

WORK PLAN

**PRELIMINARY SITE ASSESSMENT/INTERIM REMEDIAL MEASURES (PSA/IRM)
STUDY FOR THE FORMER NORTH ALBANY MGP SITE**

ALBANY, NEW YORK

SUBMITTED TO:

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**PSA/IRM STUDY WORK PLAN FOR THE
NORTH ALBANY FORMER MGP SITE**

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1. Introduction

1.1. Project Background

This Preliminary Site Assessment/Interim Remedial Measures (PSA/IRM) Study Work Plan for the North Albany (Broadway) former manufactured gas plant (MGP) site has been prepared by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) on behalf of the Niagara Mohawk Power Corporation (NMPC). The work plan has been prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) Order on Consent (Order) requiring NMPC to investigate and, if necessary, remediate 21 former MGP sites in New York. Section II of the Order requires that NMPC submit work plans for the performance of PSA/IRM investigations for each of the 21 sites. The North Albany (Broadway) former MGP site is one of the sites scheduled for PSA/IRM activities in 1994 and is the subject of this work plan.

NMPC is also in the process of obtaining a Part 373 permit for a TSD facility located at the North Albany complex. Several solid waste management units (SWMUs) have been identified in the draft Part 373 Permit per an agreement with the NYSDEC, identified corrective actions can be dealt with under the terms of the Order rather than conditions of the Part 373 Permit.

1.2. Project Objectives

In accordance with the Order, the goal of the North Albany site PSA/IRM study is to collect sufficient environmental data to facilitate a preliminary evaluation regarding the following:

- the nature and presence of hazardous substances, including MGP by-products on-site and off-site, if necessary
- whether such substances constitute a significant threat to public health or the environment
- whether additional remedial investigations are necessary at the site, and
- whether one or more IRMs or corrective actions may be appropriate due to the nature and extent of MGP residues and other contaminants possibly associated with identified SWMUs

The work performed will meet the intent and requirements of the Order and the New York State Environmental Conservation Law (ECL).

1.3. Work Plan Organization

This PSA/IRM Work Plan is organized into four sections and five appendices as outlined below:

- Section 1 - summary of **Project Background** and presentation of **Project Objectives**

PSA/IRM Study for the North Albany Former MGP Site

- Section 2 - review of **Site Background** including site setting, site history and a summary of previous investigations
- Section 3 - descriptions of tasks comprising the **PSA/IRM Scope of Work** with emphasis on field data collection activities
- Section 4 - presentation of the **Project Management** approach including project organization, schedule and communications
- Appendix A - **Sampling and Analysis Plan** consisting of a **Quality Assurance Project Plan** (Appendix A.1) and a **Field Sampling Plan** (Appendix A.2)
- Appendix B - a **Site Health and Safety Plan** which specifies the minimum health and safety procedures to be implemented during the PSA/IRM investigation
- Appendix C - a list of **References** for this Work Plan
- Appendix D - a **Citizen Participation Plan**
- Appendix E - a **Cultural Resources Management Plan**

2. Site Background

Information presented in this section is excerpted from the Initial Submittal for the North Albany (Broadway) MGP Site dated January 15, 1994, prepared by NMPC and submitted to the NYSDEC on January 12, 1994.

2.1. Site Description

The North Albany (Broadway) MGP site is located on Broadway in Albany, Albany County, New York. Figure 2-1 depicts the site location (USDOT - Troy South Quadrangle). The North Albany facility occupies approximately 25 acres covered by numerous buildings, parking lots and storage areas (Figure 2-2). The site is bordered by Broadway to the west, Interstate I-90 to the north, Conrail to the east and Bridge Street to the south. The site is currently used as an NMPC area service center.

The land use nearby the site is urban/industrial. There are several small factories and businesses around the site and a small railyard to the east. Interstate I-787 and the Hudson River exist beyond the railyard to the east.

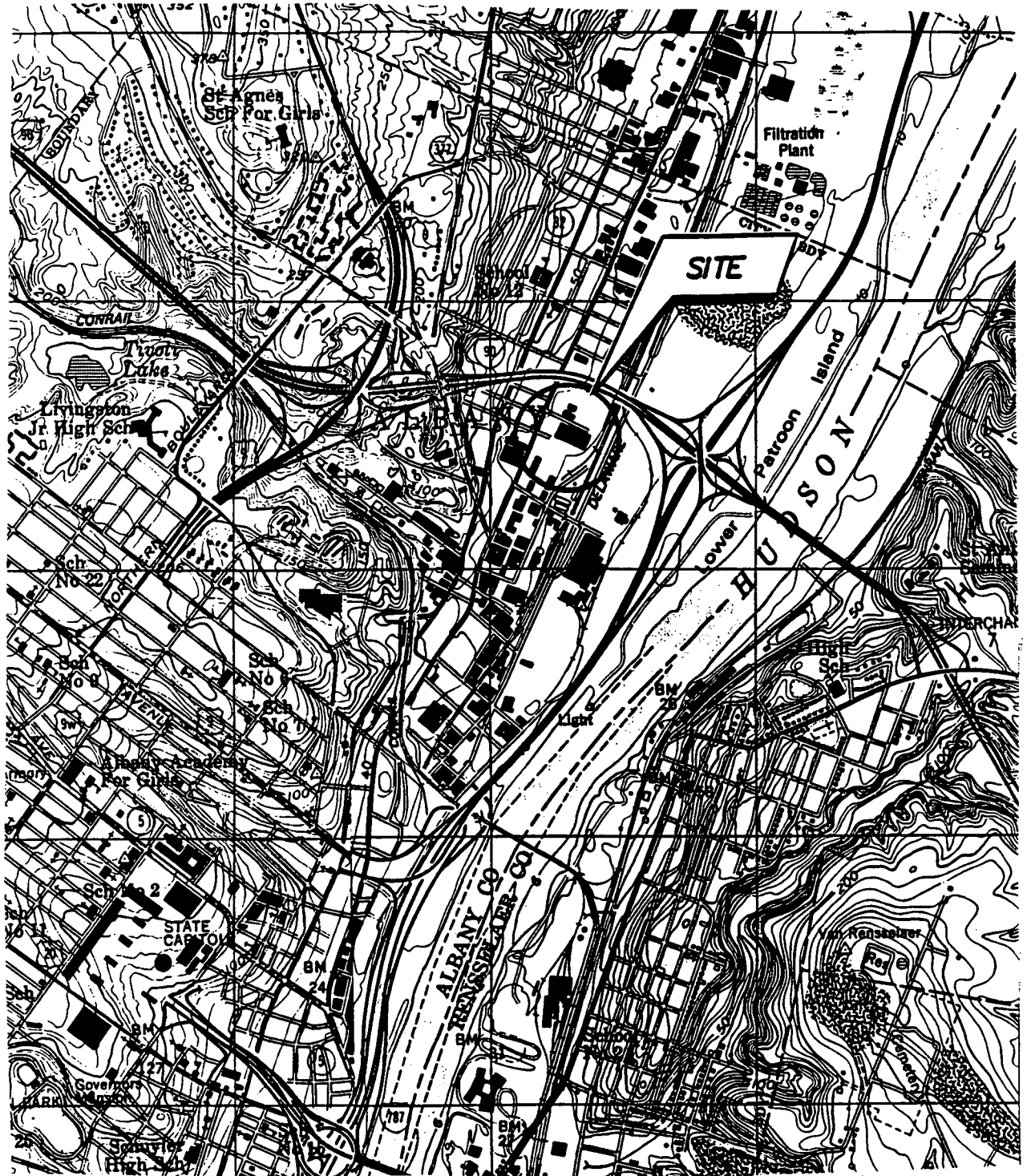
Much of the site is paved and covered with buildings. Several of the storage areas in the southern part of the site are covered with gravel and crushed stone. The site also contains the NMPC eastern region Treatment, Storage, or Disposal (TSD) Facility near the center of the site. The current TSD facility covers less than one acre. Buildings No. 3 and 4 (see Figure 2.2) on the site are from the gas plant facilities.

The site is located in the Hudson-Champlain Lowland (Fisher, 1984). The bedrock at the site is the Black Snake Hill Shale which is exposed in road cuts west of the site (Ruedeman, 1930). The depth of bedrock varies between 18 and 21 feet in the northern part of the site, and greater than 27 feet deep in the middle part of the site. The one test boring in the southern part of the site was drilled to a depth of 25 feet and did not encounter bedrock. The bedrock is overlain by fill, glacial-fluvial deposits and till with the following thicknesses:

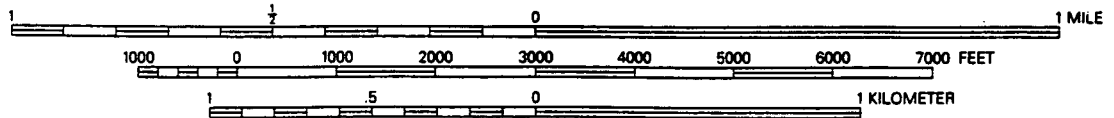
- Fill-sand, cinders, brick, concrete, gravel, slag, foundry sand, wood, coal, silt, ash-4 to 8 feet thick
- Glacial-Fluvial layer - clay, silt with layer of sand and gravel - 7 to 14 feet thick
- Till - dense clayey silt or silty sand with some gravel or shale - 5 to 12 feet thick

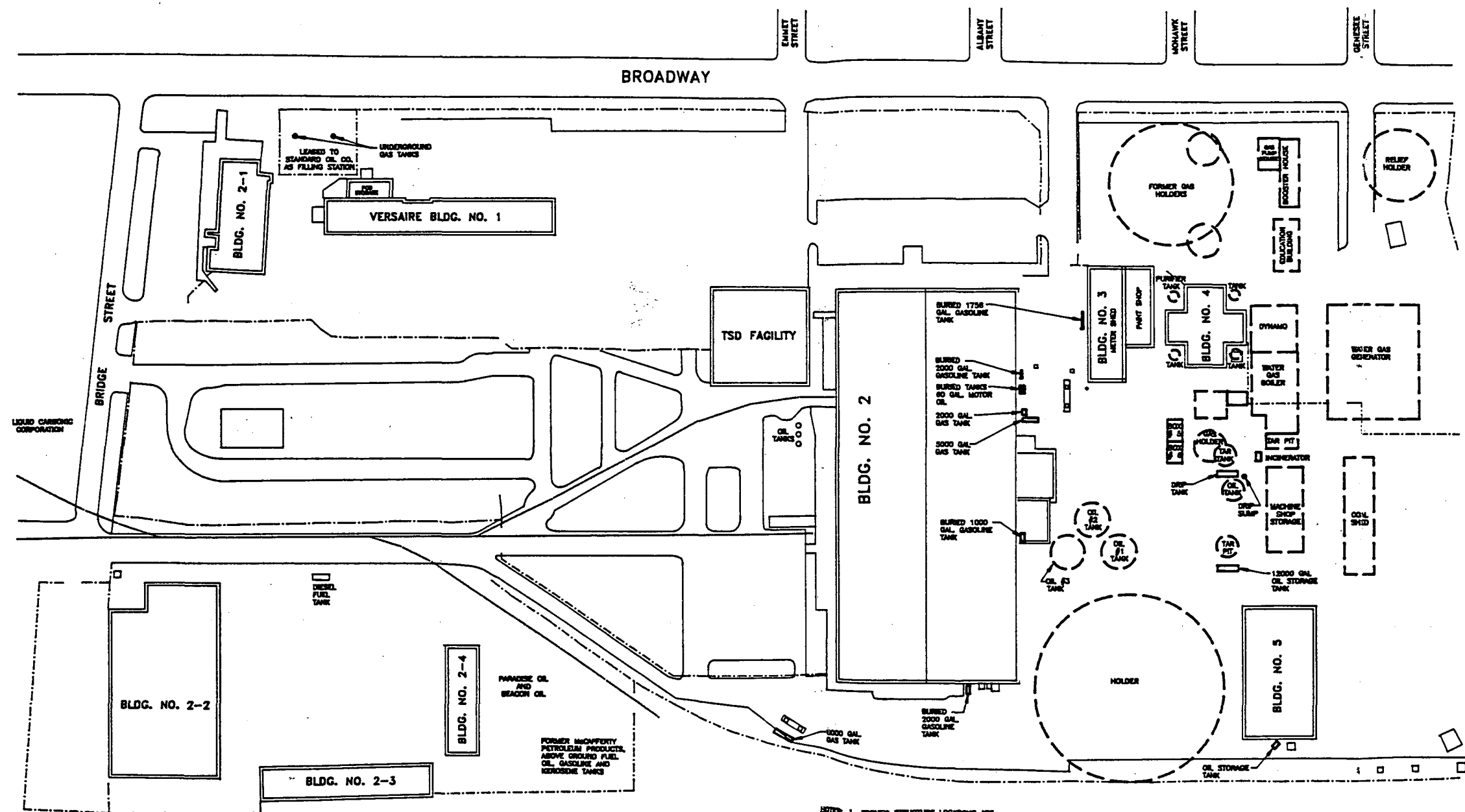
The fill layer contained purifier by-products and coal tar in several borings at the northern end of the site. A black "sludge" was encountered approximately six feet below the surface on the west side of building #4. The top of the surficial aquifer is near the bottom of the fill layer. The bedrock aquifer, the Snake Hill Shale, has a low yield (Cushman, 1950).

Site Location Map



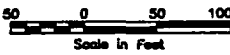
SCALE 1:24 000





LEGEND

- FORMER STRUCTURES
- ==== RAILROAD TRACKS
- FENCE



NIAGARA MOHAWK
NORTH ALBANY BUILDING
ALBANY, NEW YORK
SITE PLAN

FILE NO. 1118.074



The site soil is predominantly miscellaneous fill with widely varying soil characteristics. Surface soils at the site are classified as urban soil by the U.S. Department of Agriculture Soil Conservation Service (SCS, 1983). In urban soil areas, asphalt, concrete, buildings, or other impervious materials cover more than 85 percent of the surface. In many areas the soils have been disturbed and consist of fill or have been subject to excavation and regrading activities.

2.2. Site History

Prior to the construction of the coal gas plant in 1872, the site was part of the Stephen Van Rensselaer estate which was primarily farmland and residential. Throughout the life of the gas plant, the site was bordered on the west by Broadway. Expansion occurred primarily on the east and south sides of the site.

In 1872, the People's Gas Light Company constructed the first plant at the site. The facility consisted of a coal shed, horizontal purifier house, a gasometer, and an office. The plant was bordered to the north by a depot and stables owned by the Troy and Albany Railway. An ice house and an unidentified building labelled "Colby and Kelly" were east and adjacent to the railway.

Original installations were designed to produce quantities estimated to be adequate for anticipated requirements. However, by the 1880s demand exceeded expectations and, it was necessary to consolidate separately-owned operations to develop larger, more efficient production units. Between 1885 and 1888, the Municipal Gas Company of Albany purchased properties of the three gas light companies in the area and integrated their manufacturing plants and distribution systems. In 1892, the Municipal Gas Company added three small gas holders, a lime/oxide house, and a machine shop/storage building on the eastern portion of the property.

In 1907, The Municipal Gas Company had expanded on the south side of the property. A 2,00,000 cubic foot (cu. ft.) gas holder was added to increase storage capacity. Also, a multipurpose building (carriage house/meter storage, repair shop) was constructed on the south side. In 1892, the retort house had been converted to water gas with the replacement of Williamson sets. To the north was United Traction, a company specializing in production of electricity for the trolley service, was located where the Troy and Albany Passenger Railway once operated. To the south adjacent to Bridge Street was Hart and Fleet Planning Mill and the Hudson Valley Ice Company.

In 1924, a new 3 million cubic ft gas holder was installed at The Municipal Gas Plant, which further increased the total storage capacity to 5 million cubic ft. In 1925, gas was supplied from the Water Street gas plant in Troy, New York.

In 1927, the Municipal Gas Company was acquired by New York Power and Light (NYP&L) and, additional expansions and renovations were conducted at the site. By 1931, the property had expanded to the south through various deed acquisitions. Also, between 1930 to 1940, the 250,000 cu. ft. gas holder and retort house were torn down. An educational building was constructed, and two additional purifying were added on the south end of the purifying house. In 1931, a service building was also erected on-site. This building housed the maintenance operations and had the storage capacity for eighty cars.

PSA/IRM Study for the North Albany Former MGP Site

In the 1930's, the NYP&L purchased several properties from Albany Lumber and Planning Co., Hudson Valley Ice Co., D&H Railroad, Paradise Oil Co. and Beacon Oil Company. One property along Broadway was used by Standard Oil as a gas station.

In the 1950's, NYP&L became part of NMPC which continued to operate the site as a regional service center for gas and electric operations. Several new buildings were added to the northeast and southwest parts of the site. A PCB storage facility was located at Building No. 1.

In the 1980's, the regional NMPC hazardous waste treatment, storage and disposal (TSD) facility added to the North Albany site.

2.3. Summary of Previous Investigations

Pittsburgh Testing Laboratory, 1986

In 1986, Pittsburgh Testing Laboratory drilled 15 test borings for a new building location at the North Albany site. Five of the test borings encountered "coal tar or sludges" in the northern half of the site. Three of the most contaminated soil samples tested positive for ignitability, corrosivity, reactivity, EP toxicity for metals and PCBs. Samples from two borings were identified as reactive due to hydrogen sulfide with a pH of 2.5 to 3, however, since the results were not quantified, further testing was required. Two soil samples collected from test pits near these two borings also failed reactivity tests. Further tests on these same samples indicated that the material did not fail the corrosivity test.

NMPC, 1987

As a follow-up to the Pittsburgh Testing investigation, for the new building location, NMPC completed 15 test pits at the North Albany site. Two of the test pits, located on the west side of the site near Broadway and a former gas holder location, encountered "tar-saturated sand" between 2 and 6.5 feet.

U.S.EPA/NUS Corporation, 1987

The NUS Corporation conducted a potential hazardous waste site preliminary assessment for the USEPA which concluded the site is a low priority for further action (U.S.EPA, 1991). This assessment did not include environmental sampling and focused on the existing hazardous materials currently stored at the TSD facility on site. The report did not discuss the former MGP facilities or related by-products at the site.

Empire Soils Investigation, 1992

Empire Soils Investigations (ESI) completed nine test borings at two possible locations of former MGP structures. Four test borings, located west of Building 4 (the former MGP purifying house) encountered tar-like materials; however, samples were not collected for analysis.

NYSDEC Spill and LUST Reports

There have been several spill reports at the North Albany facility. No site investigations were conducted, however. There have also been a number of leaking underground storage tank (LUST) reports concerning the North Albany facility.

Tank Removals, 1990-1991

In 1990, an 8,000-gal underground gasoline storage tank and a 10,000-gal above ground diesel storage tank were removed from the site just east of Building 2. A new 8,000-gal underground diesel storage tank was subsequently installed at this location. These activities generated approximately 958 tons of coal tar contaminated soils. Laboratory toxicity tests indicated there were no exceedences of hazardous waste limits. The contaminated soil was transported as non-hazardous waste by Buffalo Fuel Corporation to Modern Landfill, Inc. in Model City, New York, between February 5, 1991 and February 8, 1991.

Site runoff drains through storm drains into the Hudson River lying approximately one-quarter mile to the east. The Hudson River is a Class C river according to NYSDEC's water quality classification. Most of the site is within the 100 year floodplain of the Hudson River.

3. PSA/IRM Scope of Work

This section describes the work effort which will constitute the PSA/IRM investigation at the North Albany (Broadway) former MGP site. The scope of work is based on the requirements set forth in the NYSDEC Order and is consistent with the National Contingency Plan (NCP).

This section details the proposed investigative, assessment, and reporting tasks designed to generate information sufficient to enable NMPC and the NYSDEC to identify and characterize the nature of hazardous substances at the site in order to meet the stated project objectives. PSA/IRM activities will be performed in accordance with NYSDEC requirements, protocols, and guidance including the NYSDEC's "Standby Contract Work Assignment for Engineering Services for the Performance of Preliminary Site Assessments."

Detailed quality control procedures are presented in the Quality Assurance Project Plan (QAPP). Details of field procedures mentioned in this section are presented in the Field Sampling Plan (FSP).

3.1. Field Investigation

3.1.1. Site Reconnaissance

The primary objectives of the site reconnaissance activities are to verify sampling locations for the field sampling program described in Section 3.1.3.

The intent of this task is to coordinate site investigation activities with NMPC operating personnel, to verify the locations for borings, wells, and sampling points as well as to identify staging areas for equipment, materials and decontamination zones. Additionally, coordination with the underground facilities protective organization (UFPO) and NMPC personnel for clearance of subsurface utilities and services is included in this task. The NMPC project manager will arrange a site reconnaissance meeting including the field team leader, the project geologist, and the subcontract driller's representative at least one week prior to the scheduled start date of on-site activities so that these necessary arrangements are completed prior to the start of work. This will allow time for current NMPC operations to be alerted and modified, for locating potentially affected subsurface utilities and services, and for moving stored equipment or materials for access to the proposed drilling/sampling locations.

NMPC will be responsible for identifying off-site property owners and arranging access permission. To the extent practicable, access arrangements will allow for flexibility in placing the sample/boring locations in case of subsurface interferences or other conditions requiring minor changes in sample/boring locations.

3.1.2. Base Map Development

To facilitate both implementation of the field program and subsequent reporting activities, coordination and compilation of the North Albany site survey and base map will be accomplished. The objective of the site survey is to provide the necessary data to prepare a detailed site map

which delineates current property boundaries, topography, and surface features such as buildings, roadways, above ground utilities, and drainage. The site has been flown by Lockwood Support Services for the purposes of preparing a site topographic map. The horizontal and/or vertical coordinates of cultural features will be field verified and surveyed. Surveyed measurements will be performed to the nearest one hundredth of a foot and topographic contours will be provided at an interval of 2 feet.

Surveyed information will be transferred and contained in the form of a digital export computer file (.DXF). Base maps will be generated in accordance with NMPC's System Specification C-1026 using Intergraph® or compatible computer software. Buildings, roadways, waterways, and utilities will be clearly labelled. Elevations referenced to the National Geodetic Datum of 1929 (mean sea level: MSL) will be included for utility inverts, roadways, and waterways.

In addition to current site structures, sampling locations will be identified on the survey map and will include the coordinates and ground surface elevation (MSL). For each monitoring well installed at the site, the ground surface, top of the protective casing, and top of the PVC inner casing elevation (MSL) will be provided.

On-site and off-site utilities will be identified for the health and safety of field personnel and to prevent damage to underground utilities during intrusive activities. Public and privately-owned utilities will be located by contacting responsible agencies to provide mark-outs of underground utilities. The site reconnaissance team will evaluate these utility locations in planning the field data collection approach, particularly as they relate to soil boring, test pit, and monitoring well locations. Locations for subsurface investigations will be approved by NMPC personnel prior to boring or drilling.

A supplemental metal detector screening will be conducted prior to the start of subsurface investigative activities in an attempt to locate unidentified underground utilities or tanks. Initially, the locator will be tested on known locations of underground utilities to verify that it is functioning properly. The metal detector screening is intended as a precautionary and supplemental health and safety measure only. If there is no indication of buried utilities or tanks, then subsurface sampling will proceed. However, if the locator indicates the presence of a buried object, activities will not proceed in that location until the type of buried object is identified. If the object cannot be identified from surface or shallow digging, a test pit may be needed to determine the source of the metal detection. If a test pit is needed, the procedure and scope will be reviewed with the NMPC Project Manager prior to conducting the work.

3.1.3. Field Sampling Activities

This section describes the specific field data collection activities and the rationale for these activities and analyses. A summary of proposed field activities, sampling and analyses, and associated rationale for the North Albany (Broadway) site is provided in Table 3-1. Figure 3-1 depicts the locations of proposed sampling activities. In general, the field sampling program consists of test pit excavations, soil boring and monitoring well installation, ground water

PSA/IRM Study for the North Albany Former MGP Site

Table 3-1. PSA/IRM field investigation summary for North Albany (Broadway) former MGP site.

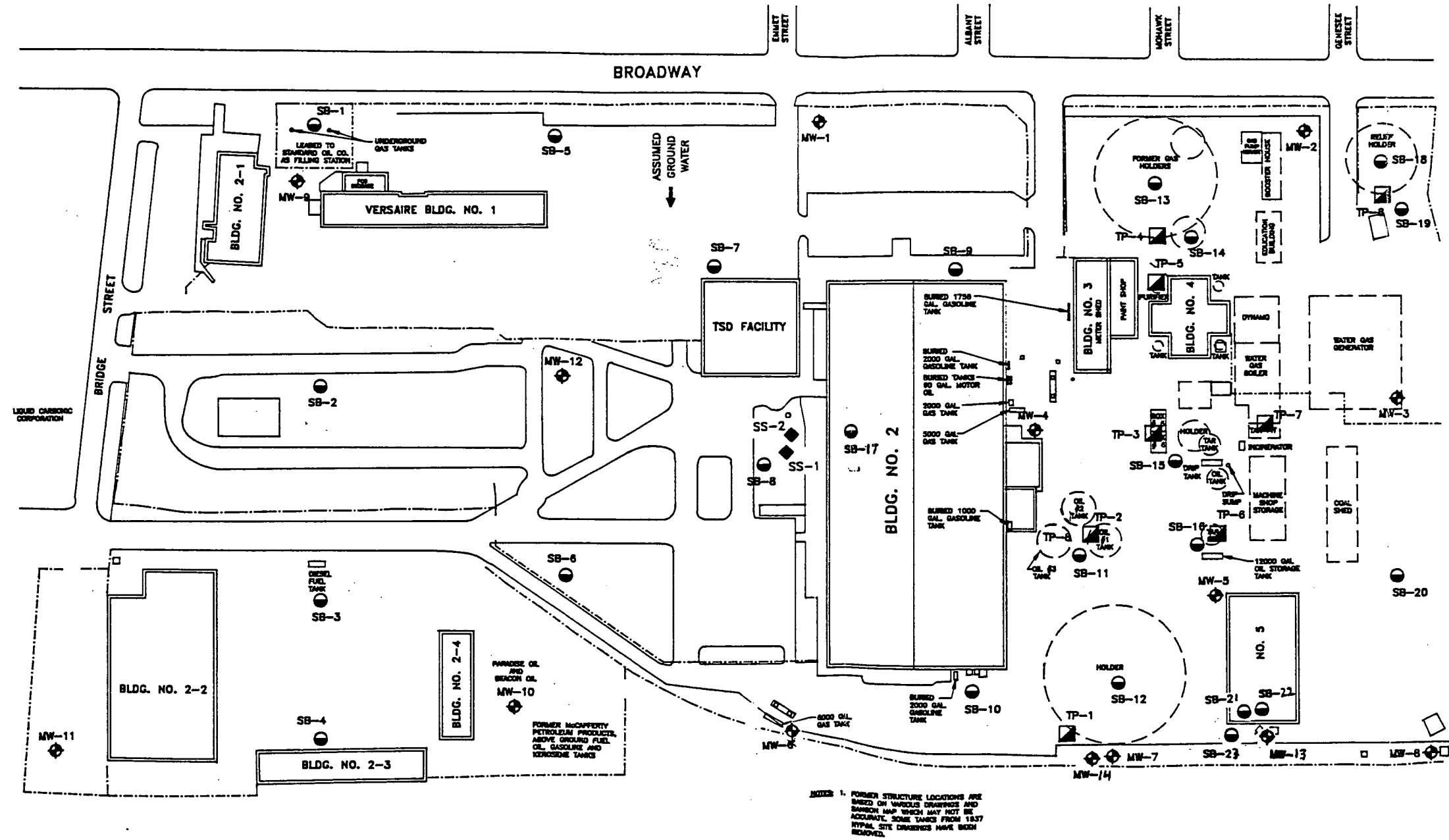
Activity	Sampling and Analysis	Objective
Test Pits - eight (8) test pit excavations on-site in areas of suspected MGP residue sources (e.g., holder, tar pit, and purifier areas).	• Full TCL/TAL analyses ¹ of up to three samples per test pit based on visual/olfactory and PID screening of suspected sources.	• to investigate subsurface conditions in the vicinity of former MGP structures and to characterize the major residue types encountered.
Sediment/Storm Drain - up to two (2) samples collected from storm sewer catch basins	• Full TCL/TAL analyses ¹	• to evaluate the nature of potential MGP residue sources in storm drains
Surface Soil - collect 2 surface soil samples from former mercury storage areas.	• Full TCL/TAL analyses ¹ and TCLP metals ³	• to evaluate the nature of potential metals contamination near the former mercury storage area
Soil Borings - twenty-three (23) soil borings installed to refusal (assumed average depth of 25 ft) in locations shown in Figure 3-1.	• Continuous split-spoon sampling. Analysis for MGP indicators ² plus full TCL/TAL ¹ analyses on 20 percent of samples. One sample each from SB-21, SB-22, and SB-23 for TCLP metals ³ .	• to collect geologic data for the site and evaluate the nature of potential MGP residue sources.
Monitoring Wells - install fourteen (14) two-inch diameter PVC monitoring wells (assumed maximum boring depth of 30 ft with 15 ft deep wells).	• Continuous split-spoon sampling. Analysis for MGP indicators ² plus full TCL/TAL analyses ¹ on 20 percent of samples.	• to evaluate the nature of potential MGP residue sources and contribute to geologic data.
Ground Water Sampling - collect ground water samples from 13 of the 14 new wells.	• Two rounds of samples analyzed for full TCL/TAL parameters ¹ .	• to characterize ground water beneath the site and to assess potential off-site migration of MGP related contaminants.

¹ TCL/TAL analyses includes TCL volatiles, semivolatiles, pesticides/PCBs, TAL metals, and cyanide.

² MGP indicators include BTEX (benzene, toluene, ethylbenzene, xylene), PAHs, and cyanide.

³ TCLP metals: Toxicity Characteristic Leaching Potential metals (including mercury).

FIGURE 3-1



LEGEND

- FORMER STRUCTURES
- FENCE
- ◆ MW-1 MONITOR WELL LOCATION (PROPOSED)
- SB-20 SOIL BORING LOCATION (PROPOSED)
- ▣ TP-1 TEST PIT LOCATION (PROPOSED)
- ◆ SS-1 SURFACE SOIL LOCATION

50 0 50 100
Scale in Feet

NIAGARA MOHAWK NORTH ALBANY BUILDING ALBANY, NEW YORK PROPOSED SAMPLING LOCATIONS

FILE NO. 1118.074

sampling and analysis, and water level monitoring. The analytical program designed for this investigation is described in Section 3.2.

Test Pit Excavation

A series of eight test pits are proposed to facilitate documentation and delineation of historic MGP structures and to evaluate the nature of MGP residues and other potential by-product materials at the site. The proposed locations of the test pits are shown in Figure 3-1. Included are test pit excavations in areas where historical data and recent observations suggest the possible presence of MGP related by-products such as within and immediately adjacent to former oxide purifier, tar pit, and gas holder areas.

Excavation of test pits will be performed in accordance with the procedures detailed in the FSP. The test pits will generally be approximately two feet wide and up to ten feet deep, or to the top of the water table. Test pit excavations will be examined visually to evaluate the horizontal and vertical extent of contaminated material. A PID will also be used to document subsurface conditions. One sample of each distinct suspected MGP related by-product or other residue type, if encountered, will be collected from each test pit, based on PID screening and visual/olfactory inspection, and submitted for analytical testing. No subsurface entry into test pits is anticipated. Collection of soil samples from within the test pits will be accomplished using the bucket of the backhoe.

Perimeter air monitoring will be conducted during test pit operations. One upwind and three downwind air monitoring stations will be established to collect air samples for laboratory analysis. A total of four air samples will be collected each day of test pit excavation. Wetting of the soil with water and particulate monitoring will be initiated if visible dust is generated by excavation activities.

Soil Boring and Sampling

A total of twenty-three borings are proposed in the areas indicated on Figure 3-1. The soil boring program will commence following completion of the test pit excavations. The drilling and sampling of soil borings will be conducted to provide deeper vertical characterization of residue sources identified in the test pits and to provide additional stratigraphic information for the site.

The borings will be advanced through the unconsolidated deposits utilizing hollow-stem auger techniques as described in the FSP. Borings which penetrate confining layers or which penetrate contaminated zones will be cased off at that depth. Subsequent drilling beyond that point will continue through telescoped casing to reduce the potential for spreading contamination into deeper zones. Twenty of the borings will be advanced to refusal at bedrock which is expected to be encountered between 18 to 30 feet below grade. The three proposed borings located within the former gas holders will terminate at the first encountered layer (concrete or clay) associated with the gas holder structure, which is assumed to be approximately ten feet below grade.

Continuous split-spoon samples will be collected and screened for MGP and other potential site related contaminants using visual and olfactory senses supplemented by a PID. Up to five samples from each boring will be collected and submitted for analysis based upon results of visual/olfactory and PID screening with the intent of delineating the upper and lower bounds of contamination. The number of samples submitted for analysis may be reduced to three at boring locations where no elevated PID readings or obvious visual/olfactory qualities characteristic of MGP residue or other by-product types are observed. Following completion of each boring, the borehole will be grouted back to the ground surface with a cement/bentonite mixture.

Monitoring Well Installation

Based on a review of available site information, ground water flow at the site appears to be principally west to east toward the Hudson River. The depth to ground water varies across the site but is expected to generally be about 10 to 15 feet deep. In order to better characterize ground water flow and quality at the site, fourteen new ground water monitoring wells are proposed to be installed at the locations shown in Figure 3-1.

Monitoring well installation and development will be conducted in accordance with the procedures described in the FSP. At each proposed monitoring well location, a test boring will be advanced utilizing hollow-stem auger drilling techniques, with continuous split-barrel soil samples collected as described in the FSP. The well borings will be installed to the top of bedrock.

Each of the fourteen well borings will be converted to monitoring wells. The wells will be constructed of 2-inch diameter, flush joint PVC riser pipe and screened across the contaminated zone identified during the well boring installation and based on the review of laboratory data, except for one of the monitoring wells nearest the river (MW-14) which will be screened just above the top of bedrock to evaluate the vertical ground water flow gradient. Based on the existing site information, it is estimated that each well will be completed to a maximum depth of 30 feet. A sump, two feet in length, will be attached to the bottom of the screen to collect dense nonaqueous phase liquids (DNAPLs), if encountered. An experienced hydrogeologist will supervise the soil boring and monitoring well installation and will be responsible for detailed logging of soil samples.

Well Development

The newly constructed monitoring wells will be developed in accordance with procedures described in the FSP. This will minimize the affect of residual, formation silts and clays that could potentially interfere with chemical analysis. Well development also increases the hydraulic conductivity immediately around the well which, in turn, reduces the potential of the well yielding an insufficient volume of water during the sampling procedure.

Each monitoring well will be developed as soon as possible after installation, but not less than 24 hours after the monitoring wells have been installed. The appropriate well development method will be selected depending on water level depth, well productivity and sediment content of water.

Well development options include bailing, manual pumping, inertial pumping, and powered suction-lift pumping.

Water-Level Measurements

The water level in each monitoring well will be gauged to provide information on hydraulic gradients and ground water flow at the site. A minimum of two rounds of measurements will be obtained during the course of the investigation from the site monitoring wells. Measurements of water levels will be obtained using an electronic water-level instrument equipped with an oil/water interface probe.

Ground Water Sample Collection

Two rounds of ground water sampling will be conducted approximately one month apart. The purpose of collecting the second round of samples is to verify the results obtained during the first round. Samples will be collected from thirteen of the fourteen new ground water monitoring wells. Sample collection will be performed in accordance with the procedures described in the FSP using a dedicated polyethylene bailer.

Sediment/Storm Drain Sample Collection

Sediment samples will be collected from the site storm drains. Up to two samples of sediment, if present, will be collected and submitted for analysis.

3.2. Analytical Program

The North Albany (Broadway) former MGP site analytical program has been designed to facilitate the initial identification of potential MGP by-product deposits at the site, as well as other sources of potentially hazardous substances. Table 3-2 presents a summary of the sampling and analysis program designed for the North Albany PSA/IRM investigation, including field and laboratory analyses and quality control sample requirements. Geotechnical soil analyses will also be conducted to support the IRM study.

The analytical program for soil boring samples is based on testing for a group of MGP indicator compounds selected from a comprehensive analytical suite including VOCs, SVOCs, pesticides/PCBs, metals, and cyanide. The MGP indicator list includes BTEX compounds (benzene, toluene, ethyl benzene, and xylene), PAHs, and cyanide, which are commonly associated with MGP by-products. PAHs are the MGP by-product constituents which have been demonstrated to be among the best indicators of coal tars and deposits. (Certain PAH constituents are of possible concern from a health perspective, as well.) BTEX compounds comprised a fraction of coal gasification by-products known as light oils. Cyanide, commonly associated with manufactured gas purifier by-products, completes the list of indicator analyses which are considered to be appropriate for this site.

Analysis for a relatively comprehensive Target Compound List (TCL) of organic compounds, including VOCs, SVOCs, and pesticide/PCBs, and Target Analyte List (TAL) of inorganic compounds, including metals and cyanide, is proposed for ground water samples collected, test pit samples, and for 20 percent

Table 3-2. Sampling and analysis summary for proposed PSA/IRM activities at the North Albany (Broadway) former MGP site.

Subtask	Sample Matrix	Laboratory Analysis	No. of Samples	Field QC Samples			Laboratory QC Samples ¹		Total
				Trip Blanks ²	Field Duplicates	Equipment Blanks	MS/MSD	MSB/LCS	
Test Pit Excavation	Soil/Waste	TCL/TAL ³	24	0	2	2	4	1	34
	Air	BTEX	8	0	0	2	0	0	10
		PAHs	8	0	0	2	0	0	10
Surface Soil Sampling	Soil	TCL/TAL ³	2	0	0	0	1	1	4
		TCLP metals ⁷	2	0	0	0	1	1	4
Sediment/Storm Drain Sampling	Sediment	TCL/TAL ³	2	0	0	0	1	1	4
Test Boring and Sampling	Soil	Indicators ⁴	119	0	5	5	10	5	144
		TCL/TAL ³	29	0	2	2	4	2	39
		Geotechnical ⁵	29	0	0	0	0	0	29
Ground Water Sampling	Ground Water	TCL/TAL *	26	4	2	2	4	2	40
		Conventionals ⁶	26	0	0	0	0	0	26

¹ Laboratory QC analyses: MS/MSD means matrix spike/matrix spike duplicate samples; MSB means matrix spike blank samples; LCS means laboratory control sample. Perform MS/MSD/MSB for organic analyses and MS/MSD/LCS for inorganic analyses.

² Trip blanks are water samples analyzed for BTEX only; trip blanks are collected with water samples only.

³ TCL/TAL: Target Compound List volatiles, semivolatiles, pesticide/PCBs, Target Analyte List metals, and cyanide.

⁴ Indicators are BTEX, PAHs, and cyanide.

⁵ Geotechnical analyses are: percent moisture, bulk density, grain size, total organic carbon, pH, cone index, and Atterberg limits.

⁶ Conventional analyses are: sulfide, sulfate, nitrate, chloride, hardness, total dissolved solids, BOD₅, COD, pH, and oil and grease.

⁷ TCLP metals: Toxicity Characteristic Leaching Potential metals (including mercury).

* The first round of ground water samples will be analyzed for full TCL/TAL. The second round will only be analyzed for the analyte groups detected in the first round.

of the soil boring samples. These TCL organic and TAL inorganic parameters will address the NYSDEC's concerns regarding identification of other possible hazardous substances which may be present at the site.

Laboratory sample analyses will be performed using NYSDEC Analytical Services Protocol (ASP) methods and Category B deliverables. The laboratory will be an accredited Environmental Laboratory Approval Program (ELAP) laboratory, and well-versed in generating data under the NYSDEC ASP and Superfund program. Use of ASP methods and formats for reporting and other deliverables facilitates the validation of data in the future, if necessary.

3.2.1. Data Quality Objectives

Laboratory analyses of environmental samples will be conducted in accordance with NYSDEC ASP-CLP protocols, therefore Data Quality Objective Level IV requirements will be utilized whenever possible. Level IV requirements, are not, however, technically applicable to analytical procedures that are not specifically defined by ASP-CLP, such as TCLP and RCRA characteristic studies. For such analyses, the applicable NYSDEC ASP method and Category B deliverables will be employed.

As indicated in Table 3-2, soil boring samples will be analyzed using NYSDEC ASP (CLP) methods for the MGP by-product indicator compounds BTEX, PAHs, and cyanide to evaluate the site for MGP related contamination. Ground water samples, and a percentage of soil samples, will be analyzed for the full suite of TCL volatiles, semivolatiles, and pesticide/PCBs, and TAL metals and cyanide (TCL/TAL). These comprehensive analyses are intended to identify hazardous substances, including but not limited to MGP related by-products, which may be present at the site or subject to off-site migration via ground water.

3.2.2. Environmental Sample Analyses

Soil

Laboratory analyses will be used to characterize soil samples collected from the test pits and subsurface borings. Samples of each distinct residue type identified in the test pits will be collected and analyzed for TCL/TAL. Analysis of up to three samples per test pit are included to characterize the various residue types which may be encountered. Up to five samples from each of the 32 borings (including the 12 well borings) will be analyzed for MGP residue indicators (BTEX, PAHs, and cyanide). Twenty percent of the soil samples will be analyzed for full TCL/TAL parameters for more complete characterization of soil boring samples.

Ground water

Ground water samples will be analyzed for full TCL/TAL parameters plus conventional analyses. The second round of ground water samples will be analyzed only for the analyte groups detected in the first round.

Laboratory analysis data will be used to characterize site-related ground water contamination. TCL/TAL analytical data will be compared to New York State Class GA ground water standards and guidance values, and will be used to assess risks to human health. Data from on-site and downgradient wells will be compared to upgradient well data to differentiate site-related contamination from that potentially due to upgradient sources. Ground water data for conventional analyses will be used to support the IRM study.

Air sampling

Perimeter air monitoring will be conducted during test pit operations. A total of four air samples will be collected each day and submitted to the analytical laboratory for BTEX and PAHs. It is anticipated that samples will be collected for two consecutive days.

3.3. Fish and Wildlife Impact Analysis

A fish and wildlife impact analysis will be performed at the North Albany former MGP site. The analysis will be conducted in accordance with the NYSDEC guidance document entitled, "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (June 18, 1991)." The objective of the analysis is to identify and address the impact of potential MGP site contamination on the fish and wildlife resource receptors. The scope of the analysis will include:

Step I: Site Description

- compilation of topographical and cover type maps
- description of fish and wildlife resources
- description of value fish and wildlife resources
- identification of applicable regulatory criteria

Step II: Contaminant-Specific Impact Analysis

- pathway analysis
- criteria-specific analysis
- analysis of toxicological effects

Implementation of Step II will be performed as part of subsequent phases of the project, if necessary.

3.4. PSA/IRM Report Preparation

Following completion of the field program, data generated during the investigation will be evaluated and a PSA/IRM report prepared for submittal to NYSDEC. The PSA/IRM report will contain a detailed and comprehensive synopsis of the tasks completed to date, as well as those intended for the future as required by applicable portions of the CERCLA, NCP, and USEPA reporting guidelines. Supporting data, including raw analytical data, boring logs and well construction diagrams will be included in the PSA/IRM report.

Introduction

The introductory section will summarize the purpose and scope of the North Albany (Broadway) PSA/IRM studies. In order to accomplish this task the following information will be provided.

- Project Objectives;
- Site Location and Description;
- Site History;
- Background;
- Previous Investigations; and
- Report Organization.

Field Methodologies

A detailed description of the scope and methodologies employed to complete the PSA/IRM investigation at the North Albany (Broadway) former MGP site will be provided. This discussion will present the number, locations, and media of sample collection activities, as well as the field techniques employed to accomplish such activities. The scope of the analytical program will also be addressed in this discussion whereupon the parameters tested and methodologies used will be described. Deviations to the field program, as described in this Work Plan, will be described and explained.

At a minimum, the following subsections are anticipated to be incorporated into the field methodologies section:

- field mobilization
- soil boring and sampling/analysis
- monitoring well installation and development
- ground water level measurements, and
- ground water sampling/analysis.

Physical Site Characteristics

The geologic and hydrologic conditions which characterize the North Albany former MGP site, as determined by both the literature review and the site investigation, will be presented in this section. Physical characteristics of site soils, including detection of contamination, will be described. Hydrologic conditions, as determined through the evaluation of water table evaluations and preparation of ground

water contour maps, will provide initial insight into hydrogeologic conditions at the site. This section will consist of the following subsections:

- regional geologic setting
- local/site-specific geology
- assessment of soil observable contamination
- regional hydrologic setting
- local/site-specific hydrology
- assessment of observable ground water contamination

Nature and Presence of Contamination

The nature and presence of contamination within the various media, including soil and ground water, will be discussed in this section. The discussion will focus on the PSA/IRM results. However, implications posed by data obtained during previous site investigations will also be addressed.

IRM Evaluation

The IRM study will evaluate site characteristics and contamination as defined by results of the PSA in order to evaluate the need for IRMs to control or mitigate contaminant sources at the site. Sources of contamination, identified during site characterization activities, will be evaluated. Additionally, a preliminary risk evaluation will be performed during the IRM evaluation to determine potential concerns regarding imminent threats to human health and the environment, as a result of site conditions. The preliminary evaluation of potential risks will establish the response objectives driving potential IRMs at the site.

Fish and Wildlife Impact Analysis

Results of Step I of the Fish and Wildlife Impact Analysis will be presented in the PSA/IRM report. A description of site fish and wildlife resources and their estimated value will be presented as well as a summary of applicable regulatory criteria. Step II will be completed later in the project, if warranted by site conditions.

Conclusions and Recommendations

This section of the PSA/IRM report will summarize the conclusions of the field investigation report. These conclusions will be based on the geologic and hydrogeologic information and analytical results for the soil, sediment and groundwater samples collected at the site. Following these conclusions, recommendations will be made regarding the need (if any) for IRM implementation, or additional remedial investigations as well as available and appropriate measures.

4. Project Management Approach

4.1. Project Organization

The management and technical staff required to execute this project and their areas of responsibility are identified in Figure 4-1. The responsibilities of key personnel are further described as follows:

Technical Advisor

A technical advisor will provide technical support and overall quality assurance. The primary objective of quality assurance is to facilitate compliance with regulatory agency guidance and regulations. The technical advisor will address the broad range of technical activities and disciplines needed for successful support of this PSA/IRM.

Project Manager

The project manager is responsible for maintaining the schedule, keeping the project within budget, and ensuring the technical adequacy of the work performed.

Health and Safety Officer

The Site Health and Safety Officer (SHSO) is responsible for the preparation of the Health and Safety Plan, and for verifying that subcontractors have adequate Health and Safety Plans. If the SHSO observes unsafe conditions, the Officer will have stop-work authority.

Project Quality Assurance Manager

The Project Quality Assurance Manager (PQAM) is responsible for verifying that QA requirements are followed by the field teams, laboratory, and other subcontractors.

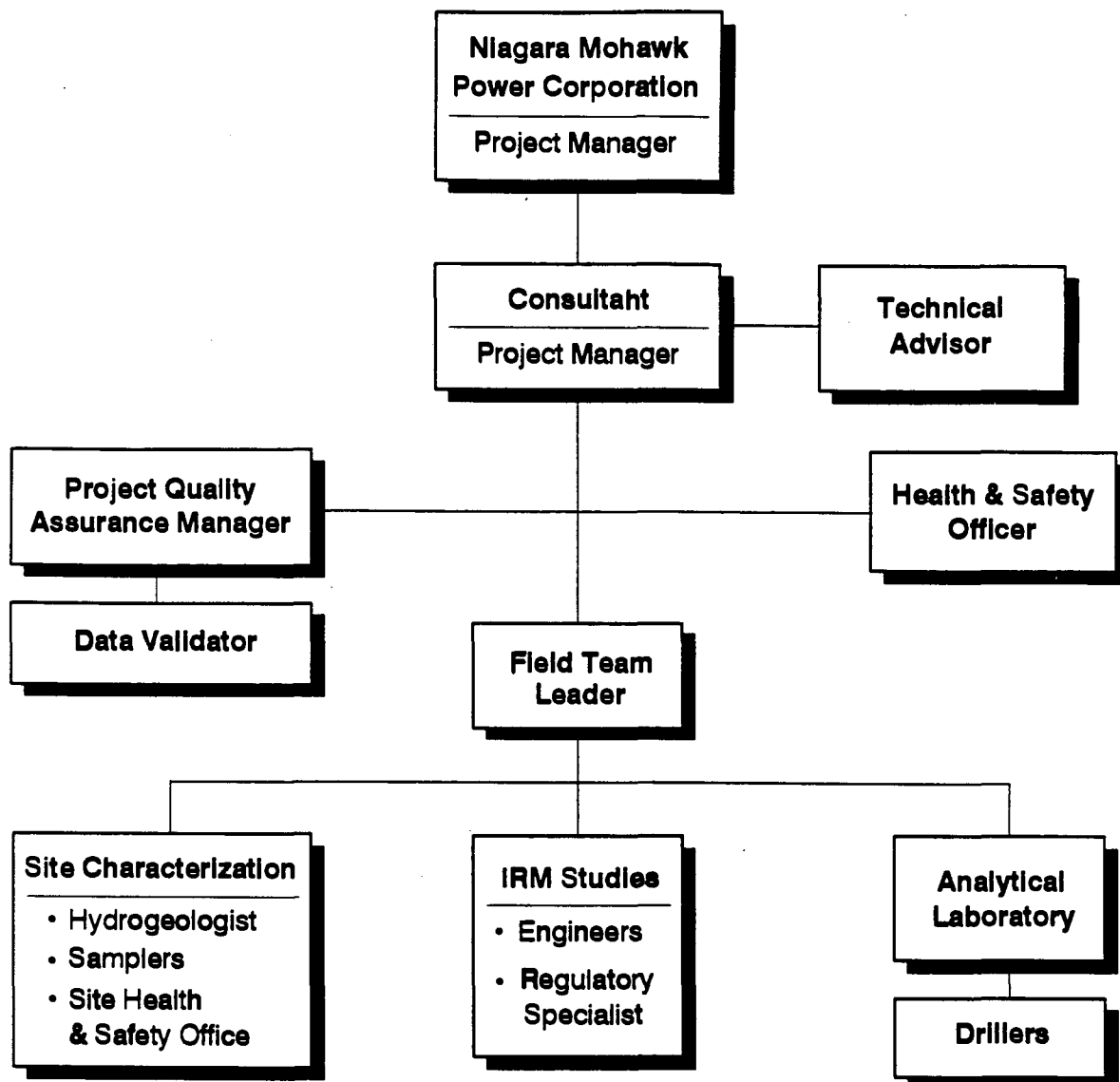
Field Team Leader

The field team leader is responsible for controlling activities at the site, including the activities of the drilling. The field team leader must be well versed in every aspect of field work, including but not limited to, well drilling and sampling procedures.

4.2. Project Schedule

A detailed schedule of activities with milestones is presented as a bar chart schedule in Figure 4-2.

Project Organization

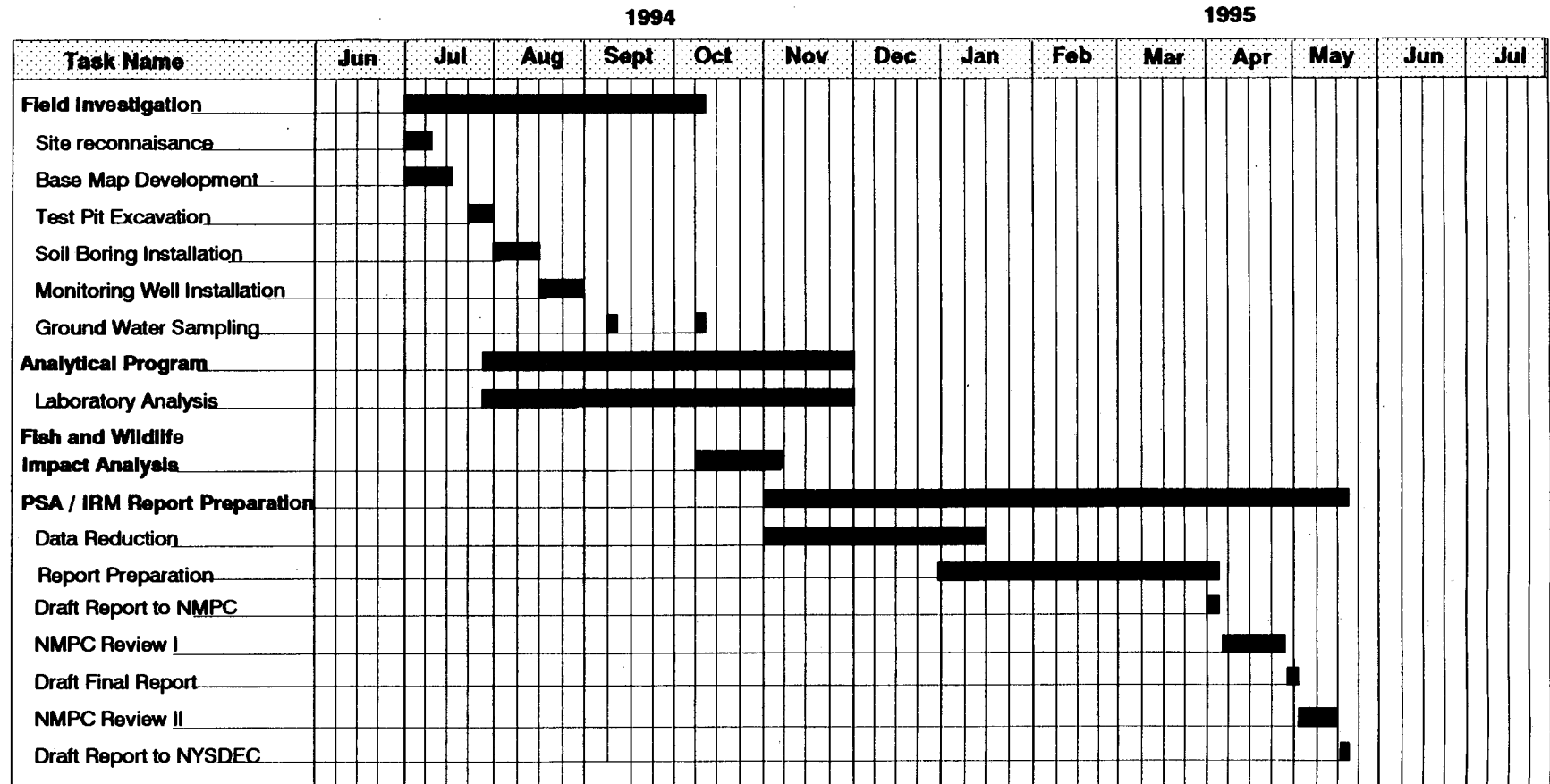


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Figure 4-2

Project Schedule

Niagara Mohawk Power Corporation
North Albany (Broadway) Former MGP Site



APPENDIX A
SAMPLING AND ANALYSIS PLAN

APPENDIX A - SAMPLING AND ANALYSIS PLAN

PSA/IRM STUDY WORK PLAN FOR THE NORTH ALBANY FORMER MGP SITE

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APPENDIX A.1
QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

Quality Assurance Project Plan
Effective Date: June 11, 1993
Revision No: 0

NORTH ALBANY (BROADWAY) PSA/IRM

CITY OF ALBANY

ALBANY COUNTY, NEW YORK

CLIENT: NIAGARA MOHAWK POWER CORPORATION

LOCATION: SYRACUSE, NEW YORK

Prepared by:

(Signature)

(Date)

Approved by:
(Project Manager)

(Signature)

(Date)

Approved by:
(Project Quality
Assurance Manager)

(Signature)

(Date)

Approved by:
(Field Team Leader)

(Signature)

(Date)

A.1. Quality Assurance Project Plan

A.1.1. Project Description

A detailed project description is presented in the work plan to which this Quality Assurance Project Plan (QAPP) is an appendix.

A preliminary site assessment/interim remedial measures (PSA/IRM) study is to be conducted at the site. Field tasks to be conducted as part of the PSA/IRM investigation at the site include the following:

- test pit excavations and sampling
- surface soil sample collection and laboratory analyses
- soil boring installation
- subsurface soil sample collection and laboratory analyses
- sediment/storm drain sample collection and laboratory analyses
- ground water monitoring well installation, sample collection, and laboratory analyses

Field investigative tasks are described in further detail in Section 3 of the Work Plan and the Field Sampling Plan (FSP).

A.1.2. Project Organization

Organization of the project team is described in Section 4 of the Work Plan. The Project Quality Assurance Manager (PQAM) will be responsible for reviewing data upon receipt from the analytical laboratory and verifying that data validation screening is performed by trained and experienced data validators using the applicable criteria specified in the New York State Department of Environmental Conservation's (NYSDEC) Analytical Services Protocol (ASP) dated December 1991. (For the purposes of this document, references to ASP indicate the NYSDEC ASP dated December 1991.) Specific requirements for data validation screening are given in Section A.1.8.3. The PQAM will be responsible for confirming that analytical data conform to the requirements of this QAPP. The resume of the PQAM will be submitted to the NYSDEC for review prior to the start of field work.

A.1.3. QA/QC Objectives for Measurement of Data

The overall quality assurance (QA) objective for the North Albany (Broadway) PSA/IRM study is to develop and implement procedures which will provide data of known, documented quality, and which will be legally defensible. Field and laboratory quality assurance/quality control (QA/QC) requirements defined in NYSDEC and other applicable guidelines help to ensure that acceptable levels of data quality are maintained throughout the sampling and analysis program. QA/QC objectives for measurement data include precision, accuracy, representativeness, completeness, and comparability. The number and type

of quality assurance samples to be collected are specified in the Field Sampling Plan. Analyses are to be conducted according to the NYSDEC ASP.

A.1.3.1. Precision

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value (U.S.EPA, 1987). Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), range (maximum value minus minimum value), and relative range are common. For this project, precision will be evaluated by recording duplicate measurements of the same parameter on similar spiked or unspiked sample aliquots under the same conditions and calculating the relative percent difference (RPD) between the values. If the analyte is not detected during an analysis then RPD cannot be calculated.

Measurement data for this project will include field data as well as laboratory analytical data. The field measurement data include pH, conductivity, temperature, organic vapor readings, water turbidity, and water level measurements. The objective for precision of field data collection methods is to take replicate measurements for field parameters (minimum of two for every 20 samples) to determine the reproducibility of the measurements.

For the pH meter, precision will be tested by multiple readings in the medium of concern. Consecutive readings should agree within ± 0.1 pH units after the instrument has been field calibrated with standard buffers before each use. The thermometer will be visually inspected prior to each use to ensure its condition is satisfactory. Consecutive measurements of a given sample should agree to within $\pm 1^\circ\text{C}$. Organic vapors will be measured using a Photovac Microtip (or equivalent) photoionization detector (PID). Daily background and upwind readings of drilling and sampling activities will be measured prior to commencing work and at periodic intervals throughout each day's activities. The natural variation/fluctuation in measurements at background or upwind locations will be used for baseline background values, and the variability will be noted. Water level indicator readings will be precise within ± 0.01 feet for duplicate measurements or additional water level measurements will be taken to determine whether the difference is due to operator or instrument error.

A.1.3.2. Accuracy

Accuracy is a measure of the difference between a measured value and the "true" or accepted reference value. The accuracy of an analytical procedure is best determined by the analysis of a sample containing a known quantity of material and is expressed as the percent of the known quantity which is recovered, or measured. The recovery of a given analyte is dependent upon the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the method detection limit of the analytical procedure is also a major factor in determining the accuracy of the measurement. Concentrations of analytes which are close to the detection limits are less accurate because they are affected by such factors

as instrument noise. Higher concentrations will not be as affected by instrument or other variables and tend to be more accurate.

The accuracy of laboratory-measured data will be evaluated by determining the percent recovery of reference standards or laboratory control samples, as well as both matrix and blank spike samples as described in Section A.1.12.1. Reference standards and laboratory control samples which will be analyzed with each batch of environmental samples must be derived from a source separate from the calibration standards. For the measurement of organics by gas chromatography (GC) or GC/mass spectroscopy (MS), the recovery of a surrogate spiked into each sample, blank, and standard will also be used to assess accuracy.

The objective for accuracy of field measurements is to achieve and maintain factory-level equipment specifications for the field equipment. Field measurements cannot be assessed for accuracy by spiking the medium with the analytical parameter and measuring the increase in response; therefore, these instruments can only be assessed for accuracy by the response to a calibration standard used to standardize them.

Field equipment will be calibrated with known standards at relevant concentrations on a daily basis.

A.1.3.3. Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter which is most concerned with the proper design of the sampling program (U.S.EPA, 1987). Samples must be representative of the environmental media being sampled. Selection of sample locations and sampling procedures will incorporate consideration of obtaining the most representative sample possible.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree that is technically possible, that the data derived represents the in-place quality of the material sampled. Effort will be made to prevent chemical compounds from being introduced into the sample via sample containers, handling, and analysis. Decontamination of sampling devices and digging equipment will be performed between sample collection as outlined in Section A.2.2. Sample containers will be thoroughly cleaned by the manufacturer or laboratory prior to use. Analysis of field blanks, trip blanks, and method blanks will also be performed to monitor for potential sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. Sampling heterogeneity will be evaluated through the analysis of field duplicate samples, coded to ensure the samples are treated and analyzed as separate samples. The analytical laboratory will make every reasonable effort to assure the samples are adequately homogenized prior to taking aliquots for analysis, so the reported results are representative of the sample received. Many means of homogenization expose the sample to

significant risk of contamination or loss through volatilization, and these should be avoided if possible.

Chain-of-custody procedures will be followed so that potential contamination of samples during container preparation, shipment, and sampling can be evaluated. Details of blank/duplicate and chain-of-custody procedures are presented in Sections A.1.4.3 and A.1.5.1.

A.1.3.4. Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid (U.S.EPA, 1987). The QC objective for completeness is generation of valid data for at least 90 percent of the analyses requested.

A.1.3.5. Comparability

Comparability expresses the degree of confidence with which one data set can be compared to another (U.S. EPA, 1987). The comparability of data collected for this project will be aided by:

- using identified standard methods for both sampling and analysis phases of this project
- confirming the source of analytical standards and/or source materials
- verifying calibrations with an independently prepared standard from a source other than that used for calibration;
- using standard reporting units and reporting formats including the reporting of QC data;
- the validation of analytical results, including the use of data qualifiers in cases where appropriate; and
- the requirement that validated flags be used whenever an analytical result is used.

A.1.4. Sampling Procedures

This section presents an overview of the sampling program to be conducted at the North Albany (Broadway) site. Standard methods for sample collection and handling described in this SAP are based on the following documents: *NIOSH Manual of Analytical Methods*, 3rd Edition (U.S. Department of Health, Education and Welfare, 1990); *A Compendium of Field Operations Methods* (USEPA, 1987b); *Quality Criteria for Water* (USEPA, 1986a); *RCRA Ground-Water Monitoring Technical Enforcement Guidance Document* (USEPA, 1986b); and *Methods for Chemical Analysis of Water and Wastes* (USEPA, 1983).

A.1.4.1. Sample Container Preparation

Sample containers will be properly washed and decontaminated by the manufacturer or laboratory prior to use. Preservatives will be added to containers prior to sample shipment. Records of the sources of bottles and preservatives will be kept by the analytical laboratory.

A.1.4.2. Sampling Protocols

Detailed descriptions of sampling protocols are presented in the FSP. Information collected during field sampling will be documented in a bound field notebook. Field notebooks will be dedicated to specific operations and entries will indicate pertinent sampling information. Field notebooks will have pre-numbered pages and entries will be made in indelible ink. Additional information regarding specific field investigation activities is presented in the Work Plan.

As a minimum, sampling procedures will be performed in accordance with the most recent NYSDEC and U.S.EPA guidelines and regulations. Appropriate and acceptable procedural techniques based on sample type and location will be utilized when such guidelines and regulations do not exist.

Referenced sampling standards are listed below. Standards employed will be the latest in effect at the time of writing.

- National Water Well Association - "Manual of Ground-water Sampling Procedures"
- U.S. EPA - 600-4-83-040, "Characterization of Hazardous Waste Sites -a Methods Manual: Volume II. Available Sampling Methods"
- U.S. EPA - OSWER - 9950.1 "RCRA Ground-water Monitoring Technical Enforcement Guidance Document"

A.1.4.3. Sample Handling

Upon collection, samples will be transferred to preserved and properly labeled sample containers. Immediately after sample collection, preservation of water sample containers will be checked with pH paper. Sample containers, sample volumes, and methods of preservation required for each matrix and analytical method are presented in Table A.1-1. Samples requiring refrigeration for preservation will be immediately transferred to coolers packed with ice and/or ice packs. Samples will be shipped to the analytical laboratory within 24 hours of being collected for overnight delivery. Sample transportation will comply with U.S. Department of Transportation (DOT) requirements. Chain-of-custody documentation will be maintained and samples will be analyzed within the holding times specified.

PSA/IRM Study for the North Albany Former MGP Site

Table A.1-1. Sample Containerization

Analysis	Bottle Type	Preservation ¹	Holding Time ²
<u>Aqueous Samples</u>			
Volatile Organics (BTEX)	40 ml glass vial	cool to 4°C	7 days
PCBs/Pesticides	1000 ml amber glass	cool to 4°C	5 days*
Semivolatile Organics (PAHs)	1000 ml amber glass	cool to 4°C	5 days*
Metals	1000 ml amber glass	HNO ₃ to pH <2	6 months (mercury 26 days)
Cyanide	1000 ml amber glass	NaOH to pH >12	12 days
<u>Soil Samples</u>			
Volatile Organics (BTEX)	wide-mouth glass w/ teflon cap	cool to 4°C	7 days
PCBs/Pesticides	wide-mouth glass w/ teflon cap	cool to 4°C	5 days*
Semivolatile Organics (PAHs)	wide-mouth glass w/ teflon cap	cool to 4°C	5 days*
Metals/Cyanide	wide-mouth glass w/ teflon cap	cool to 4°C	metals - 6 months mercury - 26 days cyanide - 12 days

¹ Samples to be preserved in ice at 4°C during collection and transport.

² Days from validated time of sample receipt (VTSR) by the laboratory.

* Extraction of water samples for pesticides/PCBs analysis by separating funnel must be completed within five days of VTSR. Continuous liquid-liquid extraction is the required extraction method for water samples...

A.1.4.4 Quality Assurance Samples

To assess field sampling and decontamination performance, two types of "blanks" and several duplicate samples will be collected and submitted to the laboratory for analyses. The blank samples will include:

Trip Blanks

A trip blank will be prepared before the aqueous sample containers are sent by the laboratory. The trip blank will consist a 40-ml VOA vial containing distilled, deionized, organic-free water which accompanies the other sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of water samples for which analysis for TCL volatiles or BTEX is planned. The trip blank will be analyzed for TCL volatile organic compounds or BTEX to assess the potential contamination from sampling, transport, and internal laboratory procedures.

Equipment Blanks

Equipment blanks will be collected at a minimum frequency of one per 20 field samples for each matrix sampled. Equipment blanks are used to determine the effectiveness of the decontamination procedures for sampling equipment. An equipment blank consists of a sample of deionized and distilled water which is passed through a decontaminated bailer or other sampling apparatus. It is usually collected as a last step in the decontamination procedure, prior to taking an environmental sample. The equipment blank will be analyzed for the same parameters as the field samples.

The precision of field sampling procedures will be assessed by collecting coded field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples. Duplicate samples will consist of:

Coded Field Duplicate

Coded field duplicates will be collected to determine the reproducibility and homogeneity of samples. The samples are termed "coded" because they will be labeled in such a manner that the laboratory will not be able to determine that they are a duplicate sample. This will eliminate any possible bias that could arise. The frequency of collection of these samples is one per 20 field samples. The criteria for assessing coded field duplicates is given in Section A.1.8.

Matrix Spike/Matrix Spike Duplicate/Matrix Duplicate (MS/MSD/MD)

MS/MSD/MD samples (MSD for organics; MD for inorganics) will be taken at a frequency of one pair per 20 field samples. The reproducibility and homogeneity of the samples can be assessed by determining the RPD for both spike and non-spike compounds as described in Section A.2.8. The MS, MSD, and MD samples must be site-specific.

A.1.5. Sample Tracking and Custody

Sample chain-of-custody (COC) is initiated by the laboratory with selection and preparation of the sample containers. To reduce the chance for error, the number of personnel handling the samples should be minimized.

On-site monitoring data will be controlled and entered in permanent log books. Personnel involved in the collection and transfer of samples will have been trained on the purpose of sample tracking procedures prior to implementation.

Evidence of sample traceability and integrity is provided by COC procedures. These procedures document the sample traceability from the selection and preparation of the sample containers by the laboratory, to sample collection, to sample shipment, to laboratory receipt and analysis. A sample is considered to be in a person's custody if the sample is:

- in a person's possession
- maintained in view after possession is accepted and documented
- locked and tagged with custody seals so that no one can tamper with it after having been in physical custody, or
- in a secured area which is restricted to authorized personnel

A.1.5.1. Field Sample Custody

A COC record accompanies the sample from time of collection to receipt by the analytical laboratory. If samples are split and sent to different laboratories, COC records will be sent with each sample. Figure A.1-1 illustrates an example of a COC record. The laboratory maintains one file copy, and the completed original is returned to the consultant's project manager.

Individual sample containers, provided by the laboratory, are used for shipping samples. The shipping containers must be insulated and their interiors maintained at approximately 4°C until samples are returned to and in the custody of the laboratory. Sample bottles within each shipping container are individually labeled and controlled.

Each sample is assigned a unique identification number by the field crew and this number is marked with indelible ink on the sample container label. This number is recorded on the COC record. The field sampler will indicate each individual sample designation/location number in the space provided on the appropriate COC form for each sample collected. Once the container used to ship samples to the laboratory is closed, a seal, provided by the laboratory, is affixed to the latch. This seal must be broken to open the container and indicates possible tampering if the seal is broken before receipt at the laboratory. The laboratory will contact the field team leader or project manager and the sample will not be analyzed if tampering is apparent.

Sample Chain-of-Custody Record

Job No. _____

Sheet of _____

Office: _____

Address:

Phone: _____

CHAIN OF CUSTODY

[illegible]

¹ Matrix = water, wastewater, air, sludge, sediment, etc.

² Type = grab, composite

Relinquished by: _____ of: _____	Date _____ Time _____	Received by: _____ of: _____	Date _____ Time _____
Relinquished by: _____ of: _____	Date _____ Time _____	Received by: _____ of: _____	Date _____ Time _____
Relinquished by: _____ of: _____	Date _____ Time _____	Received by: _____ of: _____	Date _____ Time _____
Use this space if shipped via courier (e.g., Fed Ex) Relinquished by: _____ of: _____	Date _____ Time _____	Courier Name: _____ *Attach delivery/courier receipt to Chain of Custody	Date _____ Time _____
Relinquished by: _____ of: _____	Date _____ Time _____	Received by: _____ of: _____	Date _____ Time _____

A.1.5.2. Laboratory Sample Custody

The site investigation team leader will notify the laboratory of upcoming field sampling activities and the subsequent transfer of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The laboratory sample custody program will meet the following criteria:

- the laboratory will designate a sample custodian who is responsible for maintaining custody of the samples and for maintaining associated records documenting that custody.
- upon receipt of the samples, the custodian will check the original COC documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian signs the COC record and records the date and time received.
- sample coolers will be checked for temperature and preservation requirements upon arrival. If the cooler temperatures do not fall within a temperature range of $4^{\circ}\text{C} \pm 4^{\circ}\text{C}$ or if sample preservation do not meet the requirements of this QAPP, the PQAM will be notified.
- care should be exercised to annotate labeling or descriptive errors. In the event of a discrepancy in documentation, the laboratory will immediately contact the project manager as part of the corrective action process. A qualitative assessment of each sample container is performed to note anomalies such as broken or leaking bottles. This assessment is recorded as part of the incoming COC procedure.
- environmental samples will be stored in a secured area at a temperature of approximately 4°C until analyses commence. A laboratory tracking record will accompany the sample or sample fraction through final analysis for control.
- a copy of the tracking form will accompany the laboratory report and will become a part of the project records

A.1.5.3. Sample Tracking System

A sample tracking system will be implemented to monitor the status of sampling events and laboratory analysis of samples. Information such as sample numbers, types, analytical parameters, sampling dates, sample delivery group (SDG) designations for samples, and required due dates for receipt of analytical results are entered into the system. The project manager will use the tracking system to monitor the project sampling schedules and the status of analytical reports and to implement penalty clauses for late delivery according to standard laboratory subcontracts when necessary.

A description of a representative sample tracking system follows:

1. field personnel will send the samples and the completed COCs to the laboratory.
2. field personnel will enter the following information into a designated field logbook: 1) names of field personnel, 2) site name, 3) project/job number, 4) sampling date(s), 5) shipping date, 6) numbers of samples per matrix, 7) analytical parameters requested, and 8) the laboratory name, address, and phone number.
3. the PQAM (or designee) will call the laboratory on the work day following receipt of the COCs to confirm the time, date, and condition of the samples shipped; the number and laboratory ID numbers of SDGs; and the contract-mandated due date for receipt of analytical results (confirmed by the project manager prior to calling laboratory).

The PQAM or a designated representative will maintain day-to-day contact with the laboratory concerning specific samples and analyses directly or by assignment.

A.1.6. Calibration Procedures and Frequency

A.1.6.1. Field Instruments

Field analytical equipment will be calibrated immediately prior to each day's use and more frequently, if required. Field instrument calibration procedures are detailed in the FSP.

A.1.6.2. Laboratory Instruments

The laboratory will follow calibration procedures and schedules as specified in the NYSDEC ASP relevant to the instruments necessary to analyze for the NYSDEC CLP TCL volatile and semivolatile organic compounds, PCBs, pesticides, TAL metals and cyanide as discussed in the following section.

A.1.7. Analytical Procedures

Environmental samples will be analyzed according to the methods given in Exhibit D of the NYSDEC ASP. These methods are summarized in Table A.1-2. QA/QC procedures given in Exhibits E and I of the ASP will also be followed. Regardless of the method used, analytical and extraction holding times must meet the NYSDEC ASP requirements for that analytical group. (For example, volatile analyses, including BTEX, has a holding time of seven days; semivolatile analyses including PAHs have an extraction holding time of five days.)

The analytical laboratory chosen for this project will be certified, and must maintain certification, under the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program for analyses of solid and hazardous waste including those parameters listed on Table A.1-2. The breakdown for investigative samples is detailed in the FSP. The NYSDEC ASP Contract Required Quantitation Limits for each analyte are presented in Table A.1-3. The method detection limits (MDLs) for the

Table A.1-2. Scope of the Laboratory Analysis Program

Matrix	Parameter ¹	Analytical Method ²
Water	BTEX	Method 8240*
	VOCs	91-1
	PCBs and Pesticides	91-3
	PAHs	Method 8270*
	SVOC	91-2
	Metals	CLP-M (various for individual metals)
	Cyanide	CLP-M
Soil & Sediments	VOCS	91-1
	BTEX	Method 8240*
	SVOCs	91-2
	PAHs	Method 8270*
	Pesticides and PCBs	91-3 (Method SW8080)
	Metals	CLP-M (various for individual metals)
	Cyanide	CLP-M
	TCLP	ASP Method 1311: Method Series 7000, 8000
	Waste Characteristics	ASP Methods 1010/1020; 9040/9041
Air	BTEX	Method 1500/1501
	PAHs	Method 5506

¹ Abbreviations: VOCs = volatile organic compounds; SVOCs = semivolatile organic compounds.

² NYSDEC Analytical Services Protocol, December 1991, Category B deliverables.

* BTEX and PAH analyses must meet NYSDEC ASP holding time specified for Methods 91-1 and 91-2, respectively.

Table A.1-3. Target Analytes and CRQ Limits (1)

	Contract Required Quantitation Limit Water Samples (ug/L)	Contract Required Quantitation Limit Soil Samples (ug/kg)
NYSDEC ASP TCL - Volatile Organic Compounds (NYSDEC ASP Method 91-1)		
Acetone	10	10
Benzene	10	10
Bromodichloromethane	10	10
Bromoform	10	10
Bromomethane	10	10
2-Butanone	10	10
Carbon disulfide	10	10
Carbon tetrachloride	10	10
Chlorobenzene	10	10
Chloroethane	10	10
Chloroform	10	10
Chloromethane	10	10
Dibromochloromethane	10	10
1,1-Dichloroethane	10	10
1,2-Dichloroethane	10	10
1,1-Dichloroethene	10	10
1,2-Dichloroethene (cis and trans)	10	10
1,2-Dichloropropane	10	10
cis-1,3-Dichloropropene	10	10
trans-1,3-Dichloropropene	10	10
Ethylbenzene	10	10
2-Hexanone	10	10
4-Methyl-2-pentanone	10	10
Methylene chloride	10	10
Styrene	10	10
1,1,2,2-Tetrachloroethane	10	10
Tetrachloroethene	10	10
Toluene	10	10
1,1,1-Trichloroethane	10	10
1,1,2-Trichloroethane	10	10
Trichloroethene	10	10
Vinyl chloride	10	10
Vinyl acetate	10	10
Total Xylenes	10	10

(1) Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable. Quantitation limits listed for soil are based on wet weight.

PSA/IRM Study for the North Albany Former MGP Site

Table A.1-3. (Cont.) Target Analytes and CRQ Limits (1)

	Contract Required Quantitation Limit Water Samples (ug/L)	Contract Required Quantitation Limit Soil Samples (ug/kg)
<u>NYSDEC ASP TCL - Semivolatile Organic Compounds (NYSDEC ASP Method 91-2)</u>		
<u>Base/Neutral Extractables</u>		
Acenaphthene	10	330
Acenaphthylene	10	330
Anthracene	10	330
Benzo(a)anthracene	10	330
Benzo(b)fluoranthene	10	330
Benzo(k)fluoranthene	10	330
Benzo(g,h,i)perylene	10	330
Benzo(a)pyrene	10	330
Benzyl alcohol	10	330
bis(2-Chloroethoxy)methane	10	330
bis(2-Chloroethyl)ether	10	330
bis(2-ethylhexyl)phthalate	10	330
4-Bromophenyl phenyl ether	10	330
Butyl benzyl phthalate	10	330
4-Chloroaniline	10	330
2-Chloro1Ophthalene	10	330
4-Chlorophenyl phenyl ether	10	330
Chrysene	10	330
Dibenz(a,h)anthracene	10	330
Dibenzofuran	10	330
Di-n-butylphthalate	10	330
1,2-Dichlorobenzene	10	330
1,3-Dichlorobenzene	10	330
1,4-Dichlorobenzene	10	330
3,3'Dichlorobenzidine	10	330
Diethyl phthalate	10	330
Dimethyl phthalate	10	330
2,4-Dinitrotoluene	25	800
2,6-Dinitrotoluene	10	330
Di-n-octylphthalate	10	330
Fluoranthene	10	330
Fluorene	10	330
Hexachlorobenzene	10	330

(1) Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable. Quantitation limits listed for soil are based on wet weight.

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Table A.1-3. (Cont.) Target Analytes and CRQ Limits (1)

	Contract Required Quantitation Limit Water Samples (ug/L)	Contract Required Quantitation Limit Soil Samples (ug/kg)
<u>NYSDEC ASP TCL - Semivolatile Organic Compounds (NYSDEC ASP Method 91-2) (Cont.)</u>		
<u>Base/Neutral Extractables (Cont.)</u>		
Hexachlorobutadiene	10	330
Hexachlorocyclopentadiene	10	330
Hexachloroethane	10	330
Indeno(1,2,3-cd)pyrene	10	330
Isophorone	10	330
2-methyl Naphthalene	10	330
Naphthalene	10	330
2-Nitroaniline	25	800
3-Nitroaniline	25	800
4-Nitroaniline	25	800
Nitrobenzene	10	330
N-Nitroso-diphenylamine	10	330
N-Nitroso-dipropylamine	10	330
2,2' Oxybis(1-chloropropane)	10	330
Phenanthrene	10	330
Pyrene	10	330
1,2,4-Trichlorobenzene	10	330
<u>Acid Extractables</u>		
Benzoic Acid	10	330
4-Chloro-3-methylphenol	10	330
2-Chlorophenol	10	330
2,4-Dichlorophenol	10	330
2,4-Dimethylphenol	10	330
4,6-Dinitro-2-methylphenol	25	800
2,4-Dinitrophenol	10	330
2-Methylphenol	10	330
4-Methylphenol	10	330
2-Nitrophenol	10	330
4-Nitrophenol	25	800
Pentachlorophenol	25	800
Phenol	10	330
2,4,5-Trichlorophenol	25	800
2,4,6-Trichlorophenol	10	330

(1) Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable. Quantitation limits listed for soil are based on wet weight.

PSA/IRM Study for the North Albany Former MGP Site

Table A.1-3. (Cont.) Target Analytes and CRQ Limits (1)

	Contract Required Quantitation Limit Water Samples (ug/L)	Contract Required Quantitation Limit Soil Samples (ug/kg)
<u>NYSDEC ASP TCL - Pesticides and PCBs (NYSDEC ASP Method 91-3)</u>		
Aldrin	0.05	1.7
alpha-BHC	0.05	1.7
beta-BHC	0.05	1.7
delta-BHC	0.05	1.7
gamma-BHC (Lindane)	0.05	1.7
Aroclor-1200	0.05	1.7
Chlordane (alpha &/or gamma)	0.05	1.7
4,4'-DDD	0.10	3.3
4,4'-DDE	0.10	3.3
4,4'-DDT	0.10	3.3
Dieldrin	0.10	3.3
Endosulfan I	0.05	1.7
Endosulfan II	0.10	3.3
Endosulfan sulfate	0.10	3.3
Endrin	0.10	3.3
Endrin Ketone	0.10	3.3
Heptachlor	0.05	1.7
Heptachlor epoxide	0.05	1.7
Methoxychlor	0.50	17.0
Toxaphene	5.0	170.0
Aroclor-1016	1.0	33.0
Aroclor-1221	1.0	67.0
Aroclor-1232	1.0	33.0
Aroclor-1242	1.0	33.0
Aroclor-1248	1.0	33.0
Aroclor-1254	1.0	33.0
	1.0	33.0

(1) Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable. Quantitation limits listed for soil are based on wet weight.

Table A.1-3. (Cont.) Target Analytes and CRQ Limits (1)

	Contract Required Quantitation Level (2) ($\mu\text{g/L}$)
<u>NYSDEC ASP TAL - Metals and Cyanide (NYSDEC ASP Method CLP-M)</u>	
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	407
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

- (1) Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable. Quantitation limits listed for soil are based on wet weight.
- (2) These CRQLs are the instrument detection limits obtained in pure water that must be met using the procedure in Exhibit E of the ASP. Quantitation limits for samples may be considerably higher depending on the sample matrix.

analytes will be specified by the laboratory selected for this project based on its most recent MDL studies and subject to approval by the NYSDEC.

A.1.8. Data Reduction, Validation, and Reporting

The criteria used to identify and quantify the analytes will be those specified for the applicable methods in the ASP.

The data package provided by the laboratory will contain items specified in the ASP as appropriate to the analyses performed. Level B reporting will be used.

A.1.8.1. Chain-of-Custody Records

Completed copies of the COC records accompanying each sample from time of initial bottle preparation to completion of analysis will be attached to the report of analytical testing.

A.1.8.2. Data Handling

One complete copy and two additional copies of the analytical data summary report will be provided by the laboratory. The project manager will immediately arrange for filing of the complete package, after the QA/QC reviewer confirms that appropriate deliverables have been provided. The second data summary report will be used to generate summary tables. These tables will form the foundation of a working database for assessment of the site contamination condition. A third copy of the data summary report with a copy of the chain of custody forms will be sent for review to the NMPC project manager.

The project manager will maintain close contact with the QA/QC reviewer so that non-conformance issues are acted upon prior to data manipulation and assessment routines. Once the QA/QC review has been completed, the project manager may direct the team leaders or others to initiate and finalize the analytical data assessment.

A.1.8.3. Data Validation Screening

Data validation screening will be performed following guidelines in the most recent U.S. EPA documents (U.S. EPA 1988, 1991a, 1991b) adapted to the QA/QC criteria in the Exhibits E and I of the December 1991 NYSDEC ASP, the NYSDEC RI/FS Program Data Validation Scope of Work, and this QAPP. This validation screening will be limited to a review of conformance to sample extraction and analysis holding times, a review of laboratory blank and QA/QC sample results, and a review of the analytical case narrative to ensure major analytical problems or deficiencies are not noted.

This work will be performed by trained and experienced data validators who meet the NYSDEC approval criteria. The results of the data validation screening will be incorporated into the data summary tables used in the final PSA/IRM report. A data validation report will be prepared which will include a compliancy chart, a list of the samples included in each Sample Delivery

Group, recalculations of percentage of sample results, and a narrative listing any deficiencies with comments on the effect this will have on the data. Any correctable deficiencies will be resolved prior to the submission of the data validation report.

A.1.9. Internal Quality Control Checks and Frequency

A.1.9.1. Quality Assurance Batching

Each set of samples will be analyzed concurrently with calibration standards, method blanks, MS, MSD or MD, and QC check samples (if required by the protocol). The MS/MSD/MD samples will be designated by the field personnel. If no MS/MSD/MD samples have been designated then the laboratory will contact the PQAM or project manager for corrective action.

A.1.9.2. Organic Standards And Surrogates

Standard and surrogate compounds are checked by the method of mass spectrometry for correct identification and gas chromatography for degree of purity and concentration. When the compounds pass the identity and purity tests, they are certified for use in standard and surrogate solutions. Concentrations of the solutions are checked for accuracy before release for laboratory use. Standard solutions are replaced monthly or earlier based upon data indicating deterioration.

A.1.9.3. Laboratory Quality Control Samples

Quality control samples included in the ASP protocols are detailed below.

Method Blanks

Gas Chromatograph/Mass Spectrometer (GC/MS) analyses for organic compounds include a blank analysis of the laboratory reagent water. The blank is analyzed with each set of samples or more often as required to avoid carry-over between samples. The concentration of target compounds in the blanks must be less than or equal to the MDLs specified in the ASP for the selected method of analysis.

Matrix Spike/Duplicate Spike Analysis

This analysis is used to determine the effects of matrix interference on analytical results. Spikes of analytes are added to aliquots of sample matrix in the manner specified in the ASP. Selected samples are spiked to determine accuracy as a percentage recovery of the analyte from the sample matrix. A matrix duplicate is prepared in the same manner as the matrix spike sample.

Analytical Replicate Samples

Replicate samples are aliquots of a single sample that are split on arrival at the laboratory, or upon analysis. Since it is anticipated the concentrations of most parameters will be below the laboratory detection limits, precision data on replicate analyses will largely be derived from matrix spike

duplicate data for GC/MS analyses. Significant differences between two replicates, split in a controlled laboratory environment will result in flagging the affected analytical results.

Surrogate Spike Analyses

Surrogate spike analyses are used to determine the efficiency of recovery of analytes in the sample preparations and analyses. Calculated percentage recovery of the spike is used as a measure of the accuracy of the total analytical method.

Laboratory Control Sample (Blank Spike)

A laboratory control sample will be prepared along with each quality control batch and analyzed according to criteria specified in the ASP.

A.1.10. Quality Assurance Performance Audits and System Audits

Quality assurance audits may be performed by the PQAM or personnel designated by the PQAM. The PQAM and his or her designees function as an independent body and reports directly to company quality assurance management. The PQAM may plan, schedule, and approve system and performance audits based upon company procedure customized to the project requirements. These audits may be implemented to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s). At times the PQAM may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits.

Formal audits encompass documented activities performed by qualified lead auditors to a written procedure or checklists to objectively verify that quality assurance requirements have been developed, documented, and instituted in accordance with contractual and project criteria. Formal audits may be performed on project and subcontractor work at various locations.

Audit reports may be written by lead auditors after gathering and evaluating resultant data. Items, activities, and documents determined by lead auditors to be in noncompliance may be identified at exit interviews conducted with the involved management. Noncompliances may be logged, documented, and controlled through audit findings which are attached to and are a part of the integral audit report. These audit finding forms are then directed to management to satisfactorily resolve the noncompliance in a specified and timely manner. Audit checklists, audit reports, audit findings, and acceptable resolutions are to be approved by the PQAM prior to issue. QA verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the PQAM will close out the audit report and findings.

It is the project manager's overall responsibility to ensure that corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports must be submitted to the project manager within fifteen days of completion of the audit. Serious deficiencies will be reported to the project manager within 24 hours.

A.1.10.1. System Audits

System audits, performed by the PQAM or designated auditors, may encompass evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory quality control procedures and associated documentation may be audited. These audits may be performed once during the performance of the project. However, if conditions adverse to quality are detected or if the Project Manager requests the PQAM to perform unscheduled audits, these activities will be instituted.

A.1.10.2. Performance Audits

The laboratory shall be required to conduct an analysis of Performance Evaluation samples or provide proof that Performance Evaluation samples submitted by the U.S. EPA or a state agency, such as the NYSDOH have been analyzed within the past twelve months and analytical results approved by that agency.

Also, one field audit may be performed by the PQAM or designated auditor during collection of the field samples to verify that field samplers are following established sampling procedures.

A.1.11. Preventative Maintenance Procedures and Schedules

A.1.11.1. Preventive Maintenance Procedures

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedure developed by the operators.

Analytical instruments are serviced at intervals recommended by the manufacturer. Service contracts for regular maintenance and emergency service are maintained for major instruments. An instrument repair/maintenance log book is kept for each instrument. Entries include the date of service, type of problem encountered, corrective action taken, and initials and affiliation of the person providing the service.

The instrument use log book is monitored by the analysts to detect any degradation of instrument performance. Changes in response factors or sensitivity are used as indications of potential problems. These are brought to the attention of the laboratory supervisor and preventive maintenance or service is scheduled to minimize down time. Back-up instrumentation and an inventory of critical spare parts are maintained to minimize delays in completion of analyses.

A.1.11.2. Schedules

Written procedures where applicable will identify the schedule for servicing critical items in order to minimize the downtime of the measurement system. It will be the responsibility of the operator to adhere to this maintenance schedule and to arrange any necessary and prompt service as

required. Service to the equipment, instruments, tools, gauges, etc. shall be performed by qualified personnel.

A.1.11.3. Records

Logs shall be established to record and control maintenance and service procedures and schedules. Maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced shall be reviewed, maintained, and filed by the operators at the laboratories and by the data and sample control personnel when and if equipment, instruments, tools, and gauges are used at the sites. The field team leader may audit these records to verify complete adherence to these procedures.

A.1.11.4. Spare Parts

A list of critical spare parts will be identified by the operator. These spare parts will be stored for availability and use in order to reduce the downtime. In lieu of maintaining an inventory of spare parts a service contract for rapid instrument repair or backup instruments will be available.

A.1.12. Assessment procedures for data acceptability

Procedures used to assess data precision and accuracy will be in accordance with the appropriate laboratory method, and as periodically updated. Completeness is recorded by comparing the number of parameters initially analyzed for with the number of parameters successfully completed and validated.

A.1.12.1. Accuracy

Percent recovery is calculated as below:

$$\% = \frac{S_s - S_o}{S} \times 100$$

where:

S_o = the background value (i.e., the value obtained by analyzing the sample)

S = concentration of the spike added to the sample

S_s = value obtained by analyzing the sample with the spike added

$\%$ = percent recovery

A.1.12.2. Precision

The relative percent difference is calculated as below:

$$RPD = \frac{|V1-V2|}{0.5(V1+V2)} \times 100$$

where:

V1-V2 = the absolute difference between the duplicate samples

RPD = relative percent difference

A.1.12.3. Completeness

Completeness is the measure of the amount of valid data obtained from a measurement system compared to the total amount expected to be obtained under ideal conditions. A target of 90 percent completeness, calculated for each analysis method, has been established as the overall project objective.

$$PC = \frac{N_A}{N_I} \times 100$$

where:

PC = percent completeness

N_A = actual number of valid analytical results obtained

N_I = theoretical number of results obtainable under ideal conditions

A.1.13. Corrective Action

The following procedures have been established to assure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected.

When a significant condition adverse to quality is noted at site, laboratory, or subcontractor locations, the cause of the condition will be determined and corrective action taken to preclude repetition. Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the field team leader, project manager, and involved subcontractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action. Project personnel have the responsibility, as part of normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality.

Corrective actions may be initiated, under the following conditions:

- predetermined acceptance standards are not attained
- procedure or data compiled are determined deficient

- equipment or instrumentation is found faulty
- samples and test results are questionably traceable
- quality assurance requirements have been violated
- designated approvals have been circumvented
- as a result of system and performance audits
- as a result of a management assessment
- as a result of laboratory/interfield comparison studies
- as required by NYSDEC ASP

Project management and staff, such as field investigation teams, remedial response planning personnel, and laboratory groups, will monitor on-going work performance in the normal course of daily responsibilities.

Work may be audited at the consultant's office, site, laboratory, and subcontractor locations by the PQAM and/or designated auditor. Items, activities, or documents ascertained to be in noncompliance with quality assurance requirements will be documented and corrective actions mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the PQAM.

Technicians assigned quality assurance functions will also control noncompliance corrective actions by having the responsibility of issuing and controlling the appropriate Corrective Action Request Form. Project personnel can identify a noncompliance and are responsible for documenting, numbering, logging, and verifying the closeout action. It is the project manager's responsibility to ensure that recommended corrective actions are produced, accepted, and received in a timely manner.

The Corrective Action Request (CAR) identifies the adverse condition, reference document(s), and recommended corrective action(s) to be administered. The issued CAR is directed to the responsible manager in charge of the item or activity for action. The individual to whom the CAR is addressed returns the requested response promptly to the technician in charge, affixing his signature and date to the corrective action block, after stating the cause of the conditions and corrective action to be taken. The technician maintains the log for status control of CARs and responses, confirms the adequacy of the intended corrective action, and verifies its implementation. The technician will issue and distribute CARs to specified personnel, including the originator, responsible project management involved with the condition, the project manager, involved subcontractor, and the field team leader, as a minimum. CARs are transmitted to the project file for the records.

A.1.14. Quality Assurance Reports

Quality assurance reports to management may consist of the reports on audits, reports on correction of deficiencies found in audits, a final QA report on field sampling activities and the data validation report.

At the end of the project, the PQAM may submit, at their discretion, a report to the project manager which will discuss the QA activities. That report may include discussions of conditions adverse or potentially adverse to quality, such as responses to the findings of any field or laboratory audits; field, laboratory, or sample conditions which necessitate a departure from the methods or procedures specified in this QAPP; field sampling errors; missed holding times or problems with laboratory QC acceptance criteria; and the associated corrective actions undertaken. This report shall not preclude immediate notification to project management of such problems when timely notice can reduce the loss or potential loss of quality, time, effort, or expense.

These reports, if prepared, shall be reviewed by the project manager for completeness and the appropriateness of any corrective actions, and they will be retained in the project files. In the final PSA/IRM report, laboratory and field QC data will be presented, including a summary of QA activities and problems and/or comments associated with the analytical and sampling effort. Corrective actions taken in the field, results of audits, and modifications to laboratory protocols will be discussed.

APPENDIX A.2
FIELD SAMPLING PLAN

A.2. Field Sampling Plan

This Field Sampling Plan (FSP) presents and describes the specific field sampling procedures to be utilized for implementation of PSA/IRM field investigations at the North Albany (Broadway) former MGP site. Field activities include the drilling of soil borings and excavation of test pits, collection and preparation of soil samples for chemical analysis, installation of monitoring wells, measurement of ground water elevations, collection and preparation of ground water samples for chemical analysis, and decontamination of field equipment.

Field activities associated with the PSA/IRM investigation will be conducted in accordance with NYSDEC field sampling guidelines and the site-specific Health and Safety Plan, presented in Appendix B.

A.2.1. General Field Guidelines

Underground utilities will be identified prior to drilling and sampling. Public and privately owned utilities will be located by contacting responsible agencies by phone so their underground utilities can be marked at the site. Other potential on site hazards such as sharp objects, overhead power lines, and building hazards will be identified during the site reconnaissance visit.

Each sample will be given a unique identification such that no two samples will have the same label. Labels or tags will be attached to each sample container.

The following is a general list of equipment necessary for sample collection:

- Stainless steel spoons and bowls for compositing soil and sediment samples
- Appropriate sample containers (provided by the laboratory)
- Reagent-grade preservatives and pH paper (or preserved sample containers) for aqueous samples
- Chain-of-Custody labels, tags, seals, and record forms
- Log book, field sampling records, and indelible ink markers
- Laboratory grade decontamination soaps (such as Alconox®), reagent-grade solvents, and deionized, organic-free water to be used for decontaminating equipment between sampling stations
- Buckets, plastic wash basins, and scrub brushes to be used for decontaminating equipment
- Camera and film to document sampling procedures and sample locations
- Stakes to identify sampling locations

- Shipping labels and forms
- Knife
- Vermiculite or other packing/shipping material for sample bottles
- Strapping tape
- Clear plastic tape
- Duct tape
- Aluminum foil
- Resealable plastic bags
- Portable field instruments, including a PID, pH meter, conductivity meter, and water level indicator

The project manager will control the field log books. Each field log book will receive a serialized number and be issued to the field team leader. Field log books will be maintained by the field team leader and other team members to provide a daily record of significant events, observations, and measurements during the field investigation. Entries will be signed and dated.

Information pertinent to field survey and/or sampling activities (except drill logs, sampling records, and chain-of-custody forms) will be recorded in the log books. The log books will be bound with consecutively numbered pages. Entries in the log book will include, at a minimum, the following information:

- Name and title of author, date and time of entry, and physical/environmental conditions during field activity
- Purpose and Location of sampling activity
- Name and address of field contact
- Name and title of field crew members
- Name and title of site visitors
- Sampled media, for example soil, sediment, and ground water
- Sample collection method
- Number and volume of sample(s) taken

- Description of sampling point(s)
- Volume of ground water purged prior to sampling
- Preservatives used
- Date and time of sample collection
- Sample identification number(s)
- Sample distribution, for example the laboratory to which it will be sent
- Field observations
- Field measurements such as pH, temperature, conductivity, and water level
- References for maps and photographs of the sampling site(s)
- Information pertaining to sample documentation including bottle lot numbers, dates and method of sample shipments, chain-of-custody record numbers, and air bill number

Original data recorded in field log books, sample tags, and chain-of-custody records will be written with waterproof ink. These accountable serialized documents will not be destroyed. If an error is made on an accountable document assigned to one individual that individual will make corrections simply by crossing a single line through the error and entering the correct information. Erroneous information should not be erased. Subsequent errors discovered on an accountable document will be corrected by the person who made the entry. Subsequent corrections will be initialed and dated.

A.2.2. Equipment Decontamination

A.2.2.1. Drill Rig and Backhoe Decontamination

Drilling and test pit equipment including backhoe, drilling rig, augers, bits, rods, tools, split-spoon samplers and tremie pipe will be cleaned with a high-pressure steam cleaning unit and scrubbed with a wire brush to remove dirt, grease, and oil before beginning work in the project area. Tools, drill rods, and augers will be placed on sawhorses or polyethylene plastic sheets following steam cleaning. Direct contact with the ground will be avoided. The back of the drill rig and augers, rods, and tools will be decontaminated between each drilling location according to the above procedures. The backhoe bucket, arm, and any other part of the equipment which may have contacted excavated soil will be decontaminated between each test pit location. Tools, augers, and rods will be decontaminated between drilling borings and monitoring wells. Decontamination water will be contained in 1000-gallon tanks staged on-site for proper disposal.

Polyvinyl chloride (PVC) monitoring well casing and screens will be decontaminated by the above procedures immediately before installation. The screen and casing shall then be wrapped in

polyethylene plastic and transported from the designated decontamination area to the well location. A decontamination pad will be constructed of high density polyethylene sheeting on a prepared surface sloped to a sump. The sump must also be lined and of sufficient quantity to contain at least 20 gallons of decontamination water. The size of the pad shall be sufficient to drive the drill rig on without tearing the sides or bottom of the plastic sheet. Sides of the pad will be bermed so that decontamination water is contained.

A.2.2.2. Sampling Equipment Decontamination

Prior to sampling, bowls, spoons, augers, bailers, split-spoons, and filtering equipment will be washed in potable water and a detergent (such as Alconox). The sampling equipment will then be rinsed with potable water followed by a reagent-grade methanol rinse and finally a deionized water rinse. Between rinses, equipment will be placed on polyethylene sheets or aluminum foil if necessary. At no time will washed equipment be placed directly on the ground. Equipment will be wrapped in aluminum foil for storage or transportation from the designated decontamination area to the sampling location.

A.2.3. Metal Detector Survey

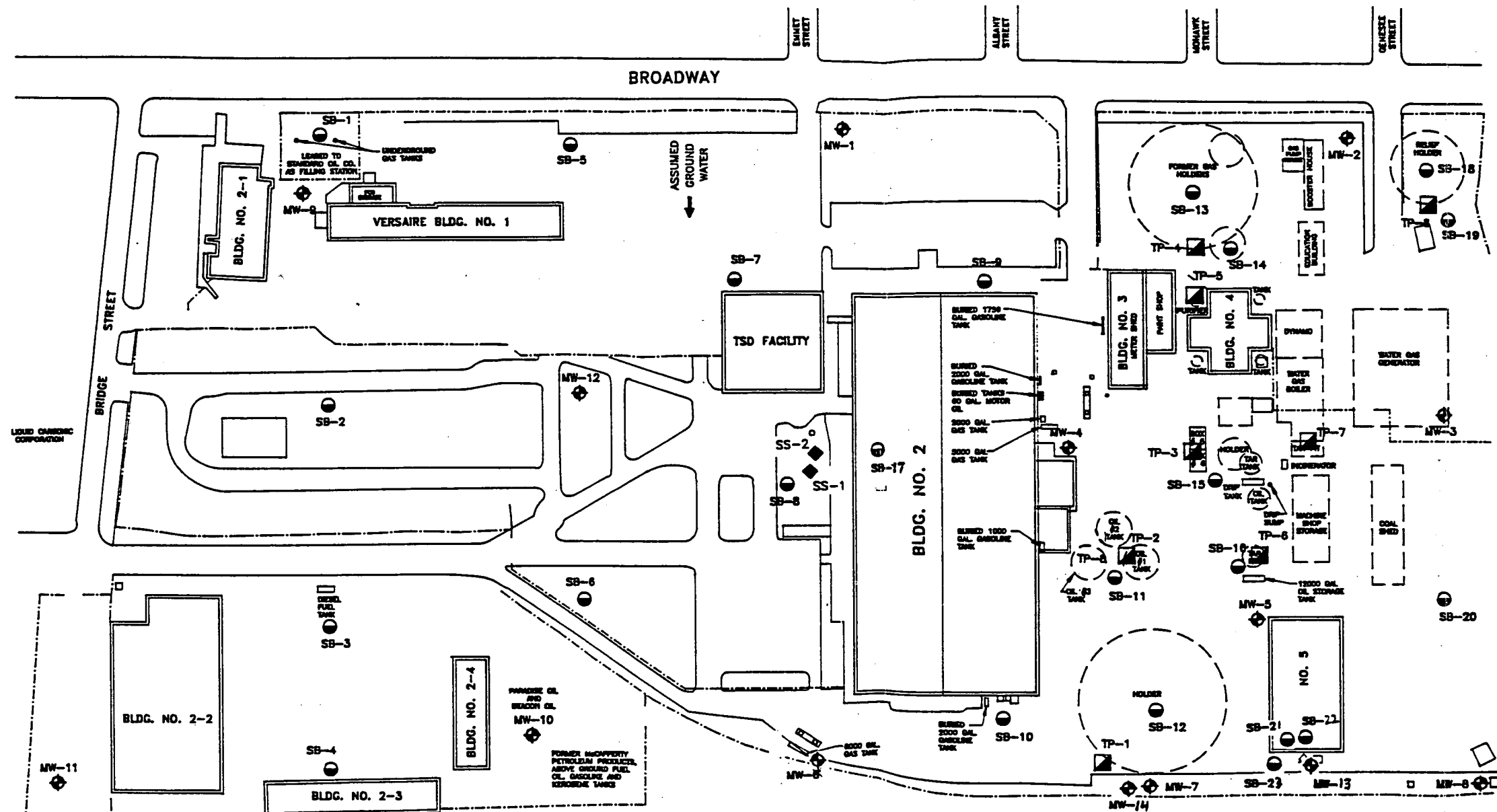
A metal detector survey will be conducted, using the magnetic cable locator model MAC-5 IB (or equivalent), to locate unidentified underground utilities and possible buried drums or tanks. The area around each proposed subsurface investigation point will be checked with the MAC-5 IB (or equivalent) prior to subsurface investigation. Initially, the locator will be tested on known locations of underground utilities to verify that it is functioning properly.

If there is no indication of buried utilities, drums, or tanks, then subsurface sampling will proceed. However, if the locator indicates the presence of a buried object, activities will not proceed in that location until the type of buried object is determined. If the object cannot be identified from surface or shallow digging, a test pit may be required to determine the identity of the buried object. If a test pit is required, the procedure and scope will be reviewed with the NMPC project manager prior to conducting the work. The local NMPC site manager will be kept informed of planned activities, either by the NMPC project manager or the consultant's project manager.

A.2.4. Test Pit Excavations

A backhoe will be used to dig a series of test pits in the areas identified in Figure A.2-1. Two persons will be present to oversee the test pit activities, one being the project hydrogeologist. The project geologist will conduct the perimeter air monitoring and log the excavations. The second person will be responsible for monitoring of volatile organic compounds using a PID at the excavation. The project geologist will direct the excavation activities and prepare geologic logs of the excavation contents. An example of a test pit log sheet is shown in Figure A.2-2. Soil retrieved from the test pit will be visually classified for texture and screened for the evolution of organic vapors using a PID. Traffic control will be established and diverted around the work area before intrusive work begins. If traffic control continues to be problematic someone other than the health and safety monitor will be assigned to traffic control duties.

FIGURE A.2-1



LEGEND

- FORMER STRUCTURES
- FENCE
- MW-1 MONITOR WELL LOCATION (PROPOSED)
- SB-20 SOIL BORING LOCATION (PROPOSED)
- TP-1 TEST PIT LOCATION (PROPOSED)
- SS-1 SURFACE SOIL LOCATION

Scale in Feet
0 50 100

NIAGARA MOHAWK NORTH ALBANY BUILDING ALBANY, NEW YORK PROPOSED SAMPLING LOCATIONS

FILE NO. 1118.074

Test Pit Record

[illegible]

Excavated material will be placed on plastic sheeting and backfilled in the reverse order that it was removed (last out-first in). The surface will be replaced with compacted crushed gravel and repaved to pre-investigative conditions. The corners of each test pit excavation will be flagged for subsequent site surveying.

Areas along the sides of the trench suspected of containing MGP residue will be sampled based on PID results and visual inspection. Samples will be collected using a stainless spoon and transferred directly into a labeled sample container. Up to three soil samples from each test pit will be analyzed for Target Compound List (TCL) volatiles, semivolatiles, pesticides/PCBs, Target Analyte List (TAL) metals, and cyanide. Table A.2-1 provides a summary of the sampling and analysis program including the sample type, number of samples, and type of laboratory analysis required.

Decontamination will be performed prior to and between test pit excavations as specified in Section A.2.2. Test pit locations, soil descriptions, PID readings, and sample locations will be recorded in the field book.

A.2.5. Subsurface Soil Sampling

Small diameter hollow-stem augers will be used during drilling to collect continuous split-spoon samples from the unconsolidated sediments beneath the site as indicated in Figure A.2-1. Samples from areas previously overlain by asphalt will be collected by cutting a patch out of the asphalt, collecting the sample, and repairing the cut as required. Four and one quarter-inch hollow stem augers will be advanced behind the 3-inch diameter split-spoon sampler assembly to the bedrock or, in the case of borings installed in the vicinity of historic MGP structures, to the first encountered concrete or clay foundation layer. Soil borings will be sampled continuously at two-foot intervals from the ground surface to the full depth of the boring.

Samples will be collected in accordance with the Standard Penetration Test (ASTM Method D-1586-84). Soil samples will be described using the Unified Soil Classification System. Descriptions of soil sample texture, composition, color, consistency, moisture content, and recovery will also be recorded. Test boring logs describing the subsurface materials encountered in each boring will be prepared by a qualified on-site hydrogeologist. An example of a test boring log sheet is shown in Figure A.2-3.

Samples for laboratory analysis will be selected based on PID readings and visual inspection. Up to five samples per boring will be submitted to the analytical laboratory for MGP indicators (BTEX, PAHs, and cyanide). Twenty percent of these samples will also be analyzed for full TCL/TAL parameters. Table A.2-1 provides a summary of the sampling and analysis program including the sample type, number of samples, and type of laboratory analysis required.

In borings which penetrate confining layers or contaminated zones, the holes will be cased off at that point. Subsequent drilling to deeper zones, if appropriate, will take place through telescoped casing to reduce the potential for spreading contamination into deeper zones. Borings will be sealed with bentonite or cement/bentonite grout following completion. Excess split-spoon samples and drill cuttings will be placed in a roll-off container staged on-site.

Drilling equipment, except the drill rig itself, will be decontaminated by steam cleaning. Drill cuttings, fluids, and decontamination water will be contained in drums, tanks (or a roll-off for soils) and staged

Table A.2-1. Sampling and analysis summary for proposed PSA/IRM activities at the North Albany (Broadway) former MGP site.

Subtask	Sample Matrix	Laboratory Analysis	No. of Samples	Field QC Samples			Laboratory QC Samples ¹		Total
				Trip Blanks ²	Field Duplicates	Equipment Blanks	MS/MSD	MSB/LCS	
Test Pit Excavation	Soil/Waste	TCL/TAL ³	24	0	2	2	4	1	34
	Air	BTEX	8	0	0	2	0	0	10
		PAHs	8	0	0	2	0	0	10
Surface Soil Sampling	Soil	TCL/TAL ³	2	0	0	0	1	1	4
		TCLP metals ⁷	2	0	0	0	1	1	4
Sediment/Storm Drain Sampling	Sediment	TCL/TAL ³	2	0	0	0	1	1	4
Test Boring and Sampling	Soil	Indicators ⁴	119	0	5	5	10	5	144
		TCL/TAL ³	29	0	2	2	4	2	39
		Geotechnical ⁵	29	0	0	0	0	0	29
Ground Water Sampling	Ground Water	TCL/TAL *	26	4	2	2	4	2	40
		Conventional ⁶	26	0	0	0	0	0	26

¹ Laboratory QC analyses: MS/MSD means matrix spike/matrix spike duplicate samples; MSB means matrix spike blank samples; LCS means laboratory control sample. Perform MS/MSD/MSB for organic analyses and MS/MSD/LCS for inorganic analyses.

² Trip blanks are water samples analyzed for BTEX only; trip blanks are collected with water samples only.

³ TCL/TAL: Target Compound List volatiles, semivolatiles, pesticide/PCBs, Target Analyte List metals, and cyanide.

⁴ Indicators are BTEX, PAHs, and cyanide.

⁵ Geotechnical analyses are: percent moisture, bulk density, grain size, total organic carbon, pH, cone index, and Atterberg limits.

⁶ Conventional analyses are: sulfide, sulfate, nitrate, chloride, hardness, total dissolved solids, BOD₅, COD, pH, and oil and grease.

⁷ TCLP metals: Toxicity Characteristic Leaching Potential metals (including mercury).

* The first round of ground water samples will be analyzed for full TCL/TAL. The second round will only be analyzed for the analyte groups detected in the first round.

Test Boring Log

PROJECT:						BORING NUMBER:			
PROJECT NO:						DATE STARTED:			
LOCATION:						DATE COMPLETED:			
GEOLOGIST:						GROUNDWATER DEPTH:			
DRILLER:						ELEVATION:			
DRILLING/SAMPLING METHOD:									

SAMPLE ID	DEPTH (feet)	BLOWS per 6"	RECO-VERY	PRO-FILE	USCS CLASS	MATERIAL DESCRIPTION	COLLECTION		HNU ppm	COMMENTS
							Time	Date		
	0									
	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
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NOTES:

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on-site for subsequent disposal by NMPC. The roll-offs, tanks or drums will be labelled with their contents (development water, decon water, personnel protective equipment, etc.) and origin (well or boring number), where practicable. The drums will be labelled as non-hazardous pending subsequent composite sampling and analysis of the drum contents. Split-spoons will be decontaminated after each sample is collected. Sample descriptions, PID and GC readings, and location will be recorded in the field book.

A.2.6. Monitoring well installation

Drilling and geological logging methods for the installation of monitoring wells will be similar to the soil boring installation procedures described in the preceding section. The well borings will be drilled to the top of bedrock in the locations indicated in Figure A.2-1. Soil samples for laboratory analysis will be selected based on PID readings and visual inspection of split-spoon samples. Up to five samples per well boring will be submitted to the analytical laboratory for MGP indicators (BTEX, PAHs, and cyanide). Twenty percent of these samples will also be analyzed for full TCL/TAL parameters. The well boring samples can be combined with the soil boring samples for QC purposes if conditions for a sample delivery group, as defined in the NYSDEC ASP, are met. Table A.2-1 provides a summary of the sampling and analysis program including the sample type, number of samples, and type of laboratory analysis required.

Drill cuttings and liquids will be placed in a roll-off container and drums, respectively, and staged on-site. The consultant will arrange for the necessary paperwork, but NMPC will ultimately be responsible for directing the consultant as to the transporter and disposal facility to be used, additional analytical requirements, and for signing the manifests.

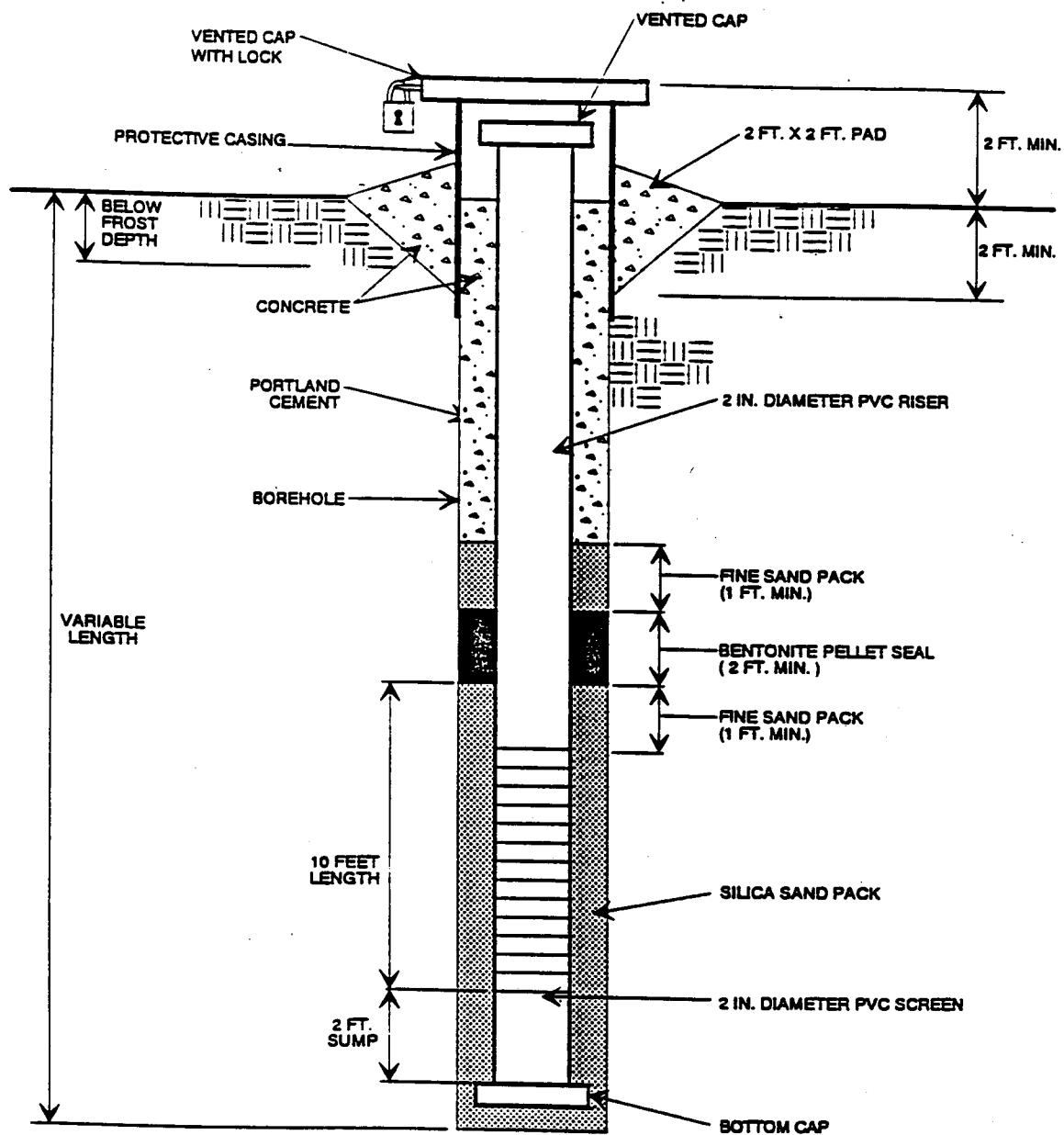
Monitoring well specifications

After completion of drilling and sampling, the well borings will be backfilled with moistened bentonite pellets to a depth of at least one foot below the desired monitoring well depth. A one foot layer of silica sand will then be placed on top of the bentonite to isolate the well screen from the bentonite. The remaining boring depth at each well location will be completed as a monitoring well and subsequently developed to prepare for sampling. The following procedures will be used to install and develop the monitoring wells.

Monitoring wells will be designed and installed in accordance with NYSDEC-approved methods and specifications. Either a standpipe or flush-mounted construction will be used depending on the final location of each well, site considerations, and the potential for damage. Figure A.2-4 shows details of a typical monitoring well construction for wells installed in unconsolidated sediments. Monitoring wells will be installed according to the following specifications:

two-inch ID threaded PVC, flush-joint casing and screens

- screened across contaminated zones identified during drilling and review of laboratory data. Screens will be a maximum of fifteen ft long and slot openings will be 0.010 in.



NOT TO SCALE

PSA/IRM Study for the North Albany Former MGP Site

- a sump, two feet in length, will be attached to the bottom of the screen to collect dense nonaqueous phase liquids (DNAPLs), if encountered
- depth of the wells may vary depending on the location of MGP residues and other contaminated zones around the well
- the top of the casing will extend to approximately two feet above ground surface where possible, given site-specific considerations. Otherwise, flushmount casings will be used.
- the annulus around the screens will be backfilled with an appropriate size of silica sand such as Morie #1 sand to a minimum height of two feet above the top of the screen.
- a bentonite pellet seal will be placed above the sand pack. The seal will be allowed to hydrate before placement of grout above the seal.
- a fine sand pack one foot thick will be placed above and below the bentonite seal to isolate it and to prevent mixing of components.
- the remainder of the annular space will be filled with a cement grout to ground surface. The grout will be pumped through a tremie pipe. The grout will be mixed in the following proportions: 6.5 gallons of water to a 94-pound bag of Portland Type I or Type III cement. Three pounds of bentonite powder will be added to the cement mixture to control shrinkage. The grout will be allowed to set for a minimum of 24 hours before wells are developed.
- each monitoring well will have a vented cap and a four-inch diameter, steel casing with a hinged, locking cap placed over the monitoring well. The protective casing will extend at least two feet below ground surface and be cemented in place. In some areas, it may be necessary to provide flush mounted casings.
- the cement seal or pad will be sloped to channel water away from the well, and be deep enough to remain stable during freezing and thawing of the ground.
- a weep hole will be drilled at the base of the protective standpipe casing to allow water between the inner and outer casing to drain.
- the top of the PVC well casing and outer protective casing will be marked and surveyed to the nearest 0.01 foot and elevations will be determined relative to a fixed benchmark or datum.

Monitoring Well Development

After a minimum of 24 hours after completion the monitoring wells will be developed by bailing, using a centrifugal pump and dedicated polyethylene tubing, or by Waterra positive displacement foot-valve pumps and dedicated polyethylene tubing. Development water will be monitored for organic vapors with a PID. The development water will be contained in 55-gallon drums or tanks and staged on-site for proper disposal.

Well development will proceed by repeated removal of water from the well until the discharged water is relatively sediment free. Development effectiveness will be monitored at regular intervals (after each well volume is removed) using a portable turbidity meter. In addition, pH, temperature, and conductivity measurements will be obtained during development. Measurements versus volume removed will be recorded. Well development will be discontinued either when the turbidity of the discharged water reaches the development goal of 50 NTUs or when the turbidity level stabilizes indicating that additional development will be ineffective.

Following development, wells will be allowed to recover for at least one week before groundwater is purged and sampled. Monitoring well development will be overseen by a field geologist and recorded in the field book.

A.2.7. Ground water sampling

The number and frequency of analytical samples to be collected and the corresponding field testing parameters for each sampling matrix are presented in Table A.2-1. Two rounds of samples will be collected approximately one month apart.

The following is a step-by-step sampling procedure to be used to collect ground water samples from the monitoring wells. Well sampling procedures will be recorded on a form similar to that shown in Figure A.2-5.

- prior to sampling each well, measure the static water level from the surveyed well elevation mark on the top of the PVC casing with an electric probe. Record the measurement to the nearest 0.01 foot in the field log book.
- decontaminate the probe between water-level measurements at each well
- place a plastic sheet on the ground to prevent contamination of the bailer rope.
- purge the well by removing a minimum of three well volumes of water. Purging will be conducted with a disposable polyethylene bailer. Purge water will be collected and stored in a tank provided by NMPC for later characterization and disposal. If the well goes dry before the required volume are removed, the well may be sampled when it recovers sufficiently.
- collect samples with a dedicated polyethylene bailer lowered by a dedicated polypropylene line. Measure temperature, pH, and conductivity, and record results in the field log book.
- fill sample containers for VOCs first. Sample containers for SVOCs and other analytes can then be filled.
- after samples are collected, dispose of polypropylene line and bailer.

Ground Water Sampling Field Log

Client _____ Job No. _____

Sample Location _____ Well No. _____

Sampled By _____ Date _____ Time _____

Weather _____ Sampled with Bailer _____ Pump _____

A. WATER TABLE

Well depth (from top of standpipe) _____ Well elevation (top of standpipe) _____

Depth to water table (from top of standpipe) _____ Water table elevation _____

Length of water column (LWC) _____ (feet)

Volume of water in well - 2" diameter wells = $0.163 \times (\text{LWC}) =$ _____ gallons
 - 4" diameter wells = $0.653 \times (\text{LWC}) =$ _____ gallons
 - 6" diameter wells = $1.469 \times (\text{LWC}) =$ _____ gallons

B. PHYSICAL APPEARANCE AT START

Color _____ Odor _____ Turbidity _____

Was an oil film or layer apparent? _____

C. PREPARATION OF WELL FOR SAMPLING

Amount of water removed before sampling _____ gallons

Did well go dry? _____

D. PHYSICAL APPEARANCE DURING SAMPLING

Color _____ Odor _____ Turbidity _____

Was an oil film, or layer apparent? _____

E. WELL SAMPLING

	<u>Analysis</u>	<u>Bottle No.</u>	<u>Special Sampling Instructions</u>
1.			
2.			
3.			
4.			
5.			

F. CONDUCTIVITY

_____ PH _____

G. COMMENTS

A.2.8. Surface Soil Sampling

Surface soil samples will be collected with stainless steel spoons at the locations indicated in Figures A.2-1 and transferred to appropriate sample containers. Soil samples will be described using the Unified Soil Classification System. Descriptions of soil sample texture, composition, color, consistency, and moisture content will also be recorded. Sample logs describing the surface materials encountered at each sample location will be prepared by a qualified on-site hydrogeologist. Sampling locations will be flagged for subsequent site surveying. Sampling equipment will be decontaminated after each discrete sample is collected.

Surface soil samples will be submitted to the analytical laboratory for analysis of full TCL/TAL parameters and TCLP metals. Table A.2-1 provides a summary of the sampling and analysis program including the sample type, number of samples, and type of laboratory analysis required.

A.2.9. Air monitoring

Air monitoring will be conducted with a PID during drilling and sampling activities. The PID will be used to monitor for organic vapors in the breathing zone and borehole, and to screen samples for analysis.

PID readings will be recorded in the field book and on the boring log during drilling activities. The PID is calibrated at least once each day and more frequently if needed.

Perimeter air monitoring will be conducted during test pit operations. One upwind and three downwind air monitoring stations will be established to collect air samples for laboratory analysis. A total of four air samples will be collected each day. Air samples will be analyzed for BTEX and PAHs. Wetting of the soil with water and particulate monitoring will be initiated if visible dust is generated by excavation activities.

A.2.10. Field instruments

Field analytical equipment will be calibrated immediately prior to each day's use and more frequently if required. The calibration procedures will conform to manufacturer's standard instructions. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer ID required by the project. Records of instrument calibration will be maintained by the field team leader and will be subject to audit by the PQAM. Copies of the instrument manuals will be maintained on-site by the field team leader.

A.2.10.1. Portable Photoionization Analyzer

The photoionization analyzer will be a PID equipped with a 10.6 eV lamp. The Photovac is capable of ionizing and detecting compounds with an ionization potential of less than 10.6 eV. This accounts for up to 73% of the volatile organic compounds on the TAL. Calibration will be performed at the beginning and end of each day of use with a standard calibration gas having an approximate concentration of 100 parts per million of isobutylene. If the unit experiences abnormal perturbation or erratic readings, additional calibration will be required. Calibration data

will be recorded in field notebooks and on calibration log sheets to be maintained on-site.

A battery check will be completed at the beginning and end of each working day. If erratic readings are experienced, the battery will be checked for proper voltage. This information will also be recorded in field notebooks and on the calibration log sheets.

A.2.10.2. pH Meter

Recalibration of the pH meter will be performed at the start of each day of use, after every five to ten readings, and after very high or low readings as required by this plan. Standard buffer solutions which bracket the expected pH range will be used. The standards will most likely be pH of 7.0 and 10.0 standard units. The use of the pH calibration and slope knobs will be used to set the meter to display the value of the standard being checked. The calibration data will be recorded on calibration sheets maintained on-site.

A.2.10.3. Specific Conductivity Meter

Calibration checks using the conductivity standard will be performed at the start of each day of use, after five to ten readings or after very high or low readings as required by this plan. The portable conductivity meter will be calibrated using a reference solution of 0.01 KCl (specific conductance, 1413 $\mu\text{mhos/cm}$ at 25°C on a daily basis. Readings must be within five percent to be acceptable. The thermometer of the meter will be calibrated against the field laboratory thermometer on a weekly basis.

APPENDIX B
HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN
FOR
PRELIMINARY SITE ASSESSMENT/INTERIM REMEDIAL MEASURE STUDY
AT THE
NORTH ALBANY (BROADWAY) MGP SITE
CITY OF ALBANY, ALBANY COUNTY, NEW YORK

Submitted For:

NIAGARA MOHAWK POWER CORPORATION
SYRACUSE, NEW YORK 13202

Submitted By:

O'BRIEN & GERE ENGINEERS, INC.
22 COMPUTER DRIVE WEST
ALBANY, NY 12205

Reviewed and Approved By:

	NAME	DATE
Project Manager	_____	_____
Health and Safety Officer	_____	_____

APPENDIX B - HEALTH AND SAFETY PLAN

PSA/IRM STUDY WORK PLAN FOR THE NORTH ALBANY FORMER MGP SITE

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B.1. Introduction

The purpose of this Health and Safety Plan (HSP) is to establish personnel protection standards and mandatory safety practices and procedures for field investigation efforts. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted at hazardous waste sites.

The provisions of the plan are mandatory for all on-site personnel. Consultant personnel shall abide by this plan. Health and safety plans must be prepared by subcontractors and they must conform to this plan as a minimum. Persons who engage in project activities must be familiar with this plan and comply with its requirements; these personnel must sign-off on the Plan Acceptance Form prior to beginning work on the site. The plan acceptance form must be filed in the project file. A copy of this form will also be retained on-site.

Personnel will have received 40 hours of initial training in hazardous waste operations in compliance with 29 CFR 1910.120. The 40-hour training or 8 hours of refresher training will have taken place within the 12 months prior to the start of field work. The site health and safety officer, field team leader, and others in a supervisory or oversight role will have up-to-date certifications in CPR and first aid. Copies of training and medical certificates for all field personnel and field subcontractors will be maintained on site during field investigations.

Forms for health and safety related activities, including the Plan Acceptance Form and Accident Report Form, are included as Attachment B-1. Standard Operating Safety Procedures are included as Attachment B-2.

B.1.1. Site Background

The North Albany (Broadway) manufactured gas plant (MGP) site is located on Broadway in Albany, Albany County, New York. Figure B.1-1 depicts the site location (USDOT - Troy South Quadrangle). The North Albany facility occupies approximately 25 acres covered by numerous buildings, parking lots and storage areas (Figure B.1-2). The site is bordered by Broadway to the west, Interstate I-90 to the north, Conrail to the east and Bridge Street to the south. The site is currently used as a NMPC area service center.

The land use nearby the site is urban/industrial. There are several small factories and businesses around the site and a small railyard to the east. Interstate I-787 and the Hudson River exist beyond the railyard to the east.

Much of the site is paved and covered with buildings. Several of the storage areas in the southern part of the site are covered with gravel and crushed stone. The site also contains the NMPC eastern region Treatment, Storage, or Disposal (TSD) Facility near the center of the site. The current TSD facility covers less than one acre. Buildings No. 3 and 4 (see Figure 2-2) on the site are from the gas plant facilities.

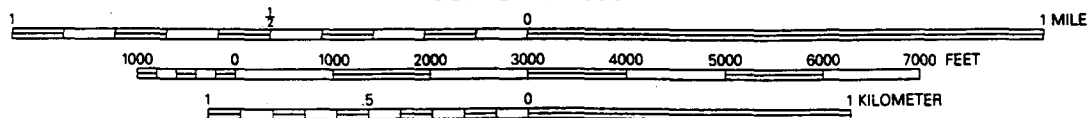
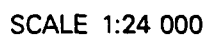
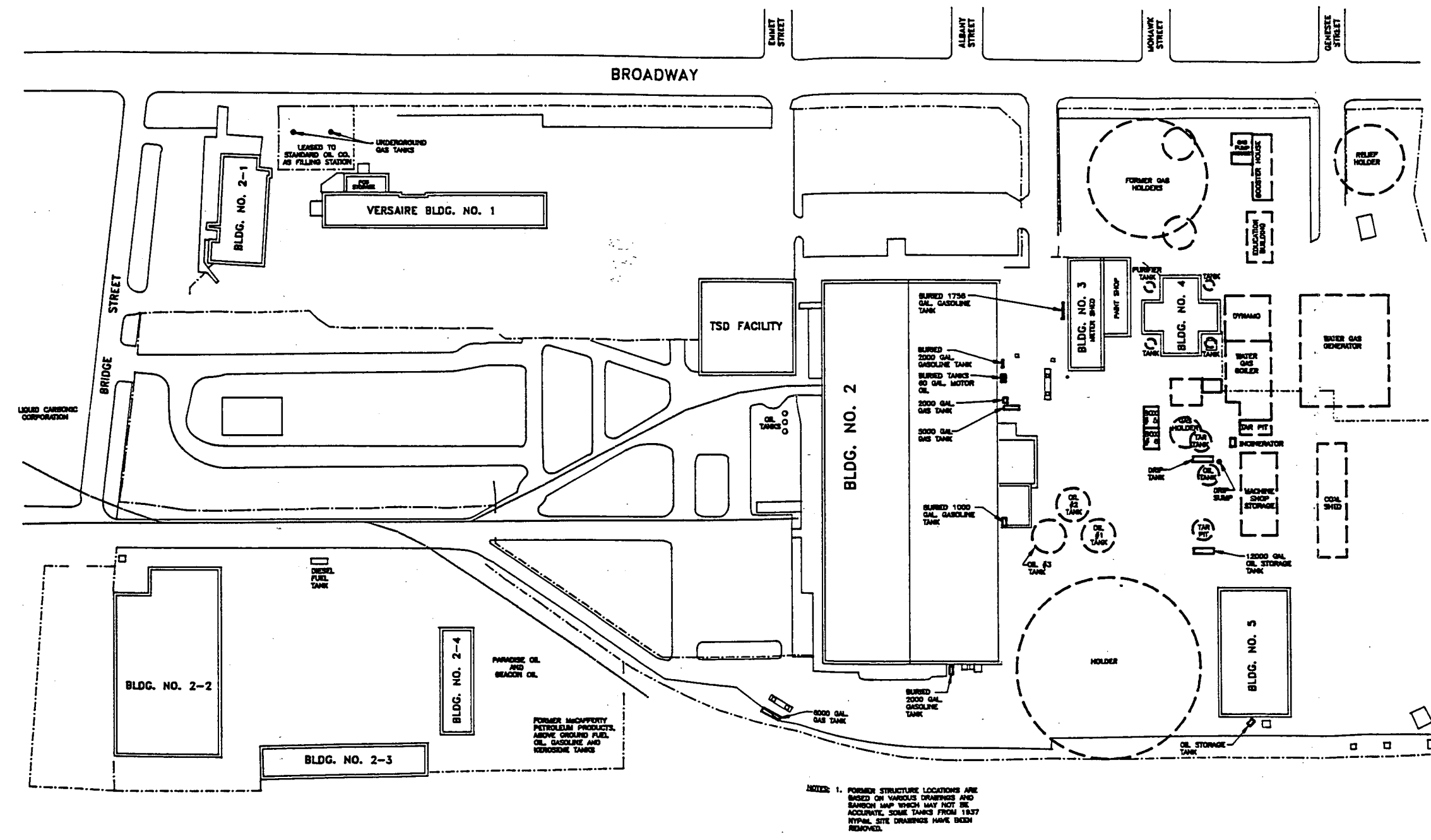


FIGURE B.1-2



LEGEND

- FORMER STRUCTURES
- RAILROAD TRACKS
- FENCE

Scale in Feet
0 50 100

NIAGARA MOHAWK
NORTH ALBANY BUILDING
ALBANY, NEW YORK
SITE PLAN

FILE NO. 1118.074



PSA/IRM Study for the North Albany Former MGP Site

B.1.2. Scope of Work

Field tasks to be conducted at the site include:

- test pit excavations and sampling
- soil borings and sampling
- sediment/storm drain sampling
- surface soil sampling
- ground water monitoring well installation and sampling

Section 3 of the Work Plan contains detailed field task descriptions.

B.1.3. Project Team Organization

Table B.1-1 describes the responsibilities of on-site personnel associated with this investigation. NMPC personnel responsible for this investigation are as follows:

NMPC, North Albany Service Center Mike Abbot	(518) 433-3696
Environmental Affairs Project Manager William Jones (Syracuse)	(315) 428-5690
NMPC Corporate Health and Safety Officer Kathleen Smith (Syracuse)	(315) 460-1278
NMPC Corporate Health and Safety Officer: William Todeschini (Syracuse)	(315) 460-1303

The names of principal on-site contractor personnel associated with this project are presented below:

Consultant Project Manager: _____	Phone # _____
Consultant Investigation Team Leader: _____	Phone # _____
Consultant Site Health and Safety Officer: _____	Phone # _____

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Table B.1-1. Responsibilities of On-Site Personnel

Title	General Description	Responsibilities
Project Manager	Reports to upper-level management. Has authority to direct response operations. Assumes total control over site activities.	• prepares and organizes background review of the situation, the Work Plan, the Site Safety Plan, and the field team • obtains permission for site access and coordinates activities with appropriate officials • sees that the Work Plan is properly carried out and on schedule • briefs the field teams on specific assignments • together with the site health and safety officer sees that health and safety requirements are met • prepares the final report and support files on the response activities • serves as the liaison with public officials
Site Health and Safety Officer	Advises the Project Manager on all aspects of health and safety on site. Stops work if site operations threaten worker or public health and safety.	• periodically inspects protective clothing and equipment • sees that protective clothing and equipment are properly stored and maintained • controls entry and exit at the access control points • confirms each team member's suitability for work based on physician's recommendation • monitors the workers for signs of stress, including heat stress, cold exposure, and fatigue • implements the site health and safety plan • conducts periodic inspections to assess whether the site health and safety plan is being followed • enforces the "buddy" system • informed of emergency procedures, evacuation routes, and telephone number of local hospital, poison control center, fire department, and police department

Table B.1-1. (Cont.) Responsibilities of On-Site Personnel

Title	General Description	Responsibilities
Site Health and Safety Officer (Cont.)		• notifies, when necessary, local public emergency officials. • coordinates emergency medical care • sets up decontamination lines and decontamination solutions appropriate for the chemical contaminants encountered • controls the decontamination of equipment, personnel, and samples from contaminated areas • facilitates the proper disposal of contaminated clothing and materials • maintains the availability of required equipment • advises medical personnel of potential exposures and consequences • notifies emergency response personnel in the event of an emergency • maintains and oversees operation of monitoring equipment and interpretation of data from the monitoring equipment
Field Team Leader	Reports to upper-level management. Has authority to direct response operations. Assumes total control over site activities.	• manages field operations • executes the Work Plan and schedule • enforces safety procedures • coordinates with the site health and safety officer in establishing worker protection levels • enforces site control • documents field activities and sample collection • serves as liason with public officials
Work Team	System operators. Work parties must comprise at least two people	• safely completes on site tasks required to fulfill the Work Plan • complies with the site health and safety plan • notifies site health and safety officer or supervisor of suspected unsafe conditions

B.2. Risk Analysis

B.2.1. Chemical Hazards

Areas of soil contamination at the North Albany site have not yet been delineated, therefore, all intrusive activities at the site will be considered to have the potential for MGP-related contamination. The primary chemical hazards identified for MGP related by-products are listed in Table B.2-1. Table B.2-1 lists chemicals suspected to be found throughout the site, including those associated with purifier by-products and coal tar deposits.

In addition to the compounds detected on site, some of the solvents used in the processing of samples and for equipment decontamination are potentially hazardous to human health if they are not used properly. Material Safety Data Sheets for these compounds are included in Attachment B-3. Some of these compounds may be used in the investigative tasks to be performed at the site.

B.2.2. Physical Hazards

Physical hazards include heat stress, cold related illnesses, and contact with overhead power lines and underground utilities.

B.2.2.1. Heat Stress

The use of protective equipment may create conditions resulting in heat stress. Monitoring of persons wearing personal protective clothing should commence when the ambient temperature is 70°F or above. Table B.2-2 presents the suggested frequency for such monitoring. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by a person with a current first aid certification who is trained to recognize heat stress symptoms. For monitoring the body's recuperative abilities to excess heat, one or more of the following techniques will be used. Other methods for determining heat stress monitoring, such as the wet bulb globe temperature (WBGT) Index from American Conference of Governmental Industrial Hygienist (ACGIH) TLV Booklet can be used.

To monitor the worker for heat stress, measure:

Heart rate - count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the. If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third.

Oral temperature - use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking). If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period. If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third.

Table B.2-1. Relevant Properties of Compounds Suspected at the North Albany (Broadway) MGP Site

Compound (Synonym)	OSHA PEL ⁽¹⁾ (ppm)	IDLH ⁽²⁾ (ppm)	LEL (%)	Odor Threshold ⁽³⁾ (ppm)	Odor Character	Vapor Pressure (mm Hg)	Physical State	Detectable with 10.6 eV lamp PID (I.P.)
Benzene	1 5 [STEL]	1,000 [CA]	1.3	119	Aromatic, sweet	75	Flammable liquid	Yes (9.24)
o-,m-,p- Xylenes	100 150 [STEL]	1,000	1.0	20	Aromatic	7,9,9	Flammable liquid vapor	Yes (8.4-8.6)
Toluene	100 150 [STEL]	2,000	1.2	37	Sweet, pungent benzene-like	20	Flammable liquid vapor	Yes 8.82)
Ethyl benzene	100 125 [STEL]	2,000	1.0	0.6	Oily solvent	10	Flammable liquid	Yes 8.76)
Styrene	50	5,000	1.1	1.9	Sweet floral	5	Flammable liquid	Yes (8.4)
Hydrogen Cyanide	5 mg/m ³ [STEL] [SKIN]	50	5.6	5	Bitter almond	630	Flammable liquid	No (13.6) (Draeger tube)

⁽¹⁾ 29 CFR 1910, July 1, 1989 (8-hour time weighted average unless otherwise specified)

⁽²⁾ ACGIH 1989 highest reported value of acceptable odor threshold range

⁽³⁾ [IDLH] - Immediately Dangerous to Life or Health

⁽⁴⁾ [CA] - suspected carcinogen (minimize possible exposures)

⁽⁵⁾ [STEL] - 15-minute Short Term Exposure Limit

Table B.2-1. (Cont.) Relevant Properties of Compounds Suspected at the North Albany (Broadway) MGP Site

Compound (Synonym)	OSHA PEL ⁽¹⁾ (ppm)	IDLH ⁽²⁾ (ppm)	LEL (%)	Odor Threshold ⁽³⁾ (ppm)	Odor Character	Vapor Pressure (mm Hg)	Physical State	Detectable with 10.6 eV lamp PID (LP.)
Phenol	5 [SKIN]	100	1.7	1.0	Acid/creosote	0.4	Combustible solid	Yes (8.50)
Napthalene	10 15 [STEL]	500	0.9	0.64	Mothballs/ tar/creosote	0.08	Combustible solid	Yes (8.12)
Polynuclear Aromatic Hydrocarbons (PAHs)	0.2 mg/m ³	700 mg/m ³ [CA]	varies	varies	varies	very low	Combustible solid	No
Arsenic	10 µg/m ³	100 mg/m ³ [CA]	NA	NA	No odor	0	Noncombustible solid	No
Lead	50 µg/m ³	700 mg/m ³	NA	NA	No odor	0	Noncombustible solid	No

⁽¹⁾ 29 CFR 1910, July 1, 1989 (8-hour time weighted average unless otherwise specified)

⁽²⁾ ACGIH 1989 highest reported value of acceptable odor threshold range

⁽³⁾ [IDLH] - Immediately Dangerous to Life or Health

⁽⁴⁾ [CA] - suspected carcinogen (minimize possible exposures)

⁽⁵⁾ [STEL] - 15-minute Short Term Exposure Limit

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Table B.2-2. Suggested Frequency of Physiological Monitoring for Fit and Acclimated Workers⁽¹⁾

Adjusted Temperature ⁽²⁾	Normal Work Ensemble ⁽³⁾	Impermeable Ensemble ⁽⁴⁾
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°F - 90°F (30.8° - 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5°F - 87.5°F (28.1° - 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5°F - 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5°F - 77.5°F (22.5° - 25.3°C)	After each 150 minutes of work	After each 120 minutes of work

⁽¹⁾ For work levels of 250 kilocalories per hour.

⁽²⁾ Calculate the adjusted air temperature (T_{adj}) using the following equation:

$$T_{adj} (^{\circ}\text{F}) = T_{air} (^{\circ}\text{F}) + (13 \times \text{percent sunshine})$$

Measure the air temperature (T_{air}) using a standard mercury-in-glass thermometer with the bulb shielded from radiant heat.

⁽³⁾ A normal work ensemble consists of cotton overalls with long sleeves and pants.

⁽⁴⁾ An impermeable work ensemble consists of an impermeable coveralls with long sleeves and pants.

Proper training and preventative measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:

- Adjust work schedules
 - Modify work/rest schedules according to monitoring requirements
 - Mandate work slowdowns as needed
 - Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods
- Maintain workers body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
 - (1) Maintain water temperature 50° to 60°F (10 to 16.6°C)
 - (2) Provide small disposal cups that hold about four ounces (0.1 liter)
 - (3) Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.
 - (4) Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

B.2.2.2. Cold-Related Illness

- If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Localized cold exposure is generally labeled frostbite.

Hypothermia - hypothermia is defined as a decrease in the patient core temperature below 96°F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interferences with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a "cold" ambient temperature. Symptoms of hypothermia include: shivering, apathy, listlessness, sleepiness, and unconsciousness.

Frostbite - frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 2°F. Symptoms of frostbite are: a sudden

blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale, and solid.

Prevention of cold related illness can be aided by educating workers on recognizing the symptoms of frostbite and hypothermia and by identifying and limiting known risk factors. The workers should be provided with enclosed, heated environments on or adjacent to the site, dry changes of clothing, and warm drinks.

To monitor the worker for cold related illnesses, start (oral) temperature recording at the job site:

- at the field team leader's discretion when suspicion is based on changes in a worker's performance or mental status
- at a worker's request
- as a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20°F, or wind-chill less than 30°F with precipitation)
- as a screening measure whenever any one worker on the site develops hypothermia

Workers developing moderate hypothermia (a core temperature of 92°F) should not return to work for at least 48 hours.

B.2.2.3. Contact with buried or overhead utilities

During excavation activities, there is a potential for contacting underground utilities or overhead power lines. The location of active utilities on-site must be verified prior to commencing intrusive activities. Standard NMPC procedures for locating buried utility lines will be employed prior to such work.

B.3. Personnel Protection and Monitoring

B.3.1. Medical Surveillance

The consultant will utilize the services of a licensed occupational health physician with knowledge and/or experience in the hazards associated with the project to provide the medical examinations and surveillance specified herein.

Personnel involved in this investigation must have undergone medical surveillance prior to commencement of work. The 12-month medical examination will meet the requirements of 29 CFR 1910.120. The medical exam is performed under the direction of a licensed Occupational Health Physician. A medical certification as to the fitness or unfitness for employment on hazardous waste projects, or any restrictions on his/her utilization that may be indicated, is provided by the physician. This evaluation will be repeated as indicated by substandard performance or evidence of particular stress that is evident by injury or time loss illness on the part of any worker. Copies of documents will be filed on-site.

B.3.2. Site Specific Training

The Site Health and Safety Officer (SHSO) will be responsible for developing a site specific occupational hazard training program and providing training to consultant personnel that are to work at the site. This training will consist of the following topics:

- names of personnel responsible for site safety and health
- safety, health, and other hazards at the site
- proper use of personal protective equipment
- work practices by which the employee can minimize risk from hazards
- safe use of engineering controls and equipment on the site
- acute effects of compounds at the site
- decontamination procedures

B.3.3. Monitoring Requirements

Monitoring for VOCs in the breathing zone will be conducted with a Photovac MicroTIP (or equivalent) photoionization detector (PID) equipped with a 10.6 eV lamp and calibrated to isobutylene. For activities taking place in areas of known or suspected contamination, continuous measurements will be taken in the breathing zone with a PID. For other activities, readings will be taken under the following circumstances.

- upon initial entry onto the site
- when weather conditions change
- when work begins on another portion of the site
- every five feet during drilling for the PID

PAHs could pose a significant health threat if ingested or inhaled as a dust. On-site personnel should avoid activities that generate potentially contaminated dust and should work upwind of suspected

contaminated areas during excavation activities. Dust emissions will be monitored in contaminated areas with a real time aerosol monitor. Should dust levels exceed $150 \mu\text{g}/\text{m}^3$ in such areas, upgrading to Level B may be warranted for affected personnel. Metals suspected to be present at the site are unlikely to become airborne because of their low vapor pressures and wet conditions under which they are expected to be encountered.

In addition, monitoring during excavation activities, such as test pit excavations, must incorporate use of cyanide color detector tubes taken at least once every half hour. Cyanide color detector tube readings of $5 \text{ mg}/\text{m}^3$ or greater shall be cause for employee retreat and/or upgrade to a Level B of personal protective equipment (PPE) as determined by the SHSO.

Background levels of VOCs should be measured with a PID initially upwind from planned site activities. If during site activities, PID readings reach 5 ppm above background levels and are sustained for 15 minutes then personnel must upgrade to Level C PPE. Upon upgrading to Level C PPE, a Draeger® Benzene 2/a color detector tube (part number 8101231) should be used to verify the absence of benzene. If benzene is greater than 5 ppm, personnel must upgrade to Level B PPE. Furthermore, if PID readings reach 25 ppm above background (sustained for 15 minutes), then personnel should retreat and consult with the SHSO before deciding to upgrade to Level B PPE. Conditions may warrant waiting until air monitoring indicates that PID concentrations have fallen below 25 ppm so that work may continue in Level C.

B.3.4. Action Levels

Action levels are used to determine activity cessation, site evacuation, emergency response, and to change PPE levels. Section B.3.5 discusses the PPE required for specified site activities. Changes to these specified levels are dependent on the results of air monitoring. The action levels apply to air monitoring in the breathing zone of on-site workers. These action levels are based on the OSHA PELs for specific compounds suspected of being present on site and are presented below.

B.3.4.1. Conditions for Level D

Level D protection will be worn for initial entry on-site and initially for every site activity. The action levels for Level D protection are as follows:

- PID readings $< 5 \text{ ppm}$
- hydrogen cyanide color detector tube readings $< 5 \text{ mg}/\text{m}^3$

B.3.4.2. Conditions for Level C

The level of PPE will be upgraded to Level C if the concentration of VOCs detected with a PID in the breathing zone equals or exceeds the action levels specified for Level D and the contaminants of concern have characteristic warning properties appropriate for air purifying respirators, such as a distinct taste or odor. Action levels for Level C protection are as follows:

- PID readings > 5 ppm and < 25 ppm
- Draeger® Benzene 2/a tube readings < 5 ppm
- any visible fugitive dust emissions from site activities that disturb contaminated soil

Dust and vapor suppression control will be implemented if the level of VOCs consistently exceeds 1 ppm or if the concentration of particulates exceeds 150 ug/m³. One such control method will be to mist surface soils. If the aforementioned action levels continue to be exceeded, the level of PPE will be upgraded to Level C.

B.3.4.3. Conditions for Retreat

If the conditions present in the worker breathing zone equal or exceed the following action levels, field personnel associated with the investigation will immediately retreat to a location upwind of the suspected source of contamination. Action levels for retreating from the work area are as follows:

- PID readings > 25 ppm
- hydrogen cyanide color detector tube readings > 5 mg/m³
- Draeger® Benzene 2/a tube readings > 5 ppm

Workers may utilize dust and vapor suppression techniques to lower airborne particulate concentrations. Work may resume when concentrations drop to acceptable levels. If concentrations do not drop sufficiently, the field team leader will consult with the NMPC Health and Safety Officer to discuss further options.

B.3.5. Personal Protective Equipment Designations

The PPE designated below conforms with OSHA and U.S. EPA criteria. The level of protection is based upon the following:

- type and measured concentration of the chemical substance in the ambient atmosphere compared with current standards
- potential for exposure to substances in air, splashes of liquids, and other direct contact with material due to site activities
- knowledge of chemicals on-site, their properties, and routes of exposure

Personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

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<u>Type of Protection</u>	<u>Regulation</u>	<u>Source</u>
Eye and Face	29 CFR1910.133	ANSI Z87. 1-1968
Respiratory	29 CFR1910.134	ANSI Z88.1-1980
Head	29 CFR1910.135	ANSI Z89. 1-1969
Foot	29 CFR1910.134	ANSIZ41.1-1967

ANSI = American National Standards Institute

Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.1025, 29 CFR 1910.134). Air purifying respirators cannot be worn under the following conditions:

- oxygen deficiency
- IDLH concentrations
- high relative humidity
- if contaminant levels exceed designated use concentrations

If respiratory protection is used, appropriate respirator usage log(s) must be filled out and returned to the NMPC Health and Safety Officer.

B.3.5.1. Level D Protection

Level D protection will consist of:

- coveralls [poly-coated tyvek overall suits should be worn if pH levels in ground water indicate acidic (pH < 4.0) or basic (pH > 11.0) conditions in excavations]
- steel-toed rubber boots or boot covers
- nitrile outer and latex inner gloves (must be worn during all sampling activities)
- hard hat (must be worn during test pit and drilling activities)
- splash goggles (must be worn if a splash hazard is present)
- 5-minute escape SCBA (available for use within exclusion zone)

B.3.5.2. Level C Protection

Level C protection will consist of:

- 5-minute escape SCBA (available for use within exclusion zone)
- full-face air-purifying respirator
- combination dust/organic vapor cartridges
- Tyvek overall suit
- PVC inner and nitrile outer gloves
- steel-toed rubber boots or boot covers
- hard hat (must be worn during test pit and drilling activities)

B.3.5.3. Level B Protection

Level B protection will consist of:

- full-face SCBA
- Tyvek overall suit
- PVC inner and nitrile outer gloves
- steel-toed rubber boots or boot covers
- hard hat (must be worn during test pit and drilling activities)

B.4. Site work zones and decontamination

B.4.1. Site Work Zones

To reduce the spread of hazardous materials by workers from the contaminated areas to the clean areas, work zones will be delineated at the site. The flow of personnel between the zones will be controlled. The establishment of the work zones will help ensure that personnel are properly protected against the hazards present where they are working, work activities and contamination are confined to the appropriate areas, and personnel can be located and evacuated in an emergency.

B.4.1.1. Exclusion Zone

Exclusion zones will be established at the site for intrusive activities such as test pit excavations, borings and drilling. The exclusion zone will be clearly delineated by cones, tape, or other means during drilling or test pitting. Unprotected onlookers should be located 50 feet upwind of drilling or soil sampling activities. Exclusion zones will also be established during any activity when Level C protection is established as a result of conditions discussed in Section 3.

Personnel within the exclusion zone will be required to use the specified level of protection. No food, drink, or smoking will be allowed in the exclusion or decontamination zones.

B.4.1.2. Decontamination Zone

Should it be necessary to establish an exclusion zone, an associated decontamination zone will also be delineated and utilized. This zone will be established between the exclusion zone and the support zone, and will include the personnel and equipment necessary for decontamination of equipment and personnel (discussed below). Personnel and equipment in the exclusion zone must pass through this zone before entering the support zone. This zone should always be located upwind of the exclusion zone.

B.4.1.3. Support Zone

The support zone will include the remaining areas of the job site. Break areas, operational direction, and support facilities (to include supplies, equipment storage and maintenance areas) will be located in this area. No equipment or personnel will be permitted to enter the support zone from the exclusion zone without passing through the personnel or equipment decontamination station. Eating, smoking, and drinking will be allowed in this area.

B.4.2. Decontamination

Due to the low level of contaminants expected, water used in decontamination procedures will be disposed on-site.

B.4.2.1. Decontamination of Personnel

Decontamination will not be necessary, if Level D protection is used alone. However, disposable gloves used during sampling activities should be removed and bagged. Personnel should be encouraged to remove clothing and shower as soon as is practicable at the end of the day. All clothing should be machine-washed. All personnel will wash hands and face prior to eating and before and after using the restroom. Disposable boots or washable boots will be removed or cleaned before leaving the site.

Decontamination will be necessary if Level C protection is used. The following OSHA-specified procedures include steps necessary for complete decontamination prior to entry into the support zone, and steps necessary if a worker only needs to change a respirator or respirator canister.

Modification can be made to the twelve station decontamination process by the site health and safety officer depending upon the extent of contamination.

Station 1: Segregated Equipment Drop

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Station 2: Suit/safety boot and outer-glove wash

Thoroughly wash chemically resistant suit, safety boots and outer-gloves. Scrub with long-handle, soft-bristle scrub brush and copious amounts of Alconox/water solution. Necessary equipment includes:

1. Wash tub (30 gallon or large enough for person to stand in)
2. Alconox/water solution
3. Long-handle soft-bristle scrub brushes

Station 3: Suit/Safety Boot and Outer-Glove Rinse

Rinse off Alconox/water solution using copious amounts of water. Repeat as many times as necessary. Necessary equipment includes:

1. Wash tub (30 gallon or large enough for person to stand in)
2. Spray unit
3. Water
4. Long-handle, soft-bristle scrub brushes

Station 4: Outer Gloves Removal

Remove the outer gloves and deposit in individually marked plastic bags. Necessary equipment includes:

1. Plastic bag

Station 5: Canister or Mask Change

If a worker leaves the exclusion zone to change a canister (or mask), this is the last step in the decontamination procedure. The worker's canister is exchanged, new outer glove donned, and joints taped. Worker returns to duty. Otherwise the worker proceeds to Station 6. Necessary equipment includes:

1. Canister (or mask)
2. Tape
3. Gloves

Station 6: Removal of Chemically Resistant Suit

With assistance of helper, remove suit. Deposit in container with plastic liner. Necessary equipment includes:

1. Container with plastic liner

Station 7: Inner-Glove Wash

Wash inner gloves with Alconox/water solution that will not harm skin. Repeat as many times as necessary. Necessary equipment includes:

1. Alconox/water solution
2. Wash tub
3. Long-handle, soft-bristle brushes

Station 8: Inner-Glove Rinse

Rinse inner-gloves with water. Repeat as many times as necessary. Necessary equipment includes:

1. Water
2. Wash tub

Station 9: Respirator Removal

Remove facepiece. Avoid touching face. Wash respirator in clean, sanitized solution; allow to dry and deposit facepiece in plastic bag. Store in clean area. Necessary equipment includes:

1. Plastic bags
2. Sanitizing solution
3. Cotton

Station 10: Inner-Glove Removal

Remove inner gloves and deposit in container with plastic liner. Necessary equipment includes:

1. Container with plastic liner

Station 11: Field Wash

Wash hands and face. Necessary equipment includes:

1. Water
2. Soap
3. Tables
4. Wash basins or buckets
5. Clean towels

Station 12: Redress

When re-entering the exclusion zone put on clean field clothes (e. g., Tyvek, gloves, etc.). Necessary equipment includes:

1. Table
2. Clothing

B.4.2.2. Decontamination of Equipment

Drill rigs will be steam cleaned and drilling equipment will be decontaminated prior to moving to a site. Drilling equipment used for multiple boreholes will be decontaminated prior to drilling each boring at the site. The equipment will be decontaminated in the following manner:

- The drilling rig will be steam cleaned to remove gross contamination. Downhole equipment (auger bits, drill rods, split spoons, etc.) will be steam cleaned and air dried to remove gross contamination.
- Surface equipment, such as field meters and surveying instruments, will be wiped with a clean, damp cloth.

A drilling sequence hierarchy (from less likely to more likely contaminated boring locations) will be imposed to reduce the potential for cross contamination.

B.5. Emergency Response

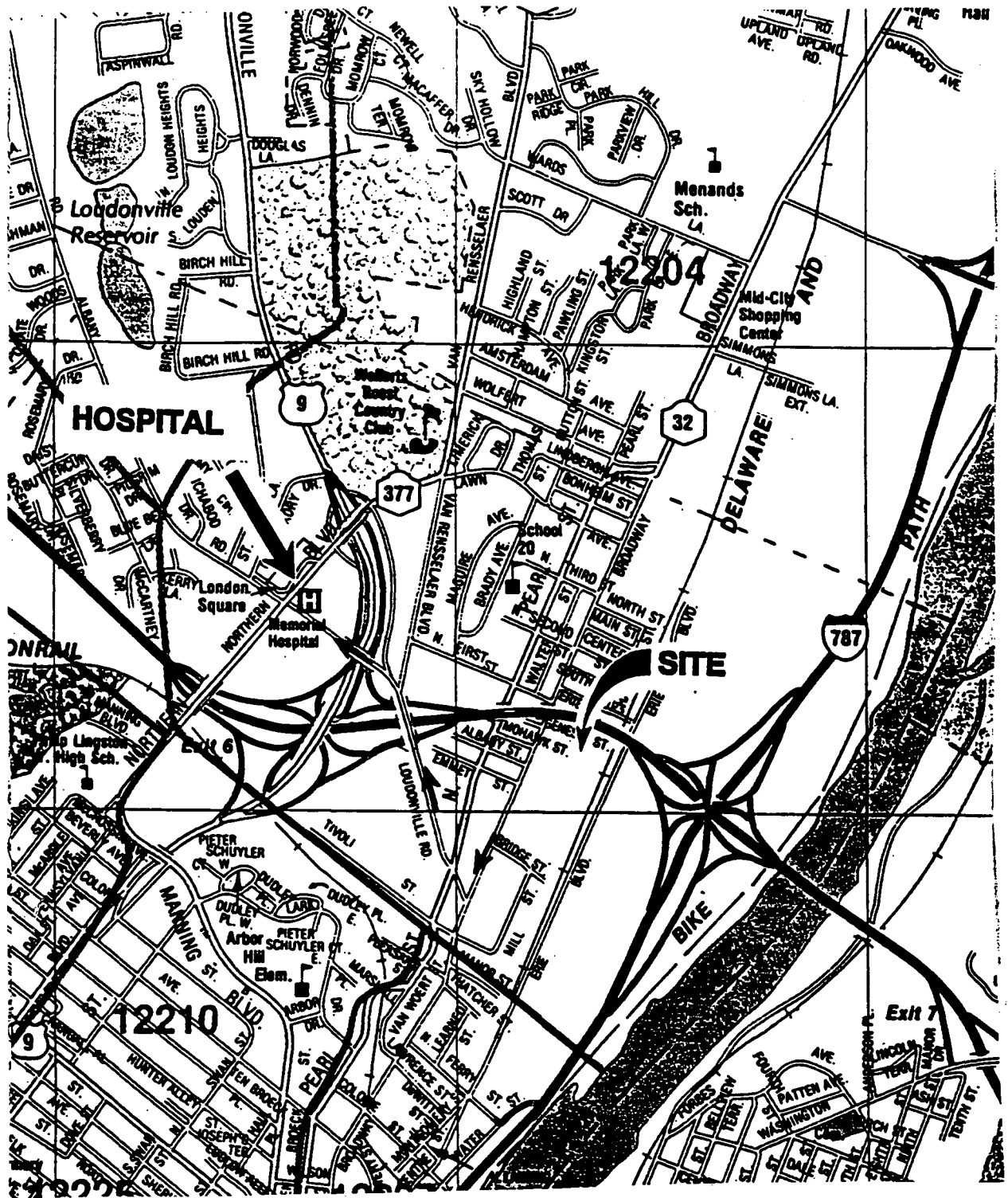
B.5.1. Emergency Contacts

In the event of a situation or unplanned occurrence requiring assistance, appropriate contact(s) should be made from the list below. For emergency situations, contact should first be made with the field team leader (or designee) who will notify emergency personnel who will then contact the appropriate response teams. This emergency contacts list must be in an easily accessible location at the site.

Contingency Contacts	Phone Number
Nearest phone located on-site	NMPC Radio System or (518) 433-3696
Fire Department	(518) 463-1234
Albany Police:	(518) 463-4141
NYS Police:	(518) 783-3211
Sheriff (Albany):	(518) 765-2351
Poison Control Center (Albany)	(800) 336-6997
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
UFPO	(800) 962-7962
Utility Emergencies: (Electric)	(800) 637-2770
Utility Emergencies: (Gas)	(800) 627-6466
Medical Emergency:	Phone Number
Mohawk Ambulance:	(518) 434-4151
Hospital Name:	Albany Memorial Hospital
Hospital Phone Number:	(518) 471-3221, Information (518) 471-3111, Emergency
Hospital Address:	600 Northern Boulevard Albany, NY 12204
Map to Hospital:	SEE FIGURE B.5-1
Travel Time From Site:	5 Minutes

Figure B.5-1

Route to Hospital



Route to Hospital:

- Exit the site onto Broadway and turn left
- Travel 1/4 mile and turn right onto Loudonville Road. (Loudonville Road becomes Albany Shaker Road.)
- Travel 3/4 mile up hill and over I-90 to Northern Boulevard
- Turn right onto Northern Boulevard
- The hospital entrance is on the right

Prior to start of work, the SHSO shall discuss site activities with hospital personnel to confirm that they will be able to handle an emergency involving workers who may not have been adequately decontaminated.

B.5.2. Accident Prevention

B.5.2.1. Site-Specific Training

Field personnel will receive health and safety training prior to the initiation of any site activities. Individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before daily work assignments, health and safety meetings should be held. The meetings should include discussions of the following:

- tasks to be performed
- time constraints (e.g., rest breaks, cartridge changes)
- hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals
- emergency procedures

B.5.2.2. Intrusive Activities

Prior to intrusive activities, such as test pit excavations, borings, and drilling, efforts will be made to determine whether underground installations will be encountered and, if so, where these installations are located. NMPC standard procedures for locating buried utility or gas lines will be employed prior to breaking ground. Attachment B-4 contains a reproduction of the International Drilling Federation Drilling Safety Guide.

The New York State Underground Facilities Protection Organization (UFPO) requires a 3 day notification to ensure that an inspection will occur before digging begins.

If a utility company locator must enter an area where there is a potential for exposure to contaminants in order to mark underground utilities, the locator will require 24 hours of training as specified for a Non-intrusive Site Worker [29 CFR 1910.120(e)].

Drilling - hard hats and safety boots must as a minimum be worn within 50 feet of the drill rig. Drilling rigs shall not be operated within 10 feet of power lines. The field team leader or SHSO will provide on-site inspection of the drilling subcontractor to ensure that they are meeting the health and safety requirements. If deficiencies are noted, work will be stopped and corrective action will be taken (e.g., retrain, purchase additional safety equipment). Reports of health and safety deficiencies and the corrective action taken will be forwarded to the NMPC Project Manager.

Excavation - when excavations reach a depth of 4 feet in areas of known or suspected contamination and entry of personnel is required or reasonably expected, persons involved must consider the hazards of a cave-in. OSHA's construction standard for excavations is found in 29 CFR 1926, Subpart P. This standard specifies design of sloping and shoring systems and outlines additional hazards posed by entering excavations or operating heavy equipment adjacent to excavations.

B.5.3. Contingency Plan

The field team leader is responsible for implementing the following contingency plan whenever there is a threat to human health or an environmental hazard. Possible situations include actual or imminent fires, explosions, or spills.

The individual discovering the emergency situation is to notify the field team leader who will then notify the appropriate organizations as described in Section B.5.1.

B.5.3.1. Emergency Decontamination

Emergency decontamination of personnel, if required, will involve the following procedures:

- immediate removal and containment of contaminated protective outerwear
- use of emergency eye wash, first aid and/or showers (Niagara Mohawk facility)
- contact emergency public health services, hospital and ambulance, if required

B.5.3.2. Assessment

The project manager in conjunction with the SHSO is responsible for ascertaining possible health or environmental hazards and determining the need for evaluation and notification of the proper authorities.

B.5.3.3. Control Procedures

The employee discovering a fire, explosion, spill or other emergency situation is responsible for notifying the project manager. The project manager will assess the situation to determine if it can be adequately handled by site personnel or if additional assistance is needed.

Before an employee attempts to extinguish a fire or clean-up and contain a spill, he or she must be aware of the properties of the material involved and its associated hazards. Employees will be familiarized with this information during their training period and will be instructed on the proper protective clothing to be worn in such a situation.

B.5.3.4. Fire and/or Explosions

In the event of a fire or explosion, the NMPC Project Manager should be notified immediately. The project manager, in conjunction with the SHSO, is responsible for determining the requirements for outside assistance as well as the necessity for site evacuation.

Small fires can be extinguished using fire extinguishers which will be maintained in the "Support Zone". Larger fires may require the assistance of the fire department. Contaminated materials must be properly cleaned before being returned to service.

B.5.3.5. Spill and/or Material Release

In the event of a spill or release of materials, the NMPC Project Manager should be notified immediately. The project manager shall immediately notify the site engineer. The project manager will be responsible for determining whether the spill or release can be handled by on-site personnel or whether outside assistance is necessary. The NMPC Project Manager will be responsible for ensuring that appropriate agency notifications are made.

Spill clean-up poses no significant danger under normal conditions. The first step (subsequent to the notification of the project manager) is to determine the source of the spill and condition. In the event of a small spill, granules or sorbent pads may be utilized to soak up the spilled material. The granules would then be swept up and containerized in Department of Transportation approved drums. Absorbent materials will be kept in the "Support Zone." Large spills that cannot be properly contained and cleaned by on-site workers will be handled by calling in appropriate off-site assistance. Contaminated materials or equipment must be properly cleaned before being returned to service.

B.5.3.6. Prevention of Recurrence or Spread of Fires, Explosions or Releases

In the event of an emergency situation, operations at the site will be suspended until the situation causing the emergency is remedied. Response actions will be taken with the primary objective of protecting human health and safety, and then the environment. The cause and subsequent handling of emergencies that occur at the site will be methodically reviewed in order to prevent future occurrences.

B.5.3.7. Post-Emergency Equipment Maintenance

After an emergency situation, materials or equipment that were used during the emergency will be decontaminated or disposed and replaced. Equipment needed for decontamination may include sorbent (such as SpeediDry), broom, shovel, rags, detergent, degreaser, water, rinse basin, protective clothing, and containers for disposal.

B.5.3.8. Personal Injury

A first-aid kit will be maintained on site at all times. In case of personal injury at the site, the following procedures should be followed:

- another team member ("buddy") should signal the field team leader that an injury has occurred. A field team member trained in first aid can administer treatment to an injured worker.
- the victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- the field team leader or SHSO is responsible for making certain that an accident report form is completed. This form is to be submitted to the NMPC Health and Safety Officer. Follow-up action should be taken to correct the situation that caused the accident.
- the NMPC Project Manager and NMPC Health and Safety Officer shall be notified and proper documentation provided after the event.

B.5.3.9. Evacuation Procedures

- the field team leader will initiate evacuation procedure by signaling personnel to leave the site. The signal will be three short blasts on an air horn.
- personnel in the work area should evacuate the area and meet in the common designated area
- personnel suspected to be in or near the contract work area should be accounted for and the whereabouts of missing persons determined immediately
- on site NMPC personnel will be notified
- further instruction will be given by the field team leader

B.5.4. Community Air Monitoring Plan

B.5.4.1. Real-Time Air Monitoring

Real-time air monitoring for volatile compounds at the perimeter of the exclusion zone will be performed. If particulates become a concern at this site, possibly as a result of drilling activities or wind erosion of soils, this community plan will be modified accordingly. Contaminants on-site are not anticipated to pose a problem as particulates because of the high moisture content of the soil.

- VOCs must be continuously monitored at the downwind perimeter of the exclusion zone during all work activities. If total organic vapor levels exceed 5 ppm above background, drilling activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for State (DEC & DOH) personnel to review.
- Particulates shall be continuously monitored downwind of the exclusion zone during all drilling and test pit activities with a portable real time particulate monitor that will have an alarm set at 150 ug/m³. If downwind particulate levels integrated over a period of 15 minutes exceed 150 ug/m³, then particulate levels upwind of the survey or work site will be measured. If the downwind particulate level is more than 100 ug/m³ greater than the upwind particulate level, then drilling activities must be stopped and corrective action taken. Corrective action will involve wetting down any exposed soil within the exclusion zone to reduce the level of dust. All readings must be recorded and be available for State (DEC & DOH) personnel to review. These action levels can be modified if particulates are better characterized and identified.
- The generation of odors as a result of test pit excavations will be minimized by minimizing the exposed area of the test pits. Should odors become a problem during intrusive work activities, the excavation or borehole will be covered and a foam odor suppressant will be applied to the suspected odor source, if possible. An odor suppressant foam dispenser unit will be available at the site.

B.5.4.2. Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the Exclusion Zone, drilling activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, drilling activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- the organic vapor level 200 feet downwind of the Exclusion Zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background

- more frequent intervals of monitoring, as directed by the Safety Officer, are conducted

If the organic vapor level is above 25 ppm at the perimeter of the Exclusion Zone work activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the SHSO will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

B.5.4.3. Major Vapor Emission

If organic levels greater than 5 ppm over background are identified 200 feet downwind from the Survey Site or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted. If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the Exclusion Zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20-Foot Zone).

If either of the following criteria are exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented:

- organic vapor levels greater than 5 ppm and less than 10 ppm above background for a period of more than 30 minutes, or
- organic vapor levels greater than 10 ppm above background for any time period

B.5.4.4. Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. the local police authorities will immediately be contacted by the SHSO and advised of the situation.
2. continuous air monitoring will be conducted within the 20 Foot Zone. If sustained readings below action levels are measured, air monitoring may be halted or modified by the SHSO.
3. emergency contacts will go into effect as appropriate

ATTACHMENT B-1

FORMS FOR HEALTH AND SAFETY RELATED ACTIVITIES

JOB SAFETY & HEALTH PROTECTION

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers by promoting safe and healthful working conditions throughout the Nation. Provisions of the Act include the following:

Employers

All employers must furnish to employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Employers must comply with occupational safety and health standards issued under the Act.

Employees

Employees must comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to their own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to help ensure compliance with the Act.

Inspection

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or for otherwise exercising their rights under the Act.

Employees who believe they have been discriminated against may file a complaint with their nearest OSHA office within 30 days of the alleged discriminatory action.

Citation

If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty

The Act provides for mandatory civil penalties against employers of up to \$7,000 for each serious violation and for optional penalties of up to \$7,000 for each nonserious violation. Penalties of up to \$7,000 per day may be proposed for failure to correct violations within the proposed time period and for each day the violation continues beyond the prescribed abatement date. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to \$70,000 for each such violation. A minimum penalty of \$5,000 may be imposed for each willful violation. A violation of posting requirements can bring a penalty of up to \$7,000.

There are also provisions for criminal penalties. Any willful violation resulting in the death of any employee, upon conviction, is punishable by a fine of up to \$250,000 (or \$500,000 if the employer is a corporation), or by imprisonment for up to six months, or both. A second conviction of an employer doubles the possible term of imprisonment. Falsifying records, reports, or applications is punishable by a fine of \$10,000 or up to six months in jail or both.

Voluntary Activity

While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries. OSHA's Voluntary Protection Programs recognize outstanding efforts of this nature.

OSHA has published Safety and Health Program Management Guidelines to assist employers in establishing or perfecting programs to prevent or control employee exposure to workplace hazards. There are many public and private organizations that can provide information and assistance in this effort, if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free assistance in identifying and correcting hazards and in improving safety and health management is available to employers, without citation or penalty, through OSHA-supported programs in each State. These programs are usually administered by the State Labor or Health department or a State university.

Posting Instructions

Employers in States operating OSHA approved State Plans should obtain and post the State's equivalent poster.

Under provisions of Title 29, Code of Federal Regulations, Part 1903.2(a)(1) employers must post this notice (or facsimile) in a conspicuous place where notices to employees are customarily posted.

More Information

Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from your employer or from the nearest OSHA Regional Office in the following locations:

Atlanta, GA	(404) 347-5573
Boston, MA	(617) 565-7164
Chicago, IL	(312) 353-2220
Dallas, TX	(214) 767-4731
Denver, CO	(303) 844-3061
Kansas City, MO	(816) 426-5861
New York, NY	(212) 337-2378
Philadelphia, PA	(215) 596-1201
San Francisco, CA	(415) 744-6670
Seattle, WA	(206) 442-5930

Lynn Martin
Lynn Martin, Secretary of Labor

U.S. Department of Labor
Occupational Safety and Health Administration

Washington, DC
1991 (Reprinted)
OSHA 2203



PLAN ACCEPTANCE FORM
PROJECT HEALTH AND SAFETY PLAN

I have read and agree to abide by the contents of the Health and Safety Plan for the following project:

PROJECT TITLE: _____

PROJECT NUMBER: _____

Name (print)

Signature

Date

Place in project Health and Safety File before starting field work.

ACCIDENT REPORT FORM

Project: _____

EMPLOYER

1. Name _____
2. Mailing Address _____
(No. and Street) (City or Town) (State)
3. Location, if different from mail address _____

INJURED OR ILL EMPLOYEE

4. Name _____ Social Security Number _____
(First) (Middle) (Last)
5. Home Address _____
(No. and Street) (City or Town) (State)
6. Age _____ 7. Sex: Male _____ Female _____ (Check one)
8. Occupation _____
(Specific job title, not the specific activity employee was performing at time of injury)
9. Department _____
(Enter name of department in which injured person is employed, even though they may have been temporarily working in another department at the time of injury)

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure _____
(No. and Street) (City or Town) (State)
11. Was place of accident or exposure on employer's premises? _____
(Yes/No)
12. What was the employee doing when injured? (Be specific - Was employee using tools or equipment or handling material?) _____

ACCIDENT REPORT FORM
(Continued)

13. How did the accident occur? _____
(Describe fully the events which resulted in the
injury or occupational illness. Tell what happened and how. Name objects and
substances involved. Give details on all factors which led to accident. Use separate
sheet for additional space.)

14. Time of accident: _____

15. ES WITNESS TO ACCIDENT	_____	_____	_____
	(Name)	(Affiliation)	(Phone No.)
	_____	_____	_____
	(Name)	(Affiliation)	(Phone No.)
	_____	_____	_____
	(Name)	(Affiliation)	(Phone No.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

16. Describe the injury or illness in detail and indicate the part of the body
affected. _____

17. Name the object or substance which directly injured the employee. (For
example, object which struck employee; the vapor or poison inhaled or
swallowed; the chemical or radiation which irritated the skin; or in cases of
strains, hernias, etc., the object the employee was lifting, pulling, etc.)

18. Date of injury or initial diagnosis of occupational illness _____
(Date)

19. Did the accident result in employee fatality? _____ (Yes or No)

ACCIDENT REPORT FORM
(Continued)

OTHER

20. Name and address of physician _____

21. If hospitalized, name and address of hospital _____

Date of report _____ Prepared by _____

Official position _____

SITE-SPECIFIC TRAINING
PROJECT HEALTH AND SAFETY TRAINING

I hereby confirm that site-specific health and safety training has been conducted by the site health and safety officer which included:

- Names of personnel responsible for site safety and health
- Safety, health, and other hazards at the site
- Proper use of personal protective equipment
- Work practices by which the employee can minimize risk from hazards
- Safe use of engineering controls and equipment on the site
- Acute effects of compounds at the site
- Decontamination procedures

For the following project:

PROJECT TITLE: _____

PROJECT NUMBER: _____

Name (print)

Signature

Date

Place in project Health and Safety File as soon as possible.

AIR PURIFYING RESPIRATOR LOG

SITE: _____

LOCATION: _____

DATE OF INVESTIGATION: _____

[illegible]

**Site Health and Safety Officer or
Project Manager**

Date

Place in project Health and Safety File as soon as possible.

SCBA

RESPIRATORY LOG

LOCATION: _____

[illegible]

**Site Health and Safety Officer or
Project Manager**

Place in project Health and Safety File as soon as possible.

ATTACHMENT B-2

STANDARD OPERATING SAFETY PROCEDURES

STANDARD OPERATING SAFETY PROCEDURES

Standard operating safety procedures include safety precautions and operating practices, that all on-site personnel will follow. These include:

Personal Precautions

- Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as being contaminated.
- Hands and face must be thoroughly washed upon leaving the work area.
- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.
- No facial hair which interferes with a satisfactory fit of the mask-to-face-seal is allowed on personnel required to wear respirators. Personnel will use the negative pressure fit test prior to each use of the equipment.
- Contact with contaminated or suspected surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, discolored surfaces, kneel on ground, lean, sit or place equipment on drums, containers, or the ground surface.
- Medicine and alcohol can potentiate the effects from exposure to toxic chemicals. Prescribed drugs should not be taken by personnel on site where the potential for adsorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverages should be avoided, in the off-duty hours, for all site personnel. The Consultant must recognize all requirements for providing a drug-free work environment as specified in Niagara Mohawk Addendum A, General Conditions of Contract for Construction - 00700, Section 760: Alcohol/Drug Screening/Testing - Nuclear.

Operations

- All personnel going on-site must be adequately trained and thoroughly briefed on potential hazards, equipment to be worn, safety practices to be followed, emergency procedures, and communications.
- Any required respiratory protection and chemical-protective clothing must be worn by all personnel going into areas designated for wearing protective equipment.
- Personnel on-site will use the buddy system at all times when working at the Queensbury site.
- Visual contact must be maintained between pairs on-site and safety personnel. Entry team members should remain close together to assist each other during emergencies.

- During continual operations, on-site workers will act as safety back-up to each other. Off-site personnel provide emergency assistance.
- Personnel should practice unfamiliar operations prior to doing the actual procedure.
- Entrance and exit locations must be designated and emergency escape routes delineated. Warning signals for site evacuation must be established.
- Communications using radios, hand signals, signs, or other means must be maintained between initial entry members at all times. Emergency communications should be prearranged in case of radio failure, necessity for evacuation of site, or other reasons.
- Personnel and equipment in the contaminated area should be minimized, consistent with effective site operations.
- Work areas for various operational activities must be clearly established.
- Procedures for leaving a contaminated area must be planned and implemented prior to going on-site. Work areas and decontamination procedures must be established based on expected site conditions.
- A boat horn will be kept in the office trailer and at the excavation site. It will be sounded to notify both the Consultant and Niagara Mohawk personnel in the event of a serious health or safety problem.
- An on-site log book will be maintained daily to record the time of arrival and departure of all personnel with this project.

Note: These procedures will be posted at the Schenectady site and reviewed with site personnel prior to commencing work.

ATTACHMENT B-3
MATERIAL SAFETY DATA SHEETS

DATE: 12/02/92
INDEX: 04923369190

ACCT: 241572-01
CAT NO: A4524

PAGE: 1/6
PO NBR: N/A

••METHANOL••
••METHANOL••
••METHANOL••

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY NUMBER: (201) 796-7100
CHEMTREC ASSISTANCE: (800) 424-9300

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SUBSTANCE IDENTIFICATION

SUBSTANCE: ••METHANOL•• CAS-NUMBER 67-56-1

TRADE NAMES/SYNONYMS:
METHYL ALCOHOL; WOOD ALCOHOL; METHYL HYDROXIDE; CARBINOL;
MONOHYDROXYMETHANE; WOOD SPIRIT; WOOD NAPHTHA; METHYLOL; COLONIAL SPIRIT;
COLUMBIAN SPIRIT; PYROXYLIC SPIRIT; COULOMATIC (R) CONDITIONER SOLUTION;
STANDARD WATER IN METHANOL; STCC 4909230; UN 1230; RCRA U154;
A454; A452; A938; A408; A947; A935; BP1105; A412; A411; A433P; SW2;
SC95; A452SK; A408SK; A412P; A434; A412SK; A450; A433S; CH40; ACC14280

CHEMICAL FAMILY:
HYDROXYL, ALIPHATIC

MOLECULAR FORMULA: C-H3-O-H

MOLECULAR WEIGHT: 32.04

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=3 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: METHYL ALCOHOL (METHANOL) PERCENT: 100
CAS# 67-56-1

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

METHYL ALCOHOL (METHANOL):
200 PPM (262 MG/M3) OSHA TWA (SKIN); 250 PPM (328 MG/M3) OSHA STEL
200 PPM (262 MG/M3) ACGIH TWA (SKIN); 250 PPM (328 MG/M3) ACGIH STEL
200 PPM (262 MG/M3) NIOSH RECOMMENDED TWA (SKIN);
250 PPM (328 MG/M3) NIOSH RECOMMENDED STEL
200 PPM (262 MG/M3) OFG MAK TWA (SKIN);
400 PPM (524 MG/M3) OFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 4 TIMES/SHIFT

MEASUREMENT METHOD: SILICA GEL TUBE; WATER; GAS CHROMATOGRAPHY WITH FLAME
IONIZATION DETECTION; (NIOSH VOL. III # 2000, METHANOL)

5000 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY
SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

*•OSHA LIMITS ADOPTED JANUARY 19, 1989 ARE SUBJECT TO THE DECISION OF THE
11TH CIRCUIT COURT OF APPEALS (AFL-CIO V. OSHA) AS OF JULY 7, 1992.*

PHYSICAL DATA

DESCRIPTION: CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC ALCOHOLIC ODOR.

BOILING POINT: 149 F (65 C) MELTING POINT: -137 F (-94 C)

SPECIFIC GRAVITY: 0.7914 VAPOR PRESSURE: 97.25 MMHG @ 20 C

EVAPORATION RATE: (BUTYL ACETATE=1) 4.6 SOLUBILITY IN WATER: VERY SOLUBLE

ODOR THRESHOLD: 100 PPM VAPOR DENSITY: 1.11

SOLVENT SOLUBILITY: ETHER, BENZENE, ALCOHOL, ACETONE, CHLOROFORM, ETHANOL.

VISCOSITY: 0.59 CPS @ 20 C

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:

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DANGEROUS FIRE HAZARD WHEN EXPOSED TO HEAT, FLAME, OR OXIDIZERS.

VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASH BACK.

VAPOR-AIR MIXTURES ARE EXPLOSIVE.

FLASH POINT: 52 F (11 C) (CC) UPPER EXPLOSIVE LIMIT: 38.0%

LOWER EXPLOSIVE LIMIT: 0.0% AUTOIGNITION TEMP.: 725 F (385 C)

FLAMMABILITY CLASS(OSHA): IB

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR ALCOHOL-RESISTANT FOAM
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL-RESISTANT FOAM
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. DIKE FIRE-CONTROL
WATER FOR LATER DISPOSAL; DO NOT SCATTER THE MATERIAL. APPLY COOLING WATER TO
SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT.
STAY AWAY FROM ENDS OF TANKS. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND
FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF TANK DUE TO FIRE. ISOLATE
FOR 1/2 MILE IN ALL DIRECTIONS IF TANK, RAIL CAR OR TANK TRUCK IS INVOLVED IN
FIRE (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5, GUIDE PAGE 28).

EXTINGUISH ONLY IF FLOW CAN BE STOPPED; USE WATER IN FLOODING AMOUNTS AS FOG.
SOLID STREAMS MAY NOT BE EFFECTIVE. COOL CONTAINERS WITH FLOODING QUANTITIES
OF WATER. APPLY FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING TOXIC
VAPORS, KEEP UPWIND.

TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49-CFR 172.101:
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49-CFR 172.101 AND
SUBPART E:
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49-CFR 173.119
EXCEPTIONS: 49-CFR 173.118

FINAL RULE ON HAZARDOUS MATERIALS REGULATIONS (HMR, 49 CFR PARTS 171-180).
DOCKET NUMBERS HM-181, HM-181A, HM-181B, HM-181C, HM-181D AND HM-204.
EFFECTIVE DATE OCTOBER 1, 1991. HOWEVER, COMPLIANCE WITH THE REGULATIONS IS
AUTHORIZED ON AND AFTER JANUARY 1, 1991. (55 FR 52402, 12/21/90)

EXCEPT FOR EXPLOSIVES, INHALATION HAZARDS, AND INFECTIOUS SUBSTANCES, THE
EFFECTIVE DATE FOR HAZARD COMMUNICATION REQUIREMENTS IS EXTENDED TO
OCTOBER 1, 1993. (56 FR 47156, 09/18/91)

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:
METHYL ALCOHOL-UN 1230

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:
3 - FLAMMABLE LIQUID

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:
PG II

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101
AND SUBPART E:
FLAMMABLE LIQUID, POISON

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS
EXCEPTIONS: NONE
NON-BULK PACKAGING: 49 CFR 173.202
BULK PACKAGING: 49 CFR 173.243

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:
PASSENGER AIRCRAFT OR RAILCAR: 1 L
CARGO AIRCRAFT ONLY: 80 L

TOXICITY

METHYL ALCOHOL (METHANOL):
IRRITATION DATA: 50 MG/24 HOURS SKIN-RABBIT MODERATE; 40 MG EYE-RABBIT
MODERATE; 100 MG/24 HOURS EYE-RABBIT MODERATE
TOXICITY DATA: 88,000 MG/M3 INHALATION-HUMAN TCLO: 300 PPM INHALATION-HUMAN
TCLO: 84,000 PPM/4 HOURS INHALATION-RAT LC50: 1000 PPM INHALATION-MONKEY
LCLO: 50 GM/M3/2 HOURS INHALATION-MOUSE LCLO: 44,000 MG/M3/6 HOURS
INHALATION-CAT LCLO: 15,800 MG/KG SKIN-RABBIT LD50: 393 MG/KG SKIN-MONKEY
LDLO: 428 MG/KG ORAL-HUMAN LDLO: 143 MG/KG ORAL-HUMAN LDLO: 8422 MG/KG
ORAL-MAN LOLO: 3429 MG/KG ORAL-MAN TOLO: 4 GM/KG ORAL-WOMAN TOLO: 7 GM/KG

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ORAL-MONKEY LD50: 5628 MG/KG ORAL-RAT LD50: 7300 MG/KG ORAL-MOUSE LD50: 14,200 MG/KG ORAL-RABBIT LD50: 1500 MG/KG ORAL-DOG LD50: 9800 MG/KG
SURCUTANEOUS-MOUSE LD50: 2131 MG/KG INTRAVENOUS-RAT LD50: 4710 MG/KG
INTRAVENOUS-MOUSE LD50: 8907 MG/KG INTRAVENOUS-RABBIT LD50: 4641 MG/KG
INTRAVENOUS-CAT LD50: 7529 MG/KG INTRAPERITONEAL-RAT LD50: 10,765 MG/KG
INTRAPERITONEAL-MOUSE LD50: 1826 MG/KG INTRAPERITONEAL-RABBIT LD50: 3558 MG/KG
INTRAPERITONEAL-QUINEA PIO LD50: 8555 MG/KG
INTRAPERITONEAL-HAMSTER LD50: 808 MG/KG UNREPORTED-MAN LOLO: MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS).
CARCINOGEN STATUS: NONE
LOCAL EFFECTS: IRRITANT- SKIN, EYE.
ACUTE TOXICITY LEVEL: SLIGHTLY TOXIC BY DERMAL ABSORPTION AND INGESTION; RELATIVELY NON-TOXIC BY INHALATION.
TARGET EFFECTS: CENTRAL NERVOUS SYSTEM DEPRESSANT; NEUROTOXIN.
AT INCREASED RISK FROM EXPOSURE: PERSONS WITH KIDNEY, EYE OR SKIN DISORDERS.

HEALTH EFFECTS AND FIRST AID

INHALATION:

METHYL ALCOHOL (METHANOL):
NARCOTIC/NEUROTOXIN. 25,000 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.
ACUTE EXPOSURE- MAY CAUSE IRRITATION OF THE MUCOUS MEMBRANES, COUGHING, OPPRESSION IN THE CHEST, TRACHEITIS, BRONCHITIS, TINNITUS, UNSTEADY GAIT, TWITCHING, COLIC, CONSTIPATION, NYSTAGMUS, AND RHEPAROSPASM.
SYMPTOMS FROM OCCUPATIONAL EXPOSURE INCLUDE PARESTHESIAS, NUMBNESS AND SHOOTING PAINS IN THE HANDS AND FOREARMS, METABOLIC ACIDOSIS, AND EFFECTS ON THE EYES AND CENTRAL NERVOUS SYSTEM MAY OCCUR AS DETAILED IN ACUTE INGESTION.
CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE MAY CAUSE EFFECTS AS IN ACUTE INGESTION. REPEATED EXPOSURE TO 200-375 PPM CAUSED RECURRENT HEADACHES IN WORKERS. EXPOSURE FOR 4 YEARS TO 1200-8000 PPM RESULTED IN MARKED DIMINUTION OF VISION AND ENLARGEMENT OF THE LIVER IN A WORKMAN. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:

METHYL ALCOHOL (METHANOL):
IRRITANT/NARCOTIC/NEUROTOXIN.
ACUTE EXPOSURE- CONTACT WITH LIQUID MAY CAUSE IRRITATION. SKIN ABSORPTION MAY OCCUR AND CAUSE METABOLIC ACIDOSIS AND EFFECTS ON THE EYES AND CENTRAL NERVOUS SYSTEM AS DETAILED IN ACUTE INGESTION.
CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT WITH THE LIQUID MAY CAUSE DEFLATTING OF THE SKIN RESULTING IN ERYTHEMA, SCALING, AND ECZEMATOID DERMATITIS. CHRONIC ABSORPTION MAY RESULT IN METABOLIC ACIDOSIS AND EFFECTS AS DETAILED IN ACUTE INGESTION.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

METHYL ALCOHOL (METHANOL):
IRRITANT.
ACUTE EXPOSURE- VAPORS MAY CAUSE IRRITATION. HIGH CONCENTRATIONS HAVE BEEN REPORTED TO CAUSE VIOLENT INFLAMMATION OF THE CONJUNCTIVA AND EPITHELIAL DEFECTS ON THE CORNEA. MILD IRRITATION MAY OCCUR WITH DILUTE SOLUTIONS; THE UNDILUTED LIQUID HAS PRODUCED MODERATE CORNEAL OPACITY AND CONJUNCTIVAL REDNESS IN RABBITS. APPLICATION OF A DROP OF METHANOL IN RABBIT EYES CAUSED A MILD REVERSIBLE REACTION, GRADED 3 ON A SCALE OF 1-10 AFTER 24 HOURS.
CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT MAY CAUSE CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE. OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

METHYL ALCOHOL (METHANOL):
NARCOTIC/NEUROTOXIN.
ACUTE EXPOSURE- MAY CAUSE MILD AND TRANSIENT INEBRIATION AND SUBSEQUENT DROWSINESS FOLLOWED BY AN ASYMPTOMATIC PERIOD LASTING 8-48 HOURS. FOLLOWING THE DELAY, COUGHING, DYSPNEA, HEADACHE, DULLNESS, WEAKNESS, VERTIGO OR DIZZINESS, NAUSEA, VOMITING, OCCASIONAL DIARRHEA, ANOREXIA, VIOLENT PAIN IN THE BACK, ARMS, AND EXTREMITIES, RESTLESSNESS, APATHY OR DELIRIUM, AND RARELY, EXCITEMENT AND MANIA MAY OCCUR. RAPID, SHALLOW RESPIRATION DUE TO METABOLIC ACIDOSIS, COLD AND CLAMMY SKIN, HYPOTENSION, CYANOSIS, OPISTHOTONOS, CONVULSIONS, MILO TACHYCARDIA, CARDIAC DEPRESSION, PERIPHERAL NEURITIS, CEREBRAL AND PULMONARY OEDEMA, UNCONSCIOUSNESS, AND COMA ARE POSSIBLE. EFFECTS ON THE EYE MAY INCLUDE OPTIC NEURITIS, BLURRED OR DIMMED VISION, DILATED, UNRESPONSIVE PUPILS, PTOSIS, EYE PAIN, CONCENTRIC CONSTRICTION OF VISUAL FIELDS, DIPLOPIA, CHANGE IN COLOR PERCEPTION, PHOTOPHOBIA, AND OPTIC NERVE ATROPHY. PARTIAL BLINDNESS OR POSSIBLY DELAYED TRANSIENT OR PERMANENT BLINDNESS MAY OCCUR. BILATERAL SENSORINEURAL DEAFNESS HAS BEEN REPORTED IN A SINGLE CASE. LIVER, KIDNEY, HEART, STOMACH, INTESTINAL AND PANCREATIC DAMAGE MAY ALSO OCCUR. DEATH

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MAY BE DUE TO RESPIRATORY FAILURE OR RARELY FROM CIRCULATORY COLLAPSE. AS LITTLE AS 18 ML HAS CAUSED BLINDNESS. THE USUAL FATAL DOSE IS 80-340 ML. PROLONGED ASTHENA AND IRREVERSIBLE EFFECTS ON THE NERVOUS SYSTEM INCLUDING DIFFICULTY IN SPEECH, MOTOR DYSFUNCTION WITH RIGIDITY, SPASTICITY, AND HYPOKINESIS HAVE BEEN REPORTED.
CHRONIC EXPOSURE- REPEATED INGESTION MAY CAUSE VISUAL IMPAIRMENT AND BLINDNESS AND OTHER SYSTEMIC EFFECTS AS DETAILED IN ACUTE INGESTION. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID- IF INGESTION OF METHANOL IS DISCOVERED WITHIN 2 HOURS, GIVE SYRUP OF IPECAC. LAVAGE THOROUGHLY WITH 2-4 L OF TAP WATER WITH SODIUM BICARBONATE (20 G/L) ADDED. GET MEDICAL ATTENTION IMMEDIATELY. LAVAGE SHOULD BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).

ANTIDOTE:

THE FOLLOWING ANTIDOTE(S) HAVE BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO WHETHER THE SEVERITY OF POISONING REQUIRES ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHOULD BE MADE BY QUALIFIED MEDICAL PERSONNEL.

METHANOL POISONING:

GIVE ETHANOL, 50% (100 PROOF), 1.5 ML/KG ORALLY INITIALLY. DILUTED TO NOT MORE THAN 5% SOLUTION, FOLLOWED BY 0.5-1.0 ML/KG EVERY 2 HOURS ORALLY OR INTRAVENOUSLY FOR 4 DAYS IN ORDER TO REDUCE METABOLISM OF METHANOL AND TO ALLOW TIME FOR ITS EXCRETION. BLOOD ETHANOL LEVEL SHOULD BE IN THE RANGE OF 1-1.5 MG/ML (DREISBACH, HANDBOOK OF POISONING, 12TH ED.). ANTIDOTE SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.

ORAL OR INTRAVENOUS ADMINISTRATION OF 4-METHYLPYRAZOLE INHIBITS ALCOHOL DEHYDROGENASE AND HAS BEEN USED EFFECTIVELY AS AN ANTIDOTE FOR METHANOL OR ETHYLENE GLYCOL POISONING (ELLENHORN AND BARCELOUX, MEDICAL TOXICOLOGY).

REACTIVITY

REACTIVITY:

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES

INCOMPATIBILITIES:

METHYL ALCOHOL (METHANOL):
ACETYL BROMIDE: VIOLENT REACTION WITH FORMATION OF HYDROGEN BROMIDE.
ALKYLALUMINUM SOLUTIONS: VIOLENT REACTION.
ALUMINUM: CORRODES.
BARIUM PERCHLORATE: DISTILLATION YIELDS HIGHLY EXPLOSIVE ALKYL PERCHLORATE.
BERYLLIUM HYDRIDE: VIOLENT REACTION, EVEN AT -196 C.
BROMINE: VIGOROUSLY EXOTHERMIC REACTION.
CALCIUM CARBIDE: VIOLENT REACTION.
CHLORINE: POSSIBLE IGNITION AND EXPLOSION HAZARD.
CHLOROFORM AND SODIUM HYDROXIDE: EXPLOSIVE REACTION.
CHROMIUM TRIOXIDE (CHROMIC ANHYDRIDE): POSSIBLE IGNITION.
CYANURIC CHLORIDE: VIOLENT REACTION.
DICHLOROMETHANE: POSSIBLE IGNITION AND EXPLOSION.
DIETHYL ZINC: POSSIBLE IGNITION AND EXPLOSION.
HYDROGEN PEROXIDE + WATER: EXPLOSION HAZARD.
IODINE + ETHANOL + MERCURIC OXIDE: EXPLOSION HAZARD.
LEAD: CORRODES.
LEAD PERCHLORATE: EXPLOSION HAZARD.
MAGNESIUM: VIOLENT REACTION.
MAGNESIUM (POWDERED): MIXTURES ARE CAPABLE OF DETONATION.
METALS: INCOMPATIBLE.
NICKEL: POSSIBLE IGNITION IN THE PRESENCE OF NICKEL CATALYST.
NITRIC ACID (CONCENTRATED): MIXTURES OF GREATER THAN 25% ACID MAY DECOMPOSE VIOLENTLY.
OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.
PERCHLORIC ACID: EXPLOSION HAZARD.
PHOSPHOROUS TRIOXIDE: POSSIBLE VIOLENT REACTION AND IGNITION.
PLASTICS, RUBBER, COATINGS: MAY BE ATTACKED.
POTASSIUM: POSSIBLE DANGEROUS REACTION.
POTASSIUM HYDROXIDE + CHLOROFORM: EXOTHERMIC REACTION.
POTASSIUM TERT-BUTOXIDE: FIRE AND EXPLOSION HAZARD.
SODIUM + CHLOROFORM: POSSIBLE EXPLOSION.
SODIUM HYPOCHLORITE: EXPLOSION HAZARD.
SODIUM METHOXIDE + CHLOROFORM: VIOLENT REACTION.
SULFURIC ACID: FIRE AND EXPLOSION HAZARD.
ZINC: EXPLOSION HAZARD.

DECOMPOSITION:

THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF CARBON

POLYMERIZATION:

HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY

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****STORAGE****

STORE IN ACCORDANCE WITH 29 CFR 1910.108.
STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

****DISPOSAL****

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262. EPA HAZARDOUS WASTE NUMBER U154.

CONDITIONS TO AVOID

AVOID CONTACT WITH HEAT, SPARKS, FLAMES OR OTHER IGNITION SOURCES. VAPORS MAY BE EXPLOSIVE. MATERIAL IS POISONOUS. AVOID INHALATION OF VAPORS OR CONTACT WITH SKIN. DO NOT ALLOW MATERIAL TO CONTAMINATE WATER SOURCES.

SPILL AND LEAK PROCEDURES

SOIL SPILL:
DIG HOLDING AREA SUCH AS LAGOON, POND OR PIT FOR CONTAINMENT.

DIKE FLOW OF SPILLED MATERIAL USING SOIL OR SANDBAGS OR FOAMED BARRIERS SUCH AS POLYURETHANE OR CONCRETE.

AIR SPILL:
APPLY WATER SPRAY TO KNOCK DOWN VAPORS.

WATER SPILL:
ALLOW SPILLED MATERIAL TO AERATE.

LIMIT SPILL MOTION AND DISPERSION WITH NATURAL BARRIERS OR OIL SPILL CONTROL BOOMS.

USE SUCTION HOSES TO REMOVE TRAPPED SPILL MATERIAL.

OCCUPATIONAL SPILL:
SHUT OFF IGNITION SOURCES. DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA! KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY.

REPORTABLE QUANTITY (RQ): 5000 POUNDS
THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 434-6802 OR (202) 426-2875 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE GENERAL DILUTION VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.
VENTILATION EQUIPMENT MUST BE EXPLOSION-PROOF.

RESPIRATOR:
THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29 CFR 1910 SUBPART Z.
THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE. MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

METHYL ALCOHOL (METHANOL):

2000 PPM - ANY SUPPLIED-AIR RESPIRATOR.
ANY SELF-CONTAINED BREATHING APPARATUS.

5000 PPM - ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS-FLOW MODE.

10,000 PPM - ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.
ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.
ANY SUPPLIED-AIR RESPIRATOR THAT HAS A TIGHT-FITTING FACEPIECE AND IS OPERATED IN A CONTINUOUS-FLOW MODE.

25,000 PPM - ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE AND OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

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ESCAPE - ANY APPROPRIATE ESCAPE-TYPE, SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES TO PREVENT EYE CONTACT WITH THIS SUBSTANCE.

EMERGENCY EYE WASH: WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - FISHER SCIENTIFIC, INC.
CREATION DATE: 09/25/84 REVISION DATE: 10/12/92

-ADDITIONAL INFORMATION-
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MATERIAL SAFETY DATA SHEET

APPROVED BY U.S. LABOR DEPT. ESSENTIALLY SIMILAR TO FORMS OSHA 20 & 174

NuTECH ENVIRONMENTAL CORP.

5350 N. WASHINGTON ST.
DENVER, CO 80216
PHONE: 800-321-8824
303-295-3702

"For Chemical Emergency
Spill, Leak, Fire, Exposure or Accident
call CHEMTREC- Day or Night
800-424-9300"

TRADE NAME
CHEMICAL NAME & SYNONYMS:
CHEMICAL FAMILY:
FORMULA:

OCA™ 21 COUNTERACTANT

Not Applicable
Not Applicable
Not Applicable

I. PHYSICAL DATA

BOILING POINT	100 °C
SPECIFIC GRAVITY (Water=1)	1.00
POUNDS/GALLON:	8.33
VAPOR PRESSURE (mm of Hg) @ 20°C:	Nil
VAPOR DENSITY (air=1):	N/A
WATER ABSORPTION	Complete
FLASH POINT (TCC) °F	>153
DRY TIME (Ether=1):	LONG
EVAPORATION RATE	not volatile
pH	ranges from 6.0 to 7.0
APPEARANCE:	Light milky color
ODOR:	Aromatic floral bubble gum odor

II. INGREDIENTS

MATERIAL	CAS #	VOL(%)	TLV(PPM)
75224 Surfonic N-95 Surfactant	9016-45-9	2.5%	N/A
DMDM Hydantoin	6440-58-0	0.2%	N/A
Triton X-114 Surfactant	9036-19-15	2.0%	N/A
Natural Essential Oils (proprietary compound)		2.5%	N/A
Inert Ingredients		92.8%	N/A

DOT SHIPPING NAME: None required

III. FIRE & EXPLOSION HAZARDS

LOWER FLAMMABLE LIMIT IN AIR (% by vol): Non flammable

FLASH POINT (TEST METHOD): >153°F (TCC)

EXTINGUISHING MEDIA: Water spray, CO₂, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Wear respirator (pressure-demand, self-contained breathing apparatus, OSHA/NIOSH approved or equivalent) and full protective gear whenever fighting fires involving chemicals.

UNUSUAL EXPLOSION AND FIRE PROCEDURES: None known to NuTech Environmental.

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE:

None established

EFFECTS OF ACUTE EXPOSURE:

INGESTION:	No effects of exposure expected
INHALING:	May cause a sore throat.
SKIN CONTACT:	No effects of exposure due to contact
EYE CONTACT:	Irritating to the eyes upon direct contact.

EMERGENCY & FIRST AID PROCEDURES:

INGESTION:	Dilute by giving 2 glasses of water to drink. Never give anything to an unconscious person. Consult a physician.
INHALING:	Move subject to fresh air.
SKIN CONTACT:	Wash skin affected skin thoroughly with soap and water. Wash clothes before reuse.
EYE CONTACT:	Flush eyes with a large amount of water for at least 15 minutes.

V. REACTIVITY DATA

STABILITY:	Stable
CONDITIONS TO AVOID:	Isolate from oxidizers, heat, sparks, and open flame.
MATERIALS TO AVOID:	Isolate from strong oxidizers such as permanganate or peroxide.
HAZARDOUS DECOMPOSITION PRODUCT:	Carbon Monoxide, Carbon Dioxide or unidentified organic compounds may be formed during combustion.

VI. ENVIRONMENTAL PROTECTION

SPILLS OR LEAK PROCEDURES:	Mop up with absorbent material. Isolate from strong oxidizers, heat, sparks, & open flame.
WASTE DISPOSAL METHOD:	<i>Small:</i> Evaporate until all vapors are gone. Dispose of remainder by legally applicable methods. <i>Large:</i> Recycle
HANDLING & STORAGE PRECAUTIONS	Store in a cool, dry, well ventilated area away from heat. Indoors or outdoors. Keep containers tightly closed and in an upright position.

VII. EMPLOYEE PROTECTION

RESPIRATORY PROTECTION (SPECIFY TYPE):	Normal room ventilation with no special respiratory protection is required for normal operations.
VENTILATION:	LOCAL EXHAUST: Preferable MECHANICAL (GENERAL): Acceptable SPECIAL: None OTHER: None
PROTECTIVE CLOTHING:	None required
EYE PROTECTION:	Protective eye goggles should be worn while handling the chemical concentrate

VIII. SPECIAL PROTECTIONS

None required.

The information on this MSDS was obtained from current and reliable sources. Legal responsibility is assumed only for the fact that all studies reported here & opinions are those of qualified experts. Buyer assumes all risk & liability. He accepts & uses this material on these conditions. He must keep a copy of this MSDS where material is handled.

ATTACHMENT B-4
DRILLING SAFETY GUIDE

Drilling Safety Guide

DRILLING SAFETY GUIDE

The *Drilling Safety Guide* has been prepared through the combined efforts of member delegations of the Diamond Core Drill Manufacturers Association (DCDMA), the National Drilling Contractors Association (NDCA) and the National Water Well Association-Drill Rig/Heavy Equipment Products Group (NWWA) and is published by the International Drilling Federation for the benefit of the drilling industries.

This guide contains suggested safety procedures. It is not intended to set forth any standard industry procedures or requirements. This manual is to be used as a guideline for the safe operation of drilling equipment. IDF, DCDMA, NDCA, NWWA, their officers, and members deny any liability for any injury to people or property that may occur even if these procedures are properly followed. Further, the IDF, DCDMA, NDCA, NWWA, their officers, and members do not accept responsibility for the completeness of the guide or the applicability of the statements or procedures to the use of all drilling machines and tools in all environments. Many aspects of drilling safety cannot be expressed in detail and cannot be met by mechanical means; drilling safety can only be accomplished with the exercise of intelligence, care, and common sense.



INTERNATIONAL DRILLING FEDERATION

DCDMA
The Drilling Equipment
Manufacturers
Association

NDCA
National Drilling
Contractors
Association

CDDA
Canadian Diamond
Drilling
Association



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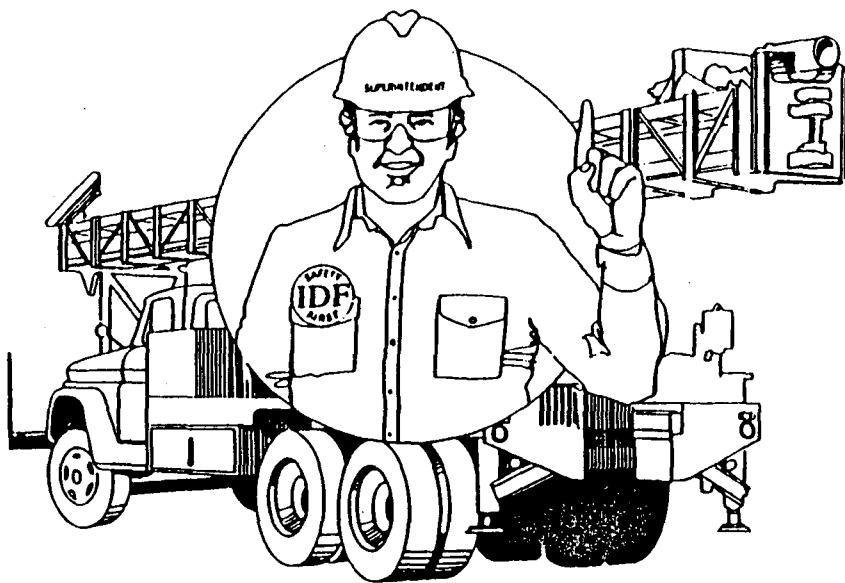
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DRILLING SAFETY GUIDE

1. An Introduction To Drilling Safety

The organization for which you work is interested in your safety. Your employer cares about your safety not only when you are working on or around a drill rig, but also when you are traveling to and from a drilling site, moving the drill rig and tools from location to location on a site, or providing maintenance on a drill rig or drilling tools. This safety guide is for your benefit. Failure to heed the safety procedures contained in this manual could result in serious injury or death.



Every drill crew should have a designated safety supervisor who has the authority to enforce safety on the drilling site. A rig worker's first safety responsibility is to obey the directions of the safety supervisor.

2. Governmental Regulations

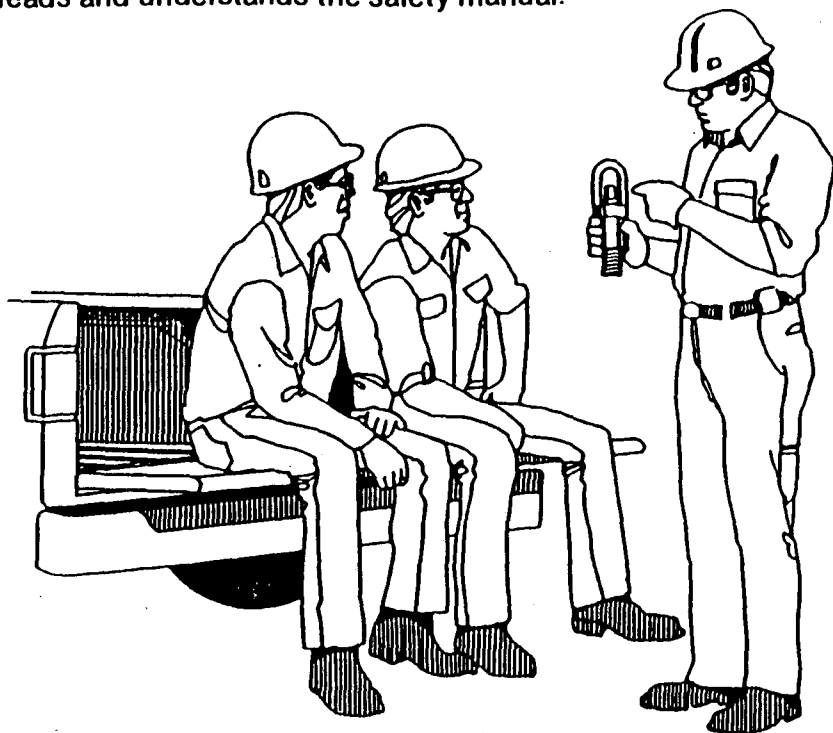
All local, state, and federal regulations or restrictions, currently in effect or effected in the future, take precedence over the recommendations and suggestions which follow. Government regulations will vary from country to country and from state to state.

3. The Safety Supervisor

The safety supervisor for the drill crew will, in most cases, be the drill rig operator. The safety supervisor must:

- Consider the "responsibility" for safety and the "authority" to enforce safety to be a matter of first importance.
- Be the leader in using proper personal safety gear and set an example in following the rules that are being enforced on others.
- Enforce the use of proper personal protective safety equipment and take appropriate corrective action when proper personal protective safety equipment is not being used.
- Understand that proper maintenance of tools and equipment and general "housekeeping" on the drill rig will provide an environment that will promote and enforce safety.
- Before drilling is started with a particular drill, ensure that anyone who operates the drill has had adequate training and is thoroughly familiar with the drill rig, its controls, and its capabilities.
- Inspect the drill rig at least daily for structural damage, loose bolts and nuts, proper tension in chain drives, loose or missing guards or protective covers, fluid leaks, damaged hoses, and/or damaged pressure gauges and pressure relief valves.
- Check and test all safety devices, such as emergency shut-down switches, at least daily and preferably at the start of a drilling shift. Drilling must not be permitted until all emergency shut-down and warning systems are working correctly. Do not allow any emergency device to be bypassed or removed.
- Check that all gauges, warning lights, and control levers are functioning properly and listen for unusual sounds each time an engine is started.
- Ensure that every drill rig worker is informed of safe operat-

ing practices on and around the drill rig. Provide every drill rig worker with a copy of the organization's drilling operations safety manual, and when appropriate, the drill rig manufacturer's operations and maintenance manual. Ensure that every employee reads and understands the safety manual.



- Carefully instruct a new worker in drilling safety and observe the new worker's progress towards understanding safe operating practices.
- Assess the mental, emotional, and physical capability of each worker to perform the assigned work in a proper and safe manner. Remove any worker from the drill site whose mental and physical capabilities might cause injury to the worker or coworkers.
- Ensure that a first-aid kit and a fire extinguisher, which are properly maintained, are on each drill rig and each additional vehicle.
- Be well trained in and capable of using first-aid kits, fire extinguishers, and all other safety devices and equipment. Train crew members.

- Maintain a list of addresses and telephone numbers of emergency assistance units (ambulance services, police, hospitals, etc.) and inform other members of the drill crew of the existence and location of the list.

4. Individual Protective Equipment

For most geotechnical, mineral, and/or groundwater drilling projects, individual protective equipment must include a safety hat, safety shoes, safety glasses, and close-fitting gloves and clothing. The clothing of the individual drill rig worker is not generally considered protective equipment; however, the worker's clothing should be comfortable but must be close fitting, without loose ends, straps, draw strings, bells or otherwise unfastened parts that might catch on some rotating or translating component of the drill rig. Rings and jewelry must not be worn during a work shift.

- **Safety Head Gear.** Safety hats (hard hats) must be worn by everyone working or visiting at or near a drilling site. All safety hats must meet the requirements of ANSI Z89.1. All safety hats must be kept clean and in good repair with the headband and crown straps properly adjusted for the individual drill rig worker or visitor.
- **Safety Shoes or Boots.** Safety shoes or boots must be worn by all drilling personnel and all visitors to the drill site that observe drilling operations within close proximity of the drill rig. All safety shoes or boots must meet the requirements of ANSI Z41.1.
- **Gloves.** All drilling personnel must wear gloves for protection against cuts and abrasions that could occur while handling wire rope or cable and from contact with sharp edges and burrs on drill rods and other drilling or sampling tools. All gloves must be close fitting and not have large cuffs or loose ties that can catch on rotating or translating components of the drill rig.
- **Safety Glasses.** All drilling personnel must wear safety glasses. All safety glasses must meet the requirements of ANSI Z87.1.
- **Other Protective Equipment.** For some drilling operations, the environment or regulations may dictate that other protective equipment be used. The requirement for such equipment must

be determined jointly by the management of the drilling organization and the safety supervisor. Such equipment might include face or ear protection or reflective clothing. Each drill rig worker must wear noise-reducing ear protectors when appropriate.



When drilling is performed in chemically or radiologically contaminated ground, special protective equipment and clothing may, and probably will, be required. The design and composition of the protective equipment and clothing must be determined jointly by the management and the client who requests the drilling services, and under some circumstances, with the concurrence of a health and safety professional.

5. Housekeeping On and Around the Drill Rig

The first requirement for safe field operations is that the safety supervisor understand and fulfill the responsibility for maintenance and "housekeeping" on and around the drill rig. The safety supervisor must:

- Provide suitable storage locations for all tools, materials, and supplies so that these items can be conveniently and safely handled without hitting or falling on a member of the drill crew or a visitor.
- Avoid storing or transporting tools, materials, or supplies within or on the mast (derrick) of the drill rig, unless designed for this purpose.
- Stack pipe, drill rods, casing, augers, and similar drilling tools in orderly fashion on racks or sills to prevent spreading, rolling, or sliding.
- Place penetration or other driving hammers at a safe location on the ground or secure them to prevent movement when not in use.
- Keep work areas, platforms, walkways, scaffolding, and other accessways free of materials, debris, obstructions, and substances such as ice, grease or oil that could cause a surface to become slick or otherwise hazardous.
- Keep all controls, control linkages, warning and operation lights and lenses free of oil, grease, and/or ice.
- Store gasoline only in a non-sparking, red container with a flame arrester in the fill spout and having the word "gasoline" easily visible.

6. Maintenance

Good maintenance will make drilling operations safer. Also, maintenance must be performed safely. The following points are essential to safety:

- Wear safety glasses when performing maintenance on a drill rig or on drilling tools.
- Shut down the drill rig engine to make repairs or adjustments to a drill rig or to lubricate fittings (except repairs or adjustments that can only be made with the engine running). Take precautions to prevent accidental starting of an engine during maintenance by removing or tagging the ignition key.

wiring and equipment.

- Place all lights positioned directly above working areas in cages or similar enclosures to prevent loose or detached lamps or vaportight enclosures from falling on workers.
- Install lights so as to eliminate glare or "blind spots" on tools, ladders, walkways, platforms, and the complete working area.
- Locate and guard electrical cables to prevent damage by drilling operations or by the movement of personnel, tools, or supplies.
- Use only three-prong, U-blade, grounded type plug receptacles and have adequate current carrying capacity for the electrical tools that may be used.
- Use only electrical tools that have three-prong, U-blade, ground wire plugs and cords.
- Do not use electrical tools with lock-on devices.
- Provide adequate grounding for all electrical welders, generators, control panels, and similar devices.
- Provide secure protective enclosures on control panels, fuse boxes, transformers, and similar equipment.
- Avoid attaching electrical lighting cables to the derrick or other components of the drill rig. If this must be done, use only approved fasteners. Do not "string" wire through the derrick.
- Do not use poles used to hold wiring and lights for any other purpose.
- Turn power off before changing fuses or light bulbs.
- Require all workers in a drilling area illuminated with electrical lighting to wear safety head gear that protects the worker's head, not only against falling or flying objects, but also against limited electrical shock and burns according to ANSI Z89.1 and Z89.2.
- Allow only trained, designated personnel to operate electrical equipment.
- Do not permit unqualified field personnel to work on or near electric lines or devices.

13. Contact with Electricity

If a drill rig makes contact with electrical wires, it may or may not be insulated from the ground by the tires of the carrier. Under either circumstance, if the human body simultaneously

comes in contact with the drill rig and the ground, electrocution can result, causing death or serious injury. If a drill rig or a drill rig carrier makes contact with overhead or underground electrical lines:

- Under most circumstances the operator and other personnel on the seat of the vehicle should remain seated and not leave the vehicle. They should not move or touch any part, particularly a metallic part, of the vehicle or the drill rig.
- If it is determined that the drill rig should be vacated, all personnel must jump clear and as far as possible from the drill. Personnel must not step off — but must jump off. Do not hang on to the vehicle or any part of the drill when jumping clear.
- If you are on the ground, stay away from the vehicle and the drill rig; do not allow others to get near the vehicle and the drill rig. Seek assistance immediately from local emergency personnel such as the police or a fire department.
- When an individual is injured and in contact with the drill rig or with power lines, attempt rescue with extreme caution. If a rescue is attempted, use a long, dry, unpainted piece of wood or a long, dry, clean rope. Keep as far away from the victim as possible and do not touch the victim until the victim is completely clear of the drill rig or electrical lines.
- Do not attempt to administer first aid unless the victim is completely clear of the electrical source. Begin cardiopulmonary resuscitation (CPR) immediately if a heart beat (pulse) cannot be detected.

14. Wire Line Hoists, Wire Rope, and Hoisting Hardware

Use wire line hoists, wire rope, and hoisting hardware only as stipulated by the American Iron and Steel Institute *Wire Rope Users Manual*.

- Visually inspect all wire ropes and fittings during use and thoroughly inspect them at least once a week for abrasion, broken wires, wear, reduction in rope diameter, reduction in wire diameter, fatigue, corrosion, damage from heat, improper reeving, jamming, crushing, bird caging, kinking, core protrusion, and/or damage to lifting hardware. Replace wire ropes when inspection indicates excessive damage, as described in the *Wire Rope Users Manual*.

• Thoroughly inspect all wire ropes that have not been used for a period of a month or more.

• Install all connections and end fittings, which consist of spliced eyes and various manufactured devices, according to the manufacturer's specifications. Do not exceed ratings specified by manufacturer.

• If a ball-bearing type hoisting swivel is used to hoist drill rods, inspect and lubricate swivel bearing daily to assure that the swivel freely rotates under load.

• If a rod slipping device is used to hoist drill rods, do not drill through or rotate drill rods through the slipping device; do not hoist more than 1 ft. (0.3 m) of the drill rod column above the top of the mast (derrick); do not hoist a rod column with loose tool joints; and do not make, tighten, or loosen tool joints while the rod column is being supported by a rod slipping device. If drill rods should slip back into the borehole, do not attempt to break the fall of the rods by hand or by tensioning the slipping device.

• Most sheaves on exploration drill rigs are stationary with a single part line. Never increase the number of parts of line without first consulting with the manufacturer of the drill rig.

• Wire ropes must be properly matched with each sheave. If the rope is too large, the sheave will pinch the wire rope. If the rope is too small, it will groove the sheave. Once the sheave is grooved, it will severely pinch and damage larger-sized wire ropes.

The following procedures and precautions must be understood and implemented for use of wire ropes and rigging hardware:

• Use tool handling hoists only for vertical lifting of tools (except when angle hole drilling). Do not use tool handling hoists to pull on objects away from the drill rig; however, drills may be moved using the main hoist of the drill if the wire rope is spooled through proper sheaves according to the manufacturer's recommendations.

• When stuck tools or similar loads cannot be raised with a hoist, disconnect the hoist line and connect the stuck tools directly to the feed mechanism of the drill. Do not use hydraulic leveling jacks for added pull to the hoist line or to the feed mechanism of the drill.

• When attempting to pull out a mired down vehicle or drilling carrier, only use a winch on the front or rear of the vehicle and stay as far as possible away from the wire rope. Do not attempt to use tool hoists to pull out a mired down vehicle or drill rig carrier.

• Apply loads smoothly and steadily to minimize shock loading of a wire rope.

• Avoid sudden loading in cold weather.

• Never use frozen ropes.

• Protect wire rope from sharp corners or edges.

• Replace faulty guides and rollers.

• Replace worn sheaves or worn sheave bearings.

• Replace damaged latches on hooks before using.

• Know the working load of the equipment and tackle being used. Never exceed this limit.

• Periodically inspect and test hoist clutches and brakes.

• Know and do not exceed the rated capacity of mast hooks, rings, links, swivels, shackles, and other lifting aids.

• Always wear gloves when handling wire ropes.

• Do not use hands to guide wire rope on hoist drums.

• Following the installation of a new wire rope, first lift a light load to allow the wire rope to adjust.

• Never conduct any hoisting operations when the weather conditions are such that hazards to personnel, the public, or property are created.

• Never leave a load suspended in the air when the hoist is unattended.

• Keep hands away from hoists, wire rope, hoisting hooks, sheaves, and pinch points while slack is being taken up or when the load is being hoisted.

• Never hoist the load over the head, body, or feet of any personnel.

• Never use a hoist line to "ride" up the mast (derrick) of a drill rig.

• Use replacement wire ropes that conform to the drill rig manufacturer's specifications.

15. Cathead and Rope Hoists

Follow these procedures when using a cathead hoist:

- Keep the cathead clean and free of rust, oil and grease. Rust should be removed from the cathead with a wire brush having a handle.

- Check the cathead periodically, when the engine is not running, for rope wear grooves. If a rope groove forms to a depth greater than 1/8 in. (3 mm), replace the cathead.

- Always use a clean, dry, sound rope. A wet or oily rope may "grab" the cathead and cause drill tools or other items to be rapidly hoisted to the top of the mast.

- Should the rope "grab" the cathead or otherwise become tangled in the drum, release the rope and sound an appropriate alarm for all personnel, including the operator, to rapidly back away and stay clear. If the rope "grabs" the cathead, and tools are hoisted to the sheaves at the top of the mast, the rope will often break, releasing the tools. If the rope does not break, stay clear of the drill rig until the operator cautiously returns to turn off the drill rig engine and appropriate action is taken to release the tools. Keep careful watch on the suspended tools and quickly back away after turning off the engine.

- Always protect the rope from contact with chemicals. Chemicals can cause deterioration of the rope that may not be detected visibly.

- Never wrap the rope from the cathead (or any other rope, wire rope, or cable on the drill rig) around a hand, wrist, arm, foot, ankle, legs, or any other part of the body.

- Always maintain a minimum of 18 inches of clearance between the operating hand and the cathead drum when driving samplers, casing, or other tools with the cathead and rope method. Be aware that the rope advances toward the cathead with each hammer blow as the sampler or other drilling tool advances into the ground.

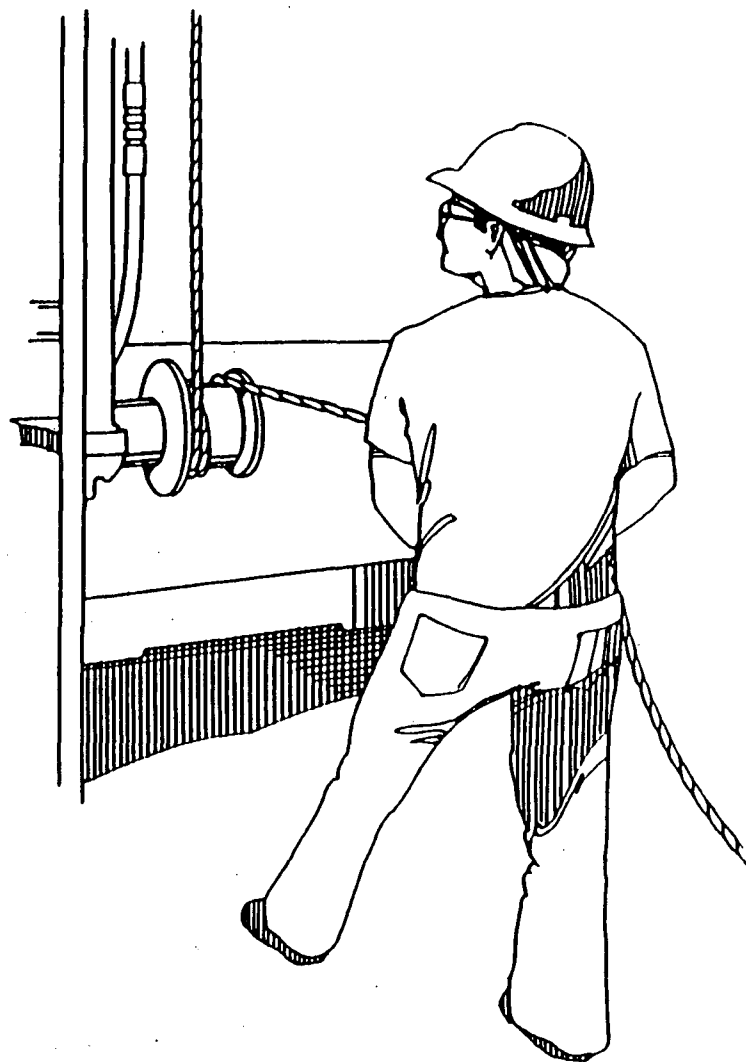
- Never operate a cathead (or perform any other task around a drill rig) with loose, unbuttoned, or otherwise unfastened clothing or when wearing gloves with large cuffs or loose straps or lacing.

- Do not use a rope that is any longer than necessary. A rope that is too long can form a ground loop or otherwise become entangled with the operator's legs.

- Do not use more rope wraps than are required to hoist a load.

- Do not leave a cathead unattended with the rope wrapped on the drum.

- Position all other hoist lines to prevent contact with the operating cathead rope.



- When using the cathead and rope for driving or back-driving, make sure that all threaded connections are tight and stay as far away as possible from the hammer impact point.

- Only operate the cathead standing on a level surface with good, firm footing conditions without distraction or disturbance.

16. Augers

Follow these general procedures when starting a boring with continuous flight or hollow-stem augers:

- Start an auger boring with the drill rig level, the clutch or hydraulic rotation control disengaged, the transmission in low gear, and the engine running at low RPM.
- Apply an adequate amount of down pressure prior to rotation to seat the auger head below the ground surface.
- Look at the auger head while slowly engaging the clutch or rotation control and starting rotation. Stay clear of the auger.
- Slowly rotate the auger and auger head while continuing to apply down pressure. Keep one hand on the clutch or on the rotation control at all times until the auger has penetrated about one foot or more below ground surface.
- If the auger head slides out of alignment, disengage the clutch or hydraulic rotation control and repeat the hole starting process.
- An auger guide can facilitate the starting of a straight hole through hard ground or a pavement.

Establish a system of responsibility for the operator and tool handler to follow during the series of various activities required for auger drilling, such as connecting and disconnecting auger sections, and inserting and removing the auger fork. The operator must ensure that the tool handler is well away from the auger column and that the auger fork is removed before starting rotation. In addition:

- When rotating augers, stay clear of the rotating auger and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason whatever.
- Only use the manufacturer's recommended method of securing the auger to the power coupling. Do not use an over-length pin or bolt. Do not touch the coupling or the auger with hands, a wrench, or any other tools during rotation.
- Whenever possible, use tool hoists to handle auger sections.
- Never place hands or fingers under the bottom of an auger

section when hoisting the auger over the top of the auger section in the ground or other hard surfaces such as the drill rig platform.

- Never allow feet to get under the auger section that is being hoisted.
- Use a long-handed shovel to move auger cuttings away from the auger. Never use hands or feet to move cuttings away from the auger.
- Do not attempt to remove earth from rotating augers. Clean augers only when the drill rig is in neutral and the augers are stopped from rotating.

17. Rotary and Core Drilling

Check rotary drilling tools prior to drilling:

- Lubricate and check for frozen bearings before using water/air swivels and hoisting plugs. Water/air swivel bearings must be free before using, and stay clear of water/air swivel hose when rotating.
- Check drill rod chuck jaws periodically and replace when necessary.
- Check the capacities of hoists and sheaves against the anticipated weight to the drill rod string plus other expected hoisting loads.

During rotary or core drilling, follow these special precautions that involve chucking, joint break, hoisting, and lowering of drill rods:

- Only the operator of the drill rig should be allowed to brake or set a manual chuck so that rotation of the chuck will not occur prior to removing the wrench from the chuck.
- Drill rods should not be braked during lowering into the hole with drill rod chuck jaws.
- Do not lower drill rods into the hole with pipe wrenches.
- If a string of drill rods is accidentally or inadvertently released into the hole, do not attempt to grab the falling rods by hand or with a wrench.
- In the event of a plugged bit or other circulation blockage, relieve the high pressure in the piping and hose between the pump and the obstruction before breaking the first tool joint.

- When drill rods are hoisted from the hole, clean them only with a wiper made of rubber or other suitable material. Do not use hands to clean drilling fluid from drill rods.
- If work must progress above a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. Equip the mud pit with rough surfaced, fitted cover panels of adequate strength to hold drill rig personnel.
- Do not lift or lean unsecured drill rods against the mast. Either provide some method of securing the upper ends of the drill rod sections for safe vertical storage or lay the rods down.

18. Transporting a Drill Rig

When transporting a drill rig on and off a drilling site:

- Allow only licensed individuals to operate the vehicle. Comply with all federal, state, and local regulations.
- Know the traveling height (overhead clearance), width, length, and weight of the drill rig with carrier and know the highway and bridge load, width, and overhead limits. Allow adequate margins and make sure that they are not exceeded.
- Never move a drill rig unless the vehicle brakes are in sound working order.
- Allow for mast overhang when cornering or approaching other vehicles or structures.
- Be aware that the canopies of service stations and motels are often too low for a drill rig mast to clear with the mast in the travel position.
- Watch for low hanging electrical lines, particularly at the entrances to drilling sites, restaurants, motels, or other commercial sites.
- Never travel on a street, road, or highway with the mast (derrick) of the drill rig in the raised or partially raised position.
- Remove all ignition keys when a drill rig is left unattended.

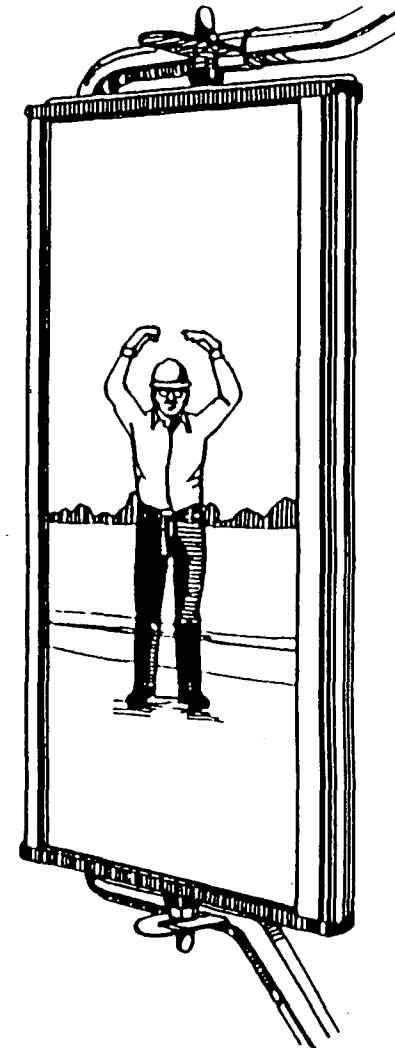
19. Loading and Unloading

When loading or unloading a drill rig on a trailer or a truck:

- Use ramps of adequate design that are solid and substantial enough to bear the weight of the drill rig with carrier —

including tooling.

- Load and unload on level ground.
- Use the assistance of someone on the ground as a guide.
- Check the brakes on the drill rig carrier before approaching loading ramps.



- Distribute the weight on the drill rig, carrier, and tools on the trailer so that the center of weight is approximately on the centerline of the trailer and so that some of the trailer load is transferred

to the hitch of the pulling vehicle. Refer to the trailer manufacturer's weight distribution recommendations.

- Secure the drill rig and tools to the hauling vehicle with ties, chains, and/or load binders of adequate capacity.

20. Off-Road Movement

Follow these procedures during off-road movement:

- Before moving a drill rig, first walk the route of travel, inspecting for depressions, stumps, gulleys, ruts, and similar obstacles.
- Always check the brakes of a drill rig carrier before traveling, particularly on rough, uneven, or hilly ground.
- Check the complete drive train of a carrier at least weekly for loose or damaged bolts, nuts, studs, shafts, and mountings.
- Discharge all passengers before moving a drill rig on rough or hilly terrain.
- Engage the front axle (for 4 x 4, 6 x 6, etc. vehicles or carriers) when traveling off highway on hilly terrain.
- Use caution when traveling side-hill. Conservatively evaluate side-hill capability of drill rigs because the arbitrary addition of drilling tools may raise the center of mass. When possible, travel directly uphill or downhill. Increase tire pressures before traveling in hilly terrain (do not exceed rated tire pressure).
- Attempt to cross obstacles such as small logs and small erosion channels or ditches squarely rather than at an angle.
- Use the assistance of someone on the ground as a guide when lateral or overhead clearance is close.
- Set all brakes and/or locks after the drill has been moved to a new drilling site. When grades are present, block the wheels.
- Never travel off-road with the mast (derrick) of the drill rig in the raised or partially raised position.

21. Tires, Batteries, and Fuel

Check tires on the drill daily for safety and, during extended travel, for loss of air. Maintain air pressures for travel on streets, roads, and highways according to the manufacturer's recommendations. Only repair truck and off-highway tires with the required special tools and follow the recommendations of a tire manufacturer's repair manual.

If tires on all-terrain drills are deflated to reduce ground pressure for movement on soft ground, reinflate the tires to normal pressures before movement on firm or hilly ground or on streets, roads, and highways. Underinflated tires are not stable on firm ground.

During air pressure checks, inspect for:

- Missing or loose wheel lugs.
- Objects wedged between duals or embedded in the tire casing.
- Damaged or poorly fitting rims or rim flanges.
- Abnormal or uneven wear and cuts, breaks, or tears in the casing.

Batteries contain strong acid. Use extreme caution when servicing batteries.

- Service batteries only in a ventilated area and while wearing safety glasses.
- When a battery is removed from a vehicle or service unit, disconnect the battery ground clamp first.
- When installing a battery, connect the battery ground clamp last.
- When charging a battery with a battery charger, turn off the power source to the battery before either connecting or disconnecting charger leads to the battery posts. Loosen cell caps before charging to permit the escape of gas.
- Spilled battery acid can burn skin and should be immediately flushed with lots of water. If battery acid gets into someone's eyes, flush immediately with large amounts of water and see a medical physician at once.
- To avoid battery explosions, keep the cells filled with electrolyte, use a flashlight (not an open flame) to check electrolyte levels and avoid creating sparks around the battery by shorting across a battery terminal. Keep lighted or smoking materials and flames away from batteries.

Take special precautions for handling fuel and refueling the drill rig or carrier.

- Only use the type and quality of fuel recommended by the engine manufacturer.
- Refuel in a well-ventilated area.

- Do not fill fuel tanks while the engine is running. Turn off all electrical switches.

- Do not spill fuel on hot surfaces. Clean any spills before starting an engine.

- Wipe up spilled fuel with cotton rags or cloths; do not use wool or metallic cloth.

- Keep open lights, lighted smoking materials, flames, or sparking equipment well away from the fuelling area.

- Turn off heaters in carrier cabs when refueling the carrier or the drill rig.

- Do not fill portable fuel containers completely full to allow expansion of the fuel during temperature changes.

- Keep the fuel nozzle in contact with the tank being filled to prevent static sparks from igniting the fuel.

- Do not transport portable fuel containers in the vehicle or carrier cab with personnel.

- During travel store fuel containers and hoses so they are in contact with a metal surface. This should prevent the buildup of static charge.

22. First Aid

Train at least one member of the drill crew, and if only one, preferably the drilling and safety supervisor, to perform first aid. First aid must be taught on a person-to-person basis, not by providing or reading a manual. Manuals should only provide continuing reminders and be used for reference. Courses provided or sponsored by the American Red Cross or a similar organization best satisfy the requirements of first aid training for drill crews.

For drilling operations it is particularly important that those responsible for first aid should be able to recognize the symptoms of and be able to provide first aid for electrical shock, heart attack, stroke, broken bones, eye injury, snake bite, and cuts or abrasions to the skin. Again, first aid for these situations is best taught to drill crew members by instructors qualified by an agency such as the American Red Cross.

Keep first aid kit available and well maintained on each drill site.

23. Drill Rig Utilization

Do not attempt to exceed manufacturers' ratings of speed, force, torque, pressure, flow, etc. Only use the drill rig and tools for the purposes for which they are intended and designed.

24. Drill Rig Alterations

Alterations to a drill rig or drilling tools must only be made by qualified personnel and only after consultation with the manufacturer.

APPENDIX C
REFERENCES

REFERENCES

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APPENDIX D
CITIZEN PARTICIPATION PLAN

CITIZEN PARTICIPATION PLAN

FOR THE

NIAGARA MOHAWK POWER CORPORATION

INVESTIGATION AND REMEDIAL PROGRAM

AT THE

**FORMER NORTH ALBANY (BROADWAY) MANUFACTURED GAS PLANT SITE
ALBANY, NEW YORK**

MAY, 1994

PREPARED BY:

**NIAGARA MOHAWK POWER CORPORATION
300 ERIE BOULEVARD WEST
SYRACUSE, NY 13202**

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1.0 INTRODUCTION

Niagara Mohawk Power Corporation (NMPC), the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) are committed to implementing a citizen participation plan as a part of their responsibilities for the former North Albany (Broadway) manufactured gas plant (MGP) site remedial program. NMPC has entered into an Order on Consent with the NYSDEC to investigate and possibly remediate the North Albany MGP site.

At North Albany, implementation of a citizen participation program will promote public understanding of site investigation activities at the former MGP site. It will provide an opportunity for NMPC, the NYSDEC and the NYSDOH to learn, from the public, information that will enable them to develop a comprehensive remedial program which is protective of both public health and the environment.

2.0 BASIC SITE INFORMATION

The North Albany (Broadway) Manufactured Gas Plant (MGP) site is located on 1125 Broadway Street in Albany, Albany County, New York (Figure 2.1). The North Albany site occupies about 25 acres and is covered by numerous buildings, parking lots, and storage areas. The site is bordered by Broadway Street to the west, Interstate I-90 to the north, Conrail to the east, and Bridge Street to the south. The site is currently owned by Niagara Mohawk Power Corporation (NMPC) and utilized as a regional service center (Figure 2.2).

The land use nearby the site is urban/industrial. There are several small factories and businesses around the site and a small railyard to the east. Interstate I-787 and the Hudson River exist beyond the railyard to the east. To the northeast of I-90 is the closed North Albany County landfill.

Several of the storage areas in the southern part of the site are covered with gravel and crushed stone. The site also contains the NMPC eastern region Treatment, Storage, or Disposal (TSD) Facility near the center of the site. The current TSD facility covers less than one-half acre. Building Nos. 3 and 4 on the site were part of the former gas plant structures.

Site History

Prior to the construction of the coal gas plant in 1872, the site was part of the Stephen Van Rensselaer estate and was primarily farmland and residential. Throughout the life of the gas plant, the site was bordered on the west by Broadway. Expansion occurred primarily on the east and south sides of the site.

In 1872, the People's Gas Light Company constructed the first MGP plant at the site. This facility consisted of a coal shed, horizontal purifier house, a gasometer, and an office. The plant was bordered to the north by a depot and stables owned by the Troy and Albany Passenger Railway. An ice house and an unidentified building labeled "Colby and Kelly" were east of and adjacent to the railway.

Original installations were designed to produce quantities estimated to be adequate for anticipated requirements. However, by the 1880's demand exceeded expectations and, it was necessary to consolidate separately-owned operations to develop larger, more efficient production units. Between 1885 and 1888, the Municipal Gas Company of Albany purchased properties of the three gas light companies in the area and integrated their manufacturing plants and distribution systems. In 1892, the Municipal Gas Company added three small gas holders, a lime/oxide house, and a machine shop/storage building on the eastern portion of the property.

In 1907, the Municipal Gas Company had expanded on the south side of the property. A 2,000,000 cubic foot (cu. ft.) gas holder was added to increase storage capacity. Also, a multi-purpose building (carriage house/meter storage, repair shop) was also constructed on the south side. In 1892, the retort house had been converted to water gas with the replacement of Williamson gas sets. To the north was United Traction, a company specializing in production of electricity for the trolley service, was located where the Troy and Albany Passenger Railway once operated. To the south adjacent to Bridge Street was Hart and Fleet Planning Mill and the Hudson Valley Ice Company.

In 1924, a new 3,000,000 cu. ft. gas holder was installed at the Municipal Gas Plant, which further increased the total storage capacity to 5,000,000 cu. ft. In 1925, gas was supplied from the Water Street gas plant in Troy, New York.

In 1927, the Municipal Gas Company was acquired by New York Power and Light (NYP&L) and, additional expansion and renovations were conducted at the site. By 1931, the property had expanded to the south through various deed acquisitions. Also, between 1930 to 1940, the 250,000 cu. ft. gas holder and retort house were torn down. An educational building was constructed, and two additional purifying tanks were added on the south end of the purifying house. In 1931, a service building was also erected on-site. This building housed the maintenance operations and had the storage capacity for eighty cars.

In the 1930's, the NYP&L purchased several properties from Albany Lumber and Planning Co., Hudson Valley Ice Co., D&H Railroad, Paradise Oil Co., and Beacon Oil Company. These acquisitions extended the southern boundary of the property to Bridge Street. One property on Broadway was used by Standard Oil as a gas station.

In the 1950's, NYP&L became part of NMPC which continued to operate the site as a regional service center for gas and electric operations. Several new buildings were added to the northeast and southwest parts of the site. A PCB storage facility was located at Building No. 1.

In the 1980's, the regional NMPC hazardous waste treatment, storage and disposal (TSD) facility was added to the North Albany site.

The site is not listed on the New York State Registry of Inactive Hazardous Waste Sites. The MGP waste materials at the site are not currently considered to be hazardous wastes by the NYSDEC.

3.0 PROJECT DESCRIPTION

The overall objective of the present program is to investigate areas at the North Albany site that contain MGP by-products or other substances associated with NMPC or predecessor operations. This program is subject to a NYSDEC Order on Consent to investigate and possibly remediate the former North Albany MPG site and 20 other MGP sites.

There have been previous studies at the former MGP site by NMPC. The planning for the next phase of investigation, the Preliminary Site Assessment and Interim Remedial Measure Study is underway.

Preliminary Site Assessments and Interim Remedial Measure Studies (PSA/IRM)

This preliminary site investigation is planned during the summer of 1994.

The site investigation will include a site history, a field survey and mapping, a field investigation program for sampling of soil and water, laboratory analyses, and an engineering evaluation of Interim Remedial Measures (IRM) for the removal and/or control of waste sources that present an imminent threat to human health and/or the environment.

The goal of the investigation at the North Albany MGP site is:

- gathering of data to enable NMPC and the NYSDEC to characterize the by-products and substances which may be present at the site.
- determine if such by-products or substances constitute a significant threat to public health or the environment.
- determine if IRMs are necessary and appropriate.

- focus the extent the scope of work of subsequent Remedial Investigation/Feasibility Studies, if deemed necessary.
- present the PSA results in a report which clearly characterizes the site, defines the extent of MGP by-products, and recommends future investigative or design activities.

4.0 IDENTIFICATION OF INTERESTED PARTIES

The project contact list (Table 4-1) will be used to inform interested parties of key milestones in the program. It is made up of elected officials, people and organizations directly affected by the remedial program, and representatives of the local media.

The list will be updated in a timely manner, based on expressions of interest at public meetings or written requests for inclusion.

The mailing list used for mailing reports, as required in the NYSDEC Order on Consent, is listed on Table 4-2.

Table 4-1

CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May 1994)

LOCAL GOVERNMENT:

Gerald D. Jennings, Mayor
Office of the Mayor
City Hall
24 Eagle Street
Albany, NY 12207
(518) 434-5100

City Council Members
District 2, Ward 4
Sarah Curry-Cobb, Alderman 4th Ward
City Hall
24 Eagle Street
Albany, NY 12207
(518) 434-5090
or
79A Lawn Avenue
Albany, NY 12204
(518) 463-8864

Joseph McElroy, District 2 Representative
41 Lindberg Avenue
Albany, NY 12204
(518) 462-0204

Other Members:
Carol S. Wallace
Keith C. St. John
Michael L. Brown
Shirley Foskey
Sharon C. Ward
Shawn M. Morris
David Torncello, III

Table 4-1

CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May 1994)

Thomas P. Nitidio
James R. Scalzo, Jr.
Michael J. Hall
Philip DiPace
Robert Van Amburgh
Harold H. Greenstein
Nicholas J. Colluccio

Pamela Primomo Alley
City Clerk
City Hall, Room 202
24 Eagle Street
Albany, NY 12207
(518) 434-5090

Willard A. Bruce
Director of City Planning
City Hall
24 Eagle Street
Albany, NY 12207
(518) 434-5190

Isaac Brown
City Engineer
City Hall
24 Eagle Street
Albany, NY 12207
(518) 434-5143

Table 4-1

CITY OF ALBANY

ALBANY COUNTY, NEW YORK

CONTACT LIST (May 1994)

Michael Haydock
Commissioner of Code Enforcement
City Hall
24 Eagle Street
Albany, NY 12207
(518) 434-5165

Joseph Pennisi
Director of Community Development
City Hall
24 Eagle Street
Albany, Ny 12207
(518) 436-4663

Vincent J. McArdle, Jr.
Corporation Counsel
City Hall
24 Eagle Street
Albany, NY 12207
(518) 434-5050

Tom Kelley
Superintendent of Streets
1 Conners Boulevard
Albany, NY 12203
(518) 432-1144

John A. Dale
Chief of Police
Public Safety Building
26 Broad Street
Albany, NY 12202
(518) 462-8013

Table 4-1

CITY OF ALBANY
ALBANY COUNTY, NEW YORK

CONTACT LIST (May 1994)

James W. Larson
Chief of Fire Department
Public Safety Building
26 Broad Street
Albany, NY 12202
(518) 447-7879

COUNTY GOVERNMENT: Michael J. Hoblock, Jr.
County Executive
112 State Street
Albany, NY 12207
(518) 447-7040

Harold L. Joyce
Chairman
Albany County Legislature
112 State Street
Albany, NY 12207
(518) 447-7168

Michael F. Connors II
County Legislator (District 4)
Room 920
112 State Street
Albany, NY 12207
(518) 447-7168

or
150 Shaker Park Drive
Albany, NY 12211
(518) 237-8000

Table 4-1 (Cont'd)
CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May, 1994)

Thomas Clingan
County Clerk
County Court House
Albany, NY 12207
(518) 487-5100

Lawrence E. Smith
Director of Planning
112 State Street, Room 1006
Albany, NY 12207
(518) 447-5660

Stephen Lukowski
Director, Environmental Health
175 Green Street
Albany, NY 12201
(518) 447-4620

Sue Tatro
County Attorney
112 State Street
Albany, Ny 12207
(518) 447-7110

Richard Rapp
Commissioner of Engineering and Public Works
175 Green Street
Albany, NY 12201
(518) 765-4829

Table 4-1 (Cont'd)
CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May, 1994)

Terrance Ryan
Fire Coordinator
Civil Defense
Morton Avenue & Broad Street
Albany, NY 12202
(518) 447-7865

William J. O'Connor, Director
Albany Public Library
161 Washington Avenue
Albany, NY 12210
(518) 449-3380

STATE GOVERNMENT:

Senator Hugh Farley
Room 412
Legislative Office Building
Albany, Ny 12248
(518) 455-2181

Assemblyman Ronald J. Canestrari
106th Assembly District
Room 731
Legislative Office Building
Albany, Ny 12248
(518) 455-4474
and
207 Simmons Avenue
Cohoes, NY 12047

Table 4-1 (Cont'd)

CITY OF ALBANY

ALBANY COUNTY, NEW YORK

CONTACT LIST (May, 1994)

Jeffrey Lacey, Esq., Director
NYS Department of Environmental Conservation
Division of Environmental Enforcement
50 Wolf Road
Albany, NY 12233
(518) 457-4348

Michael J. O'Toole, Jr., Director
NYS Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, NY 12233
(518) 457-5861

Dr. G. Anders Carlson, Director
NYS Department of Health
Bureau of Environmental Exposure
Investigation
2 University Place
Albany, Ny 12203
(518) 458-6310

Darwin Roosa
Regional Citizen Participation Specialist
NYSDEC Region 4 Headquarters
1150 North Westcott Road
Schenectady, NY 12306
(518) 357-2048

Table 4-1 (Cont'd)
CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May, 1994)

Eric Hamilton
Regional Hazardous Waste Remediation Engineer
NYSDEC Region 4 Headquarters
1150 North Westcott Road
Schenectady, NY 12306
(518) 357-2045

Fred Sievers
Regional Water Engineer
NYS Department of Environmental Conservation
NYSDEC Region 4 Headquarters
1150 North Westcott Road
Schenectady, NY 12306
(518) 357-2045

James Van Hoesen, P.E.
Chief Western Field Services Section
Bureau of Construction Services
NYS Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road
Albany, NY 12233-7010
(518) 457-9280

Mr. Sevugan Chetty, P.E.
Supervisor, Region 4 Section
Div. of Hazardous Substances Regulation
NYS Dept. of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7252

Table 4-1 (Cont'd)
CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May, 1994)

Bruce Bentley
Citizen Participation Specialist
Office of Public Affairs
NYS Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010
(518) 457-0849

Susan Van Patten
NYS Department of Health
Health Liaison Program
2 University Place
Room 240
Albany, NY 12203
(518) 458-6402 or 1-800-1158 ext. 402

FEDERAL GOVERNMENT: Senator Alphonse D'Amato
420 Leo O'Brien Office Building
Albany, NY 12207
(518) 472-4343

520 Hart Senate Office Building
Washington, DC 20510
(202) 224-6542

Senator Daniel P. Moynihan
405 Lexington Avenue, Suite 4101
New York, NY 10017
(212) 661-5150

464 Russell Senate Office Building
Washington, DC 20510
(202) 224-4451

Table 4-1 (Cont'd)

CITY OF ALBANY

ALBANY COUNTY, NEW YORK

CONTACT LIST (May, 1994)

Mr. Melvin Hauptman
U. S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278
(212) 264-2515

Congressman Michael McNulty
86 West Street
Green Island, NY 12183
(518) 374-4547

PRIVATE ORGANIZATIONS:

Laura Bierman
Attn. Natural Resources
League of Women Voters
60 Wisconsin Avenue
Delmar, NY 12054
(518) 439-7397

Kate Reilly
Executive Director
Environmental Clearinghouse
2851 Aqueduct Road
Niskayuna, NY 12309
(518) 370-4125

John Stauffer
Sierra Club - Atlantic Chapter
353 Hamilton Street
Albany, NY 12201
(518) 426-9144

Table 4-1 (Cont'd)
CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May, 1994)

Anne Rabe
Citizens Environmental Coalition
33 Central Avenue
Albany, NY 12210

Bob Briggs
Adirondack Mountain Club
16 North Grandview Terrace
Voorheesville, NY 12186
(518) 765-3117

MEDIA:

Local Newspapers

Times Union
645 Albany Shaker Road
Colonie, NY 12201
(518) 454-5441

The Daily Gazette
P.O. Box 1090
Schenectady, NY 12301

Local Television

WRGB-Channel 6
1400 Balltown Road
Schenectady, NY 12201
(518) 381-4988; FAX (518) 346-6249

Table 4-1 (Cont'd)
CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May, 1994)

WTEN-Channel 10
341 Northern Boulevard
Albany, NY 12204
(518) 436-4822

WNYT-TV Channel 13
15 North Pearl Street
Menands, NY 12204
(518) 463-8477

Channel 17
P.O. Box 17
Schenectady, NY 12301
(518) 356-1700

Channel 23
WXXA-TV
815 Central Ave.
Albany, NY 12206
(518) 438-8700

Local Radio

WGY-News
1410 Balltown Road
Schenectady, NY 12309
(518) 381-4848

WTRY
1054 Troy/Sch'dy Road
Latham, NY 12119
(518) 785-9061

Table 4-1 (Cont'd)
CITY OF ALBANY
ALBANY COUNTY, NEW YORK
CONTACT LIST (May, 1994)

WPYX
1054 Troy/Sch'dy Road
Latham, NY 12119
(518) 785-9061

WROW
341 Northern Boulevard
Albany, NY 12204
(518) 436-4841

WQBK
Box 1300 Smultz Road
Glenmont, NY 12201
(518) 462-5555

WGNA
Box 1069
Albany, NY 12201
(518) 283-4900

WFLY
4243 Albany Street
Colonie, NY 12205
(518) 456-1540

WCDC
1400 Washington Avenue
Albany, NY
(518) 442-5262

Table 4-1 (Cont'd)

CITY OF ALBANY

ALBANY COUNTY, NEW YORK

CONTACT LIST (May, 1994)

WAMC
Box 66600
Albany, NY 12206-6600
(518) 465-5233

WABY
P.O. Box 12521
Albany, NY 12212
(518) 456-4507

WCDA
Chris Benoit, News Director
222 Star Plaza East
2050 Western Avenue
Albany, NY 12212
(518) 456-9600

WPTR
4243 Albany Street
Colonie, NY 12205
(518) 456-1540

SITE AND/OR ADJACENT PROPERTY OWNERS:

Dave Hoadley
Delaware and Hudson Railway
200 Clifton Corp. Park, P.O. Box 8002
Clifton Park, NY 12065

Joseph DiFabio, Resident Engineer
New York State Dept. of Transportation
Box 31
Rensselaer, NY 12144

Table 4-2

NORTH ALBANY MAILING LIST

<u>Party</u>	<u>No. of Copies</u>
John Spellman, P.E. Bureau of Construction Services Division of Hazardous Waste Remediation New York Department of Environmental Conservation 50 Wolf Road Albany, New York 12233-7010	6 copies (1 unbound)
Mr. James Van Hoesen, P.E. Chief Western Field Services Section Bureau of Construction Services Division of Hazardous Waste Remediation New York Department of Environmental Conservation 50 Wolf Road Albany, New York 12233-7010	1 copy
G. Anders Carlson, Director Bureau of Environmental Exposure Investigation New York State Department of Health 2 University Place Albany, New York 12203	2 copies
Eric Hamilton, P.E. Regional Hazardous Waste Engineer Region 4 New York State Department of Environmental Conservation 1150 North Westcott Road Schenectady, NY 12306-4498	1 copy
Charles E. Sullivan, Jr. Division of Environmental Enforcement New York State Department of Environmental Conservation 50 Wolf Road, Room 609 Albany, New York 12233-5500	1 copy

5.0 PROJECT CONTACT PERSONS

Niagara Mohawk Power Corp.: Mr. William Jones
Project Manager - Environmental Affairs
Niagara Mohawk Power Corp.
300 Erie Boulevard West
Syracuse, New York 13202
Phone: (315) 428-5690

Mr. Steve Schaefer
Media Relations Coordinator
Niagara Mohawk Power Corp.
300 Erie Boulevard West
Syracuse, New York 13202
Phone: (315) 428-6786

New York State Department of
Environmental Conservation Mr. John Spellman, P.E.
Project Manager
NYSDEC - 50 Wolf Road
Albany, New York 12233
Phone: (518) 457-0927

NYSDEC Hazardous Waste Toll-Free Information Number: (800) 342-9296

New York State Department of Health, Environmental Health Information Line,
1-800-458-1158, Extension 402. The NYSDOH toll free number transfers calls
between 8:00 a.m. and 4:30 p.m. on business days. After hours leave a message.
Touchtone callers can ask for a list of topics.

6.0 DOCUMENT REPOSITORY

Project documents may be reviewed at the following locations:

William J. O'Connor, Director
Albany Public Library
161 Washington Street
Albany, NY 12210
(518) 449-3380
Open Monday thru Thursday 9 a.m.-9 p.m.,
Friday 9 a.m.-6 p.m.
Saturday 9:00 a.m.-5 p.m., Sunday 1 p.m.-5 p.m.

NYSDEC
Region 4
1150 Westcott Road
Schenectady, New York 12306
(518) 357-2234
Open Monday-Friday 8:30 a.m. to 4:30 p.m.

7.0 CITIZEN PARTICIPATION ACTIVITIES

OBJECTIVES

- * Identify individuals and groups (audiences) who may have an interest in the site and the planned additional investigation activities
- * Identify and develop appropriate channels of communication for these audiences
- * Provide interested and affected parties with information about the site and planned investigation, as well as the associated risks and future plans, to the extent these are known
- * Create a dialogue between NMPC and the public that seeks to identify and address issues and concerns
- * Identify and communicate those areas where interested and affected parties can provide input to the project as well as the manner in which this input will be utilized
- * Build trust and credibility among participants and in the citizen participation process
- * Evaluate and act upon feedback to achieve continuous process improvement

PUBLIC PARTICIPATION ACTIVITIES DURING SITE INVESTIGATION TO ACHIEVE OBJECTIVES:

- 1) Meetings with local elected and other governmental officials and immediate neighbors prior to announcement of site investigation activity and after results of the investigation have been received to review project details and time lines. Fact

- 2) Meet with present employees of the NMPC North Albany Broadway Service Center area before investigation commences. The group will assist with identification of public concerns regarding the site and the investigation process. The need for additional members and future meetings will be determined based on input from the group.
- 3) If the primary governmental representative (e.g. the Mayor) feels it is appropriate and necessary, meet with a small (less than ten member) focus group that represents neighborhood, local government, and environmental and other interests before investigation commences. The group will assist with identification of public concerns regarding the site and the investigation process. The need for additional members and future meetings will be determined based on input from the group.
- 4) Preparation of fact sheets covering, in easily understandable language, such issues as:
 - a) past history of the site
 - b) nature and reason for investigation activities to be performed during the summer of 1994
 - c) potential health and environmental issues associated with MGP by-products and the risks associated with the site
 - d) background information on MGP by-products
 - e) project time line, including when results will be known and decisions on further activities will be made
 - f) results of the investigation (to be prepared after studies have been completed)

The fact sheet will be issued prior to the start of the investigation and after the results are received and future actions for the site are determined.

- 6) Presentations by NMPC representatives to any groups wishing to learn more about the project.
- 7) Press releases will be issued prior to the start of investigation and/or interim remedial activities and after results of the investigation are known.
- 8) Amplification of the Albany County Public Library document repository with additional informational materials that describe the site history, the coal gasification process, coal gasification site remediation possibilities, compounds associated with coal tar by-products, and determination and interpretation of risks to the environment and human health.
- 9) Evaluation of the citizen participation process through survey of focus group members, surrounding land owners, and public officials.

- 10) The NYSDEC and NYSDOH staff will be informed of all meetings and be given the opportunity to attend.

TABLE 7-1

**SCHEDULE OF PUBLIC PARTICIPATION ACTIVITIES
NORTH ALBANY BROADWAY MGP SITE**

Following the NYSDEC approval of the Work Plan the following activities will take place:

- A copy of the Final Work Plan will be sent to the NYSDEC Regional Office and the Albany Public Library.
- A Fact Sheet will be prepared outlining background information, planned field activities and general MGP information.
- The fact sheet will be sent to on-site NMPC employees and the contact list.
- A press release will be sent out containing background information, planned activities and a contact person.
- An informational meeting NMPC on-site employees.
- A meeting with local officials.
- A focus group meeting, if recommended by local officials.

Following the submission of the draft PSA/IRM report to NYSDEC the following activities will take place:

- A copy of the draft PSA/IRM report will be sent to the NYSDEC Regional Office and the Albany Public Library.
- A Fact Sheet will be prepared summarizing the field activities, results of the investigation and any planned IRMs.
- The Fact Sheet will be sent to the on-site NMPC employees and the Contact List.
- A press release will be sent out containing the results of the field investigation, planned followup activities and a contact person.
- An informational meeting with NMPC on-site employees.
- A meeting with local officials.

- A focus group meeting to present the results of investigation and any planned IRMs. This meeting would be held if recommended by local officials at the beginning of the project.

8.0 DEFINITION OF COMMONLY USED CITIZEN PARTICIPATION TERMS

Availability Session - Scheduled gathering of the NYSDEC staff, NMPC representatives and the public in a setting less formal than a public meeting. Encourages "one-to-one" discussion in which the public meets with staff on an individual or small group basis to discuss particular questions or concerns.

Citizen Participation - A process to inform and involve the interested/affected public in the decision-making process during identification, assessment and remediation of inactive hazardous waste sites. This process helps to assure that the best decisions are made from environmental, human health, economic, social and political perspectives.

Citizen Participation Plan - A document that describes the site-specific citizen participation activities that will take place to complement the "technical" (remedial) activities. It also provides site background and rationale for the selected citizen participation program for the site. A plan may be updated or altered as public interest or the technical aspects of the program change.

Citizen Participation Specialist - A staff member within the Office of Public Affairs who provides guidance, evaluation and assistance to help the Project Manager carry out his/her site-specific Citizen Participation program.

Consent Order - A legal and enforceable negotiated agreement between the NYSDEC and responsible parties where responsible parties agree to undertake investigation and cleanup or pay for the costs of investigation and cleanup work at a site. The order includes a description of the remedial actions to be undertaken at the site and a schedule for implementation.

Construction - NMPC selects contractors and supervises construction work to carry out the designed remedial alternative. Construction may be as straightforward as excavation of contaminated soil with disposal at a permitted hazardous waste facility. On the other hand, it may involve drum sampling and identification, complete encapsulation, leachate collection, storage and treatment, ground water management, or other technologies. Construction costs may vary from several thousand dollars to many millions of dollars depending on the site of the site, the soil, ground water and other conditions, and the nature of the wastes.

Contact List - Names, addresses and/or telephone numbers of individuals, groups, organizations and media interested and/or affected by a particular hazardous waste site compiled and updated by NMPC. Interest in the site, stage of remediation and other factors guide how comprehensive the list becomes. Used to assist NMPC to inform and involve the interested/affected public.

Contract - A legal document signed by a contractor and NMPC to carry out specific site remediation activities.

Contractor - A person or firm hired to furnish materials or perform services, especially in construction projects.

Delisting - Removal of a site from the state Registry based on study which shows the site does not contain hazardous wastes.

Document Repository - Typically a regional NYSDEC office and/or public building, such as a library, near a particular site, at which documents related to remedial and citizen participation activities at the site are available for public review. Provides access to documents at times and a location convenient to the public. Environmental Management Councils (EMCs), Conservation Advisory Committees (CACs) as well as active local groups often can serve as supplemental document repositories.

Feasibility Study (FS) - A process for developing, evaluating and selecting remedial actions, using data gathered during the remedial investigation to: define the objectives of the remedial program for the site and broadly develop remedial action alternatives; perform an initial screening of these alternatives; and perform a detailed analysis of a limited number of alternatives which remain after the initial screening stage.

Information Sheet - A written discussion of a site's remedial process, or some part of it, prepared by NMPC of the public in easily understandable language. May be prepared for the "general" public or a particular segment. Uses may include, for example: discussion of an element of the remedial program, opportunities for public involvement, availability of a report or other information, or announcement of a public meeting. May be mailed to all or part of the interested public, distributed at meetings and availability sessions or sent on an "as requested" basis.

Monitoring/Maintenance - Denotes post-closure activities to insure continued effectiveness of the remedial actions. Typical monitoring/maintenance activities include quarterly inspection by an engineering technician; measurement of level of water in monitoring wells; or collection of ground water and surface water samples and analysis of factors showing the condition of water, present of toxic substances, or other indicators of possible pollution from the site. Monitoring/maintenance may be required indefinitely at many sites.

Phase I Site Investigation - Preliminary characterization of hazardous substances present at as site; estimates pathways by which pollutants might be migrating away from the original site of disposal; identifies population or resources which might be affected by pollutants from a site; observes how the disposal area was used or operated; and gather information regarding who might be responsible for wastes at a site. Involves a search of records from all agencies known to be involved with a site, interviews the site owners, employees and local residents

to gather pertinent information about a site. Information gathered is summarized in a Phase I report.

After a Phase I investigation, DEC may choose to initiate an emergency response; to nominate the site for the National Priorities List; or, where additional information is needed to determine the significance, to conduct further (Phase II) investigation.

Phase II Site Investigation - Ordered by DEC when additional information is still needed after completion of Phase I to properly classify the site. A Phase II investigation is not sufficiently detailed to determine the full extent of the contamination, to evaluate remedial alternatives, or to prepare a conceptual design for construction. Information gathered is summarized in a Phase II report and is used to arrive at a final hazard ranking score and the classify the site.

Project Manager - A staff member with responsibility for the day-to-day administration of activities, and ultimate disposition of, one or more hazardous waste sites. The Project Manager works with Public Affairs as well as fiscal and legal staff to accomplish site-related goals and objectives.

Public - The universe of individuals, groups and organization: a) affected (or potentially affected) by an inactive hazardous site and/or its remedial program; b) interested in the site and/or its remediation; c) having information about the site and its history.

Public Informational Meeting - A scheduled gathering of the NMPC, NYSDEC staff and the public to give and receive information, ask questions and discuss concerns. May take one of the following forms: large-group meeting called by NMPC; participation by NMPC at a meeting sponsored by another organization such as town board or Department of Health; working group of workshop; tour of the hazardous waste site.

Public Notice - A written or verbal information technique for telling people about an important part of a site's remedial program coming up soon (examples: announcement that the report for the PSA/IRM is publicly available; a public meeting has been scheduled).

The public notice may be formal and meet legal requirements (for example: what it must say, such as announcing beginning of a public comment period; where, when and how it is published).

Another kind of public notice may be more informal and may not be legally required (examples: paid newspaper advertisement; telephone calls to key citizen leaders; targeted mailings).

Ranking System - The United States Environmental Protection Agency uses a hazard ranking system (HRS) to assign numerical scores to each inactive hazardous waste site. The scores express the relative risk or danger from the site.

Remedial Design - Once a remedial action has been selected, technical drawings and specifications for remedial construction at a site are developed, as specified in the final RI/FS report. Design documents are used to bid and construct the chosen remedial actions. Remedial design is prepared by consulting engineers with experience in inactive hazardous waste disposal site remedial actions.

Remedial Investigation (RI) - A process to determine the nature and extent of contamination by collecting data and analyzing the site. It includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for, and proposed extent of, a remedial program for the site.

Responsible Parties - Individuals, companies (e.g. site owners, operators, transporters or generators of hazardous waste) responsible for or contributing to the contamination problems at a hazardous waste site. PRP is a potentially responsible party.

Responsiveness Summary - A formal or informal written or verbal summary and response by the Department to public questions and comments. Prepared during or after important elements in a site's remedial program. The responsiveness summary may list and respond to each question, or summarize and respond to questions in categories.

Site Classification - The Department assigns sites to classifications established by state law, as follows:

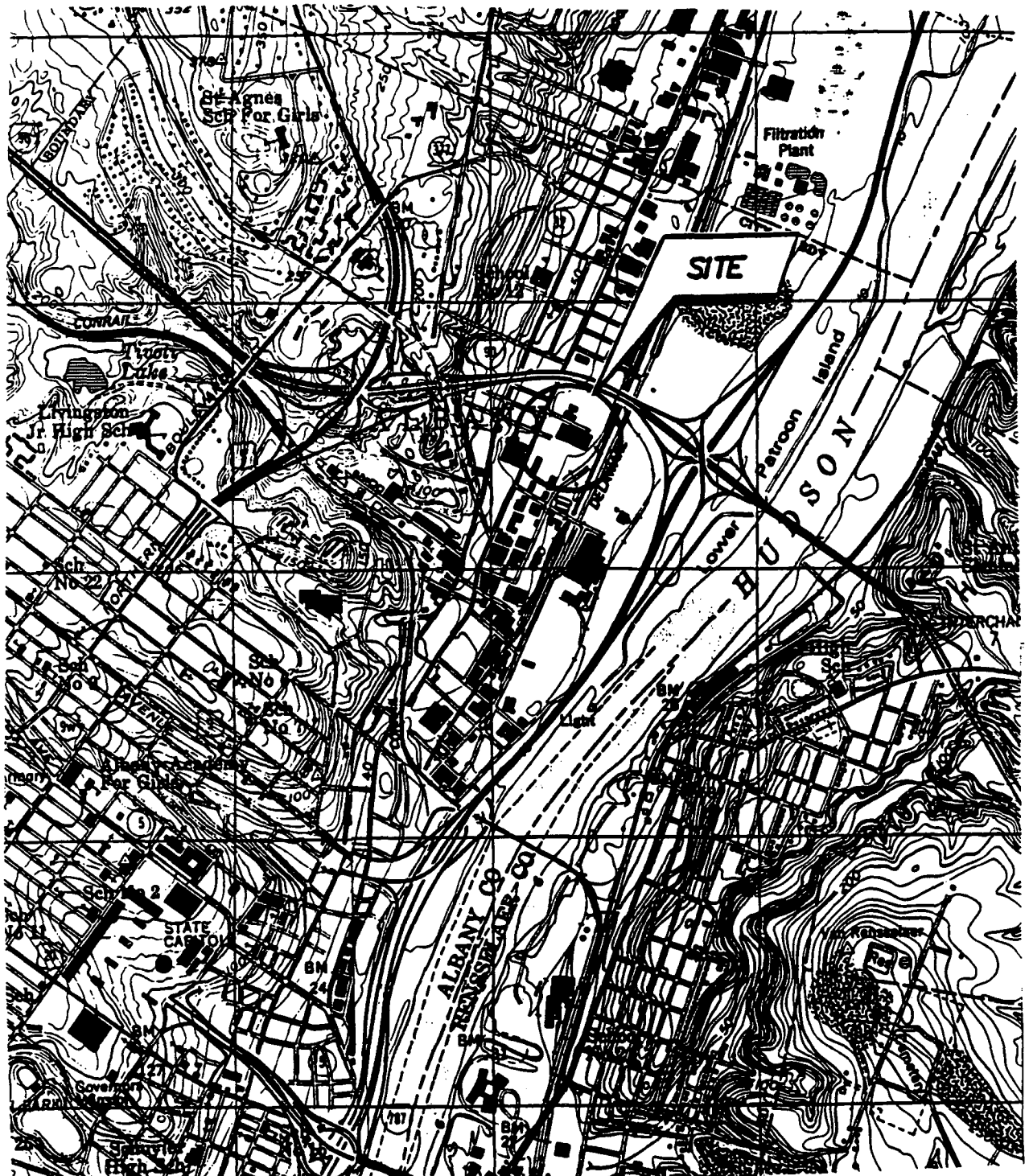
- Classification 1 - A site causing or presenting an imminent danger of causing irreversible or irreparable damage to the public health or environment - immediate action required.
- Classification 2 - A site posing a significant threat to the public health or environment - action required.
- Classification 2a - A temporary classification for a site known or suspected to contain hazardous waste. Most likely the site will require a Phase I and Phase II investigation to obtain more information. Based on the results, the site would be reclassified or removed from the State Registry if found not to contain hazardous wastes.
- Classification 3 - A site which has hazardous waste confirmed, but not a significant threat to the public health or environment - action may be deferred.
- Classification 4 - A site which has been properly closed - requires continued management.
- Classification 5 - A site which has been properly closed, with no evidence or present or potential impact - no further action required.

State-Lead Site - An inactive hazardous waste site at which the Department has responsibility for investigating problems at the site and for developing and implementing the site's remedial program. The Department uses money available from the State Superfund and the Environmental Quality Bond Act of 1986 to pay for these activities. The Department has direct control and responsibility for the remedial program.

Toll-Free "800" Telephone Information Number - Provides cost-free access to the Department by members of the public who have questions, concerns or information about a particular hazardous waste site. Calls are taken and recorded 24 hours a day and a Department staff member contacts the caller as soon as possible (usually the same day).

**FIGURE 2-1
SITE LOCATION MAP**

Site Location Map



SCALE 1:24 000

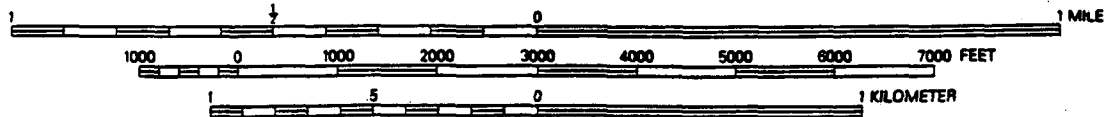


FIGURE 2-2
NORTH ALBANY MGP

FIGURE 2-2



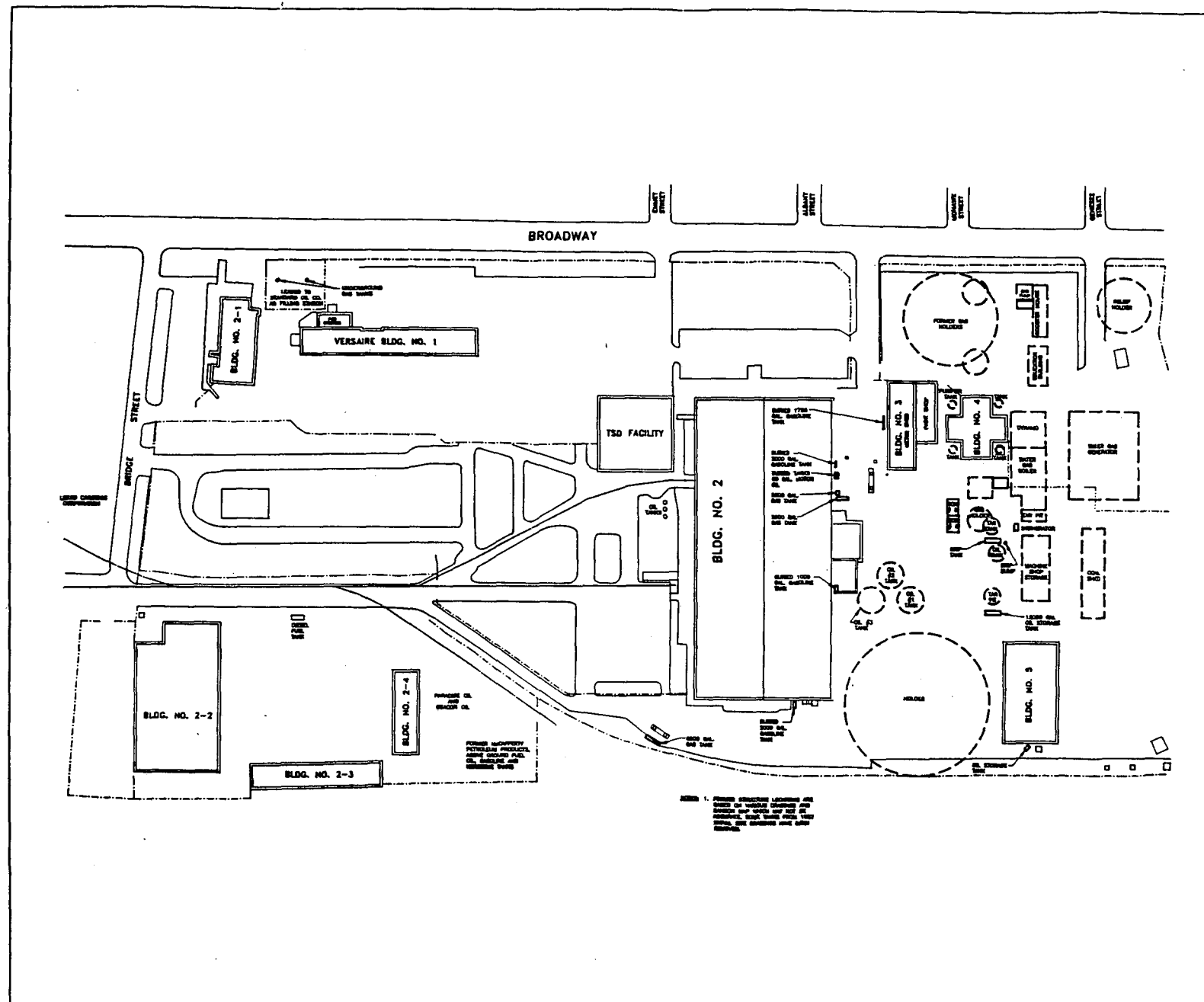
LEGEND

--- FENCE (DASHED)
--- BUILDING (DASHED)
--- FENCE (DASHED)

0 50 100
Scale in Feet

NIAGARA MOHAWK
NORTH ALBANY BUILDING
ALBANY, NEW YORK
SITE PLAN

FILE NO. 1118.074



APPENDIX E

CULTURAL RESOURCES AND MANAGEMENT PLAN



Collamer & Associates, Inc.
Archaeological Services &
Historic Research

114 Gardner Hill
East Nassau, N.Y. 12062



Collamer & Associates, Inc.
Archaeological Services &
Historic Research

PHASE 1 CULTURAL RESOURCE
INVESTIGATION PLAN
for
Niagara Mohawk Power Corporation
THE MULTI-MGP SITE PROGRAM

Prepared for: Niagara Mohawk Power Corporation
 300 Erie Boulevard West
 Syracuse, N.Y. 13202

Prepared by: Collamer & Associates, Inc.
 114 Gardner Hill Road
 East Nassau, N.Y. 12062

Date: March 31, 1993

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1.0 INTRODUCTION

Collamer & Associates, Inc. is a small, woman-owned business, enterprise with expertise in the full range of cultural resource studies and management plans, including all phases of archaeological investigations and historic research. These involve the completion of more than 300 projects throughout New York State. The company has also provided its services to the Niagara Mohawk Power Corporation (NMPC) since 1987, acting as their primary archaeologists under a blanket contract from 1990. In response to this role, we have endeavored to develop a cultural resource management program which involves a thorough understanding of NMPC construction techniques and scheduling, while still implementing a plan to ensure the information obtained, and collections recovered benefit both the average person and the scholar to the fullest extent possible. Therefore, all cultural resource surveys (CRS) conducted will result in a practical approach and thoughtful analytical presentation, rather than just a quantitative analysis of the results.

Previous cultural resource investigations conducted by the company for NMPC and other firms have involved intensive excavation and analysis of prehistoric, historic, military and/or industrial archaeological sites. The documentation, analysis and interpretation presented in these studies allowed the state and federal agencies to evaluate the effect of the proposed project upon any cultural resources identified. When impacts could not be avoided, further studies were conducted to enable an assessment of the significance of the resource and its potential inclusion in the State and National Register of Historic Places.

All investigations completed by the firm are designed to follow the intent and instruction of Federal Guidelines as established in Chapter 36 CFR 800, including Section 14.09 regulations. Ms. Collamer, serving as the Principal Investigator and President of the Company, is a member of the Society of Professional Archaeologist and meets all requirements of the federal government to conduct archaeological studies (in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation 36 CFR 61 Guidelines). She has also completed the "Health & Safety For Hazardous Waste Site Activities" course to satisfy OSHA requirements of 29 CFR 1910.120(e)(3)(i).

As outlined by Niagara Mohawk Power Corporation, a total of 21 individual project sites have been identified in the Multi-MGP Site Program which may require complete Phase 1 Cultural Resource Surveys. A schedule for preliminary site assessment, which will include the cultural resource studies, was presented to the Department of Environmental Conservation (DEC). This involved a work study plan to be initiated over a six year period. According to this schedule, three sites will be assessed each year. Collamer & Associates, Inc., in collaboration with Niagara Mohawk Power

Corporation, has developed an appropriate Cultural Resources Management Plan which will assure a thorough, in-depth study of each site. This program will be implemented upon approval by the Department of Environmental Conservation (DEC) and the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP).

2.0 CULTURAL RESOURCES MANAGEMENT PLAN FOR THE MGP PROGRAM

Each of the 21 MGP sites are related to the storage, use, and distribution of natural gas and the associated waste products. Although the involvement and extent of the facility operation varies at each local, similar site conditions may be expected at all the project areas which may include extensive fill and ground disturbance. Since the majority of the project sites are situated in regions which may be sensitive for the location of evidence of both prehistoric and historic occupation, a Phase 1 Cultural Resource Survey (CRS) has been recommended for each project area. The Phase 1 investigations generally entail the identification, documentation and assessment of cultural resources (both prehistoric and historic) with respect to the proposed undertakings to enable the continuation of the work with the least impact to the known resources. The primary goal of the study is to provide a reasonable assessment of the presence or absence of cultural resources within the project area. This is typically achieved through two general stages which include a Stage 1A Literature/Map Review, and Stage 1B Archaeological Field Investigations.

2.1 Approach to the Stage 1A Literature Search/Map Review

The intent of the Stage 1A Study outlined in this proposal is to develop a predictive sensitivity profile for each of the project areas as outlined in the MGP Program. The sensitivity assessment is designed to determine the differential probability of the land within the property boundaries to contain evidence of prehistoric or historic occupation. The resulting management plan will serve as a guide for future archaeological investigations, in the event of new construction, modifications or alterations to the existing conditions within each of the project boundaries.

The main focus of the Stage 1A level investigation revolves around the identification of known cultural resources and past land use within one mile of each of the MGP sites. This aids in the assessment of the specific probability for the location of archaeological and architectural sites which may be affected by alterations to the existing physiographic conditions at each site location. Initially, available archaeological and architectural files will be reviewed for the immediate vicinity of the sites to provide an applicable data base for the study, an indication of past land use, and to identify existing significant resources.

This information will then be augmented with archival research, relevant interviews and map analysis which will enable the development of the differential probability for each project area to contain intact archaeological deposits or associated architectural sites. In this manner, regions least likely to contain intact resources may be quickly eliminated from further consideration.

During the Phase 1A study, Collamer & Associates, Inc. will conduct the research primarily relating to the prehistoric development, including an examination of relevant archaeological files, consultations with local historians, and the development of the early historical context. Since NMPC maintains an extensive research library, manuscripts section, and map collection, they will provide the description of the historic industrial background and documentation relating to each specific site. This will include, but not be limited to deeds, maps, historic photographs, construction plans and interviews with former employees. If needed, additional historic maps will be provided by Collamer & Associates, Inc. from the sources which may include the NYS Archives, the NYS Library and/or local museums or libraries.

Collamer & Associates, Inc. will examine available archaeological site inventory files, local histories, early maps, current archaeological publications, and relevant prior cultural resource investigations applicable to the project areas. These will assist in the development of the general prehistoric and historic sequence of the land use, and provide valuable background data for the prediction of site types and densities in the project area. Since the research is also designed to confirm the level and extent of prior ground disturbance within the project limits, specific components of the study may consist of an examination and interpretation of "as built" construction plans, soil bores, auger tests, percolation trenches and other associated soil tests conducted by NMPC, if available. Elements of the Stage 1A Study may include, but not be limited to:

1. An examination of the Archaeological Site Inventory Files, Building-Structure Inventory Files, State and National Register of Historic Places listings, and existing cultural resource reports housed at OPRHP.
2. A review of the New York State Museum (NYSM) Archaeological Site Files and related agency publications.
3. Contact with appropriate Anthropological departments at local colleges to identify any archaeological sites they may have on file or relevant studies which have been previously conducted.
4. Consultation with the County and Town Historians to address their local concerns.
5. An examination of early historic maps at the New York State Archives and other local sources for the project area to aid in the identification of historic archaeological sites.

6. Detailed research specifically related to the project area to be conducted at the New York State library, local and/or regional libraries.
7. Interviews with local avocational archaeological groups and other knowledgeable persons.
8. A review of the development of the project site as prepared by NMPC from its initial industrial use to the present condition.
9. A review of available topographic, construction, and planning maps to aid in the identification and extent of previously disturbed regions.
10. A review of Interviews conducted by NMPC with relevant personnel regarding the construction methodology utilized during the development in the project area to aid in the verification of the level and extent of disturbed regions.
11. Photographic documentation of existing structures within or directly adjacent to the project boundaries. OPRHP Building-Structure Inventory forms will be completed for all structures judged to have been constructed prior to 1940, unless previous forms have been submitted.
12. A preliminary site visit will be conducted at this level by either NMPC or Collamer & Associates, Inc. to initially identify any extensively disturbed areas, existing ground conditions and document the visible structural components of the site.

Any relevant files maintained by NMPC will be made available to the consultant to aid in the accumulation of pertinent data on the development of the project area. This will include previous OPRHP Building-Structure (Blue Forms), deeds and maps. Any architectural or archaeological sites identified through the Stage 1A literature search will be located upon a base map of the project area to be incorporated within the study.

Environmental information, including the topography, geology, drainage, and soils for each project, as well as, the existing prehistoric sites, will also be obtained to form a basis for the predictive sensitivity profile. A comparison of the physiographic characteristics of known habitation sites has shown that certain environmental factors are important criteria in the choice of settlement locations, procurement sites and seasonal occupation areas. Since the major environmental factors of recorded sites can easily be recognized by an examination their locations as presented upon maps, they may indicate broad patterns of settlement, occupation or use which will be incorporated within the study.

The current environmental conditions identified at each project location resulted from the geomorphological influences, climatic changes and man-made alterations occurring over time. A general review of this development with emphasis on the bedrock geology, topography, drainage, soil types and climate enables a better understanding of the progression of the vegetation, fauna and human

occupation in the study area. Incorporated within the sensitivity profile, this information, in conjunction with the identification of existing man-made disturbances, provides the necessary background to determine the potential sensitivity in the project area for the location of intact cultural resources.

If available, aerial mapping, "as built" engineer drawings, and existing soil bore data will be incorporated into the study to document pre-existing conditions and the level and extent of prior ground disturbances. The differential sensitivity of each project area for the location of evidence of both prehistoric and historic cultural resources will be developed based upon the results of the Stage 1A Literature Review, physiographic characteristics identified in the project area, prior ground disturbance, and current theoretical assumptions related to site predictability.

This study will divide each MGP site into regions of high, moderate and low sensitivity for the identification of cultural resources. These delineations will be clearly justified within the report and presented upon a detailed sensitivity map of each project area. The predictive sensitivity map will be provided at an appropriate scale to be incorporated within the final report. If necessary, engineer drawings may be used representing sectioned units. The sensitivity profile presented upon these maps will be used in structuring the location and extent of subsequent Stage 1B archaeological field investigations.

Recorded site locations, (archaeological, archival or architectural) and the sensitivity potential will be maintained upon base maps and coded referencing their type, cultural affiliation, and level. The information will be correlated with a computerized data file management system. In this manner, the archaeological site files currently maintained by NMPC may be easily upgraded. In addition, an active file of known sites will be available for use in future planning. This method would also decrease the amount of repetition in the investigations, provide a valuable cultural resource data base, and in the event of revisions, enable a quick evaluation of the alternate impacts.

A draft report of the Phase 1A study outlining the results, with recommendations regarding the need for Phase 1B investigations can be submitted to DEC and/or OPRHP, with the NMPC initial submittal. If it is determined at the Stage 1A level that archaeological field investigations are required at any of the MGP sites, these excavation may be incorporated within the soil testing program as defined by NMPC. Prior to the initiation of the field investigations, the written comments of DEC and OPRHP will be taken under advisement and, when possible, incorporated into the field testing strategy.

2.2 Approach to the Stage 1B Archaeological Field Investigations

The second stage of the Phase 1 Cultural Resource Study generally involves appropriate field investigations to aid in the identification of existing archaeological deposits and architectural resources. This study may incorporate relevant data from soil bores, trenches, and other preliminary soil tests which may be conducted within the project boundaries. In this manner, a more informative interpretation of the existing ground disturbance, deep stratigraphy and integrity of the soils may be assessed.

Preliminarily, a visual reconnaissance of the entire project area is conducted. Information obtained during this phase will include detailed notes of any observed features, visible evidence of sites and/or disturbance. The results will be incorporated into the sensitivity profile and design strategy for the subsurface survey.

All regions where visible evidence suggests archaeological site locations and/or areas of disturbance will be noted upon the surveyed maps. The rationale for such indications and the approximate size of the areas will be explained in the narrative report. The location and angle of all general-view photographs of the project setting, including areas of disturbance and approximate size, will also be shown upon the final project maps.

As a result of the anticipation of extensive amounts of fill at each facility location (3 feet to 17 feet), the initial Phase 1B investigations may be conducted simultaneously with the PSA/IRM Study field work. This will include the incorporation, and if necessary, the modification of the program. The soil tests conducted for the PSA/IRM program will be used to verify the reliability of the sensitivity profile for each site, and reasonably determine the presence or absence of cultural resources at each project location.

NMPC will take samples of soil from what is judged to represent undisturbed soils beneath the fill to aid in the determination of the presence or absence of cultural materials. The soil samples will be obtained using split-spoon bores, backhoes, augers and/or other soils testing methods commonly used by NMPC. These deposits will be screened and the soil matrix removed. After cleaning, all resulting material will be examined.

In addition to the structured tests NMPC will conduct for their preliminary site assessments, additional investigations will be conducted in areas judged to be highly sensitive for the identification of cultural resources reflecting the results of each Phase 1A study. The location and extent of this additional testing will ultimately be determined by the results of the soil testing program, existing ground disturbance and reliability of the sensitivity model.

During these investigations, existing cultural material identified will be maintained in a collection, only if appropriate. Only significant or relevant artifacts recovered during this phase will be retained which would indicate the presence of prehistoric and/or early historic occupations. The location and description of other artifacts not collected will be recorded in the field notes. In addition, any early structural and/or foundation remains located during this phase will minimally be documented with photographs, measured and surveyed. All test locations will additionally be surveyed by NMPC. Collamer & Associates, Inc., maintains the in-house and support cartographic personnel and facilities enable the generation of specific site maps for planning purposes and final report production.

Subsurface archaeological investigations will be undertaken as required. These tests will extend to what is judged to be culturally sterile subsoils, where feasible. The interval strategy and testing design utilized during this phase of the cultural resource studies will reflect the site type and densities anticipated in the project area. Justifications for the interval strategy utilized will be clearly outlined in the narrative report. The stratigraphy within each test unit will be recorded indicating the soil type, texture, munsell color, and depth of each pedogenic horizon. The walls of each test will be cleaned and carefully examined for any intrusive features or soil stains, where possible. When identified, all cultural features will be documented with scaled drawings and photographs. A sample of soils removed from the excavations will either be sifted through 1/4 inch mesh screen or wet screened to identify any cultural resources depending on the soil consistency and contaminates.

Each site identified will be assigned a unique number or name which will relate to its location and cultural affiliation. All surface collections, foundations, subsurface test locations and significant sites will be clearly presented upon maps of the project area. In addition, excavation records and artifact catalogs will be presented in an appendix of the final report. OPRHP Archaeological Site Forms will be prepared for all sites identified. The site forms will be supplemented with information acquired during the Site Examination, if appropriate.

All structures identified within the project area during the field reconnaissance will be photographed (3 1/2" x 5" color) and preliminary data accumulated, if not already compiled by NMPC. The angle for each photograph will be shown upon the project maps. A sequential arbitrary numbering system will be maintained which will relate each structure to the base project map. All structure inventory data will be properly initiated for inclusion into the Building-Structure Inventory files, if appropriate. Field data gathered for each structure may include, but will not be limited to: the location (street address & house number where applicable), ownership/history of ownership, function/historic function,

architectural description/age, modifications to the structure/integrity, associated outbuildings, and landscape features within the project area.

The results of the archaeological field investigations conducted at each site will be presented to DEC and OPRHP as an initial Phase 1B investigation. Written comments and concerns received from OPRHP and DEC within 30 days of receipt of the draft submission will be addressed. If no cultural resources are identified and no comments are received, the Phase 1 cultural resource investigations will be considered complete and a final Phase 1 report submitted in one bound volume for each site (Stage 1A and Stage 1B).

If significant cultural resources are identified during the Stage 1B investigations, the extent of the additional field investigations will be determined by the type of resource identified, a preliminary assessment of the site integrity and the potential anticipated impacts as a result of NMPC involvement. If an archaeological site possesses integrity of location, design, setting, materials, workmanship, feeling, or association, it may be eligible for listing on the National or State Registers of Historic Places. On the other hand, if the integrity of a site has been destroyed either through construction disturbance, or natural events (floods, erosion, fire, etc.), thus precluding the identification of intact remains or cultural components, it may not be considered eligible for nomination.

The potential eligibility of all significant sites identified during the investigations should be assessed if they are within the project area, and can not be mitigated by avoidance or planned management. A written proposal outlining the specific investigations to be conducted at a Stage 2 level will be submitted to DEC and OPRHP for approval after consultation with NMPC. This will enable a reasonable strategy to be developed regarding the necessity for any additional archaeological investigations and appropriateness of these investigations.

Whether the Phase 1 investigations are considered completed, or further future work is scheduled, the NMPC contractual agreement will assure DEC and OPRHP a qualified archaeologist will remain on call for the life of the project to address any cultural resources which may come to light during deep excavations or further site analysis and NMPC work.

3.0 REPORT PRODUCTION

Reports generated by Collamer & Associates, Inc. for the MGP sites will be completed in a comprehensive, narrative format. Each phase of the investigations from the initial theoretical perspectives through the final cultural resources management plan will be presented as separate sections within one bound report. These

reports will contain original copies of photographs (or a color xerox) and project maps. The final report can be presented to NMPC on computer disk, along with the mylar copies of the base maps and illustrations for integration in their final report.

The report will not merely provide a quantitative analysis of the results, but also discuss the geographical limits and chronological periods for the themes and contexts associated with the sites identified in the project boundaries. Therefore, the study will serve as a documentary history of the project area.

The intent of the Phase 1 Investigation is to provide a reasonable assessment of the presence or absence of cultural resources within the project area. The results of the Phase 1 (Stage 1A and Stage 1B) will be presented in one bound report for each project area.

A typical final report for the Phase 1 outline will contain, but not be limited to the following:

Title Page

The title page will identify the project, location, author, and submission date.

Table of Contents

This section will cite the major sections of the report, present a list of figures, a list of tables and define the appendices.

Executive Summary (Abstract)

The intent of this section is to provide the reader with a concise non-technical summary of the proposed undertaking, the results of the investigations and the recommendations of the archaeologist. This summary will also list any structures slated for removal (keyed to the map of archaeological investigations), archaeological sites and any sites (architectural or archaeological) listed or eligible for the State or National Register, within or adjacent to the project area. The reader may then focus upon areas of initial concern and facilitate the review process.

1.0 Introduction

This section will contain a brief summary describing in general terms the NMPC work scope, date of initiation of the study, participants in the work and general conditions of the investigations. It will be further divided into two sub-chapters.

1.1 Project Location and Description

This sub-chapter will address in narrative the project location and include locational inset maps as figures. The text will further detail the project in terms of limits (length and width), outline the basis of these limits (engineer drawings, NMPC property maps and consultation with NMPC), define the study area and region of impact. Further discussions will identify the project within a regional context and the limits of the cultural resource investigations.

1.2 Approach to the Stage 1A Study

Contained in this sub-chapter will be an overview of the approach to the study. This will include a description of the survey strategy covering the entire investigative sequence from theoretical assumptions through the scope-of-work to the project objectives.

2.0 Environmental Overview

Current environmental conditions which exist in any project area are a result of the geomorphological influences, climatic changes and manmade alterations which have occurred through time. A general review of this development with emphasis on the bedrock geology, topography, drainage, soil types and climate will enable a better understanding of the progression of the vegetation, fauna and human occupation within the study area. Incorporated in the sensitivity profile, this information, in conjunction with the field identification of existing man-made disturbances, provides the necessary background to determine the probability of the project area to contain intact cultural resources. This chapter will be divided into seven sub-chapters, each relevant to the development of the particular sensitivity of the project.

2.1 Bedrock Geology and Geomorphology

The underlying bedrock structures the topographic relief and soil development in the region. Depending on the specific fault types, tectonic activity and exposed outcrops, some of the specific geological deposits may have been extensively utilized by early inhabitants as a source of raw material for tools, building materials, fertilizers, antiseptics and mining industries. While the underlying bedrock contributes to the existing conditions, glacial activity in this region has been the main geomorphological force. Thus, a review of the effects of this activity is necessary for the prediction of potential early prehistoric site locations which may be situated in the project area.

2.2 Topography

Evidence of both prehistoric and historic occupations, as documented in prior cultural resource investigations, indicate that populations have a predilection for certain landforms as habitation sites, resource procurement areas or vantage points. Other regions afforded protection from prevailing winds, provided maximum light exposure or protective ledges. A review of the topography identified on known sites compared with that in the project area will aid in the assessment of the probability of the location of sites within the project limits.

2.3 Drainage

Streams and watersheds provide natural transportation routes used by both prehistoric and historic populations through the early development of New York State. Archaeological investigations have indicated that a viable water source is an important factor in settlement locations, as well as trade routes and the transmission of cultural attributes. Thus, a discussion of the watercourses within the project area will enable a reasonable assessment of the potential for specific regions of the property to contain evidence of cultural resources.

2.4 Soils

As indicated by previous cultural resource studies and current theoretical assumptions, the location of habitation sites is affected by the types and textures of particular soils identified in any given area. Although specialized procurement sites are less prone to be situated in regions as dictated by soil types, the ability of the soils to support particular vegetative sequences is important in the predictability study. In addition, the identification of the acidity of the soils may indicate which material remains (faunal and floral) would most likely be preserved and those which would rapidly decay. The acidity of the soil also determines the types of vegetation which will exist in the area.

2.5 Climate, Vegetation and Fauna

A review of the climatic development of the region provides background relating to the progression of major vegetative sequences which may allude to the species of animals in the area during particular time frames. Since prehistoric people relied upon hunting and gathering, an understanding of this development as it relates to the project area would allow a reasonable interpretation of the types and density of sites anticipated. Photographs within the appendices will document the existing vegetation seen in the project area.

2.6 Man-made Disturbances and Alterations

The man-made disturbances identified in the project will directly affect the potential for locating intact cultural resources. These disturbances may also suggest the past land use and potential integrity of the soils. As such, the location and extent of this ground disturbance will determine the extent and location of subsequent archaeological field investigations. General photographs will be taken to preliminarily document any existing ground disturbances. In addition, the extensive research facilities maintained by NMPC may contain historic photographs of the extent of any ground disturbing activities within the project limits.

3.0 Cultural Research

A review of prior cultural resource investigations, recorded archaeological and/or architectural sites, and the prehistoric and historic regional development will aid in a reasonable assessment of the past land use and the creation of a sensitivity profile for the project. This research focuses on the cultural aspects and properties in the vicinity of the proposed project, it is not intended to locate or determine the potential for hazardous wastes. Only an examination of the soils by a qualified individual would ensure a determination of the presence or absence of any toxic or chemical components. Such work is beyond the scope of a normal cultural resource investigation.

3.1 Prior Cultural Research Investigations

A review of recorded cultural resource investigations conducted for the vicinity of each MGP site will identify if previous archaeological investigations have been conducted for the project area, and the number or location of tests. Generally, regions which have been previously examined need not be re-examined, if an appropriate testing strategy was utilized and the corridors and/or direct impacts were similar. This information will be presented in a concise manner summarizing the results and the relationship of the previous testing with the potential project impacts.

3.2 Recorded Sites and Architectural Concerns

This chapter will contain an outline of the sources checked and the results of the findings. Since the locations of both prehistoric and early historic sites are considered to be confidential, their precise locations are not for publication. However, the site types, cultural affiliations and a brief synopsis of the results of the file examinations will be discussed, and the site information presented in a concise format appropriate for the report. Agencies

and data files to be consulted will include, but not be limited to:

The Office of Parks Recreation and Historic Preservation
National and State Register Listings
Building- Structure Site Inventory Files
Archaeological Site Files
The New York State Museum Archaeological Site Files
The New York State Archives, Early Maps and Histories

3.3 Interviews and Correspondence

Interviews will be conducted with local historians, relevant landowners, avocational archaeological societies and knowledgeable persons to identify unrecorded sites and confirm the relationship of known sites with the project area. The information presented in the narrative format will consist of a concise discussion of the sites found, and their relationship to the project area. A complete list of persons interviewed including the date, address, and summary of the conversation will be presented within the text, or in an appendix, if appropriate. In addition, interviews with any technical consultants, historians, and the NMPC employees will be documented in an appendix.

3.4 Prehistoric Review

The prehistoric review will consist of a summary of the cultural development in the vicinity of the project area. This will include a discussion of the site types, cultural affiliation and site densities as identified within one mile of the project area, focusing on those within or immediately adjacent to the project boundaries. This discussion will serve as the foundation for the determination of the prehistoric sensitivity profile.

3.5 Historic Review

The historic review will develop the chronological historic context for the vicinity of the project area. The focus of the narrative text will center on the specific sites anticipated within the project boundaries which may be affected by the proposed construction. A thoughtful discussion of the sites identified through the map research, historical reviews and interviews will outline the types of sites anticipated and their known or probable locations. In addition, a discussion of any National Register properties and structures of local governmental concern (planning board, local historians, etc.) will be addressed. Representative sections of the historic maps cited in the report will be included in an appendix. All sources utilized during this review and other portions of the study will be appropriately documented in a bibliography. NMPC will provide all appropriate site documentation

significant sites, topographic conditions, and minimally possess a north arrow, and bar scale.

Report Graphics

Graphic representation to be supplied in the final report will include, but not be limited to:

1. A base map outlining the project boundaries on the appropriate portions of the relevant USGS quadrangle sheets, with the name of the sheet, scale, and north arrow clearly indicated;
2. A collection of relevant historical maps;
3. A surveyed base map with topography showing the location of all test units, cultural resources identified and construction limits;
4. Specific surveyed site maps showing structural remains, site boundaries, archaeological methodology employed, excavated units and elevations, if relevant.
5. A variety of plans, profiles, sections, and elevations as deemed appropriate and necessary documenting the existing conditions and/or features.
6. All photograph locations used in the text and appendices will be keyed to a map of the area discussed.

4.0 HANDLING OF CULTURAL MATERIALS

All artifacts recovered during field investigations are normally transported to the Collamer & Associates, Inc. laboratory located at 73 Dove Street in Albany, N.Y. for identification and analysis. However, based upon the potential health hazards involved with in the wet screening and the cleaning of any artifacts, only the cleaned materials will be transported to the laboratory for analysis and identification. The artifacts will then be processed in the laboratory using standard techniques. Flotation of soils samples taken from features, electrolysis of metal artifacts, and spectroanalysis of lithic materials may be conducted as appropriate. After cleaning, all artifacts will be placed in appropriate containers which may include either ziplock plastic bags, plastic snap-lock boxes, new pasteboard boxes.

Working stations include areas for the following: both wet and dry processing, cataloging, microscopic viewing, stabilization and conservation treatments. Generally as field work progresses, the basic stabilization procedures utilized by Collamer & Associates, Inc. are modified and become more site-specific, based upon particular micro-environments encountered. Floral, faunal and other organic remains can be treated (if required), dried appropriately, stored, and packed to assure stability. Lithics with well-preserved surfaces suitable for microwear analysis (as well as other fragile materials) are handled and packaged separately.

The artifacts will be identified within broad, easily recognizable groups. More definitive descriptions and detailed analysis may be conducted as time and budget constraints permit. Minimally, the analysis of prehistoric lithic materials reflects current stylistic and typological categories relevant to the region. In addition to categorization of recognized formal tool types, the identification and analysis of recovered lithic materials may incorporate a determination of utilized microscopic wear analysis and technical evaluations focusing on the materials and lithic processing. The precise technological and stylistic categories applied is determined by the range or variation of the artifacts recovered.

The analysis, therefore, focuses upon the identification of key stylistic and chronological indications as a basis for identifying the type and period of occupation represented as a first level of definition. The prehistoric classification used reflects past and current stylistic and typological categories pertaining to the northeast region. Diagnostic pottery and projectile point types are used in this region to assess the relative chronological range represented at the site. The identification and analysis of recovered lithic materials focuses on raw materials and techniques of manufacture as indicated by the lithic material and functional categories. Correlation of environmentally pertinent indicators of site location are determined by the range and variation of artifacts recovered during the excavation.

The historic classification will include an identification of material, and a brief description of the artifact. When possible, a date of manufacture, location and use will be included. This data may present information regarding the early historic use, areas of prior activity and/or structures.

Historic structural remains will be identified according to use, function and theme context. Where possible construction techniques will be discussed in relation to the use and date. The quality and condition of the exposed structural remains will be evaluated and the potential for additional intact remains will be assessed.

The main storage facility operated by Collamer & Associates, Inc. is situated in Albany, N.Y. and is protected by a closed circuit security system. The internal storage environment is regulated by a thermostat controlled heating system. Although Collamer & Associates, Inc. maintains approximately 1,500 feet of storage space, any significant collections should be offered to the NYS Museum for accession into their collection and incorporated into their ongoing cultural resource studies or maintained at the NMPC research facilities.

An inventory of all artifacts collected from the archaeological excavations is maintained in an artifact catalog. Minimally, the artifact catalog contains a specific catalog number, a brief description of the artifact, its material components and

chronological and cultural association. The specific catalog number reflects the project identification code, the year of the investigations, the methodology used for the collection, the specific number of the investigatory unit and the specimen number. In this manner, the provenience of the artifact is maintained at several levels and its location easily correlated with the project map. All materials will be stored in boxes and curated according to professional standards to further facilitate accession, if warranted.

Collamer & Associates, Inc. maintains the facilities and staff to provide long term storage. As required, artifacts will be curated and stored appropriately. An artifact catalog will be included within each container identifying the project and the material contained within. All original field notes, photographs, log books, field maps, original survey data, as well as specimen field bags will be boxed separately and maintained in temperature controlled facilities. All collections and records will be made available upon receipt of written notification from NMPC.