using the bucket of the backhoe or excavator. Soil samples for laboratory analysis, with the exception of those for VOCs, will be homogenized using a "coning and quartering" procedure as outlined in Section 4.1. VOC samples will be placed directly into the vial sample container. Soil samples will be analyzed for TCL VOCs, SVOCs, PCBs and TAL metals.

4.4 DECONTAMINATION OF SAMPLING EQUIPMENT

To avoid cross contamination, sampling equipment (defined as any piece of equipment which may contact a sample) will be decontaminated according to the following procedures.

4.4.1 Non-Dedicated Reusable Equipment

Non-dedicated reusable equipment such as the stainless steel mixing bowls and spoons will require field decontamination. Acids and solvents will not be used in the field decontamination of such equipment. Decontamination typically involves scrubbing/washing with a laboratory grade detergent (e.g., alconox) to remove visible contamination, followed by potable (tap) water and analyte-free water rinses. Tap water may be used from any treated municipal water system. The use of an untreated potable water supply is not an acceptable substitute. If deemed necessary, steam cleaning or high pressure hot water cleaning may be used in the initial removal of gross, visible contamination.

The soil borings may be completed through contaminated fill material or soil. The macro-core sampler for the direct-push rig will be washed between locations and new acetate liners will be used for each sampling interval.

4.4.2 Disposable Sampling Equipment

Disposable sampling equipment (e.g., bailers and polyethylene tubing) will be used as part of the proposed investigation and will not be used at more than one location. PPE and other materials used as part of the remedial investigation and IRA will be properly disposed in accordance with state and federal solid waste regulations.

4.5 SAMPLE IDENTIFICATION/ LABELING

Samples will be assigned a unique identification using the sample location or other sample-specific identifier. Sample identification will be limited to seven alphanumeric characters to be consistent with the limitations of the laboratory tracking/reporting software. The general sample identification format is TP - XX - Y-Y.

Where:
TP = Type of sample (i.e., SP for soil boring)
XX = Numeric character indicating the number from which the sample was obtained (SP-1)
Y-Y = Depth of the sample (SP-1-0.0-0.5)

Quality control (QC) field duplicate samples will be submitted blind to the laboratory. Fictitious sample identification will be created using the same system as the original. The sample identifications (of the original sample and its field duplicate) will be noted in the field notes.

All sample containers will be labeled in the field. A non-removable label will be affixed to each container and the label will include the following information recorded using permanent water-proof ink:

- Site name, location and job number
- Sample identification code
- Date and time
- Sampler's name
- Preservative
- Type of sample (e.g., water, soil, air)
- Requested analyses

4.6 SAMPLE BOTTLES, PRESERVATION AND HOLDING TIME

Table 1 specifies the analytical method, matrix, holding time, containers and preservatives for the various analyses to be completed as part of the site inspection. Sample bottle requirements, preservation and holding times are discussed further below.

4.6.1 Sample Containers

The selection of containers used to collect samples is based on the criteria of sample matrix, analytical method, potential contaminants of concern, reactivity of container material with the sample, QA/QC requirements and regulatory protocol requirements. Sample bottles will be provided by the analytical laboratory and will conform to the requirements of the USEPA Specifications and Guidance for Contaminant-Free Sample Containers.

4.6.2 Sample Preservation

Soil and groundwater samples will be placed in coolers that are maintained at an approximate temperature of 4^{o} Celsius. Groundwater samples for VOC analysis will be collected in 40-ml glass vials preserved with HCL. Water samples for TAL metal analysis will be transferred to laboratory containers preserved with nitric acid. Sample preservation methods are summarized in Table 1.

4.6.3 Holding Times

Holding times are judged from the verified time of sample receipt by the laboratory. The samples will be shipped from the field to arrive at the laboratory no later than 48 hours from the time of sample collection. Holding time requirements will be those specified in the NYSDEC ASP and are summarized in Table 1.

4.7 CHAIN OF CUSTODY AND SHIPPING

A chain-of-custody form will trace the path of sample containers from the Site to the laboratory. The project manager will notify the laboratory of upcoming field sampling events and the subsequent transfer of samples. This notification will include information concerning the number and type of samples and the anticipated date of arrival.

Insulated coolers will be provided by the laboratory for shipping samples. Sample containers will be individually labeled with an adhesive identification label provided by the laboratory. Project personnel receiving the sample containers from the laboratory will check each cooler for the condition and integrity of the bottles prior to field work.

Once the sample containers are filled, they will be immediately placed in the cooler with ice (in plastic bags to prevent leaking) or synthetic ice packs to maintain the samples at 4 ^{o} Celsius.

The field sampler will indicate the sample designation/location number in the space provided on the chain-of-custody form for each sample. The chain of custody forms will be signed and placed in a sealed bag in the cooler. The cooler will be closed for transport with shipping tape to the laboratory. When the laboratory receives the coolers, the lab personnel will sign the chain-of-custody form and will log the samples for analysis. A sample chain of custody is included in Appendix A.

5.0 DATA QUALITY OBJECTIVES

The QAPP/Sample Plan is designed to produce data of the quality necessary to achieve the project objectives and meet the minimum standard requirements for field and analytical methods. Data quality objectives (DQO) have been established to ensure that sufficient and accurate data are collected for this project. DQOs ensure that the proper data are collected and generated to address the environmental issues. Data uses may require different levels of data collection. Two levels of data collection, field analysis and definitive analysis, have been identified for this project and are described below.

Field Analysis

Field analysis provides qualitative results and includes those types of data generated through use of an OVM or other real time instrument. Field analysis data is typically used for sample selection and to support laboratory analysis using a definitive analysis method. Equipment used for field analysis will be calibrated in accordance with manufacturer specifications.

Definitive Analysis

Definitive analysis provides analytical results using standard USEPA methods performed by a certified laboratory. Soil and groundwater samples will be analyzed using definitive analysis. A laboratory certified under the NYSDOH ELAP for CLP will perform the analysis. Test America has been selected as the contract laboratory for this project.

5.1 MEASUREMENT PERFORMANCE CRITERIA

The analytical laboratory will perform accuracy, precision, completeness calculations and data will be qualified in accordance with ASP guidelines. Protocols that will ensure data accuracy, precision, representativeness, comparability, completeness and sensitivity are presented below.

5.1.1 Data Accuracy

Accuracy is defined as the degree of agreement of a measurement or average of measurements with an accepted reference value. Accuracy will be evaluated by the use of calibration and calibration verification procedures, laboratory control samples and surrogates at the frequencies specified in the analytical methods utilized. Accuracy will be calculated as percent recovery and will be evaluated by the acceptance criteria specified in each analytical method.

5.1.2 Data Precision

The laboratory objective for precision is to equal or exceed the precision demonstrated for the applied analytical methods on similar samples. Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. Precision will be evaluated by the analyses of field duplicates. Field duplicate samples will be collected at a rate of 1 per 20 samples (5 percent) for each matrix (soil and groundwater).

Relative Percent Difference (RPD) criteria, prescribed by NYSDEC and those determined from laboratory performance data, are used to evaluate precision between duplicates. Precision will be determined from field duplicates and it will be expressed as the relative percent difference (% RPD). Criteria for evaluation of laboratory duplicates are specified in the applicable methods. The objective for field duplicate precision is $\leq$ 50% RPD for all matrices.

5.1.3 Data Representativeness

Sampling and handling procedures, as well as laboratory practices, are designed to provide a standard set of performance-driven criteria to provide data of the same quality as other analyses of similar matrices using the same methods under similar conditions. Representativeness will be determined by a comparison of the quality controls for these samples against data from similar samples analyzed at the same time.

5.1.4 Data Completeness

The goal of completeness is to generate the maximum amount of valid data. The highest degree of completeness would be to find all deliverables flawless, valid and acceptable. The lowest level of completeness is excessive failure to meet established acceptance criteria and consequent rejection of data. Samples collected in the field for analysis must be accounted for in the data packages and the data should be 100% complete from a deliverable standpoint, as tracked through the chain-of-custody process. The impact of rejected or unusable data will be made on a case-by-case basis. Loss of critical data may require resampling or reanalysis.

5.1.5 Sensitivity

The sensitivity or detection limit desired for each analysis or compound is established by NYSDEC ASP, for the respective analysis being performed. It is understood that such limits are dependent on matrix interferences. Matrix interference will be assessed as part of the data quality objectives.

6.0 QUALITY ASSURANCE/ QUALITY CONTROL PROTOCOLS

This section describes the analytical methods, principles and procedures that will be used to generate quality data. These protocols include laboratory calibration, field equipment calibration, QC sample collection and analysis, quantitative evaluation of data quality protocols and data qualification, if necessary.

6.1 ANALYTICAL METHODS, PROCEDURES & CALIBRATION

6.1.1 Methods

Analytical methods to be used during this project are presented in the NYSDEC, ASP, June 2005. Specific methods and references for each parameter are shown in Table 1. The sample preservation and holding time requirements are also identified in Table 1. Quantification and detection limits for analyses are specified under the appropriate test methods.

It is the responsibility of the laboratory to be familiar with the analytical procedures and deliverables pertaining to the remedial investigation and IRA. Test America will be the contract laboratory and will perform the analytical testing. Test America is certified by the NYSDOH ELAP for ASP.

6.1.2 Laboratory Instrumentation & Equipment

Laboratory instruments will be calibrated following SW-846 analytical method protocols. Initial calibrations will be performed before sample analysis. Calibration checks will be performed at the frequencies specified in each analytical method.

Subcontractors providing analytical services should perform their own internal laboratory audits and calibration procedures with data review conducted at a frequency so that errors and problems are detected early, thus avoiding the prospect of redoing large segments of work.

Situations related to this project requiring corrective action will be documented and made part of the project file. For each measurement system identified that requires corrective action, the responsible individual for initiating the corrective action and also the individual responsible for approving the corrective action will be identified. As part of its total quality management program, PARS makes the results of laboratory audits and data validations available to the analytical laboratories. The laboratories are made aware of non-critical items and areas where improvement may be made in subsequent work.

6.1.3 Field Equipment

Field equipment will be used during the project. Qualitative organic vapor analysis will be performed using an OVM. Water quality meters (e.g., Horiba U series) will be used for groundwater sampling. Calibration of the field equipment will be completed in accordance with manufacturer specifications prior to the start of each day.

If instrument performance or data fall outside acceptable limits, corrective actions will be taken. These actions may include recalibration of instruments, acquiring new standards, replacing equipment or repairing equipment.

6.2 QUALITY CONTROL SAMPLES

6.2.1 Analytical Equipment

The analytical methods to be utilized (see Table 1) for sample analysis address the quality control to be used and the frequency of replicates, blanks and calibration standards for laboratory analytical equipment.

6.2.2 Field Samples

Field quality control samples will consist of sample duplicates and matrix spike and matrix spike duplicates.

Field duplicate soil samples are used to assess the variability of a matrix at a specific sampling point and to assess the reproducibility of the sampling method. These samples are separate aliquots of the same sample; prior to dividing the sample into "sample" and "duplicate" aliquots. Soil field duplicates are homogenized (except for the VOC aliquots). Groundwater duplicate samples are collected by alternately filling the sample containers. Field duplicate soil and groundwater samples will be collected at a frequency of 5 percent (1 per 20 samples).

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to assess the bias and precision of a method in a given sample matrix. These samples are separate aliquots of the same sample; prior to dividing the sample into "sample" and "MS/MSD" aliquots. Soil MS/MSDs are homogenized (except for the VOC aliquots). Groundwater MS/MSD samples are collected by alternately filling the sample containers. MS/MSD soil and groundwater samples will be collected at a frequency of 5 percent (1 per 20 samples).

One quality control field blank (rinsate blank) will be collected for each matrix (soil and groundwater) as part of the investigation. The field blanks will be collected by passing analyte-free water through the sampling equipment into sample containers. The field blanks will analyzed for the same parameters that are sampled for soil and groundwater. Field blanks are used to evaluate potential field contamination of the samples collected as part of the investigation.

A quality control trip blank will be prepared by the laboratory and will accompany the groundwater samples. Trip blanks will be analyzed for TCL VOCs. One trip blank will be provided by the laboratory and will accompany the sample cooler. The purpose of the trip blank is to evaluate potential laboratory contamination of the samples. The trip blank is also used to evaluate potential contamination of sample containers and field samples during transport from the laboratory to the Site and back to the laboratory.

7.0 DELIVERABLES

7.1 REMEDIAL INVESTIGATION/IRA REPORT AND FEASIBILITY STUDY

A remedial investigation report will be prepared based on the proposed scope of work. The report will present the findings and conclusions of the investigation. The report will include any applicable recommendations for additional investigation at the Site. Figures, analytical result tables, boring logs, photographs, disposal documentation, laboratory reports and other applicable documents will be included with the report.

A feasibility study will be included as part of the remedial investigation report. The purpose of the feasibility study is to evaluate potential remedies to address soil and groundwater impacts.

A draft remedial investigation report will be prepared and submitted to the USACE and USAR for review and approval. The final report will be submitted to NYSDEC for approval.

7.2 HUMAN HEALTH RISK ASSESSMENT (HHRA)

A HHRA will be performed to evaluate potential impacts to human health from exposure to soil and groundwater. The objective of the HHRA is to evaluate potential risks to human health under current and reasonably foreseeable future conditions. The risk assessment will be conducted in accordance with current regulations and guidelines set forth by the USEPA and USACE. The risk assessment will include the following four components: hazard identification, exposure assessment, toxicity assessment, and risk characterization.

During the hazard identification process, any compound that exceeds the NYSDEC Industrial-Restricted Use Soil Cleanup Objectives will be evaluated as part of the initial screening process. Compounds of potential concern (COPCs) will be further analyzed during a secondary screening process. COPCs selected from the secondary screening process will be examined in the exposure assessment for the potential risk to current commercial/industrial use. Future residential use will not be considered as part of the HHRA. The approved reuse of the Site is “no-cost Economic Development Conveyance to the Town of Niagara for reuse by aviation and aerospace firms (Building 4, the hanger and its two attached buildings, 4N and 4S) and a mix of light industrial and commercial uses permitted by the Town of Niagara zoning (remainder of Site on a building by building basis).

Exposure points and pathways will be considered for each COPC. Interaction with applicable media (soil and/or groundwater) will also be evaluated. If complete exposure pathways are identified, exposure concentrations will be calculated and a toxicity assessment and risk characterization will be conducted.

A copy of the report will be provided to the USACE, USAR and NYSDEC. The HHRA will be included as part of the remedial investigation report/feasibility study.

8.0 HEALTH AND SAFETY CONCERNS

8.1 SITE SPECIFIC HEALTH AND SAFETY PLAN

A site-specific health and safety plan has been developed for the proposed inspection activities. The health and safety plan has been prepared in accordance with the Federal Occupational Safety and Health Administration (OSHA), US Department of Labor and USACE requirements.
A copy of the Health and Safety Plan is included in Appendix B.

All personnel performing work at the Site have received initial OSHA Hazardous Waste Operator training (40 hour), as well as annual 8 hour refresher courses.

It is anticipated that all work will be completed using Level D personal protective equipment. Should health and safety monitoring during field activities indicate a threat to field personnel or warrant an upgrade to level C protection, work will stop, site conditions will be re-evaluated and the health and safety plan updated prior to further inspection activities.

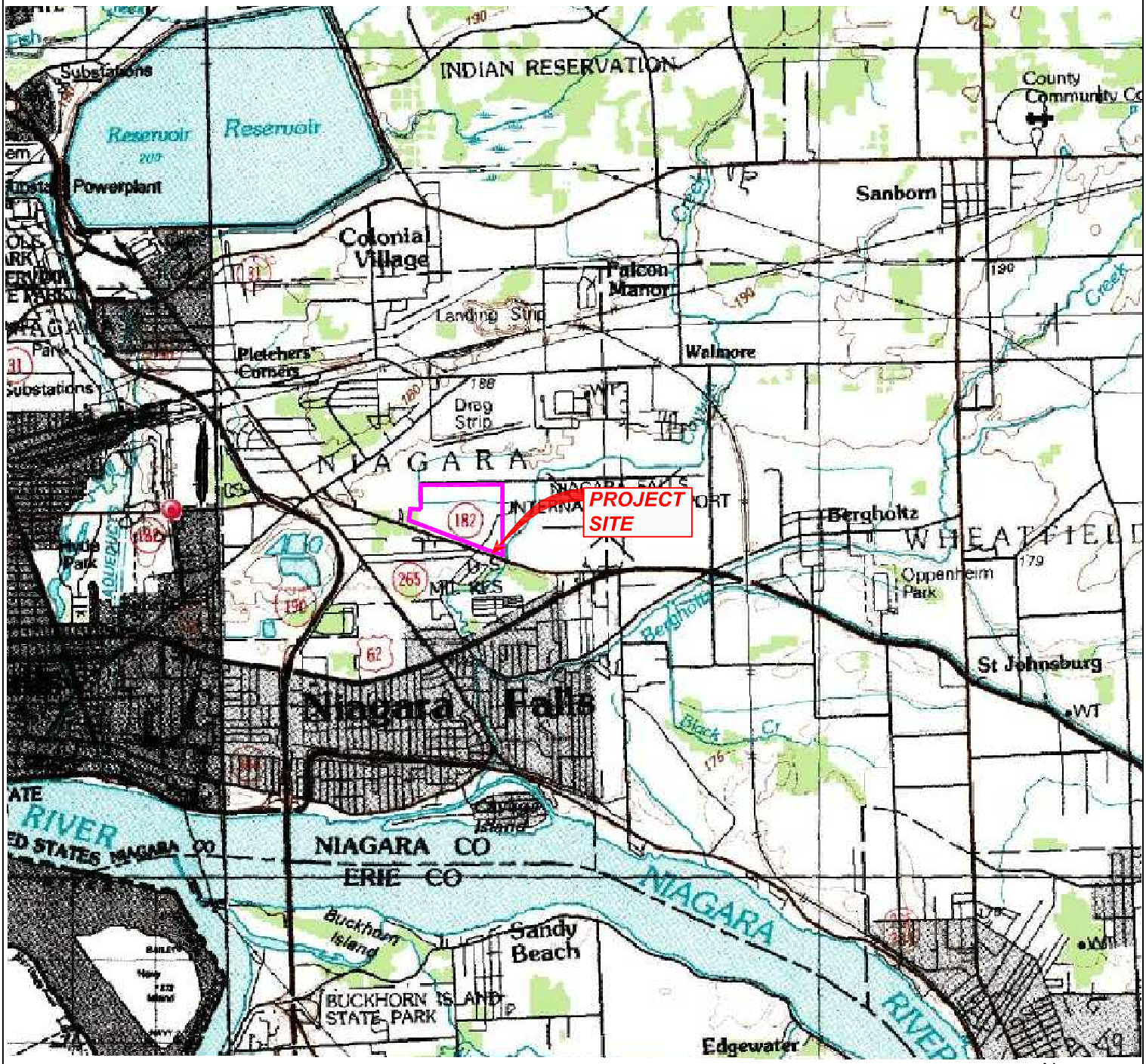
9.0 SCHEDULE

The following is the proposed schedule to complete the remedial investigation and IRA outlined this QAPP/Sampling Plan. This schedule assumes that the QAPP/Sampling Plan is approved by August 31, 2011. The schedule may be altered because of adverse weather conditions or delays in approvals.

Remedial Investigation and IRA Schedule

Task	Proposed Completion Date
Newspaper Posting/Provide Relevant Files to Library	August 2011
On-site meeting with USAR and NYSDEC	August 2011
Conduct Soil and Groundwater Sampling	September 2011
Complete Interim Remedial Action	September 2011
Dispose of Impacted Soil	October 2011
Review and Evaluate Laboratory Data	October 2011
Prepare Human Health Risk Assessment	October – November 2011
Submit Draft RI/FS/HHRA to USACE and USAR	November 2011
Address comments from USACE and USAR	December 2011
Submit Final RI/FS/HHRA	December 2011

FIGURES

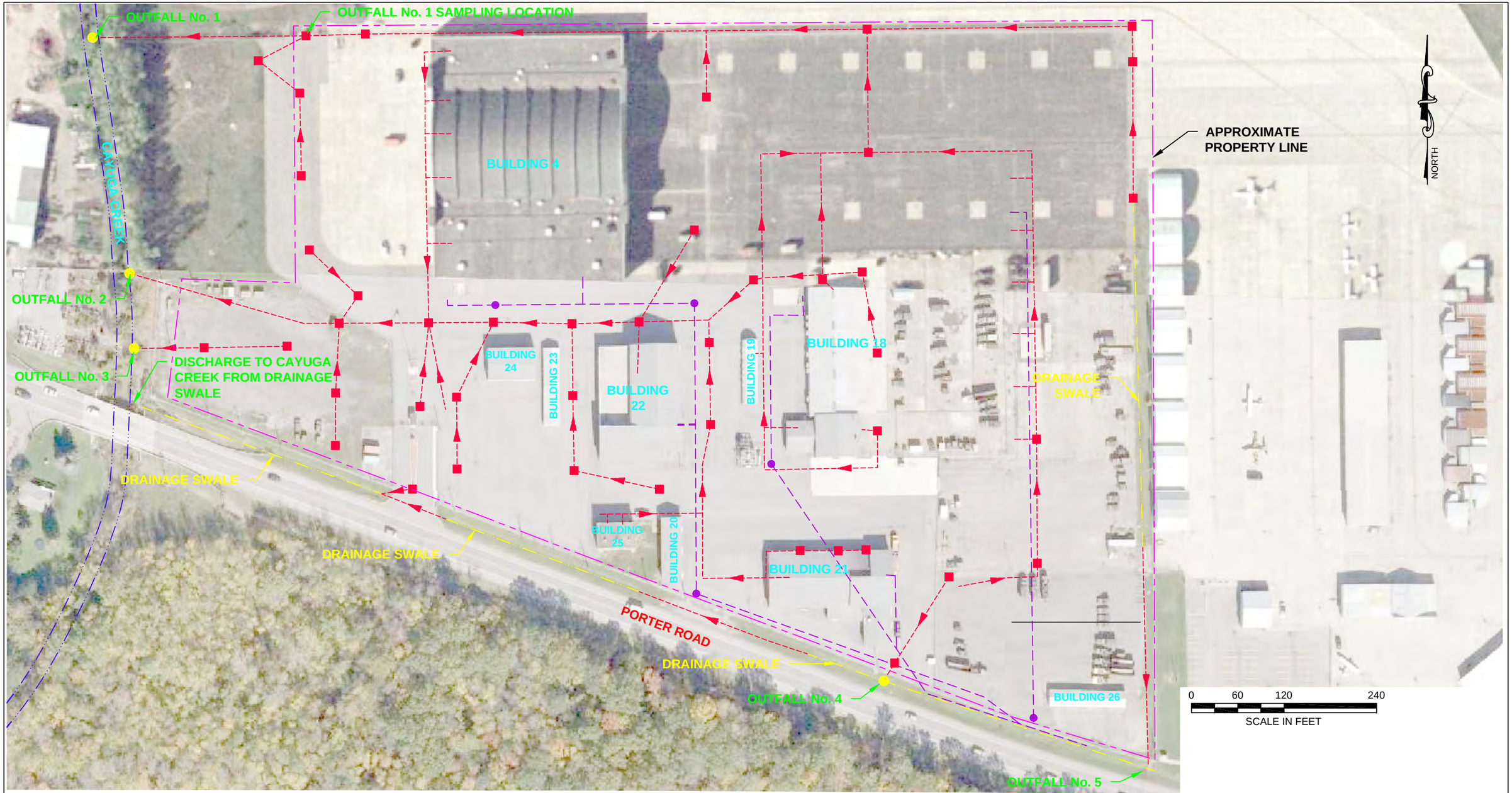


NOTE:
BASE MAP ADAPTED FROM U.S.G.S. TOPOGRAPHIC MAPS DOWNLOADED FROM TERRASERVER.MICROSOFT.COM

FIGURE 1
SITE LOCATION MAP
USAFRC
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: KN	SCALE: 1" = 2,000'	JOB No.: 773-04
CK'D. BY: MM	DATE: 1/10/10	FILE NO.: 773-04
REV. NO. –	REV. DATE: –	FIGURE NO.:1



LEGEND:

- SANITARY SEWER LOCATION
- STORM SEWER LOCATION WITH FLOW DIRECTION

NOTES:

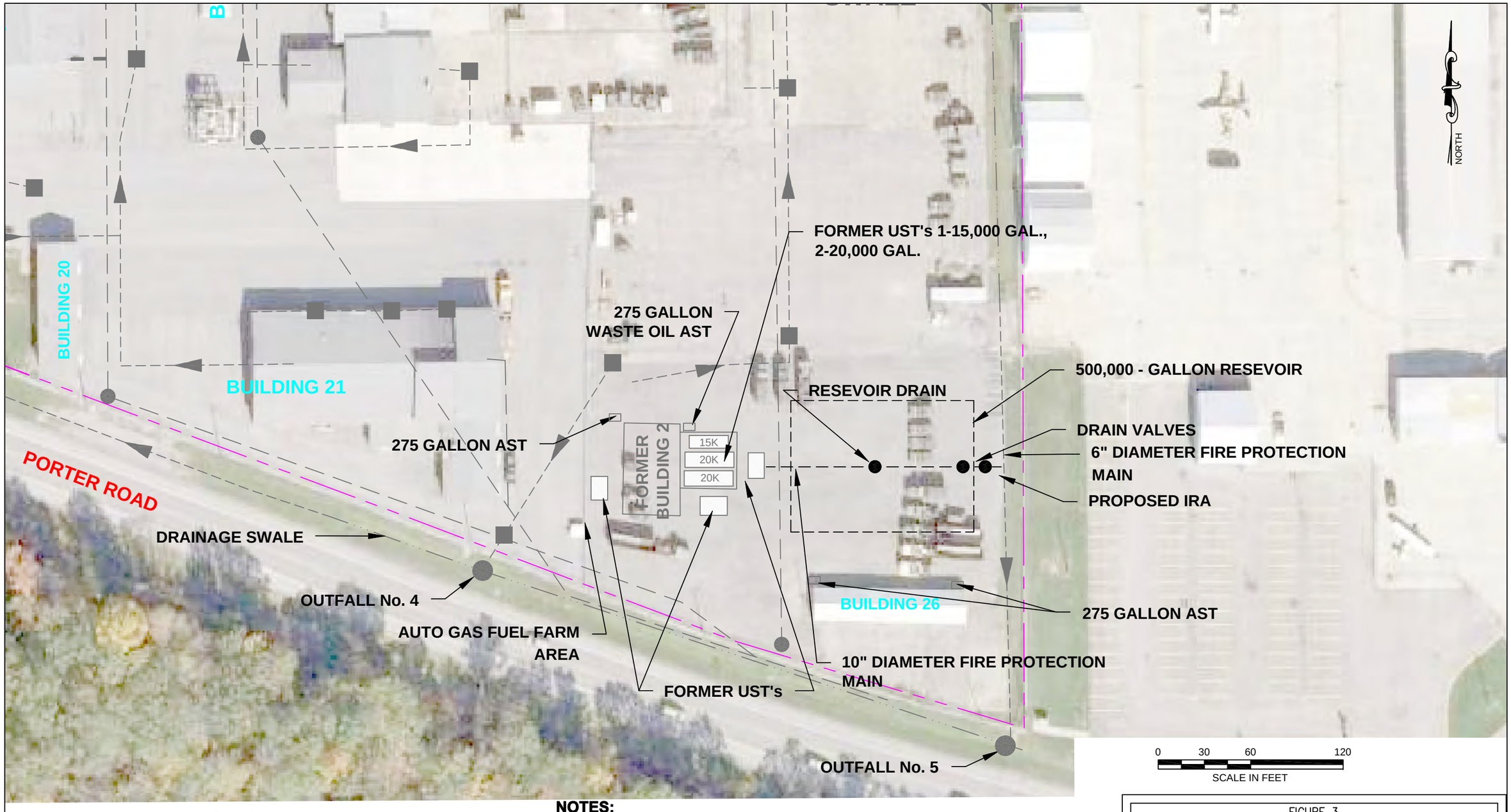
1. BASE MAP ADAPTED FROM A 2008 AERIAL PHOTO AND PROPERTY LINE DOWNLOADED FROM http://www.bing.com/maps/I AND FIELD OBSERVATIONS.

2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

FIGURE 2
SITE PLAN
USAFRC
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: KN	SCALE: 1" = 120'	JOB No.: 773-04
CK'D. BY: MM	DATE: 1/12/10	FILE NO.: 773-04
REV. NO. –	REV. DATE: 10/25/10	FIGURE NO.: 2



LEGEND:

- SANITARY SEWER LOCATION
- STORM SEWER LOCATION WITH FLOW DIRECTION
- DRAINAGE OUTFALL LOCATION

NOTES:

1. BASE MAP ADAPTED FROM A 2008 AERIAL PHOTO AND PROPERTY LINE DOWNLOADED FROM http://www.bing.com/maps/l AND FIELD OBSERVATIONS.

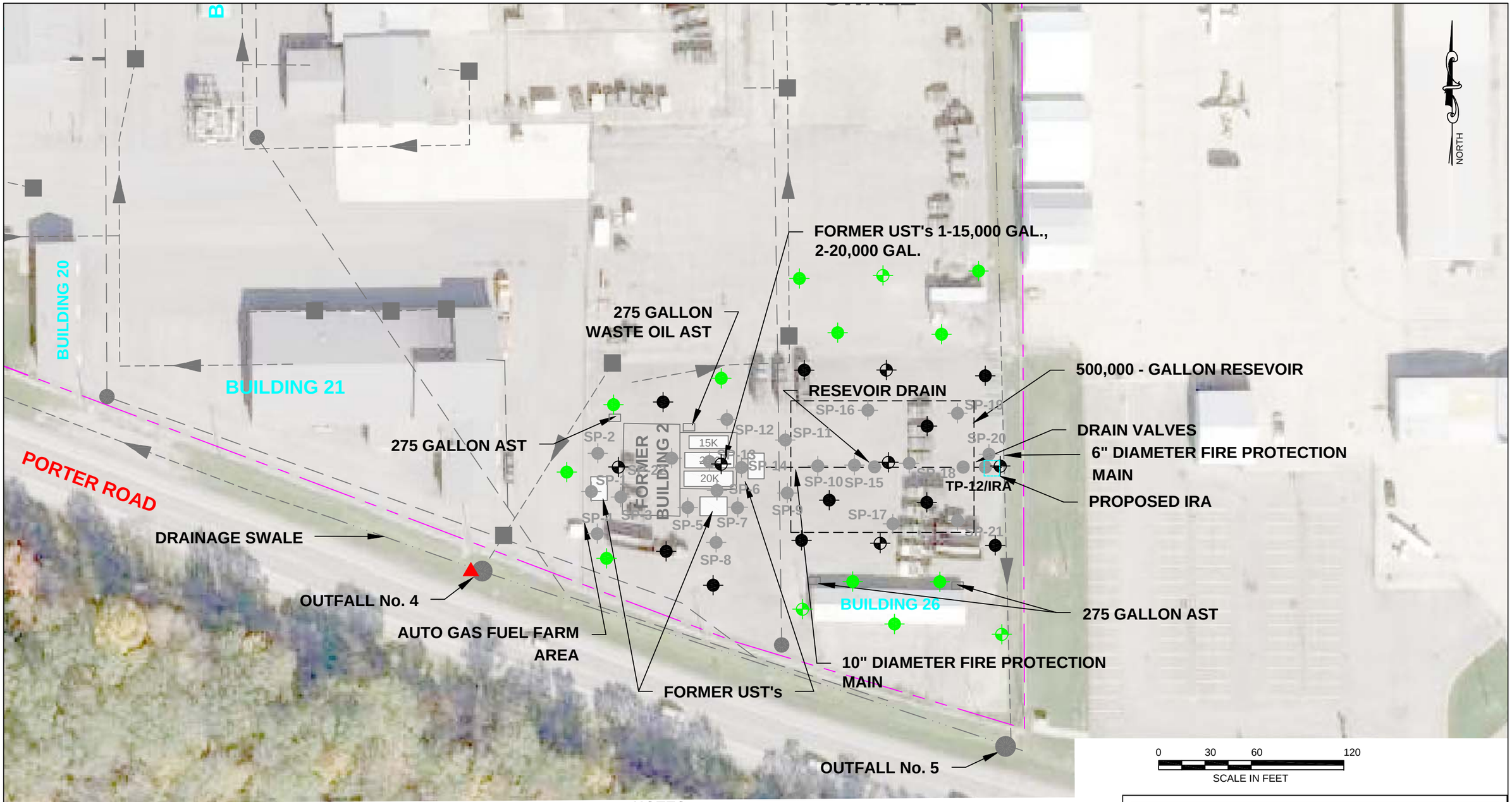
2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

3. LOCATION FOR FIRE PROTECTION MAIN AND DRAINS IS BASED ON THE GEOPHYSICAL SURVEY AND HISTORIC MAPS.

FIGURE 3
FORMER USTs AND FIRE PROTECTION LOCATION MAP
USAFRC
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: KN	SCALE: 1" = 60'	JOB No.: 773-04
CK'D. BY: MM	DATE: 1/12/10	FILE NO.: 773-04
REV. NO. –	REV. DATE: 8/9/11	FIGURE NO.:3



LEGEND:

- SP-19 — APPROXIMATE LOCATION OF SOIL PROBE COMPLETED ON DECEMBER 6 & 7 2010
- PROPOSED PRIMARY SOIL PROBE LOCATION
- PROPOSED PRIMARY SOIL PROBE AND MICRO-WELL LOCATION
- PROPOSED SECONDARY SOIL PROBE LOCATION
- PROPOSED LOCATION OF INTERIM REMEDIAL ACTION EXCAVATION
- SANITARY SEWER LOCATION
- STORM SEWER LOCATION WITH FLOW DIRECTION
- DRAINAGE OUTFALL LOCATION
- PROPOSED SECONDARY SOIL PROBE AND MICRO-WELL LOCATION
- PROPOSED SOIL SAMPLE FROM OUTFALL 4

NOTES:

1. BASE MAP ADAPTED FROM A 2008 AERIAL PHOTO AND PROPERTY LINE DOWNLOADED FROM http://www.bing.com/maps/I AND FIELD OBSERVATIONS.

2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

3. LOCATION FOR FIRE PROTECTION MAIN AND DRAINS IS BASED ON THE GEOPHYSICAL SURVEY AND HISTORIC MAPS.

FIGURE 4
PROPOSED SAMPLE LOCATIONS
USAFRC
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: KN	SCALE: 1" = 60'	JOB No.: 773-04
CK'D. BY: MM	DATE: 1/12/10	FILE NO.: 773-04
REV. NO. -	REV. DATE: 9/13/11	FIGURE NO.: 4

TABLE

Table 1
Summary of Sample Methods, Container, Preservation and Holding Time Requirements
Quality Assurance Project Plan
Building 2 USTs and Former Fire Protection Main Investigation QAPP/Sampling Plan
Niagara Falls Armed Forces Reserve Center
9400 Porter Road
Niagara Falls, New York

Analysis	Method	Holding Time (days)		Containers		Number of Samples	Preservative
		To Extraction	To Analyze	Number	Type		
Soil Samples							
Volatile Organic Compounds	SW-846 8260B	NA	14	2	L	60***	Cool
Semivolatile Organic Compounds	SW-846 8270C	14	40	1 *	J	60***	Cool
PCBs	SW-846 8080	NA	365	1 *	J	60***	Cool
Metals	SW-846 6010B/7470A	NA	180 (28 for Hg)	1 *	L	60***	Cool
Groundwater Samples							
Volatile Organic Compounds	SW-846 8260B	NA	14	2	K	9	Hydrochloric Acid
Semivolatile Organic Compounds	SW-846 8270C	14	7 to extract, 40 to analyze	1 *	M	9	Cool
PCBs	SW-846 8080	NA	7	1 *	M	9	Cool
Metals	SW-846 6010B/7470A	NA	180 (28 for Hg)	1 *	N	9	Nitric Acid

Notes
Container Types
J - 8 oz. wide mouth glass, Teflon cap liner
L - 2 oz. glass widemouth, Teflon cap liner
K - 40 ml glass vial, Teflon lined septum
M - 1 L amber glass, Teflon cap liner
N - 250 mL polyethylene, Teflon cap liner

Preservatives
Cool - Cool to 4 degrees Celsius
* - Semi-volatiles, PCBs and metals analyses can take place from a single 8 ounce glass widemouth jar with a teflon lined cap.
*** - 32 Primary samples will be analyzed, 28 Secondary samples pending Primary results.

APPENDIX A

NYSDEC Comments

Tom Dobinson

From: Dellolio, Laura A CTR CTR USAR 99TH RRC -NA- <laura.dellolio@usar.army.mil>
Sent: Tuesday, September 06, 2011 9:36 AM
To: Michael Moore; Tom Dobinson
Subject: FW: sampling and analysis plan for Niagara Falls AFRC (UNCLASSIFIED)
Signed By: laura.dellolio@usar.army.mil

Follow Up Flag: Follow up
Flag Status: Flagged

Classification: UNCLASSIFIED
Caveats: NONE

Here's the official comments from the State. I don't see anything eye raising.

Thank you,
Laura Dell'Olio
609-562-7661

-----Original Message-----
From: Chek Ng [mailto:cbng@gw.dec.state.ny.us]
Sent: Friday, September 02, 2011 4:34 PM
To: Dellolio, Laura A CTR CTR USAR 99TH RRC -NA-
Subject: Re: sampling and analysis plan for Niagara Falls AFRC (UNCLASSIFIED)

Laura,

It was nice meeting you as well. I am including the following comments for the sake of completeness. In the case where this plan will not be revised, please make a note of the comment and add it in the investigation report. Please feel free to forward this to GZA (Consultant). A copy of this email has been made into the permanent electronic record in the State.

a) Page 7, Section 3.2: It is mentioned that the depth of soil borings will be based on field observations. From the meeting, it was my understanding that the soil boring will be done until the water table, which could vary from location to location due to a perched groundwater table.

b) Page 16, Section 6.2.2: Please add that the MS/MSD duplicates wil be collected at a frequency of 5% (1 in 20 samples).

c) Page 17, Section 7.2: The State's Part 375 Soil Cleanup Guidance separates out commercial and industrial use. As such, the COPCs need to be compared to either commercial OR industrial standards. From my discussion, it seems that the end use will most likely be industrial, so the

contamination numbers should be compared to industrial use.

d) As mentioned in your email below, Outfall 4 sediment will be sampled for VOCs, SVOCs, metals, and PCB. Please also mention in the final report that the Outfalls 1, 2 and 3 will not be sampled due to accessibility issues caused by the Cayuga Creek and the outfall's position beneath the river water line.

e) Analysis of soil in the report should also mentioned that there are fill material that was brought from the nearby quarry into the site which may caused high readings for certain metals in the soil. This should nullify any concerns for the high metal content in the soil.

Regards,

Chek Beng Ng, P.E.
Environmental Engineer 2
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany NY 12233-7015
Phone: (518) 402-9620
Fax: (518) 402-9627>>> "Dellolio, Laura A CTR CTR USAR 99TH RRC -NA-" <laura.dellolio@usar.army.mil> 9/1/2011 10:44 AM >>>
Classification: UNCLASSIFIED
Caveats: NONE

Hello Chek,

Good to make your acquaintance last week.

I was wondering if you were going to be providing formal comments to the work plan. We have added a sediment sample for outfall 4 to the workplan for analysis of VOCs, SVOCs, metals, and PCBS. Were there any other comments?

Thank you,

Laura Dell'Olio
Installation Restoration Program Coordinator

99th RSC, DPW Environmental Division
Contractor, PB&A Inc.
609-562-7661 (office)
919-270-7376 (cell)

Please take a moment and tell us how we are doing...

http://ice.disa.mil/index.cfm?fa=card&service_provider_id=118861&site_id=961

&service_category_id=32

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

APPENDIX B

Sample Chain of Custody Form

Buffalo
10 Hazelwood Drive

Amherst, NY 14228
phone 716.504.9852 fax 716.691.7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	**Project Manager:**	**Site Contact:**	**Date:**	COC No:
Your Company Name here	**Tel/Fax:**	**Lab Contact:**	**Carrier:**	_____ of _____ COCs
Address	**Analysis Turnaround Time**			Job No.
City/State/Zip	Calendar (C) or Work Days (W) _____			
(xxx) xxx-xxxx Phone	TAT if different from Below _____			
(xxx) xxx-xxxx FAX	☐ 2 weeks			SDG No.
Project Name:	☐ 1 week			
Site:	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	**Sample Date**	**Sample Time**	**Sample Type**	**Matrix**	**# of Cont.**	**Filtered Sample**	Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification

☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

INSTRUCTIONS

1) Choose the correct TestAmerica Facility from the pull down list by clicking on cell A1

2) Fill in the appropriate information for your location and phone number

3) Choose a default TAT or enter a different one if appropriate

4) Please indicate whether the TAT is Working or Calendar Days

5) In the veritical columns enter the Method/Analysis being requested

6) Fill out the Sample Information -- each line represents one sample

7) Sample Date/Time is required on all samples

8) In the "# of Containers" field enter the total number of bottles for each sample

9) Check the "Field Filter" field if the sample was filtered in the field

10) The Sample name should be the one you wish to see in the final report

11) In the cell where the Sample Information intersects the method information please enter the number of containers submitted for the method. Alternatively simply "x" this field

12) In the last row of the eCOC please choose the code for the right preservative used

13) Use the Special Instructions field to add any special instructions to the lab

14) If samples are sent across the country, consider indicating the Time Zone where samples were collected

15) TestAmerica Terms and Conditions apply for the analysis performed on the submitted samples unless otherwise agreed upon between TestAmerica and Company

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from TestAmerica Laboratories, Inc., a Delaware corporation (referred to as "TestAmerica"), TestAmerica shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of TestAmerica's offer to do business under these Terms and Conditions, and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by TestAmerica in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to TestAmerica in writing or by telephone subsequently confirmed in writing, or by negotiated contract. Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable TestAmerica to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested, and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery.

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, TestAmerica will use its best efforts to meet mutually agreed turnaround times. All turnaround times will be calculated from the point in time when TestAmerica has determined that it can proceed with defined work following receipt, inspection of samples, and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, TestAmerica reserves the right to modify its turnaround time commitment, to change the date upon which TestAmerica will accept samples, or refuse Sample Delivery Acceptance for the affected samples.

1.3 TestAmerica reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of TestAmerica: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to TestAmerica by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where TestAmerica provides courier services. In no event will TestAmerica have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from TestAmerica's premises. Client is responsible to assure that any sample containing any hazardous substance which is to be delivered to TestAmerica's premises will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by TestAmerica will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. Where requested services on a group of samples received and logged in together at the laboratory total less than $200, there will be a minimum transaction charge of $200 for the sample group, or as shown on any related quote from TestAmerica. An Environmental Management Fee of 5% of the invoice value will also be applied, at TestAmerica's discretion.

2.2 Invoices may be submitted to Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with TestAmerica. For Clients with approved credit, payment terms are net 30 days from the date of invoice by TestAmerica. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, that acknowledges and accepts payment responsibility.

2.3 TestAmerica may suspend work and withhold delivery of data under this order at any time in the event Client fails to make timely payment of its invoices. Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. TestAmerica reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price, or result delivery date may be initiated by TestAmerica after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. TestAmerica will not proceed with such changes until an agreement with the Client is reached on the amount of any cost, schedule change or technical change to the Scope of Work, and such agreement is documented in writing.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification, or acceleration in the performance of the work may be initiated by the Client after sample delivery acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. TestAmerica's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. TestAmerica will be compensated consistent with Section 2 of these Terms and Conditions. TestAmerica will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, TestAmerica will use analytical methodologies which are in substantial conformity with published test methods. TestAmerica has implemented these methods in its Laboratory Quality Manuals and referenced Standard Operating Procedures and where the nature or composition of the sample requires it, TestAmerica reserves the right to deviate from these methodologies as necessary or appropriate, based on the reasonable judgment of TestAmerica, which deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or TestAmerica's Laboratory Quality Manuals. Client may request that TestAmerica perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, TestAmerica will proceed with analyses under its standard Quality Manuals then in effect, and TestAmerica will not be responsible for any resampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 TestAmerica shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, TestAmerica will use its best efforts to meet holding times and will proceed with the work provided that, in TestAmerica's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with TestAmerica's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 TestAmerica warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions provided that such requirements are specified in writing to TestAmerica prior to Sample Delivery Acceptance. TestAmerica will notify the Client in writing of any decertification or revocation of any license, or notice of either, which affects work in progress.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by TestAmerica in connection with any services performed by TestAmerica or any Results generated from such services, and TestAmerica gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of TestAmerica is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by TestAmerica, will be limited to repeating any services performed, contingent on the Client's providing, at the request of TestAmerica and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If resampling is necessary, TestAmerica's liability for resampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 TestAmerica's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after TestAmerica's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall TestAmerica be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall TestAmerica have any responsibility or liability to the Client for any failure or delay in performance by TestAmerica which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of TestAmerica. Such causes and circumstances

directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of TestAmerica. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond TestAmerica's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to TestAmerica or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by TestAmerica of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by TestAmerica for performance of work will be retained by TestAmerica, and Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by Client or at Client's request, and the result obtained by TestAmerica shall be held in confidence (unless such information is generally available to the public or is in the public domain or Client has failed to pay TestAmerica for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by TestAmerica be used by the Client or Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold TestAmerica's right to independently defend its data.

5.4 TestAmerica reserves the right to perform the services at any laboratory in the TestAmerica network, unless the Client has specified a particular location for the work. In addition, TestAmerica reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in TestAmerica's sole judgment, it is reasonably necessary, appropriate or advisable to do so. TestAmerica will in no way be liable for any subcontracted services (outside the TestAmerica network) except for work performed at laboratories which have been audited and approved by TestAmerica.

5.5 TestAmerica shall dispose of the Client's samples 30 days after the analytical report is issued, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. TestAmerica reserves the right to return to the Client any sample or unused portion of a sample that is not within TestAmerica's permitted capability or the capabilities of TestAmerica's designated waste disposal vendor(s). ALL DIOXIN, MIXED WASTE, AND RADIOACTIVE SAMPLES WILL BE RETURNED TO THE CLIENT, unless prior arrangements for disposal are made.

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, TestAmerica agrees to retain all records for five (5) years.

5.7 In the event that TestAmerica is required to respond to legal process related to services for Client, Client agrees to reimburse TestAmerica for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 TestAmerica shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over TestAmerica's employees who are engaged in the performance of the work. TestAmerica shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $5,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to TestAmerica, the Client may audit and inspect TestAmerica's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and TestAmerica shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by TestAmerica, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein, and these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and TestAmerica. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where TestAmerica's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, except to the extent of sole negligence or willful misconduct.

APPENDIX C

Health and Safety Plan

PARS
Environmental
Inc.

HEALTH AND SAFETY PLAN

Niagara Falls Armed Forces Reserve Center
Building 2 USTs & Former Fire Main
9400 Porter Avenue
Niagara Falls, NY

PREPARED FOR
U.S. Army Corps of Engineers
CELRL-ED-E-E, Room 351
Environmental Engineering Branch
600 Dr. Martin Luther King Jr. Pl.
Louisville, KY 40202

PREPARED BY
PARS Environmental, Inc.
500 Horizon Center, Suite 540
Robbinsville, New Jersey 08691
609-890-7277
609-890-9116 (fax)

PARS PROJECT NO. 773-04

August 2011

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1.0 INTRODUCTION

This plan will be used to administer health and safety measures for activities performed by PARS Environmental, Inc. (PARS) to establish the health and safety procedures required to protect on-site personnel and off-site receptors from potential hazards resulting from activities within the specified scope of work for the investigation at the Niagara Falls Armed Forces Reserve Center 9400 Porter Road, Niagara Falls, New York hereinafter the "Site." The scope of work is outlined in the Quality Assurance Project Plan (QAPP)/Sampling Plan and includes the investigation of former underground storage tanks (USTs) at Building 2 and a former fire protection main.

The Health and Safety Plan establishes policies and procedures to protect workers and the public from potential hazards posed by work at the Site. All project activities will be conducted in a manner that minimizes the probability of injury or accident that may occur during normal Site operations. The procedures in this plan have been developed based on current knowledge regarding the hazards, which are known or anticipated for the operations to be conducted at this Site. A copy of this plan will be kept at the Site and will be available for inspection during field activities.

This plan is based on the information available at the time of preparation. Unexpected conditions may arise during the project that requires a reassessment of procedures. It is important that the need for personal protective measures be thoroughly assessed by the Project Manager and the Health and Safety Officer prior to and during the planned Site activities. Unplanned activities and/or changes in the hazard status at the Site will initiate a review of and, when appropriate, alterations to the plan.

Any amendments to this plan must be approved in writing by the Project Manager or the Health and Safety Officer prior to implementation.

PARS cannot guarantee the health and/or safety of all personnel entering this Site. It is not possible to evaluate and provide protection for all possible hazards that may be encountered. Adherence to the Site Health and Safety Plan will reduce, but cannot totally eliminate the possibility for worker injuries and illness to occur at this Site.

1.1 BACKGROUND

Six USTs were reportedly present along the eastern and western sides of former Building 2. Additionally, a vehicle fueling area was located immediately west of the building. No documentation was available regarding the closure of these USTs and fueling area.

An investigation of the fire protection main was performed by United States Army Reserve (USAR) in 2008. Product was observed discharging from the cast iron line into the 24-inch diameter corrugated storm sewer and the 6-inch line was capped. The drain valve for the 6-inch line was uncovered and dislodged. After dislodging the valve, product was observed in the excavated hole. A sample was collected and the product was identified as diesel fuel. Low concentrations of polychlorinated biphenyls (PCBs) also were detected in the sample.
A yellow substance was observed discharging from the outfall (Outfall # 5) into the drainage swale. As part of the investigation, a sediment sample was collected from the 24-inch diameter storm sewer adjacent to the 6 inch cast iron pipe and a sample of the yellow substance was collected from the drainage swale. The sample results revealed that the sediment in the pipe and the yellow substance present in the swale contained detectable levels of PCBs.

The USACE and the USAR 99th Regional Support Command (99th RSC) retained the services of PARS to investigate and remediate the drainage swale at Outfall No. 5. The 24-inch diameter storm sewer was also cleaned as part of the remedial action. Additionally, approximately 134 tons of PCB impacted soil was excavated from the drainage swale.

PCB concentrations in the post-excavation soil samples from the drainage swale were below the maximum contaminant level of 1 milligram per kilogram (mg/kg) that was established by the New York State Department of Environmental Conservation (NYSDEC). Investigation and remediation activities are outlined in the *Remedial Action Report* (PARS, March 2010).

In November and December 2010, PARS conducted a site inspection to evaluate potential impacts associated with the former USTs at Building 2 and the fire protection main. Inspection activities consisted of a geophysical survey, exploratory excavations and soil and water sampling. The findings were outlined in the *Site Inspection Report* (PARS, June 2011).

The geophysical survey noted three anomalies identified as debris from former Building 2.
An approximate 150-foot long linear anomaly was identified in the general vicinity of the fire protection main that terminates at the 24-inch diameter corrugated storm sewer line. No anomalies consistent with USTs were identified as part of the geophysical survey.

Twelve exploratory excavations (TP-1 through TP-12) were completed based on the findings of the geophysical survey, previous investigations and field observations. A soil sample for laboratory analysis was collected from TP-1. Several SVOCs were detected in the sample at concentrations exceeding the NYSDEC Unrestricted and Restricted Use Soil Cleanup Objectives.

The 6-inch diameter cast iron fire protection water main was encountered in six exploratory excavations (TP-2, TP-3, TP-4, TP-11 and TP-12). At TP-11, the 6-inch diameter pipe terminated at a concrete catch basin presumed to be the 500,000-gallon reservoir drain. A sample was collected from the water flowing from the 6-inch diameter line. Several compounds including toluene, naphthalene, PCBs and chromium were detected in the water sample at concentrations exceeding the NYSDEC Class GA Objectives.

2.0 SITE CHARACTERIZATION AND ANALYSIS

Site characterization provides the information needed to identify hazards and to select the procedures and equipment required to perform the work safely and protect the workers.

The following information was gathered through a review of available records for the Site.

2.1 SITE DESCRIPTION

Site Location: Niagara Falls Armed Forces Reserve Center
9400 Porter Road
Niagara Falls, New York

Site Access: Restricted
Authorized personnel only

Site Description:

The Niagara Falls AFRC is an approximate 19.5 acre parcel located on the southern portion of Niagara Township, in Niagara Falls, Niagara County, New York. The Site is bound to the south by Porter Road and the property located immediately south of Porter Road is undeveloped forested land. Niagara Falls International Airport is located immediately north and east of the Site. Other properties in the vicinity of the Site are used primarily for commercial purposes. A Site Location Map and Site Plan are included in Appendix A.

Type of Site: Military Facility

2.2 DESCRIPTION OF TASKS/WORK PLAN:

Field activities during this investigation and IRA shall be comprised of intrusive activities and non-intrusive activities. Non-intrusive activities are site visit, meetings and geophysical survey type activities and are not expected to result in exposure to contamination. Intrusive activities are those activities, which may result in handling, excavation of potentially contaminated materials. The field activities are described briefly below.

NON-INTRUSIVE ACTIVITIES

2.2.1 Site Meeting

A Site meeting will be held on the first day of field activities to discuss investigation locations and to familiarize the field staff with the Site and various investigation activities.

INTRUSIVE ACTIVITIES

2.2.2 Interim Remedial Action

Approximately 50 tons of impacted soil will be excavated in the vicinity of exploratory excavation, TP-12. Excavated soil will be stockpiled near the excavation on polyethylene sheeting for waste characterization and off-site disposal. Residual product and groundwater exhibiting a heavy sheen will be pumped from the excavation using a vacuum truck.

Field personnel will be outfitted in Level D personnel protection (hardhat, work boots and gloves). Work zone air monitoring will be done using an OVM.

2.2.3 Soil Borings and Micro-Well Groundwater Sampling

The nature and extent of potential subsurface soil contamination will be assessed by completing 30 soil borings. Soil borings will be advanced using a truck or track mounted direct-push rig. The direct-push rig will include a hydraulic push/hammer that will be used to advance the sampler.

1-inch diameter micro-wells will be installed at nine boring locations. A groundwater sample will be collected from each micro-well.

Field personnel will be outfitted in Level D personnel protection (hardhat, work boots and gloves). Work zone air monitoring will be done using an OVM.

2.3 DESCRIPTION OF SUBCONTRACTORS AND RESPONSIBILITIES:

The subcontractors shall be solely responsible for the health and safety of their employees, subcontractors, suppliers and other parties at the work area as a result of the contractor's direction. The subcontractor shall have in place programs, policies and procedures that satisfy the requirements of all current federal, state, and local statutes, regulations and ordinances regarding health and safety. Subcontractors shall supply all the necessary safety equipment for their crews. PARS will review and approve site-specific health and safety plans prepared by the on-site contractors.

The following subcontractors will be providing various services at the Site during the project:

Matrix Environmental Technologies, Inc. 3730 California Road Orchard Park, New York 14127	GZA GeoEnvironmental of New York 535 Washington Street, 11th Floor Buffalo, New York 14203

2.4 PROJECT ORGANIZATION/KEY PERSONNEL

The names and titles of key members of the project team along with their responsibilities are listed below.

Senior Technical Guidance:
Gary Gardner
General Manager

Project Manager:
Michael Moore, P.G., LSRP
Senior Project Manager

Health and Safety Officer:
Paul Lawless, CIH
Senior Industrial Hygienist

Site Manager:
Thomas Dobinson
Project Manager

Additional Staff:
Matthew Abraham
Staff Environmental Scientist

The responsibility for health and safety is shared by all members of the team.

Each team member is responsible to safely complete the on-site tasks required to fulfill the work planned, comply with the Site Health and Safety Plan and notify the Health and Safety Officer or Project Manager of any unsafe acts or conditions at the site.

2.5 HAZARD EVALUATION

In general, potential hazards for a remediation project can be classified into physical, chemical, biological and radiological hazards.

Based upon information collected during Site characterization and analysis, the classes of hazards listed on the following pages may be present on the site during certain phases of the project.

All work practices at the site will comply with and conform to OSHA Safety and Health Procedures included in 29 CFR 1910, 29 CFR 1926, USACE Manual 385-1-1 and pertinent state and local regulations.

2.5.1 Physical/Safety Hazards and Controls:

PHYSICAL (SAFETY) HAZARDS AND CONTROLS		
Present	**Hazard**	**Control Measure(s) ***
YES	Flying debris/objects	Provide shielding and PPE
YES	Sustained loud noise	Noise protection and monitoring required
YES	Steep terrain/unstable surface	Brace and shore equipment
NO	Build up of flammable /explosive gases	Provide fire extinguisher and ventilation. No spark sources within 50 ft of an excavation, heavy equipment or UST removal. Ground as appropriate.
NO	Gas cylinders	Make certain gas cylinders are properly anchored and chained. Keep cylinders away from ignition sources.
YES	High pressure hose rupture	Check to see that fitting and pressure lines are in good condition/repair before using.
NO	Electrical shock	Make certain third wire is properly grounded. Do not tamper with electrical wiring unless qualified to do so.
YES	Vehicle Traffic	Work in busy areas (dispenser area) during off-peak hours, wear traffic safety vest w/reflector stripe, use cones and flag to mark work areas, contact Police Department if interrupting flow of traffic
YES	Moving heavy vehicles or equipment	Back up alarm required for heavy equipment. Observer remains in contact with operator and signals safe back up. Personnel to remain outside of turning radius.
NO	Overhead electrical wires	Heavy equipment (e.g. drill rigs) to remain at least 15 ft. from overhead power line for power lines of 50 kV or less. For each kV > 50 increase distance 1/2 foot.

PHYSICAL (SAFETY) HAZARDS AND CONTROLS		
YES	Buried utilities, drums, and tanks**	Call Utility Markout. To be identified and controlled by others.
YES	Slip/trip/fall hazards due to muddy work areas	Use wood pallets or similar devices in muddy work areas.
YES	Back injuries	Use proper lifting techniques, or provide mechanical lifting aids.
NO	Oxygen deficiency (confined space)	PARS personnel are not to enter confined spaces for any reason unless in compliance with confined space entry regulations.
YES	Trenches/excavations	PARS personnel are not to enter excavation greater than 4 foot depth at any time, for any reason unless in compliance with trenching regulations.
YES	Protruding objects	Flag visible objects.
YES	Holes/ditches	Restrict access by tape or other visible means.

OTHER:

***** For more detailed descriptions of the appropriate controls, consult SOPs and the relevant OSHA Standards.

****** For Underground Utilities: Call for a utility mark out at least one week prior to conducting any type of subsurface investigation or excavation for underground utility mark out.

2.5.2 Chemical Hazards

Potential chemical hazards identified at the Site are presented in Table 1. Refer to the Material Safety Data Sheets (MSDSs) for additional information regarding exposure to individual compounds (Appendix B).

TABLE 1
POTENTIAL CHEMICALS OF CONCERN

Chemical	OSHA PEL[1]	ACGIH TLV[2]	IDLH[3]	Exposure Route
Toluene	200	50	500	Inh, Ing, Abs, Con
Benzene	1	10	500	Inh, Ing, Abs, Con
Total Xylene	100	100	900	Inh, Ing, Abs, Con
Ethylbenzene	100	100	800	Inh, Ing, Abs, Con
# 2 Fuel Oil	NA	NA	NA	Inh, Ing, Abs, Con
Acetone	1,000	750	2,500	Inh, Ing, Abs, Con
Naphthalene	10 ppm	10 ppm	250 ppm	Inh, Ing, Abs, Con
Polychlorinated Biphenyls	0.5 mg/m^3	0.5 mg/m^3	5.0 mg/m^3	Inh, Ing, Abs, Con
Gasoline	NA	NA	NA	Inh, Ing, Abs, Con

1. OSHA personal exposure limit based on an eight-hour time weighted average.
2. American Conference of Governmental Industrial Hygienists threshold limit value based on an eight hour-time weighted average.
3. Immediately Dangerous to Life or Health concentration - the maximum concentration one could escape within 30 minutes without experiencing permanent or irreversible health effects.

NA- Information not available

2.5.3 Toxicity

The potential hazards, proper handling precautions, signs and symptoms of over-exposure and recommended personal protective equipment (PPE) are described in detail in the MSDSs. Available MSDSs for each of the potential contaminants can be found in Appendix B and should be reviewed prior to entering the Site.

2.5.4 Biological Hazards

All personnel on site should be provided with the information and training necessary to avoid accidental injury or illness which can result from exposure to biological hazards. This includes assuring that the Site is carefully assessed so that the hazards associated with poisonous plants, insects or other sources of biological contamination (i.e., septic systems) are recognized and eliminated or controlled. In most cases this can be done by using proper PPE. Biological waste is typically contained/disposed of in red bags. If red bags or other potential biological waste (i.e. syringes) are encountered during Site work, the work task should be stopped and a trained person contacted to evaluate the potential presence of biological waste.

2.5.5 Unexploded Ordnance

If an unexploded ordinance is uncovered at the Site, then all activities must immediately cease. Contact the client and have all workers leave the Site. If necessary, call 911 and summons emergency response personnel to respond to the Site. Work at the Site will resume after approval from the client and emergency personnel.

2.5.6 Heat Stress

The Health and Safety Officer or designee shall evaluate the potential effect of heat stress on all workers at the Site prior to the start of the work day. Overexposure to temperature extremes can represent risks to personnel if simple precautions are not observed. Control measures designed to prevent heat stress include dressing properly (light weight, light colored clothing), blocking out sun or other direct heat sources and drinking plenty of water. Workers should be familiar with the serious effects of overexposure to hot environments:

- Heat stress
- Heat exhaustion
- Heat stroke

2.5.7 Cold Stress

The Health and Safety Officer or designee shall evaluate the potential effect of cold stress on all workers at the Site prior to the start of the work day. Overexposure to temperature extremes can represent risks to personnel if simple precautions are not observed. Control measures designed to prevent cold stress include dressing properly (dry, layered clothing), the protection of feet, hands and head, taking frequent breaks in warm areas and drinking plenty of water. Workers should be familiar with the serious effects of overexposure to cold environments:

- Hypothermia
- Frost bite

2.5.8 Trenches/Excavation

OSHA requires that a competent person, who is trained to recognize the hazards associated with trenching and excavating activities and has authority to control these hazards within the limits established by OSHA Trenching and Excavation Standard (29 CFR 1926.650-652) be present at all times. Trenching and excavating will be done by a subcontractor.

3.0 SITE CONTROL

The purpose of Site control is to minimize potential contamination of workers, protect the public from the hazards and prevent vandalism. The degree of control necessary depends on Site characteristics, Site size and the surrounding community.

3.1 SAFE WORK PRACTICES

The following general safe work practices are mandatory at this Site.

1. Eating, drinking, chewing gum or tobacco, smoking or any practices that increases the probability of hand-to-mouth transfer and ingestion of material are forbidden at the Site.

2. Hands and face must be thoroughly washed upon leaving the work area. Individuals will shower as soon as possible after leaving the Site at the end of the day.

3. Contact with contaminated surfaces or surfaces suspected of being contaminated should be avoided while the worker is unprotected. Avoid walking through puddles, pools, mud, etc. Whenever possible, avoid kneeling, leaning or sitting on the ground. In the event that protective clothing is ripped or torn, work is to stop and the protective clothing removed and replaced. In the event of direct skin contact, the affected area is to be washed immediately with soap and water.

4. If respirators are deemed necessary, no facial hair that interferes with the fit of a respirator will be permitted.

5. Medicine and alcohol can intensify the effects from exposure to many chemicals. Use of medications must be reported to the Project Manager or the Health and Safety Officer. Intake of alcoholic beverages during scheduled work periods is prohibited.

6. All personnel must be familiar with relevant task-specific SOPs, as well as all instructions and information contained in the Site Health and Safety Plan.

7. Use of contact lenses is prohibited at the Site unless chemical goggles are worn during any operations involving potential eye contact with chemicals.

8. Personnel will receive training covering the contents of MSDSs for all Site specific contaminants, with particular emphasis on the signs and symptoms of exposure.

9. The buddy system must be employed at all times.

10. All personal protective equipment must be inspected for worn or deteriorated parts prior to use.

11. Site work will be performed during daylight hours whenever possible. Any work conducted during hours of darkness will comply with 29 CFR 1310.120(m).

3.2 WORK AREAS/SITE MAP

Work outlined in the sample plan will be conducted in areas as outlined on the QAPP/Sampling Plan. The sample location map(s) will be updated as needed to reflect hazards not previously identified, and any new materials introduced on site.

3.2 EXCLUSION ZONE

Due to the scattered locations of the activities covered within the scope of this HASP, the actual zones are expected to change frequently in accordance with daily activities. Therefore, all exclusion zones (EZ) are expected to be temporary or dynamic. Site personnel will be advised of the locations of temporary work zones as part of the routine safety meetings described in Section 9.0.

Each EZ will consist of the active work areas where investigations are taking place. A 15-foot radius will be established as the typical perimeter of the zone. However, this may be increased as necessary in order to protect personnel from contact with vapors that may arise from these operations. The perimeter of the zone will be identified by the PARS site manager. Personnel entering these areas must wear the prescribed level of protective equipment.

3.3 Contamination Reduction Zone

Each contamination reduction zone (CRZ) will corridor between the exclusion and support zones. The actual length and/or location of the corridor will also be temporary or dynamic based on the locations of the exclusion zones. The CRZ is where personnel will begin the sequential decontamination process when exiting the EZ. To prevent cross contamination and for accountability purposes, all personnel must enter and leave the exclusion zone through the CRZ.

3.4 Support Zone

The support zone (SZ) will coincide with the project command post, and will consist of an area outside the exclusion zone and CRZ where support equipment will be staged. Eating, drinking and smoking will be allowed only in this area.

3.5 COMMUNICATIONS SYSTEM

Communication between PARS office and site personnel will be through the use of:

__ Beeper
_X_ Mobile Telephone
__ Other

4.0 EMPLOYEE EDUCATION AND TRAINING

All personnel working at the Site must have received Health and Safety Training for Hazardous Waste Operations (HAZWOPER) or have the equivalent training and experience as required under OSHA 29 CFR 1910.120(e).

It is the responsibility of each subcontractor to determine the level of training required for their employees to satisfy the requirements of HAZWOPER. PARS will review training records for subcontractors and will maintain copies of these records with the Health and Safety Plan.

In the event unanticipated special hazards are encountered at the Site, additional training will be provided to employees on an as-needed basis.

4.1 SITE SAFETY MEETINGS

Prior to the commencement of investigative activities, a Site safety meeting will be held to review the specific requirements of this HASP. Short safety refresher meetings will be conducted by the Health and Safety Officer (HSO) as needed throughout the duration of field activities. In addition, the HSO will ensure that Site visitors have had the required training in accordance with 29 CFR 1910.120 and will provide pre-entry safety briefings.

5.0 MEDICAL SURVEILLANCE PROGRAM

All personnel assigned to field activities during this project must participate in an ongoing health surveillance program as required by 29 CFR Part 1910.120.

Medical examinations shall be provided annually.

In the event site-specific contaminants of concern are encountered, they will be added to the health monitoring program on a case-by-case basis.

The following special monitoring requirements are needed for this site:

No special monitoring needed.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of personal protective clothing and equipment (PPE) is to protect employees against potential chemical, physical, and biological hazards. Careful selection and use of PPE will reduce and maintain employee chemical exposures at or below Permissible Exposure Limits and protect against physical and biological hazards.

Work at this Site requires Level D protective equipment.

6.1 LEVEL D PROTECTION

Level D personal protection equipment for this site includes:

X disposable coverall if needed;
X hardhat if overhead hazards are present;
X safety glasses or chemical goggles, as appropriate;
X steel-toed/shank work boots, rubber boots if needed;
X hearing protection if needed;
X vinyl, latex or nitrile gloves. Outer leather gloves where potential for cuts and scrapes is present.
X long pants.

Level D protection will be used for all activities unless it is determined that an upgrade to Level C is appropriate based upon observed site conditions. A OVM reading above 5 ppm sustained in the breathing zone for over 3 minutes will warrant a work stoppage to reevaluate conditions. If necessary, air testing will be performed and PPE will be upgraded to Level C.

Job activities at the Site requiring Level D protection: **All tasks**

The Health and Safety Officer must be notified immediately if any action levels are exceeded.

The protective equipment used and the protection level assigned will be reevaluated periodically by the Health and Safety Officer as more information about the Site becomes available, and as workers are required to perform different tasks.

Personnel will upgrade or downgrade their level of protection only with concurrence of the Health and Safety Officer and the approval of the Project Manager.

7.0 DECONTAMINATION PROCEDURES

A program of equipment and personnel decontamination is essential to:

- reduce the potential of personnel exposure to chemical hazards at the Site by removing or neutralizing contaminants
- prevent cross contamination of areas within the site and contamination of environmental samples collected at each area
- prevent accidental transport of contaminated materials off Site

The following decontamination procedures shall be followed for the Site:

- Small reusable equipment will be washed and rinsed according to SOPs. Any aqueous wastes generated by the decontamination activities will be disposed of properly.
- Contaminated disposable clothing, such as gloves and disposable suits, will be placed in a polyethylene bag and disposed of properly.
- Heavy equipment decontamination is the responsibility of the operating subcontractor. The location of the decontamination station will be designated by the Project Manager.

Personnel and equipment leaving the Site will be decontaminated. Decontamination equipment includes, but is not limited to, the following: plastic sheeting, clothing collection containers, potable and deionized water and scrub brushes.

All boots and gloves will be decontaminated using soap and water solution and scrub brushes. Outer boots, outer gloves and chemical-resistant suits (if required) will then be removed. If respirators are warranted, all respiratory equipment will be decontaminated and sanitized daily. Decontamination of all field sampling equipment will consist of scrubbing with Alconox™ and rinse with analyte-free water prior to collecting samples for chemical analysis.

8.0 EMERGENCY CONTINGENCY PLAN

A Contingency Plan sets forth policies and procedures for responding to emergencies. An emergency may be limited to a worker experiencing heat stress, or as vast as an explosion that spreads toxic fumes throughout the community. Common causes of emergencies may be worker related or material/site related.

The Project Manager has overall responsibility for implementation of, and control over, the emergency response situation.

Prior to any Site activity, the following pre-emergency planning should be carried out:

- Locate nearest telephone at the Site, and inspect on-site communications
- Review emergency response plan for applicability to any changed Site conditions, alterations and on-site operations or personnel ability
- Place emergency telephone numbers, route to the hospital and site maps inside Site vehicle
- Check emergency equipment and supplies
- Verify local emergency contacts, hospital routes, evacuation routes and assembly points

8.1 NOTIFICATION/REPORTING PROCEDURES

In the event of an emergency, PARS office and the client shall be notified as soon as possible as to the nature of the incident (vapor and/or particulate release, injury, details of event, etc.)

8.2 UNEXPECTED VAPOR RELEASE/UNEXPECTED PARTICULATE RELEASE

An unexpected release of materials from the Site that could have an adverse impact on workers or the public is not expected to occur.

8.3 SPILL CONTAINMENT PROCEDURES

While it is not anticipated that a spill or leak will occur as a result of Site activities, it is necessary to implement a containment procedure.

In the event of a leak or a spill, the Project Manager or the Health and Safety Officer will be notified immediately, the area will be cordoned off, and the spill contained and cleaned up by authorized personnel. All materials will be disposed of in a proper manner.

The Project Manager or the client is responsible for making any regulatory agency notifications in consultation with the facility owner.

8.4 SAFETY EQUIPMENT LIST

The following safety equipment shall be available in each PARS site vehicle.

- **First Aid** - First Aid Kit
- **Fire Fighting** - Type ABC Fire extinguisher

8.5 CONTINGENCY CONTACTS (as needed basis):

AGENCY	PHONE NUMBER	CONTACT
Fire Department – Bergholz Fire Department	911 (716) 731-4848	Responder
Local Police – Town of Niagara Police	911 (716) 215-1480	Responder
State Police Department	911	Responder
Hospital – Niagara Falls Medical Center	(716) 278-4000	Responder
EPA National Response Center	1-800-424-8802	Responder
PARS Environmental Project Manager	609-890-7277 (office) 609-332-0062 (cell)	Michael Moore
PARS Health & Safety Officer	609-890-7277 (office) 609-496-1869 (cell)	Paul Lawless
PARS Field Personnel	609-890-7277 (office) 609-731-9131 (cell)	Thomas Dobinson

All contractors/subcontractors and client representatives conducting work operations in potentially contaminated areas are responsible for compliance with all federal, state, and local statutes, regulations, ordinances, and codes relating to health and safety. All personnel involved in any type of intrusive activities must document completion of OSHA required (29 CFR 1910.120) training.

DIRECTIONS TO HOSPITAL (EMERGENCY ROUTE):

SEE APPENDIX C

Niagara Falls Medical Center:
716-278-4000
621 10th Street
Niagara Falls, New York 14303

MAP SHOWING TESTED ROUTE TO HOSPITAL PREPARED:

SEE APPENDIX C

DIRECTIONS TO NEAREST TELEPHONE:

CELL PHONE WITH PARS PERSONNEL

9.0 DEPARMENT OF THE ARMY HEALTH AND SAFETY MANUAL

PARS will maintain a copy of the Department of the Army Health & Safety Manual at the Site. The manual will be used as a supplement to the PARS Health & Safety Plan. For health and safety procedures not covered by this plan, personnel will refer to the Department of the Army Health & Safety Manual.

This Health & Safety Plan has been completed by:

Hunter D. Blair		
(Name)	(Signature)	(Date)

This Health and Safety Plan has been reviewed & approved by:

Michael D. Moore		
(Name)	(Signature)	(Date)

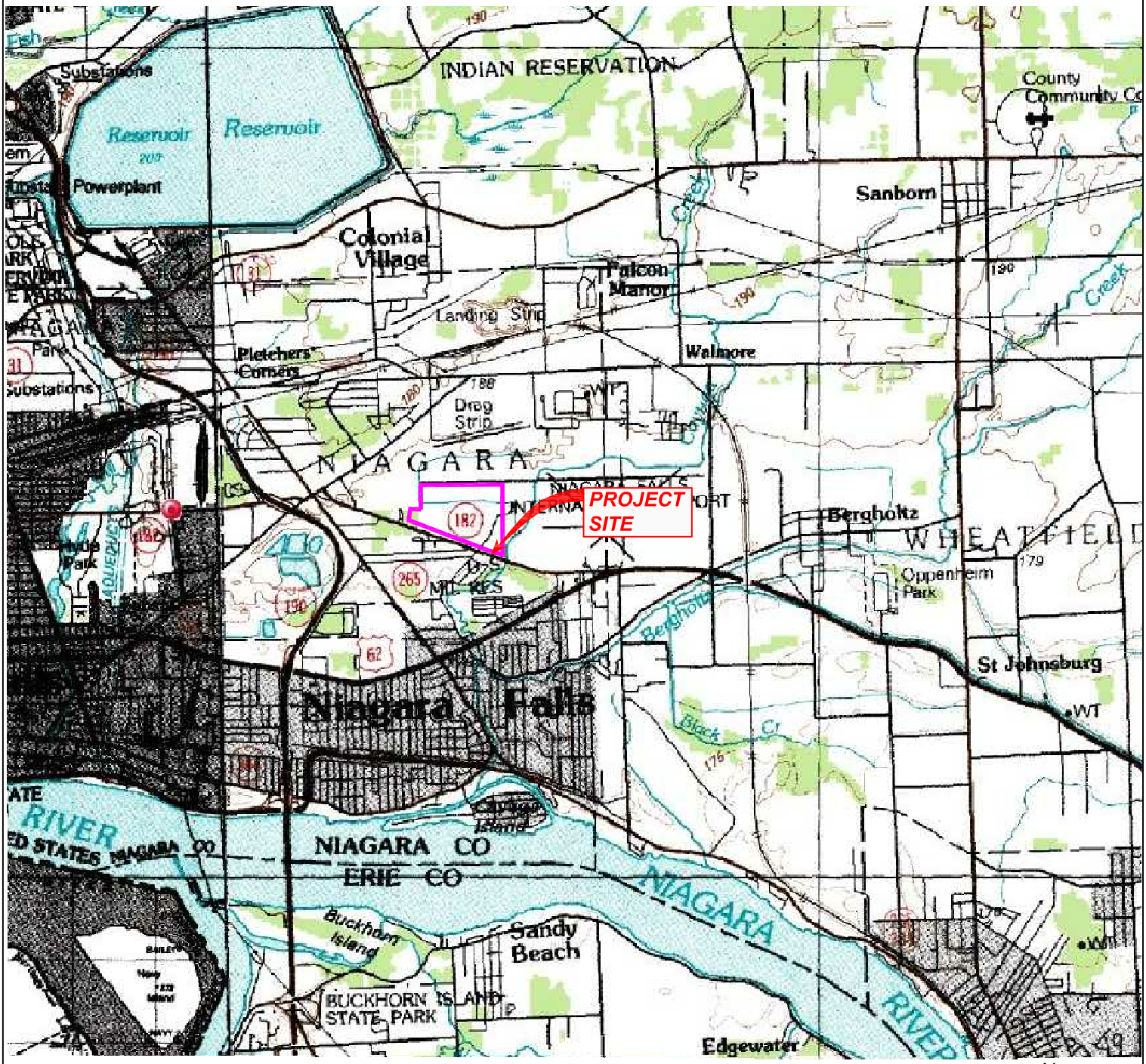
This Health and Safety Plan has been updated by:

(Name)	(Signature)	(Date)

(Name)	(Signature)	(Date)

APPENDIX A

SITE PLAN

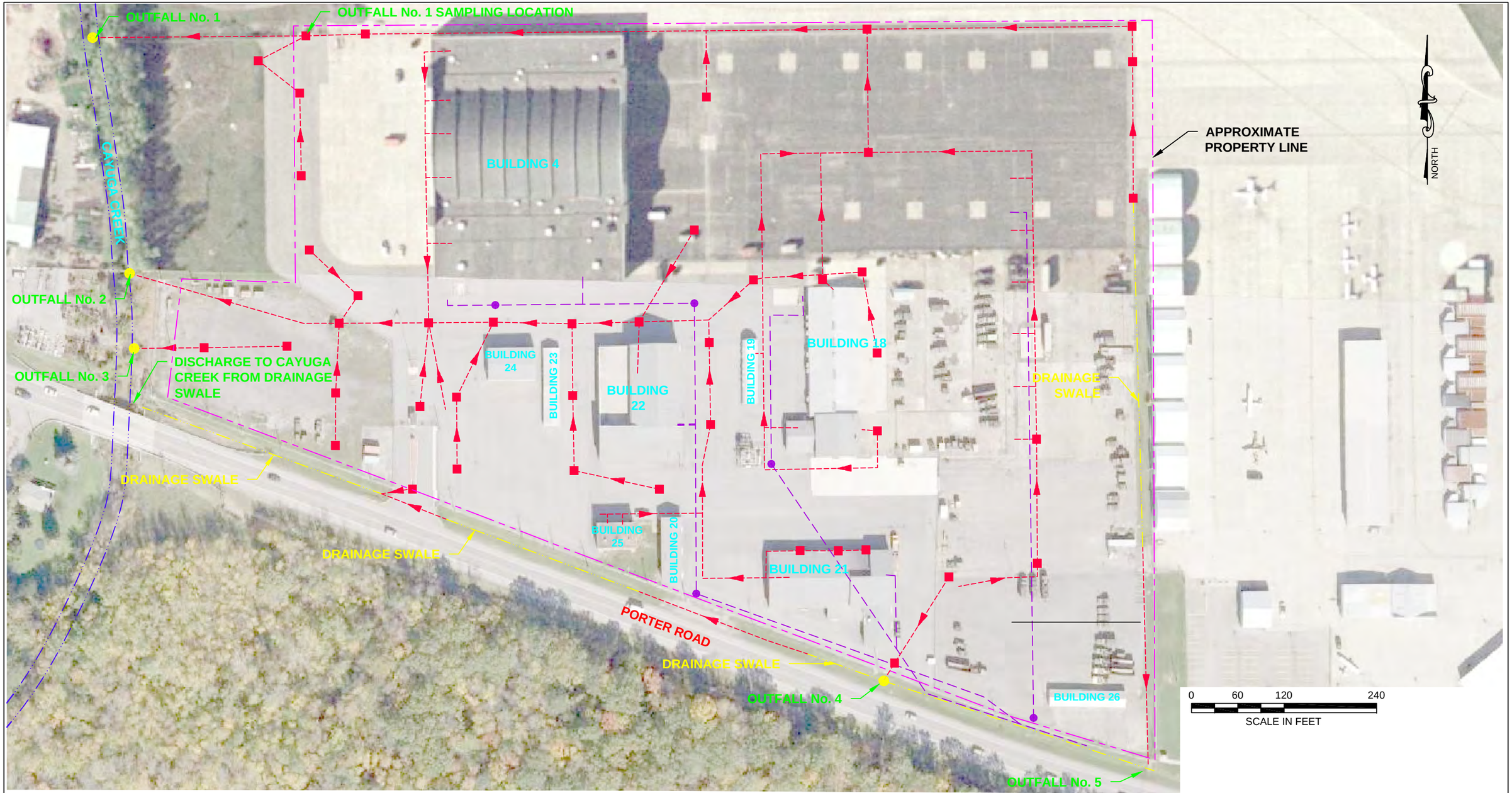


NOTE:
BASE MAP ADAPTED FROM U.S.G.S. TOPOGRAPHIC MAPS DOWNLOADED FROM TERRASERVER.MICROSOFT.COM

FIGURE 1
SITE LOCATION MAP
USAFRC
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: KN	SCALE: 1" = 2,000'	JOB No.: 773-04
CK'D. BY: MM	DATE: 1/10/10	FILE NO.: 773-04
REV. NO. –	REV. DATE: –	FIGURE NO.:1



LEGEND:

- SANITARY SEWER LOCATION
- STORM SEWER LOCATION WITH FLOW DIRECTION

NOTES:

1. BASE MAP ADAPTED FROM A 2008 AERIAL PHOTO AND PROPERTY LINE DOWNLOADED FROM http://www.bing.com/maps/I AND FIELD OBSERVATIONS.

2. THE SIZE AND LOCATION OF EXISTING SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

FIGURE 2
SITE PLAN
USAFRC
NIAGARA FALLS, NEW YORK

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: KN	SCALE: 1" = 120'	JOB No.: 773-04
CK'D. BY: MM	DATE: 1/12/10	FILE NO.: 773-04
REV. NO. –	REV. DATE: 10/25/10	FIGURE NO.: 2

APPENDIX B

MATERIAL SAFETY DATA SHEETS

PCB DISPOSAL

MATERIAL SAFETY DATA SHEET

(POLYCHLORINATED BIPHENYLS)

COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients Name: polychlorinated biphenyls (PCBs)

HAZARD IDENTIFICATION

Reports of Carcinogenicity: YES

HEALTH HAZARDS ACUTE AND CHRONIC

- **Eyes**: Moderately irritating to eye tissues.
- **Skin**: Can be absorbed through intact skin, may cause de-fatting, potential for chloracne.
- **Inhalation**: Possible liver injury.
- **Ingestion**: Slightly toxic; reasonably anticipated to be carcinogenic.

EFFECTS OF OVER-EXPOSURE

Can cause dermatological symptoms; however, these are reversible upon removal of exposure source.

FIRST AID MEASURES

- **Eyes**: Irrigate immediately with copious quantities of running water for at least 15 minutes if liquid or solid PCBs get into them.
- **Skin:** Contaminated clothing should be removed and the skin washed thoroughly with soap and water. Hot PCBs may cause thermal burns.
- **Inhalation**: Remove to fresh air; if skin rash or respiratory irritation persists, consult a physician (if electrical equipment arcs over, PCBs may decompose to produce hydrochloric acid).
- **Ingestion**: Consult a physician. Do not induce vomiting or give any oily laxatives. (If large amounts are ingested, gastric lavage is suggested).

FIRE FIGHTING MEASURES: Flash Point: >141 ^{o}C (285.8 ^{o}F)

EXTINGUISHING MEDIA: PCBs are fire-resistant compounds.

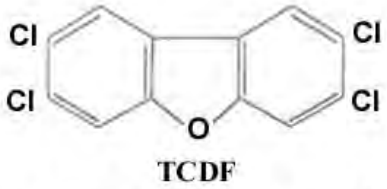
FIRE-FIGHTING PROCEDURES

Standard fire-fighting wearing apparel and self-contained breathing apparatus should be worn when fighting fires that involve possible exposure to chemical combustion products. Fire fighting equipment should be thoroughly cleaned and decontaminated after use.

UNUSUAL FIRE/EXPLOSION HAZARD

If a PCB transformer is involved in a fire-related incident, the owner of the transformer is required to report the incident. Consult and follow appropriate federal, provincial and local regulations.

***Note**: When askarel liquid becomes involved in a fire, toxic by-products of combustion are typically produced including polychlorinated dibenzofurans and polychlorinated dibenzodioxins, both known carcinogens. The structures of these chemical species are as follows:*

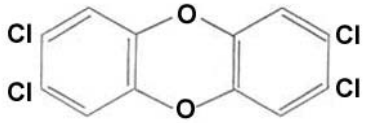


$C_{12}H_{8-n}Cl_nO$

$n = 4 - 8$

TCDF

2,3,7,8-tetrachlorodibenzofuran



$C_{12}H_{8-n}Cl_nO_2$

$n = 4 - 8$

TCDD

2,3,7,8-tetrachloro-dibenzo-p-dioxin

***Note**: 2,3,7,8-tetrachloro-dibenzo-p-dioxin is one of the most potent teratogenic, mutagenic and carcinogenic agents known to man.*

SPILL RELEASE PROCEDURES

Cleanup & disposal of liquid PCBs are strictly regulated by the federal government. Ventilate area. Contain spill/leak. Remove spill by means of absorptive material. Spill clean-up personnel should use proper protective clothing. All wastes and residues containing PCBs should be collected, containerized, marked and disposed of in the manner prescribed by applicable federal, provincial and local laws.

HANDLING AND STORAGE PRECAUTIONS

Care should be taken to prevent entry into the environment through spills, leakage, use, vaporization, or disposal of liquid. Avoid prolonged breathing of vapours or mists. Avoid contact with eyes or prolonged contact with skin. Comply with all federal, provincial and local regulations.

OTHER PRECAUTIONS

Federal regulations require PCBs, PCB items, storage areas, transformer vaults, and transport vehicles to be appropriately labelled.

RESPIRATORY PROTECTION

Use OHSA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical splash goggles. The respirator use limitations specified by the manufacturer must be observed.

VENTILATION

Provide natural or mechanical ventilation to control exposure levels below airborne exposure levels.

PROTECTIVE GLOVES: Wear appropriate chemical resistant gloves to prevent skin contact.

EYE PROTECTION: Wear chemical splash goggles and have eye baths available.

OTHER PROTECTIVE EQUIPMENT

Wear appropriate protective clothing. Provide a safety shower at any location where skin contact can occur.

WORK HYGIENIC PRACTICES

Wash thoroughly after handling. Supplemental safety and health : none

PHYSICAL/CHEMICAL PROPERTIES

- **Vapour pressure:** (mm Hg @100 ^{o}F) 0.005 - 0.00006
- **Viscosity:** (CENTISTOKES) 3.6 - 540
- **Stability indicator/materials to avoid:** Yes
- **Stability Condition to Avoid:** PCBs are very stable, fire-resistant compounds.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide, hydrogen chloride, phenolics, aldehydes, furans, dioxins

WASTE DISPOSAL METHODS

Consult the applicable PCB regulations prior to any disposal of PCBs or PCB-contaminated items.

AMERADA HESS CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades **MSDS No. 9950**

EMERGENCY OVERVIEW
DANGER!
EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD

NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-04)

Amerada Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): Corporate Safety (732)750-6000
MSDS Internet Website www.hess.com/about/environ.html

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS * (rev. Jan-04)

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION (rev. Dec-97)

EYES
Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES (rev. Dec-97)

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES (rev. Dec-97)

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 ^{o}F (-43^{o}C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 ^{o}F (>280 ^{o}C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 “Low Expansion Foam - 1994 Edition.”

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES (rev. Dec-97)

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product

vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE (rev. Dec-97)

HANDLING PRECAUTIONS

******USE ONLY AS A MOTOR FUEL******
******DO NOT SIPHON BY MOUTH******

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-04)

EXPOSURE LIMITS

Component (CAS No.)	Exposure Limits			
	Source	TWA (ppm)	STEL (ppm)	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3
Benzene (71-43-2)	OSHA	1	5	Carcinogen
	ACGIH	0.5	2.5	A1, skin
	USCG	1	5	
n-Butane (106-97-8)	ACGIH	800	--	2003 NOIC: 1000 ppm (TWA) Aliphatic Hydrocarbon Gases Alkane (C1-C4)
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--	
	ACGIH	1000	--	A4
Ethyl benzene (100-41-4)	OSHA	100	--	
	ACGIH	100	125	A3

Component (CAS No.)	Exposure Limits			
	Source	TWA (ppm)	STEL (ppm)	Note
n-Hexane (110-54-3)	OSHA	500	--	
	ACGIH	50	--	skin
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)
	ACGIH	50	--	A4 (skin)
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--	
Xylene, mixed isomers (1330-20-7)	OSHA	100	--	
	ACGIH	100	150	A4

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem ®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jan-04)

APPEARANCE

A translucent, straw-colored or light yellow liquid

ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	Odor Detection	Odor Recognition
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 ^{o}F (39 to 200 ^{o}C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 ^{o}F (38 ^{o}C) (275-475 mm Hg @ 68 ^{o}F (20 ^{o}C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H_2O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %

SOLUBILITY (H_2O): Non-oxygenated gasoline - negligible (< 0.1% @ 77 ^oF). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 ^oF); ethanol is readily soluble in water

10. STABILITY and REACTIVITY (rev. Dec-94)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES (rev. Dec-97)

ACUTE TOXICITY

Acute Dermal LD50 (rabbits): > 5 ml/kg
Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating
Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION (rev. Jan-04)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS (rev. Dec-97)

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION (rev. Jan-04)

DOT PROPER SHIPPING NAME:	Gasoline
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1203
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:

15. REGULATORY INFORMATION (rev. Jan-04)

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION - Parts per million (ppm) by weight
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION (rev. Jan-04)

NFPA® HAZARD RATING	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
HMIS® HAZARD RATING	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
	* CHRONIC		

SUPERSEDES MSDS DATED: 12/30/97

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212)642-4900
API	American Petroleum Institute (202)682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General Info: (800)467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Workplace Hazardous Materials Information System (Canada)

NFPA 704 (Section 16)

AMERADA HESS CORPORATION

MATERIAL SAFETY DATA SHEET

No. 2 Fuel Oil **MSDS No. 0088**

1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-98)

Amerada Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300
COMPANY CONTACT (business hours): Corporate Safety (732) 750-6000
SYNONYMS: #2 Heating Oil; 2 Oil; Off-road Diesel Fuel

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS (rev. Sep-98)

INGREDIENT NAME	EXPOSURE LIMITS	CONCENTRATION PERCENT BY WEIGHT
#2 Fuel Oil CAS NUMBER: 68476-30-2	OSHA PEL-TWA: 5 mg/m^3 as mineral oil mist ACGIH TLV-TWA: 1997 NOIC - 100 mg/m^3, skin, A3	100
Naphthalene CAS NUMBER: 91-20-3	OSHA PEL-TWA: 10 ppm ACGIH TLV-TWA/STEL: 10 / 15 ppm, A4	Typically 0.1

A complex combination of hydrocarbons with carbon numbers in the range C9 and higher produced from the distillation of petroleum crude oil.

3. HAZARDS IDENTIFICATION (rev. Jan-98; Tox-98)

EMERGENCY OVERVIEW
CAUTION!
OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation. Long-term, repeated exposure may cause skin cancer.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

EYES
Contact with eyes may cause mild irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Similar products have produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES (rev. Jan-98; Tox-98)

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES (rev. Sep-94)

FLAMMABLE PROPERTIES:

FLASH POINT:	100 ^{o}F (38 ^{o}C) minimum PMCC
AUTOIGNITION POINT:	494 ^{o}F (257 ^{o}C)
LOWER EXPLOSIVE LIMIT (%):	0.6
UPPER EXPLOSIVE LIMIT (%):	7.5

FIRE AND EXPLOSION HAZARDS
OSHA and NFPA Class 2 COMBUSTIBLE LIQUID (see Section 14 for transportation classification). Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES (rev. Jan-98)

ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE (rev. Jan-98)

HANDLING PRECAUTIONS

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when this product is loaded into tanks previously containing low flash point products (such as gasoline) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

STORAGE PRECAUTIONS

Keep containers closed and clearly labeled. Use approved vented storage containers. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse.

Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-98)

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jul-98)

APPEARANCE

Red or reddish/orange colored (dyed) liquid

ODOR

Mild, petroleum distillate odor

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	340 to 700 ^{o}F (171 to 371 ^{o}C)
VAPOR PRESSURE:	0.009 psia @ 70 ^{o}F (21 ^{o}C)
VAPOR DENSITY (air = 1):	> 1.0
SPECIFIC GRAVITY (H_2O = 1):	AP 0.87
PERCENT VOLATILES:	100 %
EVAPORATION RATE:	Slow; varies with conditions
SOLUBILITY (H_2O):	Negligible

10. STABILITY and REACTIVITY (rev. Sep-94)

STABILITY: Stable. Hazardous polymerization will not occur

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers; Viton ®; Fluorel ®

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES (rev. Jan-98; Tox-98)

ACUTE TOXICITY

Acute Oral LD50 (rat): 14.5 ml/kg
Acute Dermal LD50 (rabbit): > 5 ml/kg
Guinea Pig Sensitization: negative
Primary dermal irritation: moderately irritating (Draize mean irritation score - 3.98 rabbits)
Draize eye irritation: mildly irritating (Draize score, 48 hours, unwashed - 2.0 rabbits)

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenic: IARC: NO NTP: NO OSHA: NO ACGIH: 1997 NOIC: A3
Dermal carcinogenicity: positive - mice

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

This product is similar to Diesel Fuel. IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A) and NIOSH regards it as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

MUTAGENICITY (genetic effects)

Material of similar composition has been positive in a mutagenicity study.

12. ECOLOGICAL INFORMATION (rev. Jan-98)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

13. DISPOSAL CONSIDERATIONS (rev. Jan-98)

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION (rev. Jan-98)

PROPER SHIPPING NAME:	FUEL OIL, NO. 2
HAZARD CLASS & PACKING GROUP:	3, PG III
DOT IDENTIFICATION NUMBER:	NA 1993
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

May be reclassified for transportation as a COMBUSTIBLE LIQUID under conditions of DOT 49 CFR 173.120(b)(2).

15. REGULATORY INFORMATION (rev. Feb-01)

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the *de minimis* levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Amerada Hess Corporate Safety if you require additional information regarding this product.

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 3(Combustible Liquid); Class D, Division 2, Subdivision B (Toxic by other means)

16. OTHER INFORMATION (rev. Feb-01)

NFPA® HAZARD RATING	HEALTH:	0	Negligible
	FIRE:	2	Moderate
	REACTIVITY:	0	Negligible
HMIS® HAZARD RATING	HEALTH:	1 *	Slight
	FIRE:	2	Moderate
	REACTIVITY:	0	Negligible
			* Chronic

SUPERSEDES MSDS DATED: 09/03/98

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	NFPA	National Fire Protection Association (617) 770-3000
AIHA	American Industrial Hygiene Association	NIOSH	National Institute of Occupational Safety and Health
ANSI	American National Standards Institute (212) 642-4900	NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
API	American Petroleum Institute (202) 682-8000	NTP	National Toxicology Program
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	OPA	Oil Pollution Act of 1990
DOT	U.S. Department of Transportation [General info: (800) 467-4922]	OSHA	U.S. Occupational Safety & Health Administration
EPA	U.S. Environmental Protection Agency	PEL	Permissible Exposure Limit (OSHA)
HMIS	Hazardous Materials Information System	RCRA	Resource Conservation and Recovery Act
IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
		SCBA	Self-Contained Breathing Apparatus

SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Canadian Workplace Hazardous Materials Information System

APPENDIX C

HOSPITAL ROUTE

MAPQUEST.

Trip to 621 10th St

Niagara Falls, NY 14301-1813
5.49 miles - about 13 minutes

Notes

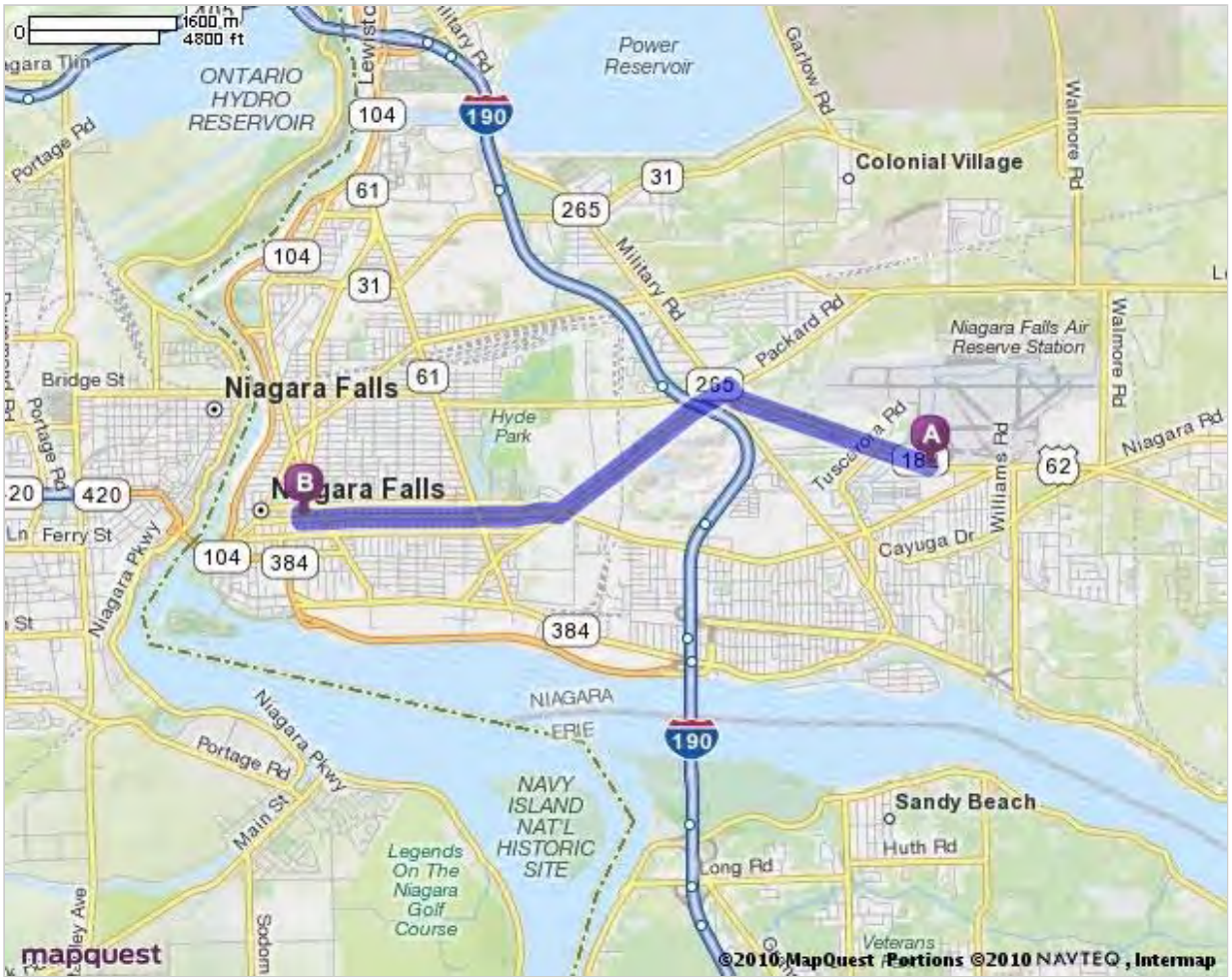
A 9400 Porter Rd, Niagara Falls, NY 14304-5713

START	1. Start out going **WEST** on **PORTER RD / RT-182** toward **TUSCARORA RD**.	go 1.7 mi
	2. Turn **LEFT** onto **PACKARD RD / RT-182 / PORTER-PACKARD RD / CR-82**. Continue to follow **PACKARD RD / CR-82**.	go 1.7 mi
NORTH 62 BR	3. Turn **RIGHT** onto **US-62-BR N / NIAGARA FALLS BLVD**.	go 0.2 mi
NORTH 62	4. **US-62-BR N / NIAGARA FALLS BLVD** becomes **US-62 N / WALNUT AVE**.	go 1.8 mi
	5. Turn **RIGHT** onto **10TH ST**.	go 0.0 mi
END	6. **621 10TH ST** is on the **RIGHT**.	go 0.0 mi

B 621 10th St, Niagara Falls, NY 14301-1813

Total Travel Estimate : 5.49 miles - about 13 minutes

Route Map Hide



APPROVAL/SIGN OFF SHEET

I have read, understood and agree with information set forth in this Site Health and Safety Plan.

NAME	TITLE	DEPARTMENT	SIGNATURE	DATE