# Operation and Maintenance and Long-Term Monitoring Plan

## PAS OSWEGO SUPERFUND SITE
## OWSWGO, NEW YORK

## Performing Settling Defendants

## July 2013


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# 1. INTRODUCTION

## 1.1 Project Scope and Objectives

This Operation and Maintenance and Long-Term Monitoring Plan (Plan) for the Pollution Abatement Services (PAS) Superfund Site (Site) located in the City of Oswego, New York (Oswego) provides a detailed description of the requirements, methods, and procedures for conducting operation and maintenance and long-term monitoring at the Site. This Plan also contains a description of the methodology for implementation of institutional controls for the Site and adjacent properties. This Plan, which was originally approved by EPA in 1998, has been updated to reflect work completed and current site activities as discussed further below. The most significant change documented in the Plan is the installation of the PAS leachate discharge system and connection to the Oswego Eastside Wastewater Treatment Facility in October 2010.

As set forth in the September 1997 Consent Decree (Consent Decree), 1993 Record of Decision (ROD), September 1996 and September 2010 Explanation of Significant Differences (ESDs) for the Site, Site operations and maintenance and long-term monitoring are to be performed in accordance with the requirements of the National Contingency Plan (NCP), 40 CFR Part 300 (as amended), and Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9601 et seq. (CERCLA), in addition to other applicable local, state, and federal rules and regulations. In general, work performed pursuant to the Consent Decree, ROD, and two ESDs includes: 1) leachate and groundwater containment, removal, and treatment and disposal; 2) groundwater monitoring; 3) Site maintenance; and 4) reporting. This Plan presents a detailed description of the procedures for satisfying these requirements.

As required by the Consent Decree and described in the associated Statement of Work (SOW), the objectives of the operation and maintenance and long-term monitoring work are to control the source of contamination at the Site to the extent practicable, to reduce and minimize the downgradient migration of contaminants in groundwater, and to minimize any potential future health and environmental impacts. These objectives are being met by continued operation of the containment system (including cover, slurry wall, and leachate and groundwater collection system [herein referred to as the leachate collection system]); treatment and disposal of the collected leachate and groundwater (herein referred to as leachate), implementation of institutional controls, and long-term monitoring.

This Plan provides a detailed description of the requirements for performing operation and maintenance and long-term monitoring activities, originally stipulated in the SOW and updated through Site modifications discussed herein. Components of this plan are based, in part, on previously established methods and procedures for conducting Site-related operations, maintenance, and monitoring activities. The following documents were originally consulted in the preparation of the Plan in 1998: Operations and Maintenance Manual (URS Consultants, Inc., 1991), Work Plan for Interim Groundwater Activities (OBG

Technical Services, Inc., 1992), and Work Plan Amendment for Interim Groundwater Activities (OBG Technical Services, Inc, 1994). This updated Plan herein references the following additional documents: PAS Interim Groundwater Completion Report (*de maximis*, 1998), PAS Five-Year Data Review Report (Roux, 1998), PAS Five-Year Review Report (EPA, 1998), PAS Five-Year Data Review Report (*de maximis,* 2003), PAS Five-Year Review Report (EPA, 2003), PAS Institutional Control Implementation Plan (*de maximis*, 2004), PAS Remedial Action Completion Report (*de maximis,* 2006), PAS Five-Year Data Review Report (de maximis, 2008), PAS Five-Year Review Report (EPA, 2008), routine site progress reports, including annual reports submitted by *de maximis* to EPA from July 2004 to July 2012.

The sections and purpose of each section of this Plan are as follows:

Section 1. Introduction - provides a Site description and history and overview of current operations.

Section 2. Project Organization - presents the protocols for selecting and approving contractors, and lists approved contractors.

Section 3. Site Monitoring - presents the requirements, frequency, methods, and procedures for performing periodic groundwater, leachate monitoring.

Section 4. Leachate Collection, Removal and Disposal - discusses the procedures for leachate collection disposal system operation, and leachate removal, treatment and disposal.

Section 5. Site Maintenance - outlines Site maintenance requirements.

Section 6. Operating and Contingency Plan - presents a plan for addressing Site-related emergencies.

Section 7. Records and Reporting - outlines the requirements for record keeping and reporting.

Section 8. Institutional Controls - discusses institutional controls and the associated schedule for implementation.

Tables, figures, and appendices are provided in support of the narrative section of the Plan. The appendices present the forms, plans, and technical information necessary for performing the operation and maintenance and long-term monitoring activities. Appendix A includes record drawings for the remedy construction; Appendices B and C, present log sheets for recording groundwater and leachate monitoring results; Appendices D and E include checklists for performing Site inspections and Leachate Disposal operations; Appendix F provides the Quality Assurance Project Plan (QAPP) for the performance of Site monitoring activities; Appendix G consists of a Site Health and Safety Contingency Plan; Appendix H consists of the Oswego Significant Industrial user Wastewater Discharged Permit; Appendix I provides the Oswego Discharge Compliance Table; Appendix J consists of the Auburn Wastewater Discharge Permit; Appendix K provides the Truck Unloading Verification Form; Appendix L provides the Non-Hazardous

Waste Manifest; Appendix M consists of the Well Construction Logs; Appendix N provides the Access Agreements.

## 1.2 Site Description

### 1.2.1 General

The PAS Site, located on 15 acres near the eastern edge of the City of Oswego, New York (City), is bounded on the south by East Seneca Street, and on the east, north, and west by wetlands formed along the stream channels of White and Wine Creeks (Figures 1 and 2). Just to the north (downstream) of the Site is the confluence of White and Wine Creeks. Wine Creek flows approximately 1,800 feet beyond the confluence (northward) to a channel and into Lake Ontario. Just east of this channel, Wine Creek connects with a wetland adjacent to the residential area known as Smith's Beach. Prior to passing through the PAS Site, White and Wine Creeks are proximate to the East Seneca Street Dump (also referred to and operated as the Oswego County Landfill), and White Creek is proximate to the Niagara Mohawk Fire Training School. The Oswego Castings site is situated upstream of the wetland adjacent to Smith's Beach (Figure 2B).

The area between the PAS Site and Lake Ontario (to the north) is mostly undeveloped and currently includes three land uses. These uses (from west to east) include a cemetery, a wetland, and a residential area. The residential area, Smith's Beach, consists of approximately 25 dwellings, and is located on the shore of Lake Ontario, approximately mile north of the Site. A public water supply is available in Smith's Beach.

### 1.2.2 Slurry Wall Containment System

As further discussed in Section 1.4, a slurry wall containment system was installed at the PAS Oswego Site in 1984. This slurry wall containment system includes a bentonite-clay slurry wall keyed into the underlying lodgement till; a cap, consisting of a synthetic liner, clay, and vegetated soils; and a leachate collection system. The leachate collection system, which is used for collection and removal of leachate that accumulates within the slurry wall, consists of collection drains (gravel-filled trenches), four collection wells, a network of polyvinyl chloride (PVC) force mains, submersible pumps, and controls, and a leachate collection tank (see Record Drawing Nos. 1 and 2 in Appendix A).

Leachate is collected into two trench systems: a downgradient perimeter trench located inside the slurry wall at the northern boundary of the Site, and a cross-trench located near the center of the Site. Three 14-inch-diameter leachate collection wells (LCW-1, LCW-2, and LCW-3), equipped with submersible pumps and controls are used to remove leachate collected in the downgradient perimeter trench. A fourth pumping well (LCW-4) is used to remove leachate collected in the cross-trench at the center of the containment area. Accumulated leachate is pumped into 2-inch-diameter PVC force mains that discharge into the

concrete leachate collection tank. The maximum capacity of the tank is 44,000 gallons; however, the operating capacity of the tank is limited to 13,000 gallons, as only one section of the partitioned tank is utilized during Site operations. In addition, leachate levels in the tank are purposefully maintained below the elevation of the high density polyethylene (HDPE) liner, which is fused to the exterior surface of the tank (further discussed in Section 1.4).

In October 2010, a new leachate discharge system was installed at the Site so that leachate could be pumped directly from the leachate collection tank at the Site to the Oswego sewer system, which is connected to the Oswego Eastside Wastewater Treatment Facility. The primary components of the leachate discharge system include a pump and flow meter, an on-site 3-inch force main and a 4-inch gravity sewer line, which connects into the Oswego sewer. A Flowserve Durco Mark III pump (main discharge pump) rated at approximately 80 gpm and flowmeter were installed in an existing shed located adjacent to the leachate collection tank (Figure 7A). A 3-inch flexible hose is utilized for transfer of leachate from the leachate collection tank to the intake of the main discharge pump. Figure 2A shows the location of the shed and existing collection tank. Drawing 8 and 9, Appendix A shows the LCW and Force main construction. Figures 5a and 5b show the tank piping. Figure 6a and 6b provides a layout of the onsite 3-inch discharge piping extending from the existing shed to a manhole just outside the Site perimeter fence, and the 4-inch gravity drain pipe running in the City right-of-way crossing under East Seneca street approximately 400 feet west of the Site and connecting to the City manhole in front of the Centro Building at 512 E. Seneca Street. The discharge piping on the Site is installed 2-3 feet below ground surface and over the top of the existing HDPE liner so that there has been no intrusion of the discharge piping through the HDPE liner. The integrity of the liner was confirmed and maintained during construction of the onsite pipeline. Per the City request, a locking valve was placed outside the fence before the manhole to provide a means for City to control the discharge if deemed necessary.

## 1.3 Hydrogeologic Setting

### 1.3.1 Regional Hydrogeology

The PAS Site is located in the eastern section of the Lake Ontario physiographic province. The geology consists of glacially derived sediments ranging from till and lacustrine silt and clays to stratified sands and gravels. These sediments overlay the Oswego Sandstone. In general, two aquifer systems exist in the region. Both the bedrock and unconsolidated aquifer systems exhibit groundwater flow northwest toward the wetlands and then toward Lake Ontario. The regional groundwater flow direction is toward the north, in the direction of Lake Ontario.

### 1.3.2 Site Hydrogeology

Several stratigraphic units have been defined at the Site. A surficial fill layer of variable depth and composition covers most of the Site. This fill layer consists primarily of demolition debris brought onto the Site before PAS was in operation. This fill layer is underlain by till throughout most of the Site. The exception to this is in an area outside the slurry wall and in the vicinity of White Creek, where fill is underlain by stratified sediments. A continuous dense till layer is purported to overly the bedrock across the Site. Two aquifer systems exist on-site, an unconfined overburden aquifer and a bedrock aquifer. The local groundwater flow direction in both the overburden and the bedrock is toward the northwest, in the direction of the Wine Creek wetlands located north of the Site, as shown on Figure 2A.

As discussed in Section 1.2.2, a slurry wall containment system was installed at the Site to control groundwater flow through the presence of the low-permeability, bentonite-clay slurry wall that extends from ground surface to the underlying lodgement till. Periodic leachate removal from the soils within the slurry wall is conducted to maintain, to the extent practicable, inward horizontal gradients across the slurry wall and upward vertical gradients beneath the containment system thus reducing and minimizing downgradient groundwater migration. The selected remedy under the 1993 ROD included: 1) enhancing the present source control system by optimizing the leachate extraction rate and other operating parameters in order to achieve, to the degree practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system;

White and Wine Creeks flow adjacent to the Site. White Creek flows along the western boundary, while Wine Creek flows along the eastern and northern boundaries. The confluence of the creeks is located to the northwest of the Site. Shallow areas adjacent to the creek channels and located east, west, and north of the Site are frequently inundated during creek flood events (Roux Associates, Inc., 1998).

Historical groundwater analytical results for groundwater samples collected at the Long-Term Monitoring (LTM) wells are presented in Figure 3. The groundwater analytical results presented on the figure date from 1989 to 2013, and show volatile organic compound (VOC) concentrations for constituents for which performance standards are stipulated in the SOW.

## 1.4 Site History

The PAS facility, a high-temperature, liquid-chemical waste incineration facility, operated from 1970 through 1977. Beginning in 1973, a series of incidents, including liquid waste spills and the overflow of liquid wastes from lagoons into White Creek, led to the involvement of the United States Environmental Protection Agency (USEPA) and New York State Department of Environmental Conservation (NYSDEC) at the Site. Response actions taken from 1973 to 1982 by the USEPA,

NYSDEC, and Coast Guard resulted in an oil spill cleanup, the removal of the incineration facilities, drummed wastes, bulk liquid wastes, and contaminated soils, and the closure of two on-site lagoons. According to the 1993 Record of Decision for the PAS Site, these removal actions constitute the first operable unit (OUI).

From 1982 to 1984, the NYSDEC performed a Site Investigation and Remedial Alternatives Evaluation of the Site which was the initial Remedial Investigation/Feasibility Study (RI/FS) conducted at the Site. Based on the results of this study, the USEPA signed a ROD in 1984 (OU2), which specified the following remedial actions: 1) limited excavation and offsite disposal of contaminated materials, 2) installation of a perimeter slurry wall, 3) Site grading and capping in accordance with Resource Conservation and Recovery Act (RCRA) requirements, 4) installation of a leachate collection and treatment system, and groundwater monitoring. The NYSDEC implemented the remedial actions identified in the ROD, with the exception of the on-site treatment system. Rather than installing an on-site treatment system, the leachate was collected by the NYSDEC from 1986 through 1991 and transported off-site to an approved RCRA treatment, storage, and disposal (TSD) facility.

From 1984 to 1986, the NYSDEC performed an environmental assessment of the area in the vicinity of the Site that included White and Wine Creeks. Based on the results of the environmental assessment, the NYSDEC determined that no remediation of the creeks was required.

In 1989, the NYSDEC began a long-term monitoring program (LTMP) for groundwater, surface water, and sediment in the vicinity of the Site. The results of soil gas and groundwater sampling, and down-hole camera investigations of the existing monitoring wells at the Site, conducted between 1987 and 1990, indicated the presence of VOC contamination in the groundwater outside the slurry wall containment system.

In September 1990, an Administrative Order on Consent (AOC) was entered into between the USEPA and a group of potentially responsible parties (PRPs) to conduct a supplemental RI/FS to evaluate the integrity of the existing containment system at the Site, to determine the nature, extent, source, risk, and to identify and evaluate remedial alternatives associated with contamination outside the containment system. The supplemental RI/FS concluded that the contamination detected in the groundwater outside the containment system was attributable to insufficient leachate removal from within the containment system, resulting in a downward hydraulic gradient in the vicinity of LCW-4, located at the center of the containment system (Figure 2B).

In October 1991, the USEPA and a group of PRPs entered into a leachate-removal AOC. This AOC required interim groundwater removal (IGR) of leachate from within the containment system on a periodic basis. These IGR activities were extended by a second AOC entered into in 1994. Leachate extracted under these AOCs was transported to a treatment and disposal facility approved by the USEPA. Table 1 presents the quantities of leachate removed under the IGR activities. As shown in the table, through the end of 1997, a total of 1,696,890 gallons of leachate were removed from the containment system under the 1991 and 1994 IGR AOCs.

Based upon the results of the supplemental RI/FS, the USEPA signed a ROD on December 29, 1993 (OU3). The 1993 ROD incorporated all of the existing components of the 1984 ROD, as well as several additional components. The selected remedy under the 1993 ROD included: 1) enhancing the present source control system by optimizing the leachate extraction rate and other operating parameters in order to achieve, to the degree practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system; 2) connecting downgradient residents in the Smith's Beach area, who were using residential wells, to the public water supply; and 3) implementing institutional controls on groundwater usage through deed restrictions that covered the Site, as well as downgradient locations.

The 1993 ROD also called for several investigations related to the enhancement of the source control system. In addition, as there was some uncertainty related to the source of the polychlorinated biphenyl (PCB) contamination detected in the sediments in the adjacent wetlands and White and Wine Creek; the ROD called for a study to determine the sources of PCB and pesticide contamination. PCBs were not detected in the surface water located adjacent to the Site and pesticides were not detected in the sediments located adjacent to the Site.

In July 1994, an AOC was entered into by the USEPA and a group of PRPs to conduct a supplemental pre-remedial design study (SPRDS) (which was completed in 1996) related to the investigations called for in the 1993 ROD. In September 1994, an AOC was entered into between the USEPA and a group of PRPs to extend the routine leachate removal called for in the 1991 AOC, and, among other things, to connect downgradient residents in the Smith's Beach area, who were using residential wells, to the public water supply. The water-supply connections were completed in July 1995.

In September 1996, an ESD was issued by the USEPA. The ESD explained the results of the additional investigations called for in the 1993 ROD and presented modifications as follows: 1) identified that bedrock pumping would adversely affect the containment system, streams, and wetlands, 2) modified the contingent remedy for the treatment of the leachate to provide for continued off site treatment and disposal in lieu of discharge to the Oswego Eastside Waste Water Treatment Plant, and 3) identified that the Site was not the source of pesticides in surface water or a present source of PCBs in the creek or wetland sediments, and identified upstream sources of PCBs.

Based upon the results of the 1996 SPRDS, a Focused Feasibility Study (FFS) was completed in June 1996 to identify and evaluate remedial alternatives for the PCB-impacted sediments in the vicinity of the Site. The FFS determined that PCB-impacted sediments do not pose a human health risk and that only marginal potential risks to conservatively selected animals are present. In October 1997, the USEPA signed a ROD for the PCB-impacted sediments in the vicinity of the Site. The 1997 ROD identified no further action with long-term monitoring as the selected remedy.

On September 26, 1997, the USEPA and the Performing Settling Defendants signed a Consent Decree for the performance of the operation, maintenance, and long-term monitoring components of the groundwater remedy described in the 1993 ROD, as clarified by the 1996 ESD. This work plan has been prepared and submitted to the USEPA in accordance with the requirements of the 1997 Consent Decree. References to the Consent Decree, as presented in the remainder of this Plan, refer to the September 26, 1997 Consent Decree 98-CV-0012.

As required by the Consent Decree, an Institutional Control Plan was developed and approved by USEPA in 2004. That plan required that certain institutional controls be developed for properties down-gradient of the Site potentially affected by impacted groundwater from the Site. Institutional controls were procured in the Consent Decree for the PAS property itself and Niagara Mohawk property. The PAS Property, owned by the NYSDEC, and the Niagara Mohawk property, located on the north side of the PAS property, are controlled through the Consent Decree and related documents. These controls include successor in title notification requirements and land use restrictions to prevent impacts to the containment system or exposure to groundwater. The land use restrictions include a prohibition on well development or actions that could adversely affect the integrity or protectiveness of the remedial measures under the Consent Decree.

In addition, the Institutional Control Implementation Plan identified the need to procure institutional controls for the Industrial Precision Products (IPP) property located on the northeast side of the PAS property. These institutional controls included the acquisition of an 'Environmental Protection Easement and Restrictive Covenants' for a westerly portion of the IPP property, as is further described in the Remedial Action Completion Report for the PAS Oswego Superfund Site (*de maximis*, July 2006). The Environmental Protection Easement and Restrictive Covenants for the IPP property include successor in title notification requirements and land use restrictions to prevent impacts to the containment system or exposure to groundwater. The Remedial Action Completion Report includes a certification that all institutional controls required by the Consent Decree have been obtained thereby completing the Remedial Action as defined in the Consent Decree. The Remedial Action Completion Report was approved by USEPA in August 2006.

Also, the City of Oswego has jurisdiction over the area and any well development is prohibited and controlled by ordinance.

The institutional controls documented in the Consent Decree and the Remedial Action Completion Report continue to be enforced, and the IPP property is monitored under the approved plan as documented in the annual report under Section 7.4.6.

As noted above, the 1993 ROD identified the preferred option for the treatment and disposal of the extracted leachate and groundwater as discharging it to at the Oswego Eastside Wastewater Treatment Facility. The ROD also identified the construction of an on-site treatment system and discharge to White or Wine

Creek or to groundwater as a contingent option (should the preferred option be determined not to be feasible). In a 1996 ESD, USEPA determined that the preferred option for the treatment and disposal of the extracted leachate and groundwater discharge to the Oswego Eastside Wastewater Treatment Facility was not viable at that time and that the contingent option construction of an on-site treatment system was significantly more costly than off-site treatment, which offered the same level of protection. Therefore, USEPA concluded that off-site treatment of the extracted leachate and groundwater should continue. The construction of an on-site treatment system and discharge to White or Wine Creek or to groundwater was retained as a contingent option to be implemented in the event that off-site treatment becomes infeasible or significantly more costly than on-site treatment.

In 2007, the PRPs, working with the City, began evaluating the option of treatment and disposal of the leachate at the Oswego Eastside Wastewater Treatment Facility. This evaluation included a study conducted by the City to determine whether the leachate discharge to the Eastside Wastewater Treatment Facility would comply with the City requirements included in its pre-treatment program for wastewater discharges from significant industrial users. Based on the results of the leachate monitoring conducted during this study, it was determined that the levels of contaminants in the leachate had declined significantly since the 1996 ESD. Further, based on the improved leachate quality, the City study determined that the leachate would comply with the Oswego pre-treatment discharge requirements, and the Oswego system could treat the PAS discharge. Based on acceptance of PAS leachate and the ability of the Oswego East Side Wastewater Treatment Facility to treat the PAS leachate, USEPA concluded that the remedy should be modified to discharge PAS leachate to the Oswego Eastside Wastewater Treatment Plant (POTW) instead of off-site treatment and disposal (Primary Option). USEPA determined that off-site treatment and disposal of extracted leachate will be retained as the contingent option. USEPA documented this determination in its Explanation of Significant Differences issued in September 2010.

USEPA has conducted three five-year reviews for this Site (USEPA June 1998, USEPA December 2003 and USEPA December 2008). The most recent five-year review, completed in December 2008, concluded that the implemented remedies are protective of human health and the environment in the short-term, and that currently there are no exposure pathways that could result in unacceptable risks and none are expected, as long as engineering and institutional controls are properly maintained and all nearby residents are connected to public water. In order for the Site to be protective in the long-term, hydraulic control within the containment system should be consistently maintained.

## 1.5 Overview of Operations and Monitoring

In general, Site operations currently include periodic leachate and groundwater monitoring, combined with routine leachate removal activities. The following sections provide an overview of these operations.

### 1.5.1 Periodic Monitoring

Monitoring activities at the Site consist of long-term monitoring of groundwater down-gradient of the containment system and operational monitoring of leachate and groundwater within and adjacent to the containment system.

**Long Term Monitoring**

Long-term monitoring requirements include periodic sampling to evaluate groundwater quality downgradient from the containment system, in addition to Site-wide groundwater elevation monitoring to evaluate groundwater hydraulic gradients at the Site. The groundwater quality monitoring activities are performed semi-annually (in the spring and fall) at specified long-term monitoring (LTM) wells, which are installed in bedrock downgradient of the containment system. Groundwater samples are analyzed for VOCs using USEPA method 8260. Long-term groundwater elevation monitoring is performed on a quarterly basis at specified monitoring wells located in the vicinity of the containment system. Quarterly groundwater elevation monitoring currently performed during the months of February, May, August and November includes monitoring at the LR-series wells, LD-series wells, OS-series, OD-series and OI-series monitoring wells.

**Operational Monitoring**

Operational monitoring activities are conducted to evaluate Site conditions relative to leachate collection, removal and disposal activities. The operational monitoring activities include groundwater elevation measurements at overburden monitoring well locations designated as the SWW-series wells, which are a series of paired wells located both inside and outside the containment system, and leachate quality monitoring from LCW 2 and LCW 4 within the containment system. Groundwater elevation measurements are collected routinely (i.e., monthly), in conjunction with periodic leachate collection, removal, and disposal activities. Leachate quality monitoring is performed semi-annually at the two LCW-series wells (LCW-2 and LCW-4), and includes the analysis of leachate samples for VOCs using EPA method 8260.

**POTW Monitoring**

Monitoring of the leachate discharge to the Oswego Eastside Wastewater Treatment Facility (POTW) is also conducted as required by the Oswego Significant Industrial User Wastewater Discharge Permit No. 6-2010-13, Appendix H. The permit includes monthly, semi- annual and 3 year monitoring requirements.

Detailed monitoring program information is presented in Section 3.

### 1.5.2 Leachate Removal and Disposal

Leachate collection, removal, and disposal activities are performed on a monthly basis, and are performed in conjunction with the operational monitoring activities described in Section 1.5.1. The following is an overview of the leachate collection, removal and disposal operations based on the primary leachate and disposal option – discharge to the Oswego Eastside Wastewater Treatment Facility. An overview description of the contingency leachate treatment and disposal option - off-site transportation and disposal at the City of Auburn (Auburn) Wastewater Treatment Facility - is also provided in this section. A more detailed description of these activities is provided in Section 4.

During the first week of each month, pre-pumping groundwater elevation measurements are collected from the SWW-Series monitoring wells. The leachate collection system is then operated to remove leachate from the leachate collection trenches. Leachate is removed by operating leachate collection well pumps LCW-1, LCW-2, LCW-3 and LCW-4. During the first week of the month, approximately 10,000 gallons will be pumped into the leachate collection tank. During months when regional groundwater elevations outside the slurry wall containment system are seasonally low (summer and fall), the leachate removal volume may be increased to what can be efficiently removed during a one-day pumping event up to approximately 20,000 gallons.

These target removal volumes are based on historical system balances to allow the flushing of Site soils and meet the control objectives to the degree practicable. These target rates may be modified if leachate accumulation rates and Site conditions (e.g. groundwater elevations in and around the containment system, precipitation rates) change from historic trends. Evaluation and potential modifications to removal volumes are described in Section 4.3.4.1.

#### 1.5.2.1 Primary Leachate Treatment and Disposal Option – Oswego Eastside Wastewater Treatment Facility

The leachate disposal process is initiated by using the LCW pumps to transfer leachate from the Site leachate trenches to the leachate collection tank. Leachate is then pumped from the collection tank to the Oswego sanitary sewer. Leachate discharged into the sanitary sewer will be conveyed to the Oswego Eastside Wastewater Treatment Facility, the primary option for leachate treatment and disposal. The leachate collection pumps will be operated until a minimum of approximately 10,000 gallons has accumulated in the leachate collection tank. Once approximately 10,000 gallons has been accumulated, the main discharge pump will be activated pumping leachate into the Oswego sewer. During events

when the target leachate volume is greater than 10,000 gallons, the leachate collection pumps will continue to be operated while leachate is being pumped out of the tank into the Oswego sewer. Leachate volumes will be monitored while pumping into the Oswego sewer until such time as the targeted leachate removal volume for that month is achieved. The leachate discharge will be routinely monitored in accordance with the Oswego Significant Industrial User Wastewater Discharge Permit issued by the City. The permit requires that the flow, pH and temperature be monitored during each discharge event. The permit also requires semi-annual monitoring of leachate quality for select metals and pollutants.

#### 1.5.2.2 Contingent Leachate Treatment and Disposal Option – Auburn Wastewater Treatment Facility

In the event leachate is scheduled to be transported off-site for treatment and disposal at the Auburn Wastewater Treatment Facility under the contingent option, Auburn will be notified and tanker trucks scheduled for the shipment. Leachate will be pumped into the leachate collection tank as described above. The leachate accumulated in the collection tank will subsequently be pumped out of the collection tank, through a bag filter system, and into vacuum and straight tanker trucks for off-site transportation to the Auburn Wastewater Treatment Facility. Leachate shipped to the Auburn Wastewater Treatment Facility will be manifested as a non-hazardous waste as approved by USEPA and NYSDEC in 2008.

# 2.0 PROJECT ORGANIZATION

This section describes the project organization, including a description of approved contractors.

## 2.1 Approved Contractors

All aspects of the work performed as part of the operation and maintenance and long-term monitoring activities required under the Consent Decree and ROD will be carried out by contractors approved by the USEPA. As described in this Plan, tasks performed as part of the operation, maintenance, and monitoring activities will include leachate removal, transportation, and off-site treatment and disposal; compliance and operational monitoring; site maintenance; and reporting. The contractors currently approved for these tasks by the USEPA are presented below.

| ***OPERATION, MAINTENANCE & MONITORING ACTIVITY*** | ***APPROVED CONTRACTOR*** |
|---|---|
| Overall Project Coordination | *de maximis,inc.* |
| Leachate Collection and Removal | O'Brien & Gere Operations |
| Leachate Treatment and Disposal (Primary Option) | Oswego Eastside Wastewater Treatment Facility |
| Transportation (Contingent Option) | Op-Tech |
| Leachate Treatment and Disposal (Contingent Option) | Auburn Wastewater Treatment Facility |
| Site Maintenance | O'Brien & Gere Operations |
| Long-term and Operational Monitoring | O'Brien & Gere Operations |
| Laboratory Analyses | Life Sciences Laboratories |

## 2.2 Description of Approved Contractors

The contractors that are currently approved to perform work as part of the operation and maintenance and long-term monitoring program are presented below along with details of their responsibilities.

***Project Coordinator – de maximis, inc.***

*de maximis, inc.(de maximis)* is the Project Coordinator and oversees all work at the Site. *de maximis* is also responsible for overall coordination with the City regarding leachate treatment and disposal at the Oswego Eastside Wastewater Treatment Facility. *de maximis* will coordinate scheduling of leachate removal events with the City and OBG as the prime contractor at the Site. *de maximis* will also prepare quarterly reports required by the City for discharge monitoring and annual progress reports required by USEPA. *de maximis* is also responsible for maintaining project records. Contact information for *de maximis* is as follows:

de maximis, inc.
450 Montbrook Lane
Knoxville, TN 37919
(865) 691-5052

***Prime Contractor – O'Brien & Gere Operations***

O'Brien & Gere Operations (OBG) serves as the prime contractor for the operation and maintenance and long-term monitoring program activities. In general, OBG's responsibilities include performing all leachate collection, removal, maintenance and monitoring activities. This includes leachate collection and removal activities which include pumping leachate from the on-site collection wells into the leachate collection tank and pumping from the collection tank to the Oswego sewer. OBG is responsible for providing prior notification to the City wastewater treatment personnel of planned leachate removal events. In the event the contingent option (off-site transportation and disposal) for leachate disposal is used, OBG is responsible for coordinating and subcontracting the off-site transportation of leachate to the Auburn Wastewater Treatment Facility. OBG is also responsible for performing all monitoring and maintenance activities, maintaining records of OBG site activities, and preparing reporting documentation. OBG provides on-site representatives to oversee site activities by other approved contractors, if needed. The contact information is as follows:

O'Brien & Gere Operations
7600 Morgan Road.
Liverpool, NY 13090
(315) 956-6100

***Primary Treatment and Disposal Facility – Eastside Wastewater Treatment Facility, Oswego, New York***

The primary treatment and disposal facility for PAS leachate is the Eastside Wastewater Treatment Facility located at 71 Mercer St. in Oswego, New York. PAS leachate treatment and disposal is conducted under a Significant Industrial User Wastewater Discharge Permit issued by the City of Oswego in July 2010. The contact information for the City of Oswego is as follows:

City of Oswego City Hall
13 W. Oneida St
3rd Floor West Wing
Oswego, NY 13126
ATTN: City Engineer
(315) 342-8153

***Contingency Treatment and Disposal Facility – Auburn Wastewater Treatment Facility, Auburn, New York***

Under Auburn Wastewater Discharge Permit No. 2011-01, the Auburn Wastewater Treatment Facility located at 35 Bradley Street in Auburn, New York serves as the contingent treatment and disposal facility for PAS leachate. In April 2008, the USEPA confirmed that the Auburn Wastewater Treatment Facility was acceptable to receive

leachate removed from the PAS Site. The Auburn Wastewater Treatment Facility served as the primary leachate treatment and disposal facility for the period July 2008 to September 2010. The Auburn Wastewater Treatment Facility was re-designated at the contingent treatment and disposal facility after approval of the City of Oswego as the primary treatment facility. The address and telephone for the City of Auburn are as follows:

Department of Municipal Utilities
City of Auburn
24 South Street
Auburn, NY 13021
(315) 255-4135

***Contingent Transportation Contractor -Op-Tech, Syracuse, New York***

As a subcontractor to the prime contractor, Op-Tech serves as the contingent contractor for transporting leachate from the PAS Site to the Auburn Wastewater Treatment Facility, which is the contingent leachate treatment and disposal facility. Op-Tech provides the personnel and equipment necessary for loading and transporting the leachate to the Auburn Wastewater Treatment Facility. The contact information and USEPA identification information for Op-Tech are as follows:

Op-Tech Environmental Services
1 Adler Drive
E. Syracuse, NY 13057
(315) 437-2065
USEPA I.D. No. NYD986980753

***Analytical Laboratory - Life Sciences Laboratories, East Syracuse, New York***

As a subcontractor to the prime contractor, Life Sciences Laboratories serves as the analytical laboratory for the analysis of groundwater and leachate samples collected as part of the long-term monitoring activities at the Site. The address, telephone, and certification information for Life Sciences Laboratories are as follows:

Life Sciences Laboratories, Inc.
5854 Butternut Drive
East Syracuse, NY 13057
(315) 445-1105
New York State Certification No. 10248

Table 2 presents the organization of approved contractors, along with their associated general responsibilities for performing operation, maintenance, and long-term monitoring activities.

## 2.3 Approved Contractor Selection Procedures

As set forth in the Consent Decree, work carried out as part of the operation and maintenance and long-term monitoring activities is required to be performed by USEPA approved contractors. If contractors other than the approved contractors listed in Section 2.2 are to perform work regulated under the Consent Decree at

the Site, the name, title, and qualifications of the proposed contractor will be submitted to the USEPA for approval. Based on a review of the submitted information, the USEPA will issue an authorization or notice of disapproval. The proposed contractor will not perform, direct, or supervise any work at the Site under the requirements of the Consent Decree until the issuance of the notice to proceed by the USEPA.

If the USEPA disapproves of a proposed contractor, the USEPA will issue a notice of disapproval and the reasons therefore. Subsequently, the name, title, and qualifications of one or more alternative proposed contractors will be submitted to the USEPA within 30 days of receipt of the USEPA's notice of disapproval. The USEPA will then provide written notice of the name(s) of any contractor(s) that it disapproves and an authorization to proceed with respect to any of the other proposed contractors. Any of the approved contractors will be eligible to perform work at the Site, and the name of the contractor that is selected to perform work at the Site will be submitted, in writing, to the USEPA within 21 days of the USEPA's authorization to proceed.

# 3. SITE MONITORING

## 3.1 General

The Site monitoring program will include periodic monitoring of groundwater and leachate at the Site. The monitoring program methods, procedures, frequency, and locations presented in this plan are based on the requirements originally stipulated in the SOW, including such changes as approved by USEPA, for both operational and long-term monitoring. In addition, periodic monitoring requirements for the Oswego Significant Industrial user permit are included in this section. Requirements, frequency, methods, and procedures for conducting monitoring of groundwater and leachate are described below.

## 3.2 Monitoring Requirements and Frequency

The monitoring program will include long-term monitoring activities required in the Consent Decree, as well as operational monitoring activities performed in support of the leachate collection, removal and disposal activities. The requirements and frequency for these activities are described in the following sections.

### 3.2.1 Long-Term Monitoring Requirements and Frequency

Long-term monitoring of groundwater is required as part of the SOW, and will include the performance of periodic groundwater elevation measurements and groundwater quality analyses. These activities will be performed concurrently and twice annually, in the spring and fall, and in conjunction with the leachate collection, removal, and disposal activities (Section 4.3). The schedule and requirements for groundwater monitoring are described below.

#### *3.2.1.1 Long-Term Monitoring Requirements and Frequency: Groundwater Elevation Monitoring*

Groundwater elevations will be measured monthly at the twelve SWW-series wells and quarterly for other wells, including the LCW-series wells, M-series wells, LR-series wells, LD-series wells, and OS-, OD-, LS- and OI-series wells. The list of wells and frequency of monitoring for groundwater of elevation may be modified based on Site observations with USEPA approval. The well locations are shown on Figure 2A. Leachate and groundwater elevation measurements will be collected prior to the scheduled leachate removal event during the month requiring measurement. The methods and procedures for monitoring groundwater elevations are presented in detail in Section 3.3.1.1.

Groundwater elevation records-will be recorded and retained using the format presented on the Groundwater Elevation Monitoring Log (Appendix C).

### 3.2.1.2 *Long-Term Monitoring Requirements and Frequency: Groundwater Quality Monitoring*

Groundwater will be sampled from three (LR-6, LR-8 and M-21) of the five downgradient LTM bedrock monitoring wells originally specified in the SOW. Former LTM wells M-25 and M-26 were approved for abandonment by USEPA in 2007 and are no longer part of long-term monitoring program as documented in the July 2007 Annual Progress Report. The remaining LTM wells will be sampled twice annually, in the spring and fall. (See Figure 2A for well locations and Appendix M for construction information). Groundwater collected from these sampling locations will be analyzed for benzene, chlorobenzene, 1,1-dichloroethane, ethylbenzene, toluene, and xylenes (referred to herein as selected VOCs), as required by the SOW. In addition to the samples collected from the three LTM wells, one duplicate, matrix spike / matrix spike duplicate (laboratory quality control sample) sample will be collected from a selected well, and will be submitted, along with trip and rinse blanks (field quality control samples), for laboratory analysis. Detailed groundwater sampling information is presented in Section 3.3.1.2.

Groundwater samples collected at the LTM wells, and the quality control samples will be submitted for analysis using USEPA SW-846 Method 8260B Rev. 2 (12/96). Detailed sample analysis and quality assurance/quality control information is presented in the QAPP (Appendix F).

Groundwater quality data will be recorded and retained using the format presented on the Groundwater Quality Monitoring Logs (Appendix B). The schedule for performing long-term groundwater monitoring is presented in Table 3.

### 3.2.1.3 *Long-Term Monitoring Requirements and Frequency: Groundwater Monitoring Data Evaluation*

The groundwater performance standards, as presented in the SOW, are as follows:

| Chemical Constituent | Concentrations (ug/L) |
|---|---|
| Benzene | 0.7 |
| Chlorobenzene | 5 |
| 1,1-Dichloroethane | 5 |
| Ethylbenzene | 5 |
| Toluene | 5 |
| Xylenes | 5 |

If monitoring results from any of the LTM wells demonstrate that performance standards for a specific LTM well have been achieved in two consecutive monitoring events, a request will be made to the USEPA to modify the prescribed monitoring frequency. Modifications may consist of deletion of one or more constituents at a specific LTM well from future

monitoring event analysis, or removal of one or more LTM wells from the long-term monitoring protocol.

### 3.2.2 Operational Monitoring Requirements and Frequency

Operational monitoring will consist of groundwater and leachate quality monitoring performed in conjunction with the leachate collection, removal, and disposal activities, and long-term monitoring activities, where the schedules for these activities coincide. The operational monitoring results will be used to evaluate Site hydrogeologic conditions. These evaluations will be subsequently used to determine leachate removal requirements. A description of the operational monitoring requirements and frequency is presented below.

#### 3.2.2.1 Operational Monitoring Requirements and Frequency: Groundwater Elevation

Operational groundwater monitoring will consist of measuring groundwater elevations at selected monitoring wells on a monthly basis prior to each leachate removal event. The monthly monitoring events will include the measurement of groundwater elevations at monitoring wells within and at the perimeter of the containment system, specifically, the twelve SWW-series paired wells and four LCW-series wells (Figure 2A). The quarterly monitoring events will include the measurement of groundwater elevations at monitoring wells within and in the vicinity of the Site, specifically, the twelve SWW-series paired wells, four LCW-series wells, three M-series wells, the L series wells, and the O-series wells (Figure 2A).

The monitoring wells included as part of the monthly and quarterly operational monitoring activities are subject to change during future monitoring activities based on data needs. If a review of operational monitoring data indicates that a well is not needed for monitoring data, these wells will be deleted from the monitoring protocol.

The schedule for performing operational groundwater monitoring is presented in Table 3. Where the operational groundwater elevation monitoring schedule coincides with the long-term groundwater elevation monitoring schedule, the long-term monitoring activities will be performed in lieu of the operational monitoring activities. Detailed groundwater elevation measuring methods and procedures are presented in Section 3.3.1.1.

#### 3.2.2.2. Operational Monitoring Requirements and Frequency: Leachate Quality Monitoring

Leachate samples will be collected from two of the LCW-series wells on a semi-annual basis, in conjunction with the leachate collection, removal, and disposal activities, as deemed necessary

by the Performing Settling Defendants to evaluate leachate removal and disposal activities. This information will be used to periodically verify that the constituent concentrations in the leachate are consistent with the waste characterization information on file with the primary and contingency treatment and disposal facilities. It will also be used to monitor any changes in the leachate quality over time. One round of leachate samples will be collected from LCW-2 and LCW-4 (Figure 2A) in the spring and fall in conjunction with the semiannual LTM activities. In addition to the samples collected from the LCW-series wells, one trip blank (field quality control sample) will be submitted for analysis.

The leachate and quality control samples will be analyzed for selected VOCs using USEPA SW-846 Method 8260B Rev. 2 (12/96). If deemed necessary by the Performing Settling Defendants and their representatives for evaluative purposes, additional leachate analyses may be performed as-needed. Detailed quality assurance/quality control sample collection and analytical requirements are presented in the QAPP (Appendix F).

Leachate quality sampling data are recorded and retained using the format presented on the Groundwater and Leachate Quality Monitoring Logs (Appendix B). The schedule for performing operational leachate monitoring is presented in Table 3. Detailed leachate sampling methods and procedures are presented in Section 3.3.2.3.

#### 3.2.2.3 Operational Monitoring Requirements and Frequency: POTW Permit Compliance

The primary disposal option approved by USEPA allows discharge of leachate into the Oswego sewer system under the Oswego Significant Industrial User Permit No. 6-2010-13. POTW Compliance monitoring under this permit includes leachate discharge sampling for pH, and temperature during each discharge event, and semi-annual composite sampling of the leachate discharge for TSS, BOD, Sb, As, Be, Cd, Cr, Cu, Cn, Pb, Hg, Ni, Se, Ag, Ti, Zn and phenols. The leachate discharge will be sampled for priority pollutants every three years.

The schedule for performing POTW Compliance monitoring is presented in Table 3. Detailed discharge monitoring methods and procedures are provided in Section 3.3.2.3.

## 3.3 Methods and Procedures

The Site monitoring program will include groundwater, and leachate monitoring. The methods and procedures for conducting long-term and operational monitoring activities are presented separately in the following sections.

### 3.3.1 Long-Term Monitoring Methods and Procedures

Methods and procedures used for long-term monitoring of groundwater will be performed as specified in the SOW, and will include periodic groundwater elevation measurements, and groundwater quality analysis. Descriptions of the specific groundwater monitoring methods and procedures are presented below.

#### 3.3.1.1 Long-Term Monitoring Methods and Procedures: Groundwater Elevations

Long-term groundwater elevation monitoring will be performed at the monitoring well locations specified in Section 3.2.1.1. The methods and procedures for measuring groundwater elevations are as follows:

1. Don the personal protective equipment specified in the Health and Safety Contingency Plan.

2. Identify the monitoring wells requiring sampling on the Groundwater Elevation Monitoring Log. Record the date, time, weather conditions, and personnel collecting the monitoring data.

3. Use a PID calibrated in accordance with the manufacture specifications to establish the background reading near the well.

4. Establish the background reading with the PID.

5. Verify that the well is not damaged. Examine the well casing, concrete collar, and lock.

6. Remove the well cover while standing upwind of the well. Remove the well cap. Place the PID probe in the breathing zone above the well casing. Proceed if the PID reading is below 1 ppm. If the PID reading is above 1 ppm, move upwind from well for approximately 5 minutes to allow the well headspace to aerate. Repeat the PID reading. If above 1 ppm, follow the instructions in the Health and Safety Contingency Plan.

7. Use a calibrated electronic water level probe with a least count of 0.01 foot.

8. Clean the water level probe and cable as described in Step 8a below.

8a. Wash and scrub surfaces with a low-phosphate detergent (Alconox or equivalent), followed by a tapwater (tap water may be from any treated municipal water supply; untreated water is

unacceptable) rinse. Rinse the surfaces with acetone, followed by hexane (pesticide grade or better for each solvent), and then with demonstrated, analyte-free, deionized water (the volume of rinse water must be at least 5 times greater than the volume of solvent). Allow equipment surfaces to air dry. Place decontamination solutions in the leachate collection tank.

9. Locate the marked measuring reference point on the well casing. If a reference point is not marked use north side of casing.

10. Lower the water-level indicator probe until it indicates the top of water or bottom of well has been reached. Measure to the nearest hundredth foot from the measuring reference point, and record the depth to water (DTW) or depth to the bottom of the well.

11. Repeat step 9 and record the DTW measurements on the Groundwater Elevation Log.

12. Remove probe from the well.

13. Compare measurement with historic data provide in the Groundwater Elevation Log for well level range.

14. If the DTW is outside the range on the Groundwater Elevation Log repeat Step 9 and record.

15. Clean the water level probe as described in Step 8a above.

16. Replace the well cover and lock the well.

17. Properly dispose of the disposable sampling materials (plastic sheeting, bailer, and health and safety equipment).

Groundwater elevation monitoring requirements and frequency information is presented in Section 3.2.1.

#### 3.3.1.2 Long-Term Monitoring Methods and Procedures: Groundwater Quality

Long-term groundwater quality monitoring will be performed at the monitoring well locations specified in Section 3.2.1. The methods and procedures for collecting groundwater samples are as follows:

1. Don the personal protective equipment specified in the Health and Safety Contingency Plan.

2. Identify the monitoring wells requiring sampling on the Groundwater Quality Monitoring Log (Appendix B). Record

the date, time, weather conditions, and personnel collecting the monitoring data.

3. Determine the order of wells to be sampled based on previous sampling results. For each well, calculate the total quantity of VOCs during the previous sampling event, and establish the well sampling order from lowest total VOC concentration to highest total VOC concentration.

4. Place plastic sheeting adjacent to monitoring well to use as a clean work area,

5. Use a PID calibrated in accordance with the manufacture specifications to establish the background reading near the well.

6. Verify that the well is not damaged. Examine the well casing, concrete collar, and lock.

7. Remove the well cover while standing upwind of the well. Remove the well cap and place it on the plastic sheeting. Place the PID probe in the breathing zone above the well easing. Proceed if the PID reading is below 1 ppm. If the PID reading is above 1 ppm, move upwind from well for approximately 5 minutes to allow the well headspace to aerate. Repeat the PID reading. If above 1 ppm, follow the instructions in the Health and Safety Contingency Plan.

8. Measure the DTW and depth of well following the procedures presented in Steps 7 through 13 in Section 3.3.1.1.

9. Calculate the number of gallons of water in the well using the length of water column (in feet) (the difference between the depth of the well and the DTW) multiplied by the area (in feet) of the monitoring well casing (screened section) (conversion: 1 gallon = 0.1337 cubic feet).

10. Decontaminate an adjustable-rate, positive-displacement groundwater sampling pump (i.e., centrifugal or bladder pump constructed of stainless steel or Teflon) and associated sampling equipment (Teflon or Teflon lined tubing) as described in Step 10a below.

10a. Operate the pump sequentially for 5-minute intervals in separate vessels containing the following solutions: potable water, potable water/nonphosphate solution (Alconox or equivalent), potable water, and distilled/deionized water. Collect a sample of the distilled/deionized-water rinsate to serve as an equipment blank sample. Flush associated pump equipment similarly in each of the four solutions. Use detergent sparingly.

Place decontamination solutions in the leachate collection tank.

11. Slowly lower the pump into the well to a level at least 2 feet above the bottom of the well to minimize disturbance of sediment. Record the depth of the pump, and measure and record the static water level in the well. Leave the water level probe in the well.

12. Purge the well at a maximum rate of 500 milliliters per minute (ml/min). Monitor the water level at 5-minute intervals, and maintain no more than a 0.3-foot drawdown. Place purged groundwater in the leachate collection tank.

13. During purging, monitor the following parameters at approximate 5-minute intervals: turbidity, specific conductance, pH, redox potential (in-line), and dissolved oxygen (in-line). The well is considered stabilized and ready for sampling when the parameters have stabilized for three consecutive readings as follows:

    +/- 0.1 for pH;
    +/- 3% for specific conductance;
    +/- 10 millivolts for redox potential; and
    +/- 10% for dissolved oxygen and turbidity.

    Alternatively, if the monitoring well has not stabilized after 4 hours of continuous purging, suspend and document the stabilization attempts, and proceed with sample collection. Record the measurements on a Groundwater Quality Monitoring Log (Appendix B). Do not remove the pump from the well between purging and sampling.

14. Determine the proper quantity of sample preservative to be placed into the sample containers by using a trial sample of purged water. Add 1:1 hydrochloric acid (12N hydrochloric acid demonstrated, analyte-free, deionized water) drop by drop, to a third portion of the sample water in the sample container. Determine the number of drops of hydrochloric acid required to attain a pH less than 2, and discard the trial sample. Add the same number of drops of hydrochloric acid to each sample container to be used for the sample activities. Alternately, the laboratory may provide appropriately preserved bottles.

15. Collect samples in preserved sample containers at a flow rate between 100 and 250 ml/min while maintaining a drawdown of no more than 0.3 feet. Fill VOC sample containers by allowing the water to flow down the side of the sample container. Fill the sample container completely, such that no headspace or air bubbles are present in the container or

sample, respectively. Screw on the Teflon cap tightly. Do not filter the sample.

16. At the conclusion of the sampling activities, remove the pump and associated equipment. Retain the dedicated tubing for reuse.

18. Label the sample container with the following information: sample type (groundwater); project number and Site name; sample identification code; analysis required; date; sampling time; and preservative. Cover the label with clear packing tape to secure the label onto the container. Place a signed custody seal over the cap such that the cap cannot be removed without breaking the custody seal.

18. Initiate chain-of-custody by designating the sampling personnel as the responsible party (after sampling or prior to sample packing). Note: If the designated sampling person relinquishes the samples to other sampling or field personnel for packing or other purposes, the samplers will complete the chain-of-custody prior to this transfer. The appropriate personnel will sign and date the chain-of-custody form to document the sample custody transfer.

19. Secure the sample(s) with packing material and store at 4°C in an insulated transport container.

20. Replace the well cover and lock the well.

21. Properly dispose of the disposable sampling materials (plastic sheeting, bailer, and health and safety equipment).

Additional groundwater quality sampling information is available in USEPA Region II *Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling, Standard Operating Procedure* (March 1998).

### 3.3.2 Operational Monitoring Methods and Procedures

Operational monitoring will consist of groundwater elevation, leachate quality, and POTW compliance monitoring. The results of the operational monitoring activities will be used to evaluate Site hydrogeologic and hydrologic conditions and ensure compliance with the discharge permit. These evaluations will be used to determine groundwater and leachate removal requirements. Operational monitoring methods and procedures are described in the following sections.

### 3.3.2.1 Operational Monitoring Methods and Procedures: Groundwater Elevations

Operational groundwater monitoring will consist of the collection of groundwater elevation measurements, and will be performed at the well locations and frequency specified in Section 3.2.2.1. The general methods and procedures for measuring groundwater elevations are presented below.

1. Don the personal protective equipment specified in the Health and Safety Contingency Plan.

2. Identify the monitoring wells requiring monitoring on the Routine Groundwater Elevation Measurement Data Sheet (Appendix C). Record the date, time, weather conditions, and personnel collecting the monitoring data.

3. Use a PID calibrated in accordance with the manufacture specifications to establish the background reading near the well.

4. Remove the well cover while standing upwind of the well. Place the PID probe in the breathing zone above the well casing. Proceed if the PID reading is below 1 ppm. If the PID reading is above 1 ppm, move upwind from the well for approximately 5 minutes to allow the well to aerate. Repeat the PID reading. If above 1 ppm, follow the instructions in the Health and Safety Contingency Plan.

5. Obtain DTW measurements following the procedures in Steps 7 through 13 in Section 3.3.1.1.

6. Replace the well cover and lock the well.

Groundwater elevation monitoring requirements and frequency information is presented in Section 3.2.1.1.

### 3.3.2.2 Operational Monitoring Methods and Procedures: Leachate Groundwater Quality

Operational monitoring of leachate quality will be performed at the well locations specified in Section 3.2.2.2. The methods and procedures for monitoring leachate quality are as follows:

1. Don the personal protective equipment specified in the Health and Safety Contingency Plan.

2. Identify the monitoring wells requiring sampling on the Groundwater Quality Monitoring Log. Record the date, time, weather conditions, and personnel collecting the monitoring data. Record field observations on a field data sheet (Appendix B).

3. Place plastic sheeting adjacent to well to use as a clean work area.

4. Use a PID calibrated in accordance with the manufacture specifications to establish the background reading near the well.

5. Remove the well cover while standing upwind of the well. Place the cover on the plastic sheeting. Place the PID probe in the breathing zone above the well casing. Proceed if the PID reading is below 1 ppm. If the PID reading is above 1 ppm, move upwind from the well for approximately 5 minutes to allow the well to aerate. Repeat the PID reading. If above 1 ppm, follow the instructions in the Health and Safety Contingency Plan.

6. Obtain a DTW and depth of well measurement following the procedures in Steps 7 through 13 in Section 3.3.1.1.

7. Calculate the number of gallons of water in the well using the length of water column (in feet) (the difference between the depth of well and DTW) multiplied by 0.143 (applicable only to the 14-inch-diameter LCW-series wells) (conversion: 1 gallon = 0.1337 cubic feet). Purge five well volumes of leachate from the well using the pump permanently located in the well, unless the well runs dry, in which case the leachate that infiltrates into the well after it has been pumped dry will be sampled. Place purged leachate in the leachate collection tank.

8. Decontaminate an adjustable-rate, positive-displacement groundwater sampling pump (i.e., centrifugal or bladder pump constructed of stainless steel or Teflon) and associated sampling equipment (Teflon or Teflon lined tubing) as described in Step 10a below.

9. Operate the pump sequentially for 5-minute intervals in separate vessels containing the following solutions: potable water, potable water/nonphosphate solution (Alconox or equivalent), potable water, and distilled/deionized water. Collect a sample of the distilled/deionized-water rinsate to serve as an equipment blank sample. Flush associated pump

equipment similarly in each of the four solutions. Use detergent sparingly. Place decontamination solutions in the leachate collection tank.

10. Slowly lower the pump into the well to a level at least 2 feet above the bottom of the well to minimize disturbance of sediment. Record the depth of the pump, and measure and record the static water level in the well. Leave the water level probe in the well.

11. Purge the well at a maximum rate of 500 milliliters per minute (ml/min). Monitor the water level at 5-minute intervals, and maintain no more than a 0.3-foot drawdown. Place purged groundwater in the leachate collection tank.

12. During purging, monitor the following parameters at approximate 5-minute intervals: turbidity, specific conductance, pH, redox potential (in-line), and dissolved oxygen (in-line). The well is considered stabilized and ready for sampling when the parameters have stabilized for three consecutive readings as follows:

    +/- 0.1 for pH;
    +/- 3% for specific conductance;
    +/- 10 millivolts for redox potential; and
    +/- 10% for dissolved oxygen and turbidity.

    Alternatively, if the monitoring well has not stabilized after 4 hours of continuous purging, suspend and document the stabilization attempts, and proceed with sample collection. Record the measurements on a Groundwater Quality Monitoring Log (Appendix B). Do not remove the pump from the well between purging and sampling.

13. Determine the proper quantity of sample preservative to be placed into the sample containers by using a trial sample of purged water. Add 1:1 hydrochloric acid (12N hydrochloric acid demonstrated, analyte-free, deionized water) drop by drop, to a third portion of the sample water in the sample container. Determine the number of drops of hydrochloric acid required to attain a pH less than 2, and discard the trial sample. Add the same number of drops of hydrochloric acid to each sample container to be used for the sample activities. Alternately, the laboratory may provide appropriately preserved bottles.

14. Collect samples in preserved sample containers at a flow rate between 100 and 250 ml/min while maintaining a drawdown of no more than 0.3 feet. Fill VOC sample containers by allowing the water to flow down the side of

the sample container. Fill the sample container completely, such that no headspace or air bubbles are present in the container or sample, respectively. Screw on the Teflon cap tightly. Do not filter the sample.

15. At the conclusion of the sampling activities, remove the pump and associated equipment. Retain the dedicated tubing for reuse.

16. Label the sample container with the following information: sample type (groundwater); project number and Site name; sample identification code; analysis required; date; sampling time; and preservative. Cover the label with clear packing tape to secure the label onto the container. Place a signed custody seal over the cap such that the cap cannot be removed without breaking the custody seal.

17. Initiate chain-of-custody (COC) by designating the sampling personnel as the responsible party (after sampling or prior to sample packing). Note: If the designated sampling person relinquishes the samples to other sampling or field personnel for packing or other purposes, the samplers will complete the chain-of-custody prior to this transfer. The appropriate personnel will sign and date the COC form to document the sample custody transfer.

18. Secure the sample(s) with packing material and store at 4°C in an insulated transport container.

19. Replace the well cover and lock the well.

20. Properly dispose of the disposable sampling materials (plastic sheeting, bailer, and health and safety equipment).

Additional groundwater quality sampling information is available in USEPA Region II *Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling, Standard Operating Procedure* (March 1998).

Leachate quality monitoring requirements and frequency information is presented in Section 3.2.2.2.

### 3.3.2.3 Operational Monitoring for POTW Permit Compliance

POTW Compliance monitoring includes leachate discharge sampling for the frequency and parameters specified in Section

3.2.2.3. The general methods and procedures are presented below.

1. Initiate leachate discharge pumping as prescribed in Section 4.3.2. The following procedures are performed under step 24 of the leachate discharge pumping procedure.

2. Position safety gear near work area (absorbent pads, fire extinguisher) that's contained within the sites wooden storage shed.

3. Position plastic drip pan under the location of the sample port to collect any spillage

4. Position leachate sample bottle and transportation containers near the sample location.

5. Verify the Durco centrifugal discharge pump is operating correctly, by verifying the discharge flow meter is recording the discharge of leachate water from the leachate collection tank (Figure 7A).

6. Using a plastic utility pail, place pail under sample port and slowly open sample port for approximately 5-10 seconds, in order to purge the sample port of air and foreign matter. Any accumulated purge water will be placed back into the leachate collection tank.

7. Inspect sample bottle for foreign matter prior to collecting sample.

8. Position the plastic 0.5 liter sample bottle obtained from the lab under the sample port, and slowly open the port valve in order to fill approximately 1/3 the volume of the sample bottle.

9. Place the cap on the sample and place the sample into an iced lined cooler and record sample collection times.

10. Repeat steps 7 and 8 two additional times over the span of the entire leachate discharge. (a total of three (3) equal aliquots will be collected from the sample port per sample)

11. Using laboratory grade pH test strips, record the pH of the collected sample by inserting the strip into the top portion of the bottled leachate sample.

12. Record pH reading onto the Chain of Custody (COC).

13. Record the samples water temperature on the COC.

14. Complete the laboratory COC for test parameters requiring laboratory analysis. (a complete list of parameters is found in the Oswego discharge permit Appendix H)

15. Complete laboratory supplied sample bottle "label" with time the sample was collected, and by whom (technician).

16. Place composite sample in ice lined cooler.

17. Deliver sample to project approved laboratory.

# 4. LEACHATE COLLECTION, REMOVAL, AND DISPOSAL

## 4.1 General

Leachate collection, removal, and disposal activities will include the removal of leachate from the system of collection trenches, via pumps and force mains, to the leachate collection tank. The leachate will be subsequently pumped from the leachate collection tank, metered and discharged into the Oswego sanitary sewer system. Leachate discharged into the sanitary sewer will be conveyed to the Oswego Eastside Wastewater Treatment Facility, the primary option for leachate treatment and disposal. The leachate collection pumps will be operated until a minimum of approximately 10,000 gallons has accumulated in the leachate collection tank. Once approximately 10,000 gallons has been accumulated, the leachate discharge pump will be activated thus pumping leachate into the City sewer. During events when the target leachate volume is greater than 10,000 gallons, the leachate collection pumps will continue to be operated while leachate is being pumped out of the tank into the City sewer. Leachate volumes will be monitored while pumping into the City sewer until such time as the targeted leachate removal volume for that month is achieved. The leachate discharge will be routinely monitored in accordance with the Significant Industrial User Wastewater Discharge Permit issued by the City of Oswego. The permit requires that the flow, pH and temperature be monitored during each discharge event. The permit also requires semi-annual monitoring of leachate quality.

In the event the primary option for leachate disposal becomes unavailable, leachate will be transported off-site for treatment and disposal at the Auburn Wastewater Treatment Facility under the contingent option, the City of Auburn will be notified and tanker trucks scheduled for the shipment. Leachate will be pumped into the leachate collection tank as described above. The leachate accumulated in the collection tank will subsequently be pumped out of the collection tank, through a bag filter system, and into vacuum and straight tanker trucks for off-site transportation to the Auburn Wastewater Treatment Facility. Leachate will be manifested to the Auburn Wastewater Treatment Facility as a non-hazardous waste as approved by USEPA and NYSDEC in 2008. The following sections describe the leachate collection system components, operation of the leachate collection system, leachate loading and transfer operations, and transportation and disposal operations and requirements.

## 4.2 Leachate Collection System Components

The leachate collection system consists of a series of gravel-filled leachate collection trenches, four leachate collection wells (the LCW-series wells) with submersible pumps, a leachate collection tank, a network of PVC force mains, and system controls. As depicted in Figure 2B, a downgradient perimeter leachate collection trench is located inside the slurry wall at the northern boundary of the containment system, while a cross trench is located in the center of the containment system. Leachate is withdrawn from the downgradient leachate collection trench through LCW-1, LCW-2, and LCW-3. Leachate is removed from the cross trench through LCW-4. Each leachate collection well

pump discharges to the leachate collection tank through the force main. A detailed description of the system is presented below.

### 4.2.1 Leachate Collection Wells and Trenches

Leachate is removed from the two collection trenches through a series of four leachate collection wells. Each leachate collection well consists of a 14-inch-diameter stainless steel casing that extends from the surface of the cap to the top of the lodgement till. Each collection well is equipped with a stainless steel submersible pump, independent pump controls, and a control panel and local electrical disconnect. Detailed leachate collection well construction details are presented on Record Drawing No. 8 (Appendix A).

### 4.2.2 Electrical System

Power is supplied by a 120/240-volt (V), 4-Watt (W), 3-phase, 60-Hertz (Hz) transformer sized for 200 ampere (A) service. The transformer, which is owned by Niagara Mohawk Power Corporation, is located on a utility pole on the north side of East Seneca Street to the south of the Site. The power is supplied to a 200-A, 120/240-V, 4-W, 3-phase, 60-Hz, NEMA 4 power distribution panel that consists of a 200-A main circuit breaker and 42-circuit panel connected to the following circuits via underground feeders.

| Circuit No. | Circuit Breaker Size | Use |
|---|---|---|
| 1 | 20A/3Phase | Control panel for LCW-1 |
| 2 | 20A/3Phase | Control panel for LCW-2 |
| 3 | 20A/3Phase | Control panel for LCW-3 |
| 4 | 20A/3Phase | Control panel for LCW-4 |
| 5 | 15A/1Phase | Automatic telephone dialer |

System power can be controlled through the on-off switch on the control box located adjacent to the power distribution panel. Power to the individual leachate collection wells can be controlled through the on-off switch located on the control panel adjacent to each leachate collection well. A process and instrumentation diagram for the leachate collection system is presented on Figure 4.

### 4.2.3 Leachate Pumps and Controls

Each leachate collection well is equipped with a stainless steel submersible pump to pump leachate from the leachate collection well to the leachate collection tank. The features of the pump and motor are summarized below.

***Stainless Steel Leachate Collection Well Pumps***

| | |
|---|---|
| Number of units | Four (located at LCW-1, LCW-2, LCW-3, and LCW-4) |
| Manufacturer | Gorman-Rupp Company, Mansfield, Ohio |
| Supplier | Siewart Equipment Co., Inc. Rochester, New York (716) 482-9640 |
| Type | Submersible Centrifugal |
| Model No. | S2E65-E3.5230/3 |
| Impeller Diameter (inches) | 4-5/16 |
| Pumping Capacity (gallons per minute) | 50 |
| Total Dynamic Head (feet) | 64 |

***Leachate Collection Well Pump Motors***

| | |
|---|---|
| Number of units | Four (located at LCW-I, LCW-2, LCW-3, and LCW-4) |
| Manufacturer | Durham |
| Power (horsepower) | 3.5 |
| Speed (revolutions per minute) | 3,450 |
| Voltage (V) | 230 |
| Current (A) | 10.8 |

***Leachate Main Discharge Pump & Mofor***

| | |
|---|---|
| Manufacture | Flowserve |
| Supplier | Siewart Equipment Co., Inc. Rochester, New York (585) 482-9640 |
| Type | Centrifugal Self Prime |
| Model | Durco Mark III 1K1.5X1.5US82RV M3FPD-s/c |
| Impeller | D4.CF.8M. Recessed |
| Pumping Capacity | 80-100 gpm |
| Speed | 1800 rpm |
| Motor | 3hp |
| Voltage (V) | 230 |

The control panel located adjacent to each leachate collection well allows for manual leachate collection pump operation. The control panel includes a power disconnect switch, pump on-off switch, and pump power-on indicator light.

### 4.2.4 Collection Tank System

The leachate collection tank is a rectangular, below-grade concrete tank with a corrugated metal sheeting-covered truss roof, The tank was in existence prior to the implementation of the remedial action in 1986, and was incorporated into the remedial design to temporarily store leachate during the leachate collection, removal, and disposal activities. The approximate inner dimensions of the tank are 18 feet wide by 38 feet long by 8 feet deep. The tank is partitioned into two sections by a concrete wall. During leachate collection, removal, and disposal operations, the larger of the two sections, which is located on the south end of the tank, is used for temporary leachate storage. Based on field measurements, the approximate maximum capacity of this section of tank is 14,300 gallons. However, maintaining approximately four inches of freeboard in the tank for safety results in a maximum operating capacity of approximately 13,000 gallons. Figures 5A and 5B depict plan and elevation information for the leachate collection tank and piping system. Upon filling the leachate collection tank from the leachate collection wells, leachate is either discharged directly into the Oswego sewer system through a metered line or loaded into a tank truck for off-site disposal using the trucks pump.

## 4.3 Leachate Collection and Discharge System Operation

### 4.3.1 General

Routine operation of the leachate collection system will include operation of the leachate collection pumps, collection of leachate in the leachate collection tank, and monitoring the inflow to the tank and the volume of leachate collected in the tank. The Site operating schedule is presented in Table 4. A detailed description of the leachate collection system operations is presented in the following sections.

### 4.3.2 Routine Operation and Control Procedures

Routine leachate collection system operation will include operation and monitoring of the pumps located at the LCW-series wells and monitoring of the leachate volume contained in the leachate collection tank. The typical procedures for system operation and control are presented below. It should be noted that variations to these procedures are possible, and the procedures presented herein represent those that are typically conducted during leachate collection, removal, and disposal activities. Alternative procedures may be necessary and may be performed to adapt to specific field conditions or Site activity requirements.

1. Open main entrance inspect gate and clear of snow if necessary.

2. Inspect the power distribution panel and if necessary energize the power by switching the control box adjacent to the power distribution panel to the "on" position.

3. Open the Site storage and pump shed. Ensure safety supplies are available (absorbent pads, spill pan, fire extinguisher). Inspect the main discharge pump for any damage, vermin, oil levels, proper valve position (closed). Ensure heat trace system is on during cold periods (Oct-May).

4. Manually turn on the main discharge pump (bump) for 10 seconds to ensure proper operation (Figure 7A and 7B).

5. Inspect the 20 foot sections of 3 inch rubberized hose and ensure camlocks are working properly and will secure against camlock body.

6. Open the locked door to the leachate collection tank (Figure 7C). Take an initial reading of the leachate level in the tank using the graduated measuring stick (see Section 4.3.3). Record this measurement, as well as other pertinent information on the Site Inspection Checklist (Appendix D) and Leachate Disposal Checklist (Appendix E).

7. Perform monthly water level monitoring for all 12 slurry wall well (SWW) locations and 4 leachate collection well (LCW) locations following procedures presented in Section 3.3.1.1.

8. If required, perform quarterly water level measurements for seventeen (17) wells OS, OI, LD, LS, LR and M.

9. Upon completing well level measurements, ensure the 3 inch PVC stan-pipe is vertically positioned in the leachate collection tank and the T-valve is closed.

10. Open the 2 inch leachate collection tank inlet valve (main) using the stem mounted handle located at the front of the collection tank (Figure 7C).

11. Measure the amount of residual leachate water contained in the leachate collection tank using the 10 foot wooden depth gauge (stick) 305 gallons per inch. Record the measurement onto the Leachate Disposal Checklist.

12. At each control panel adjacent to the leachate collection well, open and inspect for moisture, vermin or anomalies. Turn the control panel power "on" and the manual pump on-off switch to the "on" position. Remove the well cover and visually inspect the well for flow and listen for the sound of the running pump to ensure proper operation. Operate the four leachate collection well pumps as needed to meet the leachate collection objectives determined by project coordinator and as pump operation allows. Record the time each pump is turned on.

13. After turning on the four leachate collection well pumps calculate the flow rate into the leachate collection tank using the procedures presented in Section 4.3.3.

14. Periodically perform a visual and auditory inspection of each LCW well pump to confirm appropriate flow from the pump. If the sound of the operating pump indicates that the pump is not efficiently flowing (i.e., detection of a slurping sound emanating from the pump), turn the pump off, allow the leachate collection well to recharge with leachate, and restart the pump after the level of leachate in the well is above the pump inlet elevation. Continue this periodic monitoring of each operating pump for the duration of the leachate collection, removal, and disposal activities.

15. Periodically measure the volume of leachate in the tank and calculate the flowrate into the tank (see Section 4.3.3). Record these measurements. If the flowrate into the tank decreases in comparison to previous flowrate determinations, perform an inspection of each LCW well for proper pump operation.

16. When the leachate volume approaches 10,000 gallons, collect depth measurements at a frequency of approximately one minute.

17. When the volume in the tank reaches 10,000 to13,000 gallons depending on the volume required for disposal, turn the four leachate collection pumps off and move the 2 inch leachate collection tank inlet valve to the off position.

18. Connect the transfer hose to the inlet of the pump and the stan-pipe in the tank. Make sure the stan-pipe T valve is closed.

19. Prior to discharge to the City, the flow meter pre discharge reading must be recorded onto the Leachate Disposal Checklist.

20. Using a plastic funnel pour approximately 10 gallons of water into the main discharge pump primer port until the hose is full.

21. Start the main discharge pump and open the stan-pipe T-valve.

22. The main discharge pump will begin to prime. This may take 5-15 minutes. The priming of the pump will be known when the pressure gages indicate positive pressure and the meter displays discharge flow.

23. The main discharge pump will remain in the on position until the required volume of leachate has been discharged into the Oswego sewer system.

24. If a semi-annual (May and November) composite grab sample for leachate disposal compliance monitoring will be collected from the main discharge pump sample port. The composite sample will be derived from 3 periodic collections over the time of disposal. This sample will be tested for the parameters listed in the Oswego Wastewater disposal permit. Procedures for compliance monitoring are identified in Section 3.3.2.3.

25. If more than 10,000 gallons of leachate is required to be discharged during the event, repeat steps 4-7 keeping leachate inflow into the leachate collection tank ahead of the amount discharged.

26. When the leachate volume needed to meet the discharge requirement for the event is approached turn off the LCW pumps and record the leachate discharge information including start times, stop times.

27. When the required leachate disposal volume is achieved, the technician will turn off the main discharge pump and record the pH, temperature and total gallons discharged as observed on the meter onto the Leachate Discharge Checklist.

28. The main pump primer T valve is open to gravity feed the remaining leachate into the holding tank.

29. Note, upon completing the monthly discharge, residual leachate may remain in the leachate collection tank. A residual level of 12 inch is preferred in the winter months to help prevent the residual leachate in the collection tank from freezing.

30. The 3 inch rubber hoses are disconnected from the pump and rolled up to drain any potential residual into the leachate collection tank. Then the hoses are disconnected and stored in the shed.

31. The lower volute drain on the main discharge pump is opened to enable accumulated leachate to drain into the spill pan to prevent potential freezing in the pump. This leachate is dumped into the leachate collection tank (Figure 7-A).

32. Heat tracing will remain on during cold months (Oct-May).

33. The 3 inch stan-pipe is lifted and stowed into the leachate collection tank rafters for the next event.

34. The leachate collection tank 2 inch ball valve is opened.

35. The leachate holding tank door is closed and locked.

36. If contingency operation is required perform tasks 1-17 above.

37. When the transportation contractor arrives on site, commence the leachate loading and transfer operations, as described in Section 4.4.

38. When the vacuum tank truck is filled to capacity (approximately 5,000 gallons), measure the leachate level in the leachate collection tank using the graduated measuring stick (see Section 4.3.3). Calculate the volume remaining in the tank and the volume required to fill the remaining tank truck(s) (the maximum capacity of the tank truck for transporting leachate can be obtained from the transportation subcontractor). If the measured volume remaining in the leachate collection tank is less than the calculated volume required to fill the remaining tank trucks, restart the leachate collection well pumps and resume auditory monitoring of the operating pumps and quantitative monitoring of the tank volume in accordance with the procedures presented in Steps 10 and 17 above.

39. Discontinue the pumping operation when the stick-measured volume of leachate in the leachate collection tank equals the volume required to fill the remaining tank truck(s), or the measured flow rate into the leachate collection tank has decreased below approximately 5 gallons per minute (by visual inspection of leachate discharge rate). After turning the pumps off, record the volume transferred.

40. Continue the leachate loading and transfer operations (see Section 4.4). This step and the procedures presented in Step 10 - 17 above can be performed concurrently.

41. At the completion of the leachate loading and transfer operations, replace the cover on the leachate collection wells, close the cover to the power distribution panel, turn the power switch on the control box located adjacent to the power distribution panel to the "off" position, and close and lock the door to the leachate collection tank.

    Operating problems associated with leachate collection well pump systems may be separated into two categories: pump failures and control equipment failures. A trouble shooting guide for the system is presented in Table 6.

### 4.3.3 Leachate Flow and Volume Measurement

As described in Section 4.3.2, leachate flowrate and volume will be determined as part of the leachate collection, removal, and disposal activities. A graduated measuring stick is available to determine the volume of leachate in the leachate collection tank. Descriptions of the procedures for measuring and calculating leachate volume and flowrate are presented below.

#### 4.3.3.1 Measuring Volume in the Leachate Collection Tank

Total volume collected in the leachate collection tank can be determined by stick measurement. To determine the volume of leachate in the leachate collection tank using the graduated measuring stick, insert the stick into the leachate, and measure the distance from the bottom of the tank to the phreatic surface of the leachate. As the stick is graduated in units of inches, the volume in the tank is determined by multiplying the depth of leachate by 305 gallons per inch.

#### 4.3.3.2 Calculating Flowrate into the Leachate Collection Tank

The flowrate into the leachate collection tank can be determined by performing stick measurements. To determine the flowrate into the leachate collection tank using the graduated measuring stick, determine the depth of leachate in the tank at two separate times. Determine the time interval, in minutes, between the two depth measurements. Determine the difference between the two depth measurements and multiply this value by 305 gallons per inch. This calculation yields the volume change during the measured time interval. The average flowrate, in gallons per minute, is the quotient of the volume change during the measured time interval divided by the measured time interval.

### 4.3.4 Leachate Removal Rates

Monthly leachate removal volumes are based on leachate accumulation rates in the leachate collection system, which in turn are based on seasonal hydrogeologic conditions at the Site. Trends in leachate removal volumes or groundwater constituent concentrations measured at the LTM wells may result in a need to adjust the targeted monthly removal volume, as described below.

#### 4.3.4.1 Initial Removal Rate

As described in Section 1.5.2 and presented in Table 4, the current leachate collection, removal, and disposal operations include the performance of up to two removal events per month. During the first event, performed during the first week of the month, the volume that can be efficiently removed during a one-day pumping event (up to 20,000 gallons) in the spring and summer, is collected, removed, and disposed. During the fall and winter months the removal volume is reduced to 10,000 gallons. In addition, a contingency removal event, performed (if necessary) during the third week of the month, may be scheduled to collect, remove and dispose of approximately 10,000 gallons of additional leachate

These target removal volumes will continue to be used for future removal events, provided that leachate accumulation rates and Site conditions (e.g., groundwater elevations in and around the containment system, precipitation rates, etc.) are consistent with control objectives. If removal volumes and Site conditions deviate from historic trends, efforts may be undertaken to modify the target monthly leachate removal volume as described in Section 4.3.4.2.

#### 4.3.4.2 Removal Rate Adjustments

As described in Section 4.3.4.1, changes in leachate accumulation rates and Site conditions may be reason to reevaluate the monthly target removal volume, and implement an adjustment of the target removal volume. The attributes of the adjustments will be determined through an examination of historical leachate removal volumes and Site hydrogeology and hydrology, and may include modifying the target removal volume, or modifying the frequency of leachate collection, removal, and disposal activities. Any target removal rate adjustments will be made with the concurrence of the USEPA. If adjustments to the target removal rate are made, the effects of the adjustments will be monitored and evaluated during the following year. Criteria used to evaluate the efficacy of the adjustments will include: the ability to consistently achieve the adjusted target removal volume; groundwater quality trends; and effects on horizontal gradients across the slurry wall and vertical gradients beneath the containment system. If the evaluation of these criteria indicates that the removal rate adjustments were appropriate, no additional adjustments will be made. If the evaluation indicates that further adjustments are required, additional adjustments will be made, as necessary. Such adjustments may include a contingency removal event as a potential removal option in the event that recommended removal volumes are unable to be obtained through the monthly removal events. An example would be if the trenches were unable to produce the recommended amount of leachate for removal in the monthly removal event, the POTW could not accept the total volume in one event, or a truck was unable to arrive at the Site for disposal during an event. Adjustments to the removal rate will be reported in the annual progress reports, as described in Section 7.4.1.

## 4.4 Loading and Transfer

Currently, leachate is directly discharged into the Oswego Wastewater Treatment Plant. Therefore, there are no loading or transfer operations required in the primary disposal option. The contingency operation includes leachate loading and transfer operations which constitute the activities undertaken to withdraw leachate from the leachate collection tank to a vacuum tank truck, and to transfer leachate from the vacuum tank truck to a straight tank truck,

respectively. As presented in the contingency option, a vacuum tank truck will be utilized to transfer leachate from the leachate collection tank to a straight tank truck. A vacuum truck is a tank truck that has the ability to draw liquid into its tank through the operation of a vacuum pumping system. A straight tank truck is a tank truck that does not have the ability to exert a vacuum, and is utilized during contingency Site option activities strictly for containing and transporting, rather than withdrawing leachate. The following section describes the procedures for the loading and transferring leachate in the contingency option.

### 4.4.1 Loading from Leachate Collection Tank to Vacuum Tank Truck

The leachate loading operations will consist of the withdrawal of leachate from the leachate collection tank and containment of the leachate in a vacuum tank truck. The operation will be performed as follows:

1. When the transportation contractor arrives on site, visually inspect the interior of each tank, viewing from the open manway located at the top of the tank, to ensure that the tank is empty. Record relevant observations on the Leachate Disposal Checklist (Appendix E).

2. Place spill collection containers below the loading/unloading connection on the vacuum and straight tank trucks.

3. Following an acceptable inspection of the tank, begin loading leachate from the leachate collection tank into the vacuum tank truck. Withdraw leachate from the tank using the reinforced hose connected to the loading/unloading connection. Leachate can be loaded either by lowering the free end of the hose into the leachate collection tank (below the level of the leachate in the tank), or by connecting the free end of the hose to the quick-connect fitting on the stan-pipe at the south end of the leachate collection tank. These two hose arrangements withdraw leachate directly from the tank, and through the leachate collection tank piping, respectively.

4. When the vacuum tank truck is filled to capacity, discontinue loading by closing the valves at the loading/unloading connection. Allow the pressure inside the tank to equalize to atmospheric pressure.

5. If the leachate contained in the vacuum tank truck will be transported directly to the treatment and disposal facility, the volume of leachate contained in the tank will be measured by stick measurement and the transportation and disposal documentation will be completed as described in Section 4.5.2. Record the leachate volume on the Leachate Disposal Checklist (Appendix E).

6. If the leachate is to be transferred to a straight tank truck, perform the leachate transfer operations as described in Section 4.4.2.

### 4.4.2 Transfer from Vacuum Tank Truck to Straight Tank Truck

The leachate transfer operations will consist of the transfer of leachate from the vacuum tank truck to a straight tank truck. The operation will be performed as follows:

1. Visually inspect the interior of the straight tank, viewing from the open manway located at the top of the tank, to ensure that the tank is empty. Inspect the interior surfaces at the rear end of the tank, where the loading/unloading connection is located, to determine that there are no obstructions, such as ice or other deleterious materials that could potentially block the flow of leachate from the vacuum tank truck to the straight tank truck. If a potential obstruction is observed, investigate the nature of the potential obstruction before commencing any leachate transfer operations from the vacuum tank truck to the straight tank truck. If necessary, mitigate the obstruction to allow unobstructed leachate transfer, or order a substitute straight tank truck from the transportation contractor.

2. When the vacuum tank truck is filled to capacity, and loading has been discontinued by closing the valves on the vacuum tank truck and allowing the pressure inside the tank to equalize to atmospheric pressure, commence the leachate transfer operations.

3. Establish a secure, leak-proof hose connection between the loading/unloading connections on the vacuum and straight tank trucks.

4. Position the driver of the vacuum tank truck between the ends of the trucks to operate the valves at the loading/unloading connections and monitor the hose connections for leaks. Position the driver of the straight tank truck at the manway of the straight tank, visually monitoring the inside of the straight tank for leachate flowing from the vacuum tank truck into the straight tank. Note: the manway on the straight tank truck should remain open throughout the transfer operation.

5. Open the valves on the straight tank truck.

6. Open the valves on the vacuum tank truck. Allow the leachate to gravity flow from the vacuum tank truck to the straight tank truck. Confirm the establishment of gravity flow through the visual observation of leachate flowing into the straight tank by the straight tank truck driver.

7. Observe the hose and its connections for leaks. If leaks are identified, contain the leaking leachate (Section 6.3.3), and close the vacuum tank truck valves, followed by the straight tank truck valves. Mitigate the leak by replacing the hose or reestablishing the hose connections.

8. When gravity flow has been established with no identifiable leaks at the hose connections, commence pressure-driven flow from the vacuum tank truck to the straight tank truck. Increase the positive pressure in the vacuum tank truck to a maximum of 5 pounds per square inch (psi). Under no circumstances shall the positive pressure in the vacuum tank truck exceed 5 psi.

9. Continue pressure-driven flow until the straight tank truck driver observes bubbles emerging from the leachate transferred to the straight tank truck. At this time, the transfer is complete.

10. Immediately close the valves on the vacuum tank truck loading/unloading connection, followed by the valves on the straight tank truck.

11. Remove any leachate from the hose prior to disconnecting the hose from the loading/unloading connection on the straight tank truck.

12. Place the cap onto the loading/unloading connection on the straight tank truck.

13. Measure the volume of leachate contained in the straight tank truck by stick measurement. Close the manway on the straight tank truck and complete the transportation and disposal documentation requirements as described in Section 4.5.2. Record the leachate volume on the Leachate Disposal Checklist (Appendix E).

## 4.5 Documentation

As leachate that will be transported off Site to Auburn for treatment and disposal is categorized as a non-hazardous waste, the transportation will include a Non-Hazardous Waste Manifest and treatment and disposal will be recorded using the leachate disposal forms signed by field technician, transporter and Auburn facility representatives.

### 4.5.1 Pre-Shipment Notification Requirements

Prior to the off-site shipment of leachate or other material to a treatment and disposal facility other than Auburn, written notification of the proposed leachate removal facility will be approved by USEPA Remedial Project Manager. Upon approval USEPA will be advised of the associated removal schedule for the shipment. The address of the USEPA Remedial Project Manager is as follows:

Remedial Project Manager
Central New York Remediation Section
Emergency and Remedial Response Section U.S. Environmental Protection Agency Region 2 290 Broadway, 20th Floor
New York, NY 10007-1866

If the shipment of leachate will be made to a treatment and disposal facility located outside New York State, written notification will be provided to the USEPA and the State Agency to which the material is shipped prior to the shipment. Under this shipping scenario the leachate is considered hazardous waste and will require appropriate notification and manifesting. The notification will include the following information, where available: 1) the name and location of the Site; 2) the type and estimated quantity of the hazardous waste to be shipped; 3) the expected schedule for shipment of the hazardous waste; and 4) the method of transportation.

### 4.5.2 Transportation and Disposal Documentation

In accordance with the NYSDEC ruling for the PAS leachate shipments to the primary disposal facility (Oswego Eastside Wastewater Treatment Plant) or the contingency facility (Auburn Wastewater Treatment Plant) are characteristically non-hazardous and do not require manifesting. However, if waste is shipped to an alternate treatment and storage facility appropriate documentation must accompany the leachate during transport by tank truck from the Site to the treatment and disposal facility. The forms will include the Site identification number (PAS Site USEPA I.D. No. NYD000511659). The required documentation includes a hazardous waste manifest specific to the state where the leachate will be treated and disposed, and a land disposal notification and certification form specific to the destination treatment and disposal facility (Note that the treatment and disposal facility will define the frequency with which land disposal notification and certification forms will be required).

## 4.6 Transportation

Leachate will be transported via tank truck to the treatment and disposal facility by the transportation contractor. The responsibilities of the transportation contractor are described below.

### 4.6.1 Transportation Contractor

The transportation contractor will provide transportation services for transporting leachate from the Site to the treatment and disposal facility. The transportation contractor will be responsible for the leachate from the time that it is released from the Site to the time that it is received by the treatment and disposal facility, and will be licensed to transport hazardous waste in accordance with applicable federal, state, and local regulations. Vehicles used by the transportation contractor to transport leachate will be placarded as necessary. The appropriate copy of the hazardous waste manifest form, if necessary, will be retained by the

transportation contractor for records retention.

## 4.7 Disposal

As described in Section 2.2, waste characterization information is maintained on file with the primary and contingency treatment and disposal facilities. If the contingency disposal facility is used the prime contractor will be provided a scale-measured quantity of the leachate received at the facility.

# 5. SITE MAINTENANCE

## 5.1 General

The purpose of Site maintenance activities is to ensure that the remediation objectives are satisfied through the duration of the Site operations and long-term monitoring activities. The maintenance program will include preventative and corrective maintenance. Activities performed as preventative maintenance will include routine work such as inspections, adjustment of equipment, mowing, etc. Corrective maintenance will include non-routine work undertaken to repair equipment or components of the Site that have been found to be either deficient, or out of working order through inspection. The schedule for Site maintenance is presented in Table 5. The components of the maintenance program are described in the following sections.

## 5.2 Leachate Collection System

The leachate collection system will be inspected prior to each leachate collection, removal, and disposal event. The results of the inspection will be recorded on the Site Inspection Checklist (Appendix D). The visual inspection will include an examination of the leachate collection wells, pump controls, and leachate collection tank. Problems identified during the inspection will be investigated and repaired, as necessary. During operation, any performance problems will also be investigated. If major problems are identified, the leachate collection system will be shut down for emergency maintenance, and the leachate collection, removal, and disposal activities will be postponed, as necessary. If repairs are required, the repair work will be performed as described in the following sections.

Health and safety requirements for leachate collection system maintenance activities are presented in the Health and Safety Contingency Plan (Appendix G).

### 5.2.1 Repair Procedures

If identified, defective leachate collection system component(s) will be repaired or replaced, as required, to maintain reliability of the overall system. The maintenance activities will be documented on the Site Inspection Checklist (Appendix D), and recorded in the Site maintenance records (see Section 7.2.6).

If pump-related deficiencies are identified, the pump will be removed from the LCW-series well using a hand-winch and tripod assembly. As the pump and associated piping equipment are removed from the well, the surfaces will be decontaminated using a low-pressure steam cleaner. Decontamination rinsate will be collected and placed in the leachate collection tank. Following the performance of the decontamination procedures, the pump will be disconnected from the attached discharge piping, and transported to the support zone for inspection and maintenance/repair.

If deficiencies in the leachate collection system piping (located in the leachate collection tank) are identified during the inspection or leachate collection, removal, and disposal operations, repairs or replacement activities will be performed, as necessary. Piping and valves will be removed, decontaminated with a low-pressure steam cleaner, inspected, and repaired or replaced.

### 5.2.2 Disposal of Used Material and Waste

Waste materials generated during leachate collection system maintenance activities will be properly disposed of in accordance with state and federal regulations. Water used to decontaminate equipment will be placed in the leachate collection tank to await removal and off site treatment and disposal. Disposable equipment, such as PPE, and decommissioned equipment, such as pump parts, piping, valves, etc. will be decontaminated using a low pressure steam cleaner, characterized, and disposed of as necessary.

## 5.3 Cap

Maintenance activities performed for the cap will include routine inspections to determine the status of the Site landscaping, evaluate erosion control and drainage, and identify damage caused by burrowing animals. The following sections describe cap-related maintenance requirements.

### 5.3.1 Mowing/Seeding

The purpose of the vegetation on the cap is to control erosion and stabilize the cap soils. Perennial grasses planted on the cap maintain a strong vegetative stand through underground root stalks and self seeding. During periods when snow and ice have not accumulated on the surface of the cap, it will be inspected quarterly to identify areas of sparse vegetation, bare spots, stressed vegetation, cracks, erosion, and differential settlement. If the inspection indicates that vegetation is sparse, stressed, or nonexistent, the affected area(s) will be reseeded with a perennial grass seed mixture. If erosion is identified on the cap, erosional rills and gullies, if present, will be backfilled or regraded, and the area will be reseeded. If differential settlement is observed, an evaluation of the conditions will be undertaken, and mitigative action will be implemented based on the results of the evaluation.

The vegetative cover will be mowed once annually, during the late spring. The mowing will be performed on the area inside the perimeter fence and in the area located adjacent to the fence. In conjunction with the mowing, vegetation will be trimmed along the base of the equipment storage shed, leachate collection tank, each on-site monitoring well, and perimeter fence. The grass will be cut to no closer than 6 inches above ground level and the cuttings will not be removed from the cap.

### 5.3.2 Weed Control

The occurrence of weeds on the cap will be evaluated during the quarterly cap inspections (see Table 5 and Appendix D). If a preponderance of weeds is identified, localized removal or cutting will be undertaken to eliminate the weeds. In order to reduce the potential for additional weed growth through seed germination, removed or cut weeds will be transported off of the cap area. Herbicides will not be used for weed control on the cap.

### 5.3.3 French Drains

French drains located along East Seneca Street and at the western fence line (see Record Drawing No. 1 in Appendix A) will be visually inspected quarterly during cap inspections to ensure that the drains are effectively draining surface water from the cap to White Creek (drain located along East Seneca Street), and the concrete drainage trough (drain located at the western fence line). The effectiveness of the French drains will be evaluated based on the presence or absence of surficial ponded water in the vicinity of the drains. If significant ponded water is observed on the cap in the vicinity of the French drain more than 24 hours after a rainfall event, maintenance activities will be performed to increase the drainage capacity of the drain. Vegetation will be trimmed around the French drains once annually.

### 5.3.4 Concrete Drainage Trough

The concrete drainage trough (see Record Drawing No. 1 in Appendix A) will be inspected quarterly to ensure that the trough is free of obstructions and effectively draining surface water runoff from the cap toward the northwest corner of the Site, If the results of the inspection indicate that sediment, vegetative debris, trash, or other obstructions are preventing efficient drainage, the obstructions will be removed. Vegetation at the edge of the concrete drainage trough will be trimmed once annually. Materials removed from the trough and trimmings will be properly disposed of.

### 5.3.5 Burrowing Animals

As part of the quarterly cap inspection activities, damage caused by burrowing animals will be evaluated to ensure that the integrity of the underlying HDPE liner is maintained, and continuous vegetative cover is maintained across the cap. If the results of the inspection indicate that burrowing animals are residing on the cap, or have caused damage to the cap vegetation, soils, or HDPE liner, measures will be undertaken to remove the animal(s) from the Site. Following removal of the animal(s), the damaged areas will be repaired, as required.

## 5.4 Foliage Control

Vegetation within 5 feet of the perimeter fence line along East Seneca Street and along the western fence line to Wine Creek will be trimmed to a height of 6 inches. This trimming activity will be performed once annually. In addition, vegetation growing along the remainder of the fence line will be cut back if the vegetation poses a threat to the integrity of the fence (i.e., dead tree limbs lying above or on the fence). Cuttings will not be removed from the Site.

## 5.5 Monitoring Wells

Monitoring wells associated with the long-term and operational groundwater monitoring activities will be inspected prior to use. The well locks, casing, and riser will be inspected for wear and damage. If the results of the inspection indicate that the well is deteriorated or damaged, parts will be repaired or replaced, as necessary, or the well will be decommissioned. The determination of whether the well is repaired or decommissioned will be made based on the condition of the well,

## 5.7 Equipment Storage Shed

The equipment storage shed will be inspected annually during scheduled Site activities to ensure that the integrity of the structure is maintained, and that the doors can be locked to secure equipment stored inside the shed. Repairs will be performed as necessary.

## 5.8 Perimeter Fence

The Site perimeter fence, and signs on the fence will be inspected monthly, as allowed by snow and ice, to ensure that security is maintained, and that signage is in place. If accidental damage is identified along the perimeter fence, or signage is damaged or missing, repair or replacement work will be performed to restore the fence or signage to its original condition.

## 5.9 Site Access Drive

The Site access drive will be evaluated periodically during scheduled Site activities to ensure that the asphalt has not deteriorated. If accidental damage occurs, or deterioration results from long-term usage, patching, sealing, resurfacing, or replacement will be performed, as necessary.

## 5.10 Fire Extinguisher

A fire extinguisher will be maintained on site in the equipment shed. The fire extinguisher will be inspected monthly by prime contractor personnel to ensure that it is properly charged. An annual inspection will be performed by a trained fire protection professional to maintain the equipment in conformance with applicable fire protection regulations.

## 5.11 Spill Control Materials

Spill control materials will be maintained at all times in the equipment storage shed. These materials will be stored on site for use, if necessary, during the leachate removal, collection, and disposal activities. At a minimum, the following spill control materials will be stored on site: absorbent material (e.g., Speedi-Dry), absorbent booms, a shovel, and an empty 55-gallon drum. The spill control materials will be inventoried quarterly to ensure that adequate spill control supplies are available.

## 5.12 Snow Removal

The Site access road will be plowed, as necessary, during the winter months to allow access for vehicles and personnel conducting operation and maintenance and long-term monitoring activities.

# 6. OPERATING CONTINGENCY PLAN

## 6.1 General

This section presents the general and emergency response procedures to be followed in the event that an emergency situation is identified and response action is required.

## 6.2 General Response Procedures and Reporting

Site activities will be performed by, or under the oversight of the prime contractor. As such, Site operational problems will initially be observed by, or reported to the prime contractor. Upon identification or notification of an operational problem, the on-site representative of the prime contractor will determine the extent of the problem, and notify the prime contractor's Project Manager. The on-site representative will inform the prime contractor's Project Manager of the potential threat to human health or the environment. If possible, the on-site representative will make a preliminary assessment of the nature and extent of any potential threat identified, and will take actions to mitigate the problem if deemed necessary, and if possible. The prime contractor's Project Manager will subsequently notify *de maximis* of the situation. Notification of the appropriate regulatory agencies will be made by *de maximis*. If *de maximis* is not available for notification of an operational problem, the USEPA Remedial Project Manager will be notified.

## 6.3 Emergency Recognition and Prevention

A potential exists for the development of emergency situations during the leachate collection, removal, and disposal activities. These situations include leachate collection tank overfill, pump failure, tank truck hose rupture, and tank truck overfill. A description of these emergency situations and the associated preventative measures are presented below.

### 6.3.1 Leachate Collection Tank Overfill

The maximum capacity of the southern section of the leachate collection tank is approximately 14,300 gallons; however, the tank operational volume is limited to 13,000 gallons to maintain a four-inch freeboard on the east-west oriented wall that separates the northern and southern sections of the tank. The tank capacity is also limited to maintain a level of leachate below the elevation of the HDPE liner in the cap, which is sealed to the exterior surface of the tank. To minimize the potential for tank overfill, leachate level measurements will be collected periodically, and the level of leachate contained in the tank will be visually evaluated during the leachate collection, removal, and disposal operations, as described below.

During operation of the leachate collection well pumps, prime contractor personnel will measure the depth of leachate in the tank at a frequency of 10 minutes. Based on a volume to height-of-leachate relationship of 305

gallons per inch, the volume of leachate collected in the tank will be calculated for each height measurement. When the leachate volume approaches 10,000 to 13,000 gallons depending on volume required, depth measurements will be collected at a frequency of one minute. When the volume in the tank reaches 13,000 gallons, the pumps will be turned off, and no additional leachate will be pumped into the tank until a sufficient volume has been removed to allow additional volume input. Detailed leachate measurement techniques are described in Section 4.3.3.

In the event that the 14,300 gallon capacity is exceeded, leachate will spill over the concrete partition, into the northern section of the leachate collection tank. If this occurs, the pumps will be turned off immediately, and the leachate that spilled into the northern section of the leachate collection tank will be removed to the extent possible.

### 6.3.2 Pump Failure

In the event that one or more of the leachate collection well pumps fails to operate properly, the standard mitigative action will be to install a replacement pump and any required parts as soon as practical. However, should the leachate collection well pumps or force main remain out of commission for an extended period of time, the potential exists for leachate levels within the containment system to rise.

If the leachate collection system pumps or force main remain out of commission for an extended period of time, the prime contractor will notify *de maximis*, and monitor hydrogeologic conditions at the perimeter of the containment system. Concurrent with the increased monitoring effort, a contingency leachate removal program will be implemented to mitigate any potential for excess accumulation of leachate within the containment system. The contingency leachate removal program may include operating the unaffected pumps, combined with hydrogeologic monitoring, or mobilization of a temporary pumping system to pump water to the leachate collection tank.

### 6.3.3 Hose Rupture and Leakage

During the leachate loading and transfer operations, the potential for spillage and/or hose leaks exists. As described in Section 4.4, leachate will be conveyed through hoses from the leachate collection tank to the vacuum tank truck, and from the vacuum tank truck to the straight tank truck. The potential for a hose leak exists during the withdrawal of leachate from the leachate collection tank and transfer of leachate to the straight tank truck under gravity flow. A leak could be caused by a hole in the hose, or a faulty seal where the hose connects to the loading/unloading connection. The potential also exists for a hose rupture under pressurized flow during the transfer of leachate to the straight tank truck.

If a hose leak or rupture, or hose connection leak is identified, the response action is to immediately close the valves on the vacuum tank truck, followed by the valves on the straight tank truck. Leachate that has leaked will be contained as described below, and leachate remaining in the hose will be drawn back into the vacuum tank truck through vacuum pressure. Defective hose(s) will be replaced.

Released leachate will be confined using absorbent booms or absorbent material, and subsequently solidified using vermiculite, or other similar solidification agent. Spill cleanup material will be containerized, characterized, and properly disposed of at an off-site disposal facility. Absorbent booms and absorbent materials are stored on site in the equipment shed for spill response actions.

### 6.3.4 Tank Truck Overflow

During the leachate transfer operations, the potential for spillage from the manway at the top of the straight tank truck exists. As described in Section 4.4, leachate will be conveyed through a hose from the vacuum tank truck to the straight tank truck. The potential exists for spillage during pressurized flow operations. The spillage would be caused by air bubbles being conveyed through the hose from the vacuum tank truck to the straight tank truck. As the air bubbles discharge into the straight tank truck and rise through the leachate column, waves are generated. at the leachate surface. If the waves are of sufficient magnitude, leachate can escape through the open manway at the top of the tank, spilling onto the ground. The mitigative action for this situation is to limit the magnitude of pressure used to convey leachate to the straight tank truck to a maximum of 5 psi, and to close the valves on the vacuum and straight tank trucks immediately when the straight tank truck driver observes bubbles emanating from the leachate in the straight tank truck (see Section 4.4).

If leachate is released from the manway, it will be confined using absorbent booms or absorbent material, and subsequently solidified using vermiculite, or other similar solidification agent. Spill cleanup material will be containerized, characterized, and properly disposed of at an off-site disposal facility. Absorbent booms and absorbent materials are stored on Site in the equipment shed for spill response actions.

# 7. RECORDS AND REPORTS

## 7.1 General

Record keeping and reporting requirements will include maintaining operating and monitoring records that provide detailed descriptions of the Site operation, maintenance, and monitoring activities; preparation and submission of quarterly reports that summarize Site operation, maintenance, and monitoring activities; and preparation of activity specific notification reports. The requirements for record keeping and report preparation are presented in the following sections.

## 7.2 Operating Records

Operating records will be maintained to document the leachate collection, removal, and disposal activities. Data included as part of the operating records will be recorded during the field activities and retained on file by the prime contractor. The content of the operating records is described below.

### 7.2.1 Leachate Removal Checklist

To accurately account for the disposition of removed leachate, a Leachate Disposal Checklist will be completed for each leachate collection, removal, and disposal event information to be recorded on the checklist is as follows:

- Date and time of leachate collection, removal, and disposal;
- Prime contractor personnel;
- Transportation contractor and treatment and disposal facility;
- Destination of leachate for treatment and disposal and hazardous waste manifest numbers;
- Leachate levels in the leachate collection tank prior to and after leachate collection, removal, and disposal operations;
- Volume of leachate transferred from leachate collection wells to the leachate collection tank and average flow rate; and
- Volume of leachate transported off site in the vacuum and straight tank trucks.

The Leachate Disposal Checklist is presented in Appendix E.

### 7.2.2 Site Inspection Checklist

The results of the Site inspection activities will be recorded on the Site Inspection Checklist. A Site Inspection Checklist will be completed for each leachate collection, removal, and disposal event, in addition to any other Site inspection activities. Information to be recorded on the checklist is presented in Appendix D. Inspection frequency requirements are presented in Table 5.

### 7.2.3 Groundwater Elevation Monitoring Records

Groundwater monitoring records will include groundwater elevations at Site monitoring wells, and will be maintained on two independent forms. Field DTW data and associated calculations will be recorded on Routine Groundwater Elevation Monitoring Log (Appendix C). Data included on the Routine Groundwater Elevation Measurement Data Sheets are as follows:

- Date and time of and personnel collecting groundwater elevation measurements; Distance from the marked measuring reference point on the well casing to static groundwater (DTW) during the previous monitoring event;
- Field-measured DTW, where the measurement will be performed a minimum of two times;
- A range of DTW measurements calculated based on the minimum and maximum DTW during the previous month;
- A third DTW measurement, if the first two DTW measurements fell outside the acceptable DTW range; and
- Calculated groundwater elevations based on the National Geodetic Vertical Datum (NVGD) of 1929.

Groundwater elevation monitoring records will be compiled and recorded on the Historical Groundwater Elevation Monitoring Log (Appendix C). The purpose of these sheets is to summarize groundwater elevation data collected during the long-term monitoring activities. The groundwater elevation data will be used to record the data and time of groundwater elevation measurement, monitoring well identification, and calculated groundwater elevations.

### 7.2.4 Emergency Response Records

In the event of a Site emergency, information concerning the nature of the situation as well as response actions will be recorded in a Site log book. Emergency response and record keeping requirements are described in detail in Section 6 and the Health and Safety Contingency Plan (Appendix G).

### 7.2.5 Maintenance Records

Maintenance activities performed at the Site will be described on the Site Inspection Checklist, in addition to a Site maintenance log. Information recorded as part of the maintenance records will include:

- Date and time of maintenance;
- Personnel performing maintenance;
- Reason for maintenance (i.e., routine, non-routine);
- Description of condition prior to maintenance;
- Description of maintenance activities performed, including parts

replaced or repaired; and
- Date of next scheduled maintenance, if necessary.

The Site Inspection Checklist is presented in Appendix D.

### 7.2.6 Hazardous Waste Manifests

Currently, there are no hazardous wastes generated at the Site. However, if it becomes necessary, copies of hazardous waste manifests generated during Site activities will require retention by the generator, transportation contractor, and treatment and disposal facility, as well as filing with the state(s) where the hazardous waste is generated and disposed. The responsibilities of the generator, transportation contractor, and treatment and disposal facility, as related to the copies of the manifest form are described below. Note that the titles used to reference each of the copies of the manifest form are based on the New York State hazardous waste manifest format.

On behalf of the Performing Settling Defendants, the prime contractor will retain the "Generator - retained by generator" and "Generator - mailed by TSD facility" copies of the manifest. The prime contractor will also transmit the "Generator State - mailed by generator" and "Disposer State - mailed by generator" copies of the manifest to the regulatory agency or agencies in the state(s) where the leachate was generated and disposed.

The treatment and disposal facility will retain the "TSD Facility - retained by TSD facility" copy of the manifest, and transmit the signed "Generator - mailed by TSD facility" copy to the prime contractor. The treatment and disposal facility will also transmit the "Generator State - mailed by TSD facility" and "Disposer State - mailed by TSD facility" copies of the manifest to the regulatory agency or agencies in the state(s) where the waste was generated and disposed.

The transportation contractor will retain the "Transporter Copy - retained by transporter" of the manifest.

### 7.2.7 Land Disposal Notification and Certification Forms

If necessary, original land disposal notification and certification forms will be prepared by the prime contractor and transported by the transportation contractor to the treatment and disposal facility, where they will be retained by the treatment and disposal facility. The prime contractor will also retain a copy of the form.

### 7.2.8 Disposal Certification Records

Under contingency operations a certification that the leachate was properly disposed of in accordance with the applicable laws and regulations will be provided by the Auburn facility. One certificate of disposal form will be provided for each truck load of leachate that is transported to the facility. The certificate of disposal will describe the name and location of the treatment and disposal facility, type and quantity of waste, and waste manifest number under which the waste was transported to the facility. The certificates of disposal will be retained by the prime contractor.

## 7.3 Groundwater Quality Monitoring Records

Monitoring records will be maintained to document the groundwater quality monitoring activities. Data included as part of the monitoring records will be retained on file by the prime contractor. The content of the monitoring records is described below.

### 7.3.1 Groundwater Monitoring Records

Groundwater quality monitoring records will include the results of semi-annual groundwater elevation and groundwater quality monitoring. Groundwater elevation measurements will be recorded along with operational monitoring results, as described in Section 7.2.3. Groundwater quality monitoring results will be recorded on the appropriate Groundwater Quality Monitoring Log (Appendix B). Data included in the groundwater quality monitoring records will include the laboratory analytical data provided by analytical laboratory for the analysis of groundwater samples collected semi-annually at the LTM wells.

### 7.3.2 Leachate Quality Monitoring Records

Leachate quality monitoring records will be recorded on the Leachate Quality Monitoring Log (Appendix B). Laboratory analytical data received from the analytical laboratory for the analysis of semi-annual leachate samples from LCW-2 and LCW-4 will be recorded in the two tables LCW2 and LCW4 included in Appendix B and include the constituents listed in Section 3.2.1.3.

### 7.3.3 POTW Permit Compliance Monitoring Records

Monthly leachate disposal monitoring will be presented in the Leachate disposal checklist. This includes pH and temperature. The semi-annual composite grab sample results will be presented in the Leachate Quality Data table shown under Appendix I and the priority pollutant result currently required every three years under the Oswego Wastewater Discharge Permit will be presented in the format of the Leachate Quality Data table in Appendix I. These results will be provided to the City in accordance with the Oswego Wastewater Discharge Permit quarterly reporting schedule requirements.

## 7.4 Annual Progress Reports

An annual progress report summarizing the results of the operation and maintenance and long-term monitoring activities performed at the Site will be prepared by *de maximis* using the operation, maintenance, and long-term monitoring records provided by the prime contractor. The report will then be submitted by *de maximis* to the USEPA and NYSDEC in July of each year covered and will cover the prior twelve month period (July 1 through June 30). The objective of the annual progress report is to document field activities and procedures such as leachate collection, removal, and disposal activities; groundwater, leachate monitoring activities; and maintenance and repair activities. The progress report will also provide the anticipated schedule for Site activities for the upcoming year. Major components of the annual progress report are described in the following sections.

### 7.4.1 Leachate Collection and Removal Activities

The annual progress report will include a summary of the leachate collection, removal, and disposal activities. Information that will be presented includes:

- Leachate collection and removal dates;
- Operating summary of the leachate collection well operation as recorded on the Leachate Disposal Checklist;
- A summary of Site inspection results as recorded on the Site Inspection Checklist; and
- An evaluation of any leachate removal rate adjustment, if appropriate.

### 7.4.2 Leachate Treatment and Disposal Activities

The annual progress report will include a summary of leachate treatment and disposal activities for routine discharge of leachate into the Oswego Eastside Wastewater Treatment Facility, or as treatment and disposal at the Auburn Wastewater Treatment Facility, if the contingent off-site treatment and disposal facility is used for a leachate disposal event. The contingent facility will be utilized in the unlikely event that the Oswego Eastside Wastewater Treatment Facility is not available for leachate treatment and disposal.

#### 7.4.2.1 Routine Leachate Disposal at the Oswego Eastside Wastewater Treatment Facility

- Dates and actions performed for the period of the report;
- Volume of leachate removed, as measured at the Site using a graduated stick, and as measured on a scale at the treatment and disposal facility;

#### 7.4.2.2 Contingent Leachate Treatment and Disposal at the Auburn Wastewater Treatment Facility

The annual progress report will also include a summary of the any off-site leachate transportation and disposal activities conducted as part of any contingency removal event, including the following information:

- Dates and actions performed for the period of the report;
- Transportation contractor and treatment and disposal facility;
- Non-Hazardous waste manifest number for each truck load of leachate released from the Site; and
- Disposal date and certificate of disposal from the Auburn facility.

### 7.4.3 Groundwater Monitoring Activities

The results of the groundwater monitoring activities, including groundwater elevations and groundwater quality analyses, will be presented in tabular form on the applicable tables along with the field data collection logs. Laboratory analytical data sheets for groundwater analyses will also be presented.

### 7.4.4 Leachate Monitoring Activities

The results of leachate quality monitoring will be presented in the Leachate Quality Monitoring Tables and include data for selected indicator compounds. The field sampling logs will also be provided along with the laboratory analytical data sheets for leachate analyses.

### 7.4.5 POTW Compliance Activities

The results of POTW compliance monitoring will be presented in the Leachate Quality Data Table (Appendix I) and laboratory data sheets will be provided.

## 7.5 Other Reports

Other reports include notification of out-of-state hazardous waste shipment and force majeure reports that are prepared and submitted to the USEPA and/or state regulatory agency under the circumstances described below.

### 7.5.1 Out-of-State Hazardous Waste Shipment

Although none are anticipated, notification requirements for out-of-state shipment of leachate for treatment and disposal are presented in detail in Section 4.5.1.

### 7.5.2 "Force Majeure" Report

A force majeure report will be issued, if necessary, in accordance with Section XVIII of the Consent Decree.

# 8. INSTITUTIONAL CONTROLS

## 8.1 General

This section provides a description of required access and institutional controls for operation, maintenance, and long-term monitoring activities at the PAS Site, and adjacent properties where work required by the Consent Decree will or may be performed. A description of the access agreements, institutional control agreements, or related easements is provided in the following sections.

## 8.2 Access Agreements

Access agreements have been obtained as required by Section IX of the Consent Decree to cover all required work for operation, maintenance, and long-term monitoring activities at the Site, and other such property where such work will be performed. The agreements provide access to representatives of the Unites States, including the USEPA and their contractors, and the State in accordance with Paragraph 25 of the Consent Decree. The Access Agreements are included as Appendix N.

## 8.3 Institutional Control Agreements

As provided in Paragraph 25(b) of the Consent Decree, institutional controls were developed and implemented to prevent use of the Site, or such other property, in any manner that would interfere with, or adversely affect, the integrity or protectiveness of the remedial measures to be implemented under the Consent Decree. Such institutional controls include (a) not installing or using groundwater wells at or downgradient of the Site, except as such work is approved by the USEPA, and (b) not using the Site in a manner that adversely affects the integrity of the containment system installed at the Site.

In developing institutional controls, the same steps identified in Section 8.2 would be followed to identify the land area affected by the required work and current land ownership. Proposed institutional controls would be developed for specific properties that address the requirements of Paragraph 25(b) of the Consent Decree, and submitted to the USEPA for review and approval. The institutional control agreements have been executed and have been recorded. The institutional controls documented in the Consent Decree and the Remedial Action Completion Report continue to be enforced, and the IPP property is monitored under the approved plan as documented in the annual report under Section 7.4.6.

## 8.4 Easements

Upon USEPA request, property easements that run with the land will be obtained in accordance with Paragraph 26(c) of the Consent Decree. Property easements will be obtained that grant right of access for conducting work as required by Paragraph 25(a) of the Consent Decree, and right to enforce identified land/water use restrictions as required by Paragraph 25(b) of the Consent Decree, or any other restrictions deemed necessary by the USEPA.

Such rights will be granted per the Consent Decree language, as described in Paragraph 26(c).

Draft easements along with a current title commitment or report, shall be provided to USEPA within the 60 days if possible of the USEPA request. Within 15 days of USEPA approval, the easement shall be recorded contingent upon the results of an updated title search. Within 30 days of easement recordation, USEPA will be provided final title residence as required by Paragraph 26(c) of the Consent Decree. The easements were recorded and remain in enforced as discussed above.

## 8.5 Institutional Control Reporting

In accordance with the approved Institutional Control Plan, a memorandum of certification will be provided in the annual report (Section 7.4.6). This certification will include the date of property and record inspection. The memorandum of certification will be in the format provided in Appendix P.

## 9. REFERENCES


*de maximis, Interim Groundwater Removal Completion Report* (October 1998)

*de maximis, Five-Year Data Review Report*, PAS Oswego Site (June 2003)

*de maximis, Institutional Control Implementation Plan, PAS Oswego Site* (June, 2004)

*de maximis, Remedial Action Completion Report, PAS Oswego Site* (July 2006)

*de maximis, Five-Year Data Review Report*, PAS Oswego Site (November 2008)

Geraghty & Miller, Inc. *Field Operations Plan* (May 1991).

OBG Technical Services, Inc. 1992. *Work Plan for Interim Groundwater Activities* (February, 1992).

OBG Technical Services, Inc. 1994. *Work Plan Amendment for Interim Groundwater Activities* (September, 1994).

*Roux Associates, Inc. 1998. 1996/1997IGR and LTMP Data Review (March 2, 1998).*

URS Consultants, Inc., 1991. *Operations and Maintenance Manual* (April 1991),

USEPA. 1991. *Consent Order for Groundwater/leachate Removal,* PAS Oswego *Site* (October 4, 1991), USEPA. 1993. *Record of Decision, Pollution Abatement Services* (November *1993).*

USEPA. 1994. *Consent Order for Interim Groundwater Removal, PAS Oswego Site (October 4,* 1994). USFPA. 1996. *Explanation of Significant Differences, Pollution Abatement Services Site* (September 1996). USEPA. *1997. Record of Decision, Pollution Abatement Services Site* (September, 1997).

USEPA. 1997. *Consent Decree for Operation, Maintenance, and Long-Term Monitoring, Pollution Abatement Services Site* (September 1997),

USEPA. *1998. Groundwater Sampling Procedure, Low Stress (Low Flow) Purging and Sampling* (March 16, 1998).

USEPA, 1998 Five-Year Review Report, (June 1998)

BBL, 1998 Operation and Maintenance and Long-Term Monitoring Plan (August 6, 1998)

USEPA, 2003 Five-Year Review Report (December 2003)

USEPA, 2008 Five-Year Review Report (December 2008)

# TABLES

*Table 1*
*BBL Environmental Services, Inc.*
*PAS Site*
*Oswego, New York*

*Operation and Maintenance and Long-Term Monitoring Plan*
*Interim Ground-Water Removal Rates Under the 1994 IGR Order*

| Month | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|
| January | N/A | 25,445 | 25,441 | 25,972 |
| February | N/A | 25,830 | 23,457 | 22,316 |
| March | N/A | 24,852 | 25,098 | 24,257 |
| April | N/A | 22,815 | 22,187 | 26,793 |
| May | N/A | 23,690 | 23,718 | 24,840 |
| June | N/A | 24,586 | 23,924 | 23,830 |
| July | N/A | 23,450 | 25,402 | 25,340 |
| August | N/A | 24,188 | 25,129 | 19,677 |
| September | N/A | 18,343 | 21,514 | 20,417 |
| October | 0 | 23,288 | 24,541 | 17,867 |
| November | 25,562 | 20,133 | 20,589 | 18,564 |
| December | 25,121 | 22,544 | 22,347 | 19,498 |
| TOTALS | 50,683 | 279,164 | 283,347 | 269,371 |

**Summary:**

1994 IGR Order: 882,565 gallons (through 1997)
1991 IGR Order: 814,325 gallons
Total: 1,696,890 gallons (through 1997)

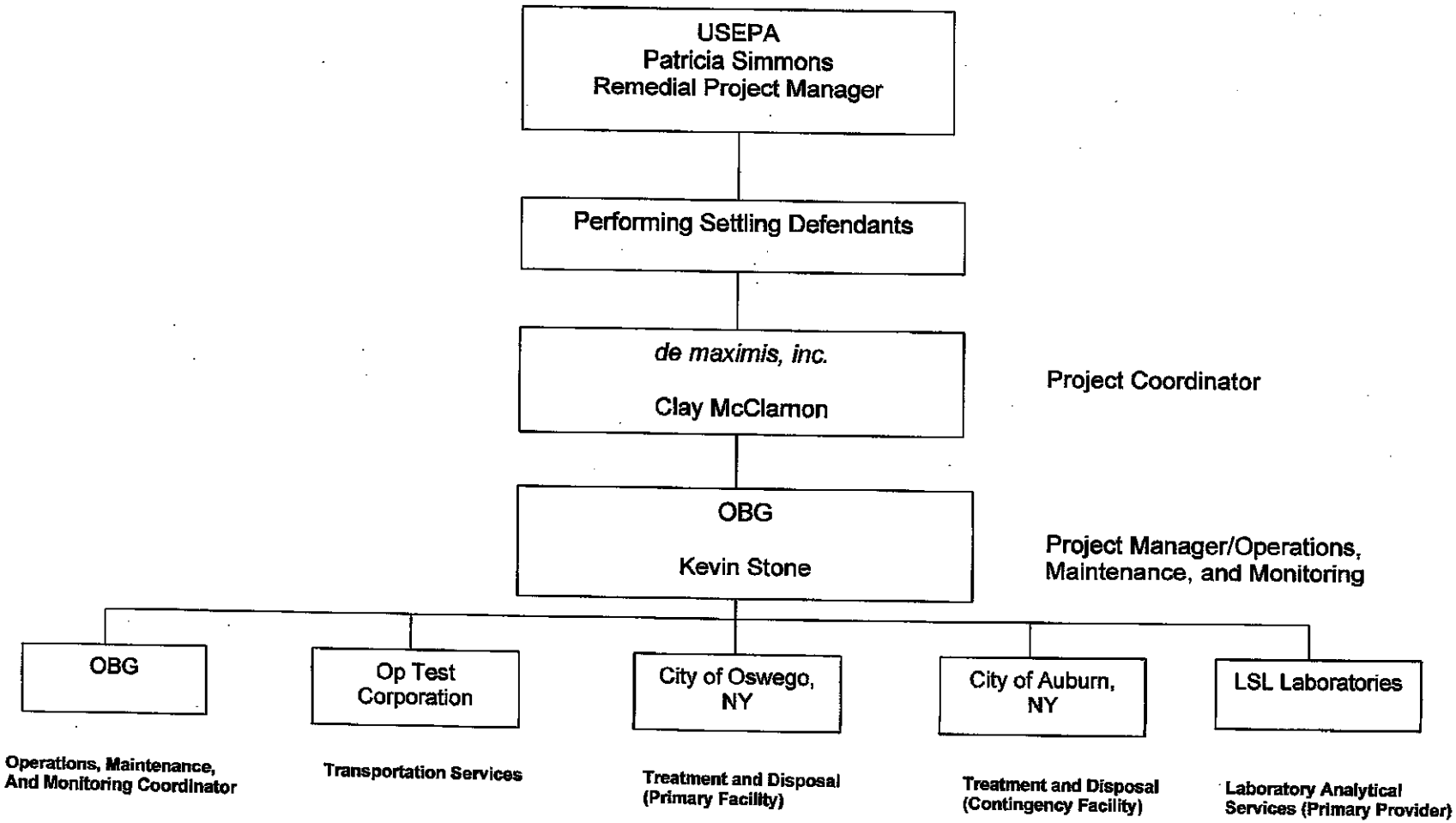
**Note:**
1. N/A = Not available.
2. 1994 IGR activities continued into 1998. The results of these activities are not shown.

## Table 2

BBL Environmental Services, Inc.
PAS Site
Oswego, New York

Operation and Maintenance and Long-Term Monitoring Plan

Project Personnel



## Table 3

**PAS Site**
**Oswego, New York**

**Operation and Maintenance and Long-Term Monitoring Plan**
**Ground-Water, Leachate, and Compliance Monitoring Schedule**

| Activity | Frequency | Locations |
|---|---|---|
| Long-Term Monitoring | | |
| Ground-Water Elevations | Quarterly | SWW-, LCW-, M-, and LR-series monitoring wells |
| Ground-Water Quality | Semi-Annually (Spring and Fall) | LR-6, LR-8 and M-21(LTM wells) |
| | | |
| Operational Monitoring | | |
| Ground-Water Elevations | Monthly (pre-pumping only) | SWW- and LCW-series monitoring wells |
| Ground-Water Elevations | Quarterly (pre-pumping only) | SWW-, LCW-, M- series ,O- series, and LR-series monitoring wells |
| Leachate Quality | Semi-Annually (Spring and Fall) | LCW-2 and LCW-4 |
| | | |
| POTW Permit Compliance Monitoring | | |
| Discharge Characteristic Monitoring (pH, Temp) | Monthly (each pumping) | Discharge Pump |
| Discharge Quality Monitoring (see QAPP Table 1) | Semi-Annually (Spring and Fall) | Discharge Pump |
| Discharge Quality Monitoring (See QAPP Table 1) Priority Pollutants | Every Three Years | Discharge Pump |
| | | |

Notes:

1. See Figure 2 for monitoring locations.
2. Where long-term and operational ground-water elevation measurement activity schedules coincide, the activities will be combined into a single monitoring event.
3. Operational ground-water elevation and, leachate quality elevation monitoring will be performed as necessary to conduct site operations.
4. Monitoring wells included as part of the operational monitoring activities may be deleted based on a review of operational monitoring data and data needs.

F:\PROJECTS\3131\2012\OM&M plan\Table 3.doc

**Table 4**

**PAS Site**
**Oswego, New York**

**Operation and Maintenance and Long-Term Monitoring Plan**
**Operating Schedule**

| Operating Activity | Frequency | Description of Activity |
|---|---|---|
| | | |
| Leachate collection, removal and disposal | First week of each month | Removal of approximately 10,000 – 20,000 gallons of leachate from the LCW-series wells, collection in the leachate collection tank, and off –site treatment and disposal |
| Contingency leachate removal, collection, and disposal | Third week of each month | Removal of approximately 10,000 gallons of leachate from the LCW s-series wells, collection in the leachate collection tank, and off-site treatment and disposal |
| | | |

Notes:

1. The need for a contingency leachate removal, collection, and disposal event will be determined based on operational groundwater elevation monitoring data (see Table 3).
2. Off-site transportation services will be provided by the transportation contractor.
3. Off-site treatment and disposal will be performed at the primary or contingency treatment and disposal facility.

**Table 5**

**PAS Site**
**Oswego, New York**

**Operation and Maintenance and Long-Term Monitoring Plan**
**Maintenance Schedule**

| Site Feature | Frequency | Description of Maintenance Activity |
|---|---|---|
| | | |
| Leachate collection, system | As required | Repair or replace leachate collection system equipment and components. |
| Cap vegetation | Annually | Mow grass on cap inside and adjacent to the security fence. |
| Cap vegetation | Annually | Trim vegetation growing along the base of the equipment storage shed, leachate collection tank, and each on-site monitoring well. |
| Weeds | As required | Remove weeds from the perennial grasses established on the cap. |
| Drainage system | Quarterly | Trim vegetation in the French drains and concrete drainage trough, and remove obstructions from the concrete drainage trough. |
| Borrowing animals | As required | Remove burrowing animals residing on the cap and repair any areas of the cap damaged as a result of the Borrowing. |
| Foliage | Annually | Trim vegetation within 5 feet of the perimeter fence line along East Seneca Street and along the western fence line. |
| Monitoring wells | As required | Repair or replace damaged well locks, casing, or riser equipment. |
| Stream gauges | As required | Reset stream gauges and survey the top of gauge elevation. |
| Equipment storage shed | Annually | Repair damage to the equipment storage shed. |
| Perimeter fence | As required | Maintain signage and the perimeter fence line. |
| Site access drive | As required | Maintain the integrity of the access drive pavement. Remove snow from the access drive during the winter Months. |
| Fire extinguisher | Monthly/Annually | Maintain a charged fire extinguisher in the equipment storage shed. Inspect the fire extinguisher monthly and service it annually |
| Spill control materials | Quarterly | Maintain absorbent materials, absorbent booms, shovel, and drum in equipment storage shed. |

Notes:

1. In general, site conditions will be maintained such that the site remedial objectives can be satisfied through the duration of the site operation and long-term monitoring activities.

*Table 6*

***BBL Environmental Services, Inc.***
***PAS Site***
***Oswego, New York***

***Operation and Maintenance and Long-Term Monitoring Plan***
***Pump Operation Trouble Shooting Chart***

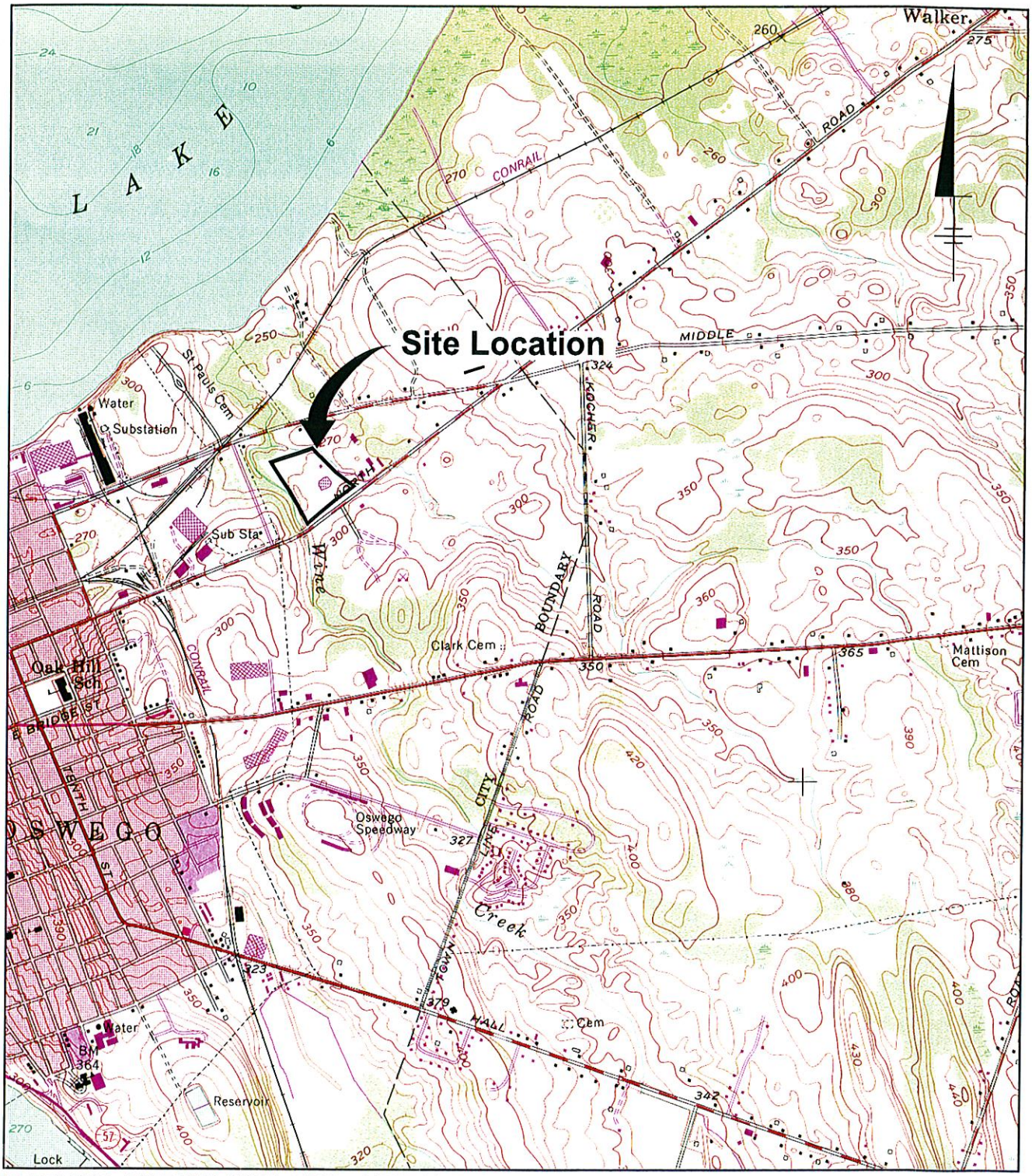
| Trouble | Possible Cause | Probable Remedy |
|---|---|---|
| Pump fails to start, overload unit not tripped | Power Source incompatible with control box. | Correct power source. |
| | No voltage at line side of overload unit. | Check power source for blown fuse, open overload unit, broken lead, or loose connection. |
| | Open circuit in motor windings or power cable. | Check continuity. |
| | Defective motor power cable. | Replace cable. |
| | Motor defective. | Check for and replace defective unit. |
| Pump Overload Unit Trips | Low or high voltage, or excessive voltage drop between pump and control box. | Measure voltage at control box. Check that wiring is correct type, size, and length. |
| | Defective insulation in motor windings or power cable; defective windings. | Check insulation resistance; check continuity. |
| | Impeller jammed due to debris or insufficient clearance. | Disassemble pump and check impeller. |
| | Bearing(s) frozen. | Disassemble pump and check bearing(s). |
| | Terminal housing incorrectly wired. | Check terminal housing internal connections against motor wiring plate and schematic wiring diagram. |
| Pump motor runs, but fails to deliver rated discharge | Discharge head too high. | Reduce discharge head, or install staging adapter and additional pump. |
| | Low or incorrect voltage. | Measure control box voltage, when pump is running and when pump is shut off. |
| | Discharge throttling valve partially closed; check valve installed improperly. | Open discharge valve fully; check piping installation. |
| | Discharge line clogged or restricted. | Check discharge lines. |
| | Liquid being pumped too thick. | Dilute liquid if possible. |
| | Strainer screen or impeller clogged. | Clear clog(s). Stop pump; back flow may flush away debris. |
| | Insufficient liquid in sump tank. | Stop pump until liquid level rises. |
| | Worn impeller vanes; excessive impeller clearance. | Check impeller and clearance. (See pump End Reassembly Section E of O&M Manual). |
| | Pump running backwards. | Check direction of rotation and correct by interchanging any two motor leads at control box. (See Pump Rotation, Section C of O&M Manual). |

*Table 6*
*(Cont'd)*
*BBL Environmental Services, Inc.*
*PAS Site*
*Oswego, New York*

***Operation and Maintenance and Long-Term Monitoring Plan***
***Pump Operation Trouble Shooting Chart***

| Trouble | Possible Cause | Probable Remedy |
|---|---|---|
| Pump runs with excessive noise or vibration | Pumping entrained air. | Check liquid level in sump; check position of pump and liquid level sensing device(s). |
| | Damaged or unbalanced impeller. | Replace impeller. |
| | Discharge piping not properly supported. | Check piping installation. |
| | Impeller jammed or loose. | Check impeller. |
| | Motor shaft or bearings defective. | Disassemble pump and check motor and bearings. |
| | Pump cavitation. | Reduce discharge head, or restrict flow on low head applications. |

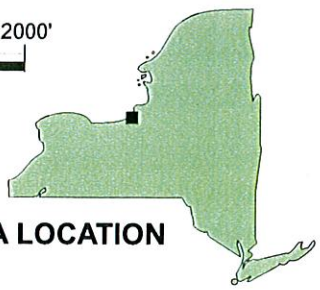
# FIGURES




**REFERENCE:** BASE MAP USGS QUAD., OSWEGO EAST, NY, 1978.

2000' 0 2000'

**Approximate Scale: 1" = 2000'**



**AREA LOCATION**

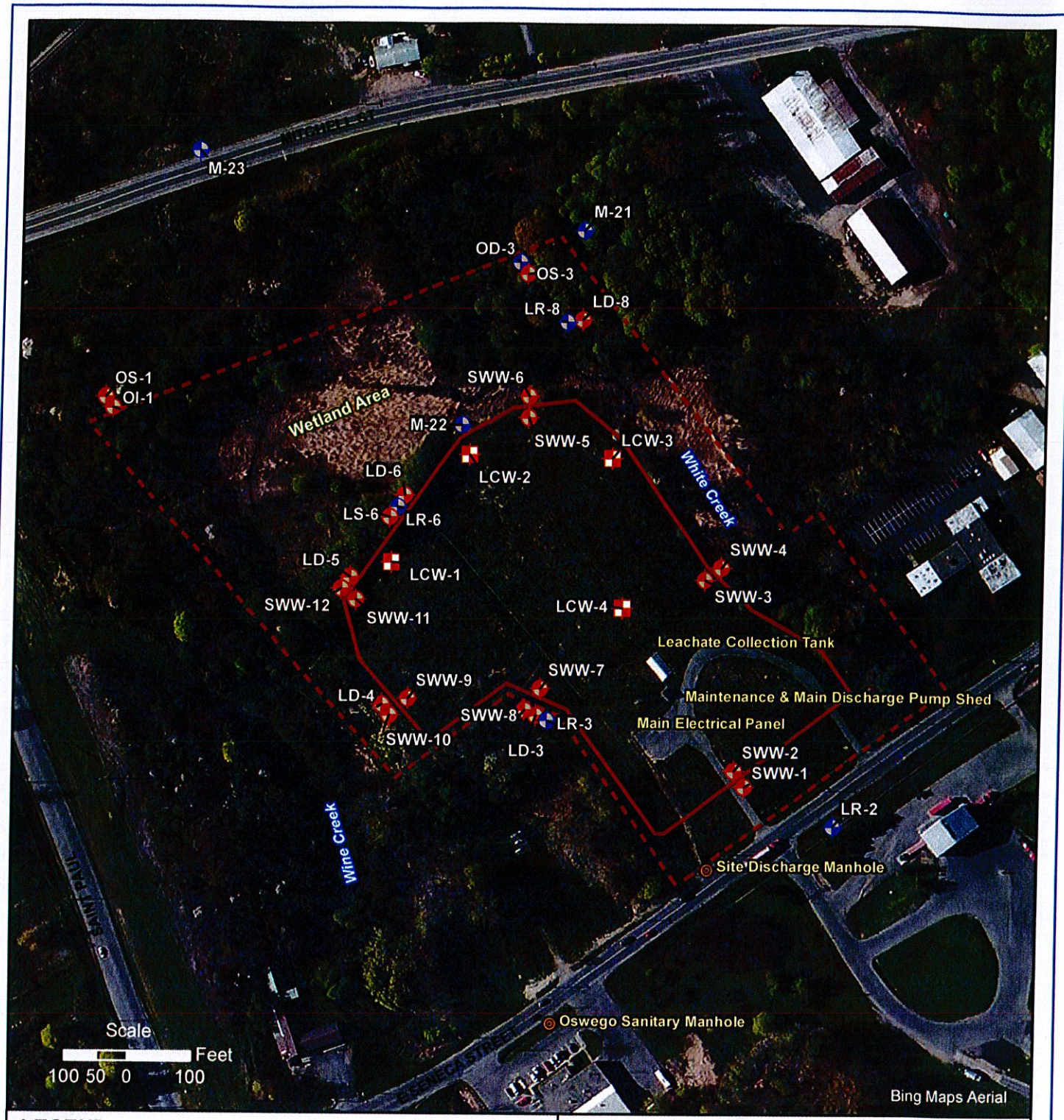
POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK
**OPERATION AND MAINTENANCE AND LONG-TERM MONITORING PLAN**

# SITE LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

**FIGURE 1**

03/98 SYR-D54-DJH
54620001/54620n01.cdr




## LEGEND

**Sample Locations**

- Bedrock Monitoring Well
- Leachate Collection Well (Overburden)
- Overburden Monitoring Well
- Manhole
- Fence (Site Boundary)
- Slurry Wall

# EXISTING SITE WELLS

PAS Site, Oswego, New York

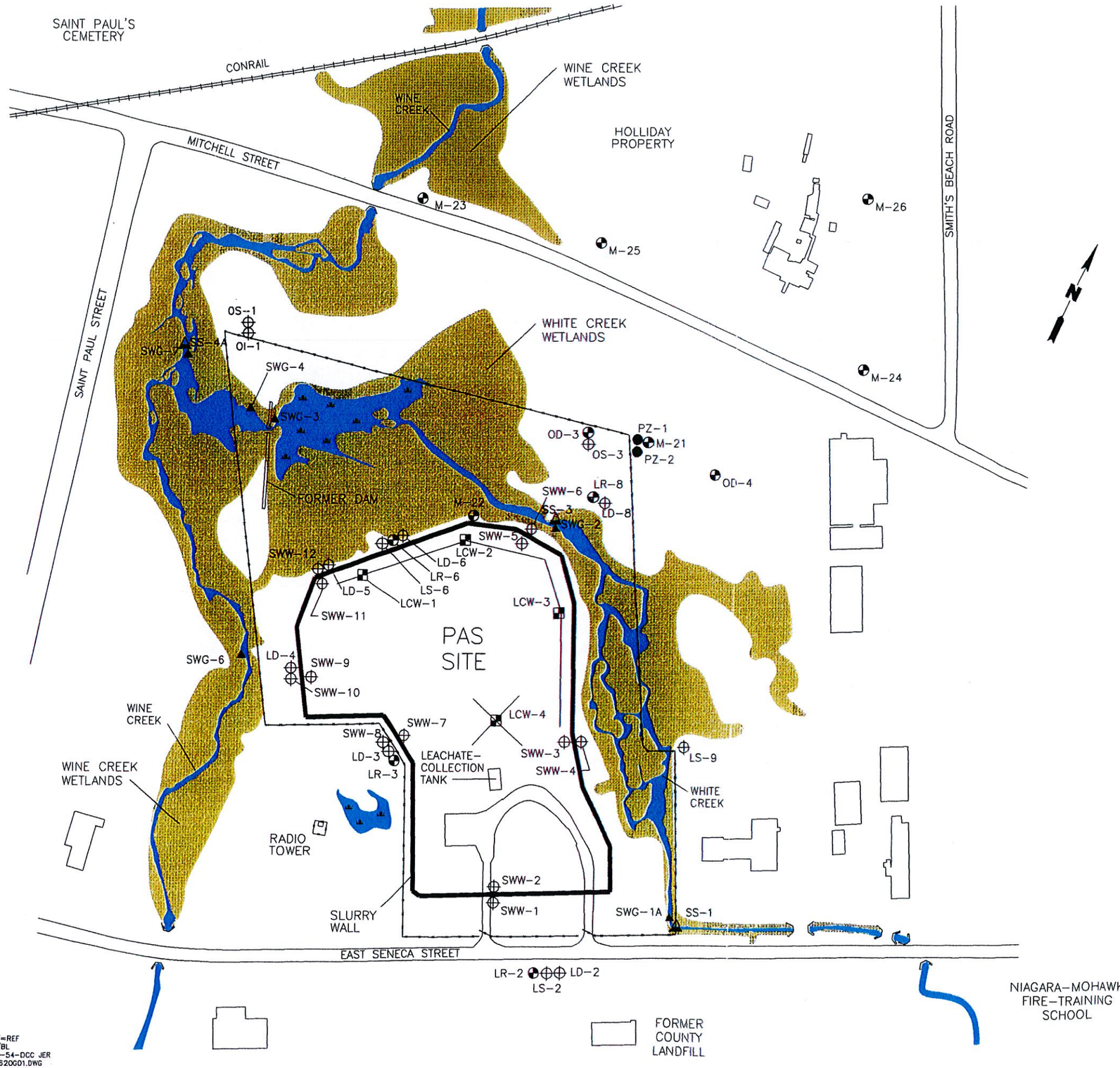
N

Project No.: 3131
Plot Date: 4 May 2012
Arc Operator: BJAR
Reviewed by:

**Figure 2A**

ddms
1217 Bandana Boulevard North
Saint Paul, Minnesota 55108
Main Phone: (651) 842-4224
www.ddmsinc.com

R:\Projects\DEF\demax-1547\3131-PAS\DataAnalysis\GISData\Projects\120504_SiteMap.mxd




LEGEND:

- M-23 — BEDROCK MONITORING WELL
- PZ-1 — BEDROCK PIEZOMETER
- LS-9 — OVERBURDEN MONITORING WELL
- LCW-3 — LEACHATE COLLECTION WELL
- SS-1 — SEDIMENT SAMPLING LOCATION
- SWG-1 — STREAM GAUGE LOCATION
- FENCE (SITE BOUNDARY)
- SLURRY WALL
- APPROXIMATE LOCATION OF SUBSURFACE LEACHATE COLLECTION TRENCH
- LAND AREAS SUBJECT TO FREQUENT, SHALLOW INUNDATION
- WETLAND AREAS DELINEATED BY MENZIE-CURA & ASSOCIATES, INC. (AUGUST 1992)

NOTES:
1. BASE MAP ADAPTED FROM TOPOGRAPHIC MAP DEVELOPED BY LOCKWOOD MAPPING, INC. BASED ON AN APRIL 14, 1993 AERIAL PHOTOGRAPH; SOME WELL AND STREAM-GAUGE LOCATIONS ARE INFERRED; LOCATION OF SLURRY WALL BASED ON SITE PLAN DRAWN BY DUNN GEOSCIENCE CORP. (DEC. 1984), TITLED "BORING, WELL & TEST PIT PLOT PLAN;" LOCATION OF SUBSURFACE LEACHATE-RECOVERY TRENCHES BASED ON SITE MAP PROVIDED BY O'BRIEN & GERE ENGINEERING INC.
2. SURFACE WATER IS SHOWN IN BLUE; AREAS SHADED GREEN REPRESENT WETLAND AREAS DELINEATED BY MENZIE-CURA & ASSOCIATES, INC. (AUGUST 1992).

0 200' 400'
GRAPHIC SCALE

POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK
OPERATION AND MAINTENANCE AND LONG-TERM MONITORING PLAN

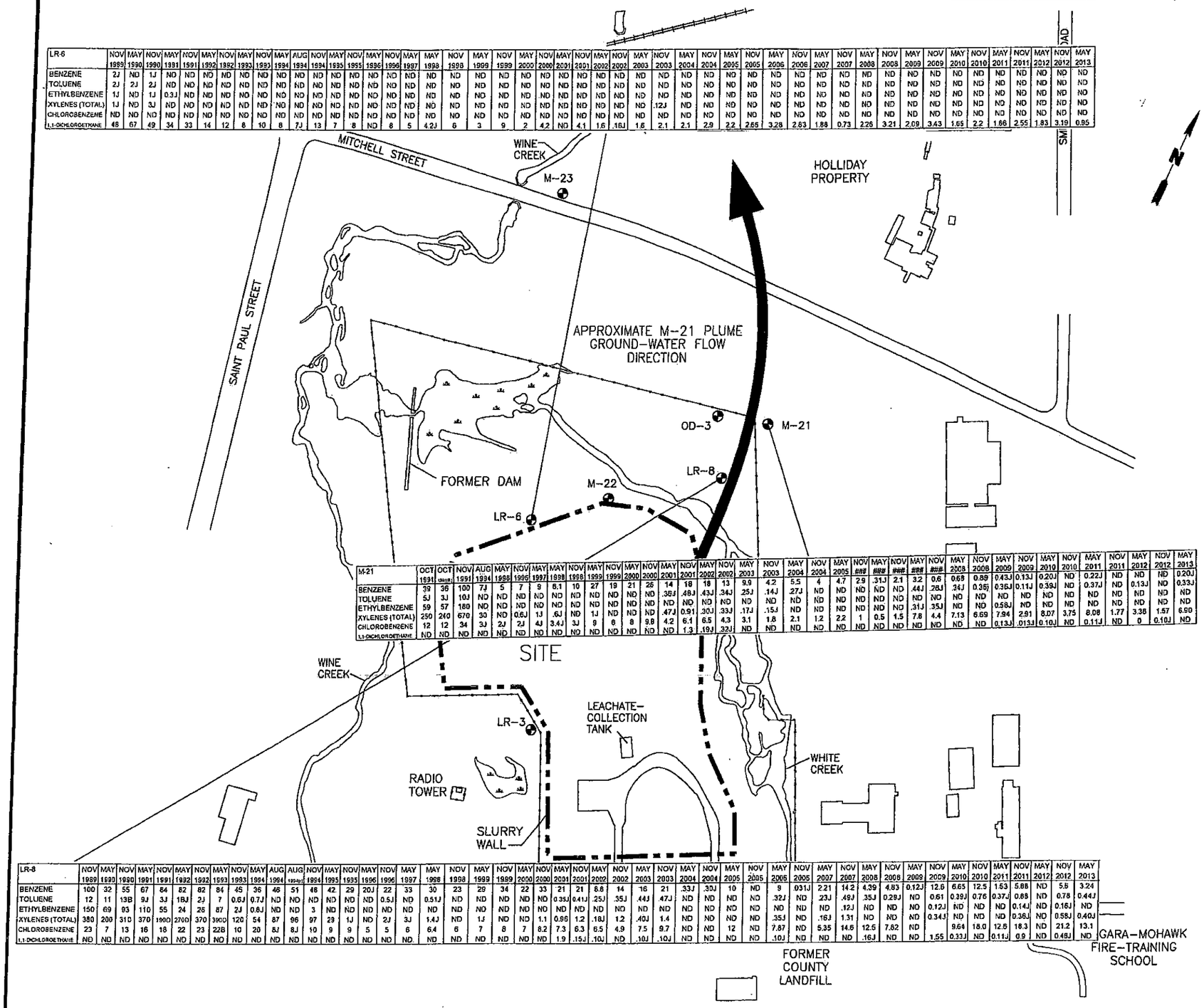
# Leachate Collection Trench Layout and Historic Features

de maximis, inc.

FIGURE 2B

L: ON=*, OFF=REF
P: STD-PCP/BL
3/15/98 SYR-54-DCC JER
54620001/54620G01.DWG

| LR-6 | NOV 1989 | MAY 1990 | NOV 1990 | MAY 1991 | NOV 1991 | MAY 1992 | NOV 1992 | MAY 1993 | NOV 1993 | MAY 1994 | AUG 1994 | NOV 1994 | MAY 1995 | NOV 1995 | MAY 1996 | NOV 1996 | MAY 1997 | MAY 1998 | NOV 1998 | MAY 1999 | NOV 1999 | MAY 2000 | NOV 2000 | MAY 2001 | NOV 2001 | MAY 2002 | NOV 2002 | MAY 2003 | NOV 2003 | MAY 2004 | NOV 2004 | MAY 2005 | NOV 2005 | MAY 2006 | NOV 2006 | MAY 2007 | NOV 2007 | MAY 2008 | NOV 2008 | MAY 2009 | NOV 2009 | MAY 2010 | NOV 2010 | MAY 2011 | NOV 2011 | MAY 2012 | NOV 2012 | MAY 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | 2J | ND | 1J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TOLUENE | 2J | 2J | 2J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| ETHYLBENZENE | 1J | ND | 1J | 0.3J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| XYLENES (TOTAL) | 1J | ND | 3J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | .12J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| CHLOROBENZENE | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1,1-DICHLOROETHANE | 48 | 67 | 49 | 34 | 33 | 14 | 12 | 8 | 10 | 8 | 7J | 13 | 7 | 8 | ND | 8 | 5 | 4.2J | 6 | 3 | 9 | 2 | 4.2 | ND | 4.1 | 1.6 | .16J | 1.6 | 2.1 | 2.1 | 2.9 | 2.2 | 2.65 | 3.28 | 2.83 | 1.88 | 0.73 | 2.26 | 3.21 | 2.09 | 3.43 | 1.65 | 2.2 | 1.66 | 2.55 | 1.83 | 3.19 | 0.95 |




| M-21 | OCT 1991 | OCT ### | NOV 1991 | AUG 1994 | MAY 1996 | NOV 1996 | MAY 1997 | MAY 1998 | NOV 1998 | MAY 1999 | NOV 1999 | MAY 2000 | NOV 2000 | MAY 2001 | NOV 2001 | MAY 2002 | NOV 2002 | MAY 2003 | NOV 2003 | MAY 2004 | NOV 2004 | MAY 2005 | NOV ### | MAY ### | NOV ### | MAY ### | NOV 2006 | NOV 2006 | MAY 2009 | NOV 2009 | MAY 2010 | NOV 2010 | MAY 2011 | NOV 2011 | MAY 2012 | NOV 2012 | MAY 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | 39 | 36 | 100 | 7J | 5 | 7 | 9 | 6.1 | 10 | 27 | 19 | 21 | 26 | 14 | 18 | 18 | 13 | 9.9 | 4.2 | 5.5 | 4 | 4.7 | 2.9 | .31J | 2.1 | 3.2 | 0.6 | 0.68 | 0.89 | 0.43J | 0.13J | 0.20J | ND | 0.22J | ND | ND | ND | 0.20J |
| TOLUENE | 5J | 3J | 10J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | .48J | .43J | .34J | .25J | .14J | 27J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.36J | 0.11J | 0.39J | ND | 0.37J | ND | 0.13J | ND | 0.33J |
| ETHYLBENZENE | 59 | 57 | 180 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.58J | ND | ND | ND | ND | ND | ND | ND | ND |
| XYLENES (TOTAL) | 250 | 240 | 670 | 30 | ND | 0.6J | 1J | .6J | ND | 1J | ND | ND | ND | .47J | 0.91 | .30J | .33J | .17J | .15J | ND | ND | ND | ND | ND | ND | .31J | .35J | ND | ND | 0.58J | ND | ND | ND | ND | ND | ND | ND | ND |
| CHLOROBENZENE | 12 | 12 | 34 | 3J | 2J | 2J | 4J | 3.4J | 3J | 9 | 6 | 8 | 9.8 | 4.2 | 6.1 | 6.5 | 4.3 | 3.1 | 1.8 | 2.1 | 1.2 | 2.2 | 1 | 0.5 | 1.5 | 7.8 | 4.4 | 7.13 | 6.69 | 7.94 | 2.91 | 8.07 | 3.75 | 8.08 | 1.77 | 3.38 | 1.57 | 6.99 |
| 1,1-DICHLOROETHANE | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.3 | .19J | .32J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.13J | .013J | 0.10J | ND | 0.11J | ND | 0 | 0.10J | ND |

| LR-8 | NOV 1989 | MAY 1990 | NOV 1990 | MAY 1991 | NOV 1991 | MAY 1992 | NOV 1992 | MAY 1993 | NOV 1993 | MAY 1994 | AUG 1994 | AUG 1994 | NOV 1994 | MAY 1995 | NOV 1995 | MAY 1996 | NOV 1996 | MAY 1997 | MAY 1998 | NOV 1998 | MAY 1999 | NOV 1999 | MAY 2000 | NOV 2000 | MAY 2001 | NOV 2001 | MAY 2002 | NOV 2002 | MAY 2003 | NOV 2003 | MAY 2004 | NOV 2004 | MAY 2005 | NOV 2005 | MAY 2006 | NOV 2006 | MAY 2007 | NOV 2007 | MAY 2008 | NOV 2008 | MAY 2009 | NOV 2009 | MAY 2010 | NOV 2010 | MAY 2011 | NOV 2011 | MAY 2012 | NOV 2012 | MAY 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZENE | 100 | 32 | 55 | 67 | 84 | 82 | 82 | 84 | 45 | 36 | 48 | 51 | 46 | 42 | 29 | 20J | 22 | 33 | 30 | 23 | 29 | 34 | 22 | 33 | 21 | 21 | 8.6 | 14 | 16 | 21 | .33J | .30J | 10 | ND | 9 | .03J | 2.2 | 14.2 | 4.39 | 4.83 | 0.12J | 12.6 | 6.65 | 12.5 | 1.53 | 5.88 | ND | 5.8 | 3.24 | |
| TOLUENE | 12 | 11 | 13B | 9J | 3J | 18J | 2J | 7 | 0.6J | 0.7J | ND | ND | ND | ND | ND | ND | 0.5J | ND | 0.51J | ND | ND | ND | ND | ND | 0.35J | 0.41J | .25J | .35J | .44J | .47J | ND | ND | ND | ND | .32J | ND | .23J | .49J | .35J | 0.28J | ND | 0.61 | 0.39J | 0.76 | 0.37J | 0.88 | ND | 0.78 | 0.44J | |
| ETHYLBENZENE | 150 | 69 | 93 | 110 | 55 | 24 | 25 | 87 | 2J | 0.8J | ND | ND | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | .12J | ND | ND | ND | 0.12J | ND | ND | ND | 0.14J | ND | 0.16J | ND | |
| XYLENES (TOTAL) | 380 | 200 | 31D | 370 | 190D | 270D | 370 | 390D | 120 | 54 | 87 | 96 | 97 | 23 | 1J | ND | 2J | 3J | 1.4J | ND | 1J | ND | ND | 1.1 | 0.66 | 1.2 | .18J | 1.2 | .40J | 1.4 | ND | ND | ND | ND | .35J | ND | .16J | 1.31 | ND | ND | ND | 0.34J | ND | ND | ND | 0.36J | ND | 0.58J | 0.40J | |
| CHLOROBENZENE | 23 | 7 | 13 | 16 | 18 | 22 | 23 | 22B | 10 | 20 | 8J | 8J | 10 | 9 | 9 | 5 | 5 | 6 | 6.4 | 6 | 7 | 8 | 7 | 8.2 | 7.3 | 6.3 | 6.5 | 4.9 | 7.5 | 9.7 | ND | ND | 12 | ND | 7.87 | ND | 5.35 | 14.6 | 12.5 | 7.82 | ND | | 9.64 | 18.0 | 12.6 | 16.3 | ND | 21.2 | 13.1 | |
| 1,1-DICHLOROETHANE | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.9 | .15J | .10J | ND | .10J | .10J | ND | ND | ND | .10J | ND | ND | ND | .16J | ND | ND | 1.55 | 0.33J | ND | 0.11J | 0.9 | ND | 0.48J | ND | |

EXPLANATION

- LR-6 ⊕ LOCATION AND DESIGNATION OF EXISTING BEDROCK MONITORING WELL
- OD-1 ● LOCATION AND DESIGNATION OF ABANDONED BEDROCK MONITORING WELL
- FENCE (SITE BOUNDARY)
- SLURRY WALL
- LAND AREAS SUBJECT TO FREQUENT, SHALLOW INUNDATION

DESIGNATION OF SAMPLING LOCATION

DATE OF SAMPLING EVENT (R=REPLICATE)

| M-25 | AUG 1994 | MAY 1996 | NOV 1996 | MAY 1997 |
|---|---|---|---|---|
| BENZENE | 4J | 8 | ND | 12 |
| TOLUENE | ND | ND | ND | ND |
| ETHYLBENZENE | ND | ND | ND | ND |
| XYLENES (TOTAL) | ND | ND | ND | ND |
| CHLOROBENZENE | 1J | 3J | ND | 6 |
| 1,1-DICHLOROETHANE | ND | 2J | 4J | ND |

CONCENTRATION OF VOC DETECTED IN BEDROCK GROUND WATER, MEASURED IN ug/L.

- ND -- NOT DETECTED
- J -- ESTIMATED CONCENTRATION (LESS THAN SAMPLE QUANTITATION LIMIT)
- D -- CONCENTRATION CALCULATED FROM SECONDARY DILUTION
- B -- COMPOUND DETECTED IN QUALITY CONTROL BLANKS

NOTES:

1. BASE MAP ADAPTED FROM TOPOGRAPHIC MAP DEVELOPED BY LOCKWOOD MAPPING, INC. BASED ON AN APRIL 14,1993 AERIAL PHOTOGRAPH; SOME WELL AND STREAM-GAUGE LOCATIONS ARE INFERRED; LOCATION OF SLURRY WALL BASED ON SITE PLAN DRAWN BY DUNN GEOSCIENCE CORP., INC. (DEC. 1994), TITLED "BORING, WELL & TEST PIT PLOT PLAN."
2. ANALYTICAL DATA PRIOR TO AUGUST 1994 OBTAINED FROM GOLDER ASSOCIATES, INC. (1993g) AND URS COMPANY, INC. (1994)
3. FIGURE PROVIDED BY ROUX ASSOCIATES, INC. (PROJECT No. 32702M06, FILE D0610002, DATED 3/98) AND PREVIOUSLY PRESENTED IN "REVIEW OF INTERIM GROUNDWATER REMOVAL AND LONG-TERM MONITORING PROGRAM DATA FOR PAS SITE" (MARCH 1998).

0 200' 400'

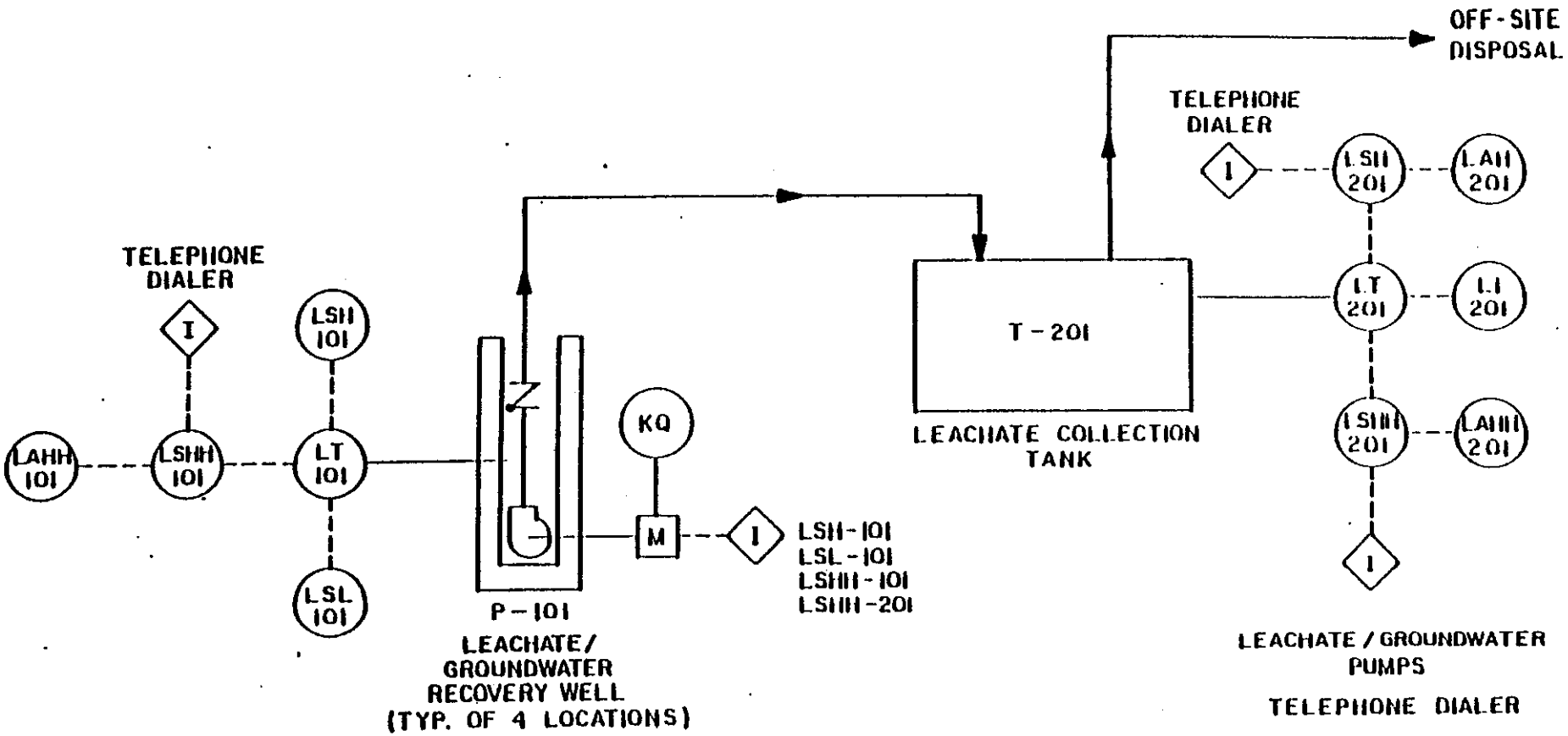
GRAPHIC SCALE

POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK
OPERATION AND MAINTENANCE AND
LONG-TERM MONITORING PLAN

HISTORICAL CONCENTRATIONS OF VOCs OF CONCERN DETECTED IN CONSENT DECREE WELLS (1998 – 2013)

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 3




## ABBREVIATIONS

KQ – TOTALIZER
LT – LEVEL TRANSMITTER
LSH – LEVEL SWITCH HIGH
LSL – LEVEL SWITCH LOW
LSHH – LEVEL SWITCH HIGH HIGH
LAHH – LEVEL ALARM HIGH HIGH
LAH – LEVEL ALARM HIGH
LI – LEVEL INDICATOR

## LEGEND

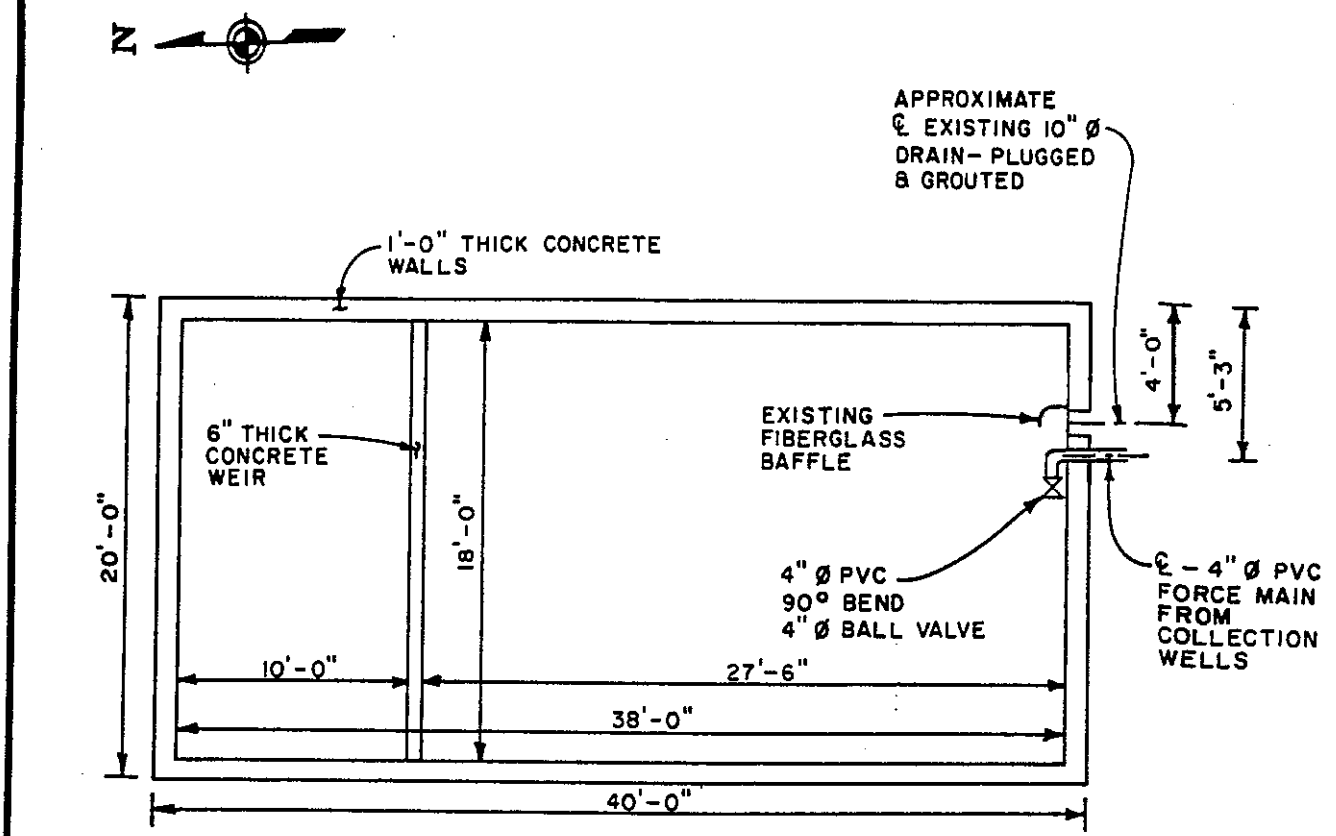
PUMP
CHECK VALVE
INTERLOCK

Adapted from
URS Consultants, Inc.
O&M Figure 1-1

TECHNICAL SERVICES
Syracuse, New York

# LEACHATE COLLECTION SYSTEM P&ID

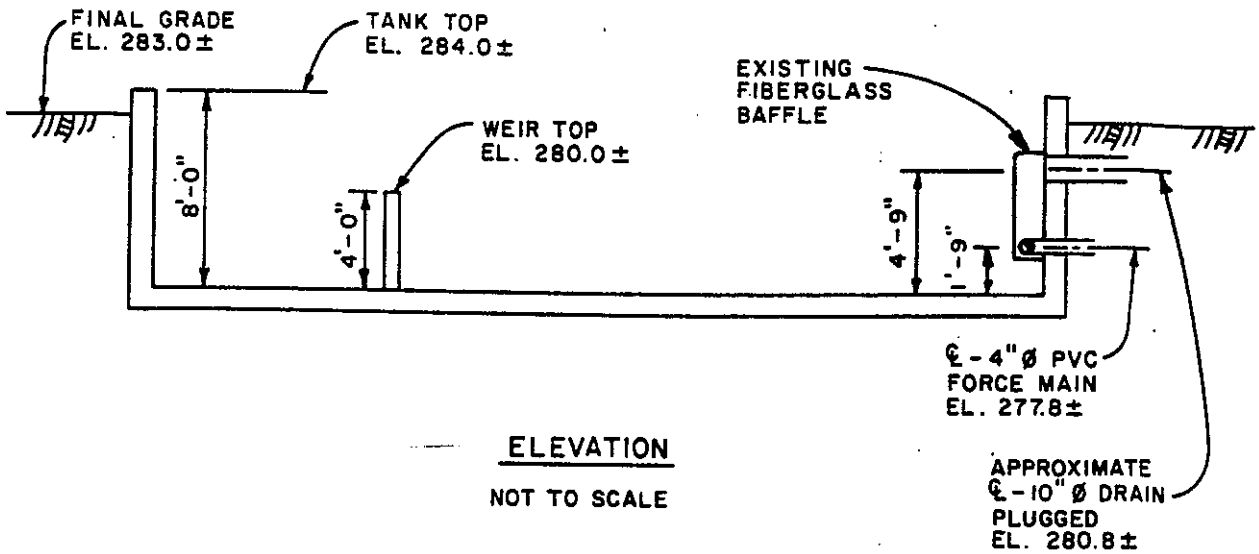
FIGURE 4




LEACHATE COLLECTION TANK

PLAN

NOT TO SCALE



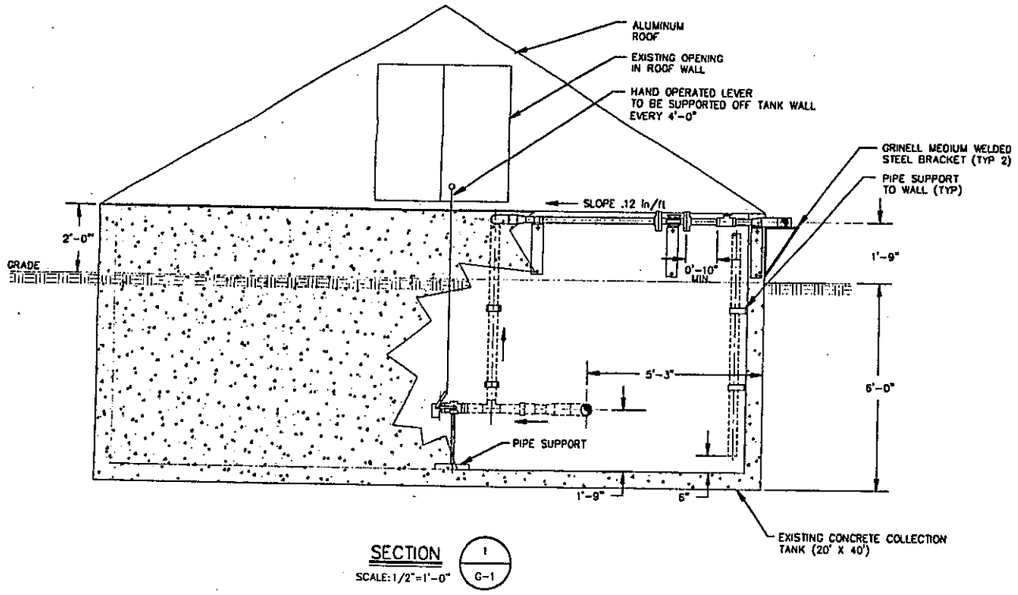

ELEVATION

NOT TO SCALE

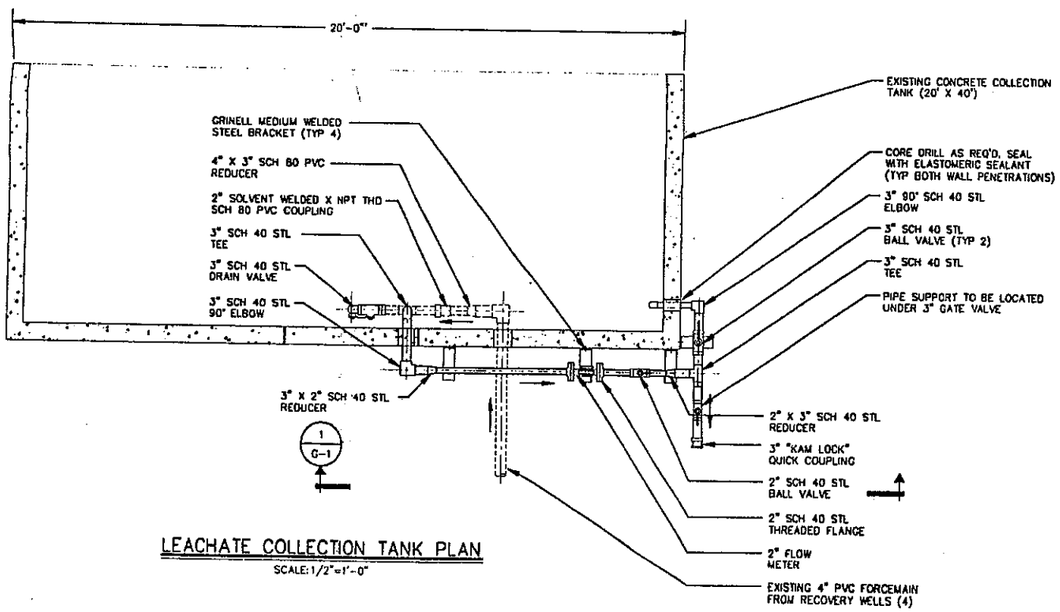
NOTE: DIMENSIONS PROVIDED IN THE PLAN & ELEVATION WERE VERIFIED IN THE FIELD ON MAY 16, 1991 BY URS CONSULTANTS, INC.

A-3791

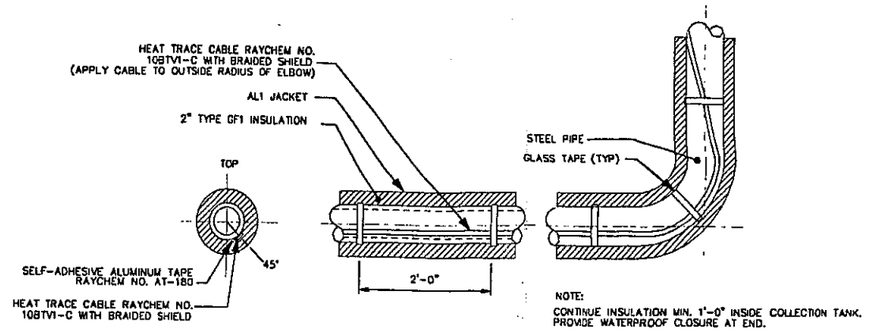
| URS CONSULTANTS, INC | LEACHATE COLLECTION TANK PLAN & ELEVATION | FIGURE 5A |
|---|---|---|



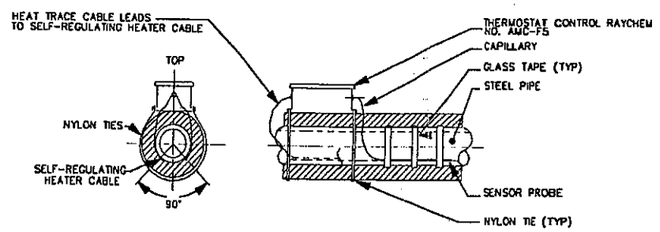

SECTION (1 / G-1)
SCALE: 1/2"=1'-0"




LEACHATE COLLECTION TANK PLAN
SCALE: 1/2"=1'-0"




HEAT TRACE INSTALLATION DETAIL
NOT TO SCALE




THERMOSTAT CONTROL DETAIL
NOT TO SCALE

NOTES:

1. ALL EXTERIOR SCH 40 STEEL PIPING (INCLUDING ALL FITINGS AND VALVES) TO BE INSULATED. AND HEAT TRACED AS SHOWN. POWER SOURCE TO BE PROVIDED AT A LATER DATE.
2. THERMOSTAT CONTROL TO BE LOCATED IN FIELD.

These plans are not to scale. All scales are reduced from indicated to approximately half size.

| NO. | DATE | REVISION | INIT |
|---|---|---|---|

1/2"=1'-0" (2 0 1 2 3 4 5)

It is a violation of law for any person unless he is acting under the direction of a licensed professional engineer to alter this document.

This drawing was prepared at the scale indicated in the title block. Inaccuracies in the stated scale may be introduced when drawings are reproduced by any means. Use the graphic scale bar in the title block to determine the actual scale of this drawing.

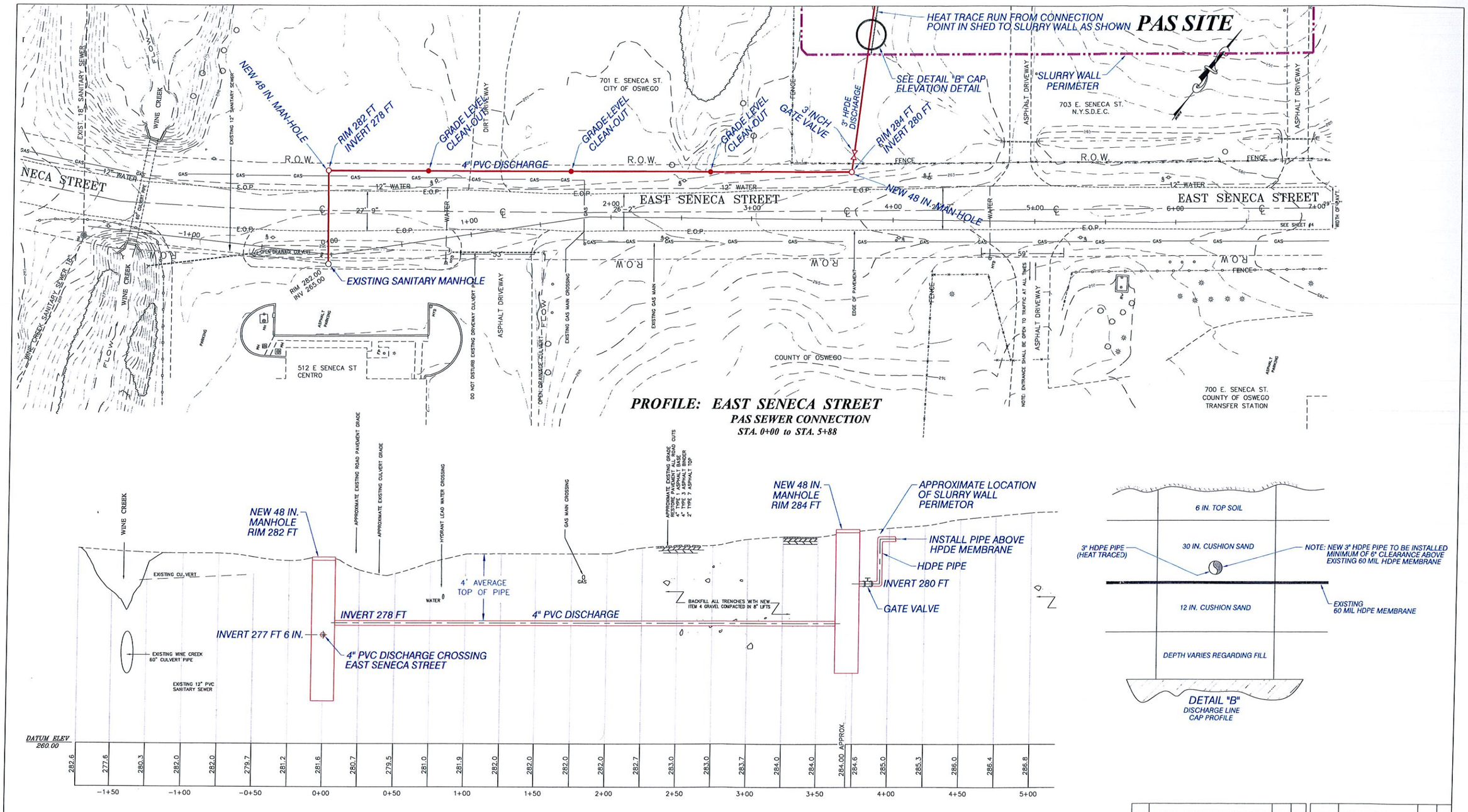
O'BRIEN & GERE ENGINEERS, INC.
TECHNICAL SERVICES

PAS OSWEGO SITE
INTERIM GROUNDWATER REMOVAL ACTIVITIES
GENERAL
LEACHATE COLLECTION TANK
# FLOW METER INSTALLATION PLAN AND DETAILS

In charge of Thomas C. Hull
Designed by NAS Checked by TCH
Drawn by NAS

FILE NO. 2488.SW-02F
G-1
DATE SEPT 29 1994
5B

H:\DIVISION\71\OSWEGO\02F.DWG\SF:24\9-29-94




## PROFILE: EAST SENECA STREET

**PAS SEWER CONNECTION**

**STA. 0+00 to STA. 5+88**







**DETAIL "B"**
DISCHARGE LINE CAP PROFILE

**LEGEND**

= NEW PRIMARY HPDE PIPE RUN

= EXISTING SLURRY WALL

| REV NO | DESCRIPTION | REV DATE | REV BY |
|---|---|---|---|
| REVISION | | | |

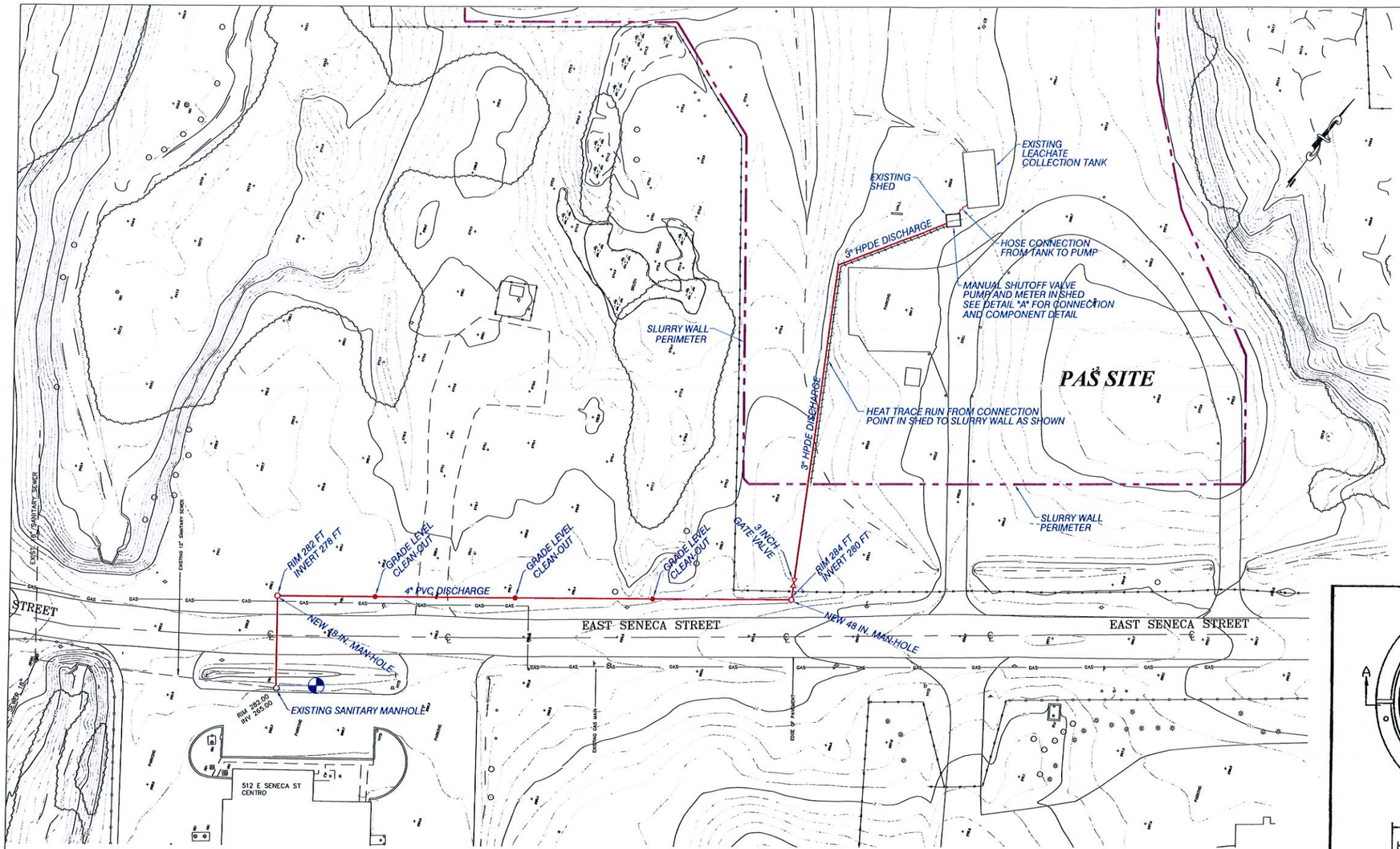
| RELEASED FOR | RELEASED TO | DATE | QTY |
|---|---|---|---|
| DISTRIBUTION | | | |

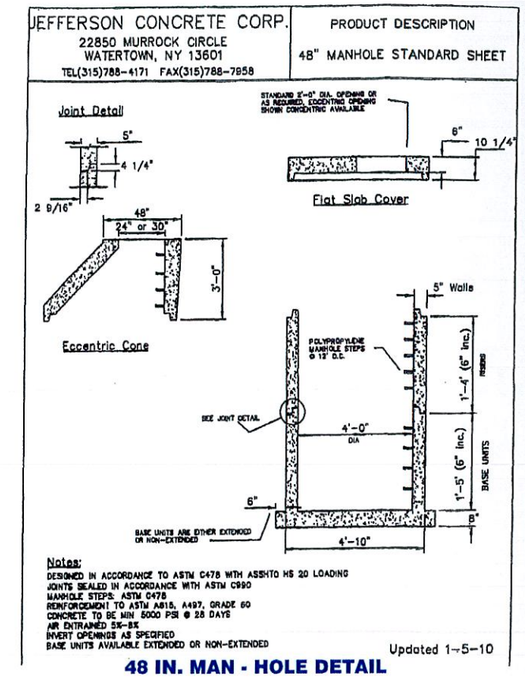
**J & A Mechanical Contractors**
5814 State Route 104, Oswego, NY 13126
TEL. (315) 343 9315 FAX. (315) 343 3954

J&A MECHANICAL CONTRACTORS, INC.

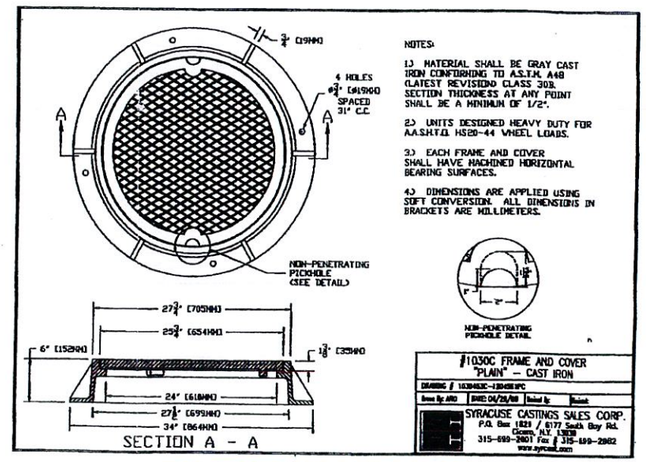
**PAS SEWER CONNECTION PARTIAL PLAN & PROFILE**

| MADE BY | DATE | CUSTOMER: | | JOB NO: |
|---|---|---|---|---|
| TMM | 6/14/10 | demaximis | 6A | N/A |
| CHK'D BY | DATE | ARCHITECT: | ENGINEER: | SHEET NO: / REV |
| | JUNE 2010 | N/A | | P-2 / - |

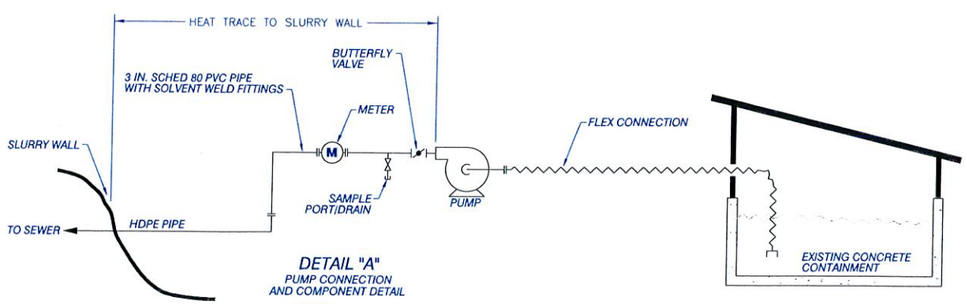



**48 IN. MAN - HOLE DETAIL**




**TOP FRAME AND COVER DETAIL FOR MAN-HOLE**




**DETAIL "A"**
PUMP CONNECTION AND COMPONENT DETAIL

NOTE:
1 - PUMP, METER, SAMPLING PORT AND BUTTERFLY VALVE TO BE LOCATED IN EXISTING SHED.

**LEGEND**

= NEW PRIMARY HPDE PIPE RUN

= EXISTING SLURRY WALL

| REV NO | DESCRIPTION | REV DATE | REV BY |
|---|---|---|---|
| REVISION | | | |

| RELEASED FOR | RELEASED TO | DATE | QTY |
|---|---|---|---|
| DISTRIBUTION | | | |

J & A Mechanical Contractors
5814 State Route 104, Oswego, NY 13126
TEL. (315) 343 9315 FAX. (315) 343 3954

# PAS SEWER CONNECTION PLAN

| MADE BY | DATE | CUSTOMER: | | JOB NO: |
|---|---|---|---|---|
| TMM | 6/14/10 | demaximis | 6B | N/A |
| CHK'D BY | DATE | ARCHITECT: | ENGINEER: | SHEET NO: / REV |
| | JUNE 2010 | N/A | | P-1 / - |

Figure 7-A

Main Discharge Pump and Sample Port

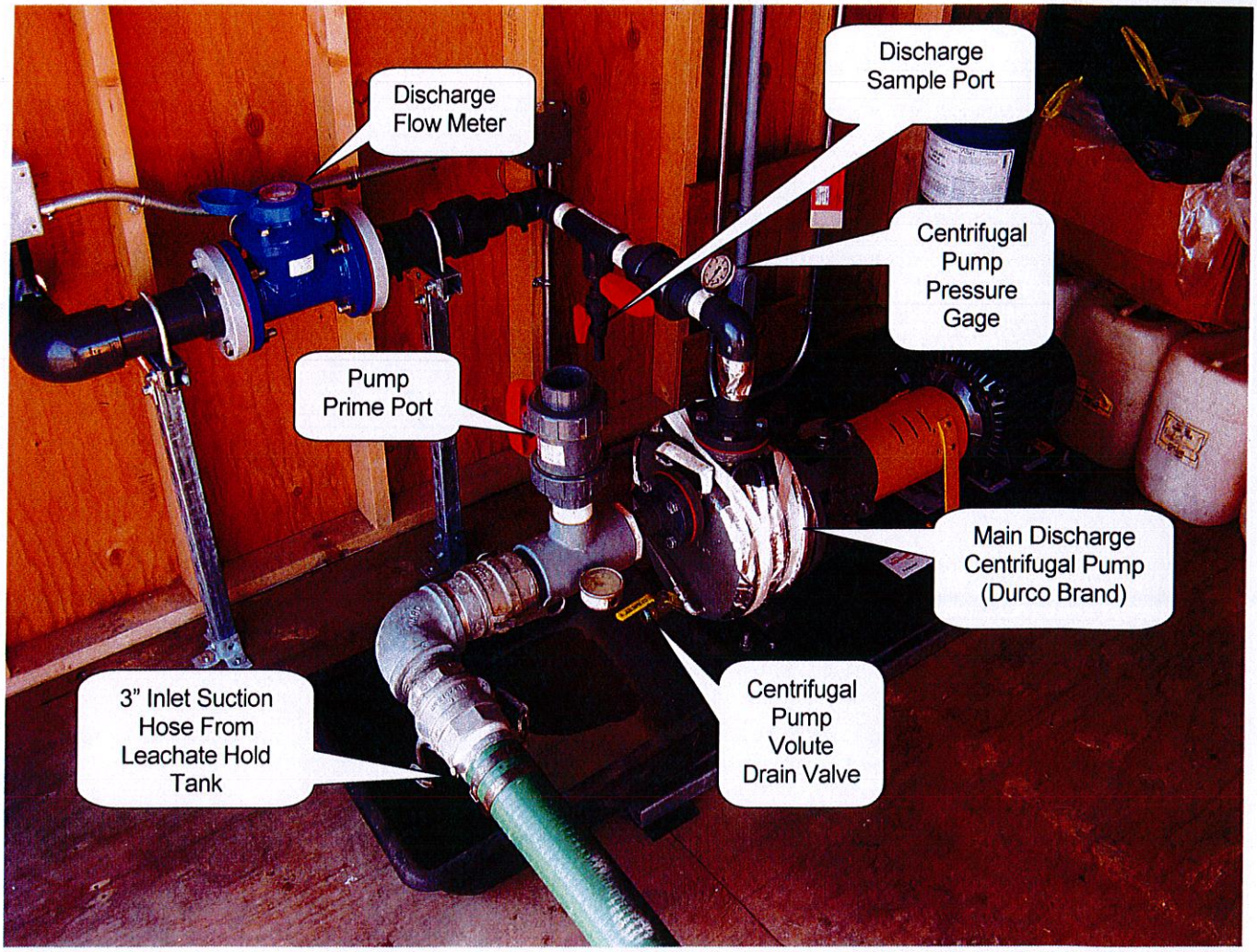


Figure 7-B

Main Discharge Pump and Heat Trace Switches

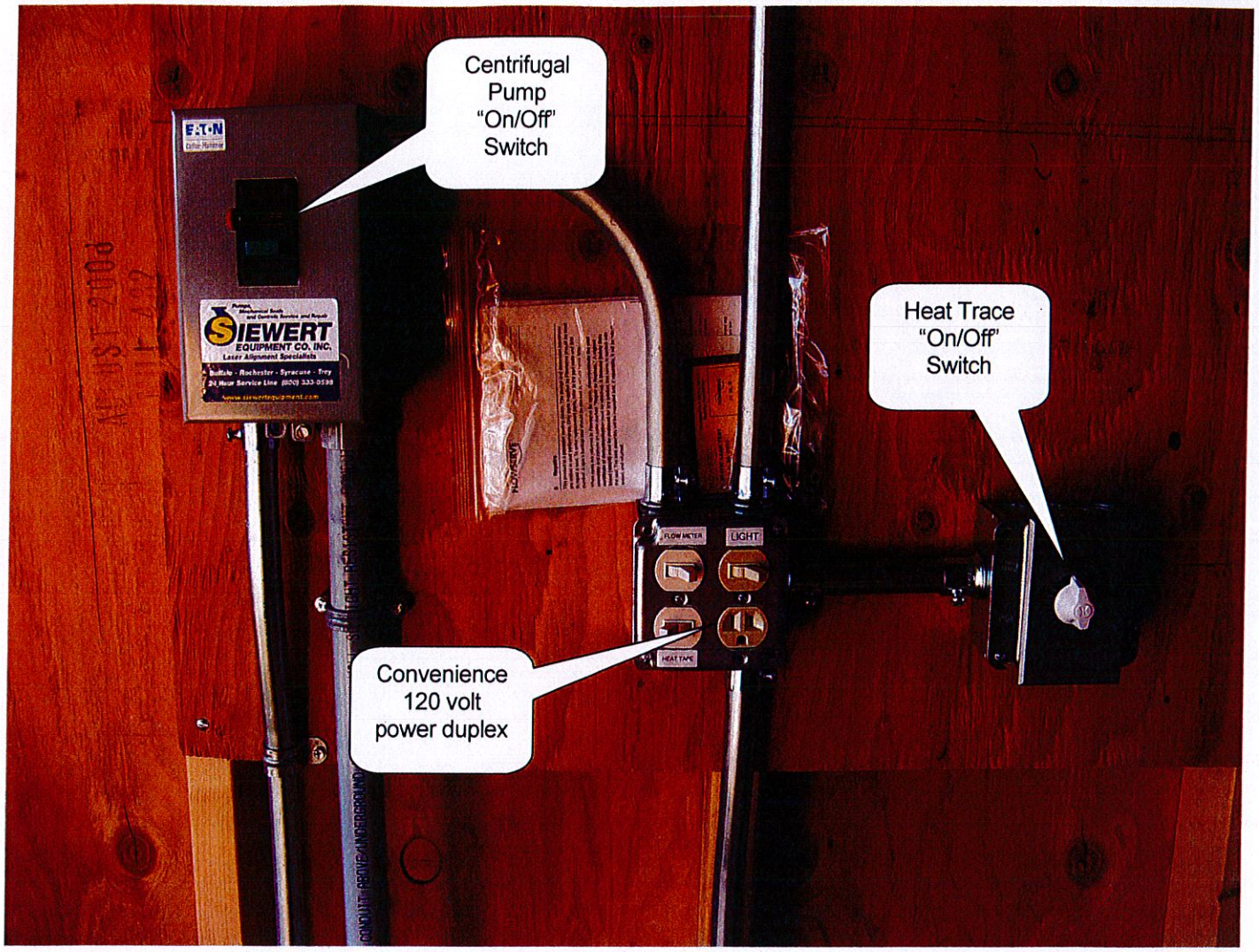
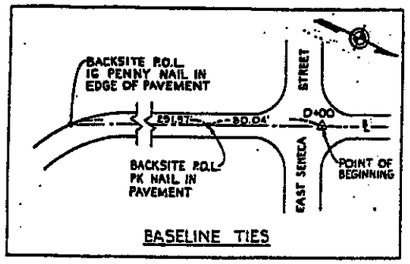


Figure 7-C

Leachate Collection Tank Access and T Valve Handles



# *Appendix A*
# *Record Drawings*




BASELINE TIES

These plans are not to scale. All scales are reduced from indicated to approximately half size.

RIPRAP

EARTH SWALE / FRENCH DRAIN

WELL #1

3'-0" WIDE CONCRETE DRAINAGE CHANNEL (SEE DWG. 7 FOR DETAILS) MAIN CHANNEL & SPUR

ELEC. PULLBOX #1

STORAGE SHED

ELEC. PANEL WALL

ELEC. PULLBOX #2

P.T. ℄ STA. 2+41.56

P.C. ℄ STA. 2+18

SWW 1

SWW 2

12"ø CMP CULVERT

WELL #2

EXIST LEACHATE COLLECTION TANK

WELL #4

GROUNDWATER RECOVERY TRENCH

ELEC. PULLBOX #3

CONSTRUCTION BASELINE

FRENCH DRAIN

℄ CURVE DATA
Δ = 45°
R = 30'
T = 12.43'
L = 23.56'

P.C. ℄ STA. 3+01.56

P.T. ℄ STA. 3+25.12

P.C. ℄ STA. 3+50.12

℄ CURVE DATA
Δ = 15°
R = 192'
T = 17.38'
L = 34.46'

℄ CURVE DATA
Δ = 45°
R = 20'
T = 8.28'
L = 15.71'

EXISTING WATER METER MANHOLE

12"ø CMP CULVERT

P.T. ℄ STA. 3+65.83

P.T. ℄ STA. 4+34.66

SWW #3

SWW #4

SLURRY WALL

LEACHATE COLLECTION TRENCH

SWW #5

SWW #6

P.T. ℄ STA. 5+01.59

P.T. ℄ STA. 5+22.17

℄ CURVE DATA
Δ = 90°
R = 20'
T = 11.40'
L = 28.18'

EAST SENECA STREET

36.55'

P.A.

STATIONING (ALL VALUES IN "FEET")

MONITORING WELLS
- SWW # 1 - ℄ 0+81.11, ⅝ 11.89 E
- SWW # 2 - ℄ 1+10.97, ⅝ 11.78 E
- SWW # 3 - ℄ 3+77.95, ⅝ 132.44 E
- SWW # 4 - ℄ 3+82.48, ⅝ 120.69 E
- SWW # 5 - ℄ 7+52.80, ⅝ 36.16 E
- SWW # 6 - ℄ 7+75.64, ⅝ 47.17 E

CULVERTS
- ℄ 12" C.M.P. @ ℄ WEST RD. - ℄ 0+33.00, ⅝ 0.00
- ℄ 12" C.M.P. @ ℄ EAST RD. - ℄ 0+35.00, ⅝ 196.45 E

8'x 5' SEPTIC TANK
- S.W. CORNER - ℄ 0+60.70, ⅝ 138.22 W
- S.E. CORNER - ℄ 0+60.44, ⅝ 138.30 W

CONC. DRAINAGE CHANNEL & SPUR ℄'s
- MAIN OUTLET - ℄ 5+33.66, ⅝ 44.33 W
- MAIN RADIUS (START) - ℄ 7+08.21, ⅝ 19.51 W
- MAIN RADIUS (END) - ℄ 6+76.28, ⅝ 147.62 W
- MAIN INLET - ℄ 3+47.79, ⅝ 113.72 W
- INTERSECTION MAIN RADIUS NORTH EDGE & SPUR RADIUS ℄ - ℄ 7+01.05, ⅝ 150.10 W
- SPUR RADIUS (END) - ℄ 7+05.63, ⅝ 140.46 W
- SPUR INLET - ℄ 7+70.69, ⅝ 35.63 W

EXISTING LEACHATE COLLECTION TANK 20'x 40'
- S.W. CORNER - ℄ 2+90.47, ⅝ 6.35 E
- N.W. CORNER - ℄ 3+30.32, ⅝ 2.29 E

EARTH SWALE/FRENCH DRAIN
- WEST END - ℄ 4+08.24, ⅝ 202.03 W
- EAST END - ℄ 4+37.18, ⅝ 124.35 W

FRENCH DRAIN
- OUTLET - ℄ 0+36.55, ⅝ 343.25 E
- 45° BEND - ℄ 0+36.55, ⅝ 261.00 E
- 45° BEND - ℄ 0+22.55, ⅝ 252.00 E
- INLET - ℄ 0+27.55, ⅝ 73.00 W

EXISTING CITY WATER MANHOLE
- ℄ 0+25.64, ⅝ 145.07 E

LEGEND
- EARTH SWALE
- 280 FINAL CONTOUR
- PERMANENT PAVED AREA
- CONCRETE DRAINAGE CHANNEL
- ⊕SWW#1 MONITORING WELL (SEE DWG. 13 FOR BORING LOGS)
- ⊙WELL#2 LEACHATE COLLECTION/GROUNDWATER RECOVERY WELL & CONTROL PANEL
- COLLECTION TRENCH

NOTES:
1) BASE MAP BASED ON AERIAL SURVEY FLOWN ON 1/17/87 BY LOCKWOOD SUPPORT SERVICES, INC., ROCHESTER, N.Y.
2) ALL STATION AND OFFSET INFORMATION WAS SUPPLIED BY SEVENSON CONTAINMENT CORP.

PRELIMINARY
URS Co...
BUFFALO, N.Y. YORK

| NO. | DATE | DESCRIPTION | NO. | DATE | DESCRIPTION |
|---|---|---|---|---|---|
| REVISIONS | | | | | |

DESIGNED BY :
DRAWN BY : R.A.L.
CHECKED BY : R.E.M.
PROJ. ENGR. : D.W.R

URS Company, Inc. CONSULTING ENGINEERS NEW YORK NEW JERSEY

JOB No. 35070

DATE PRINTED

P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
FINAL GRADING & MASTER SITE PLAN

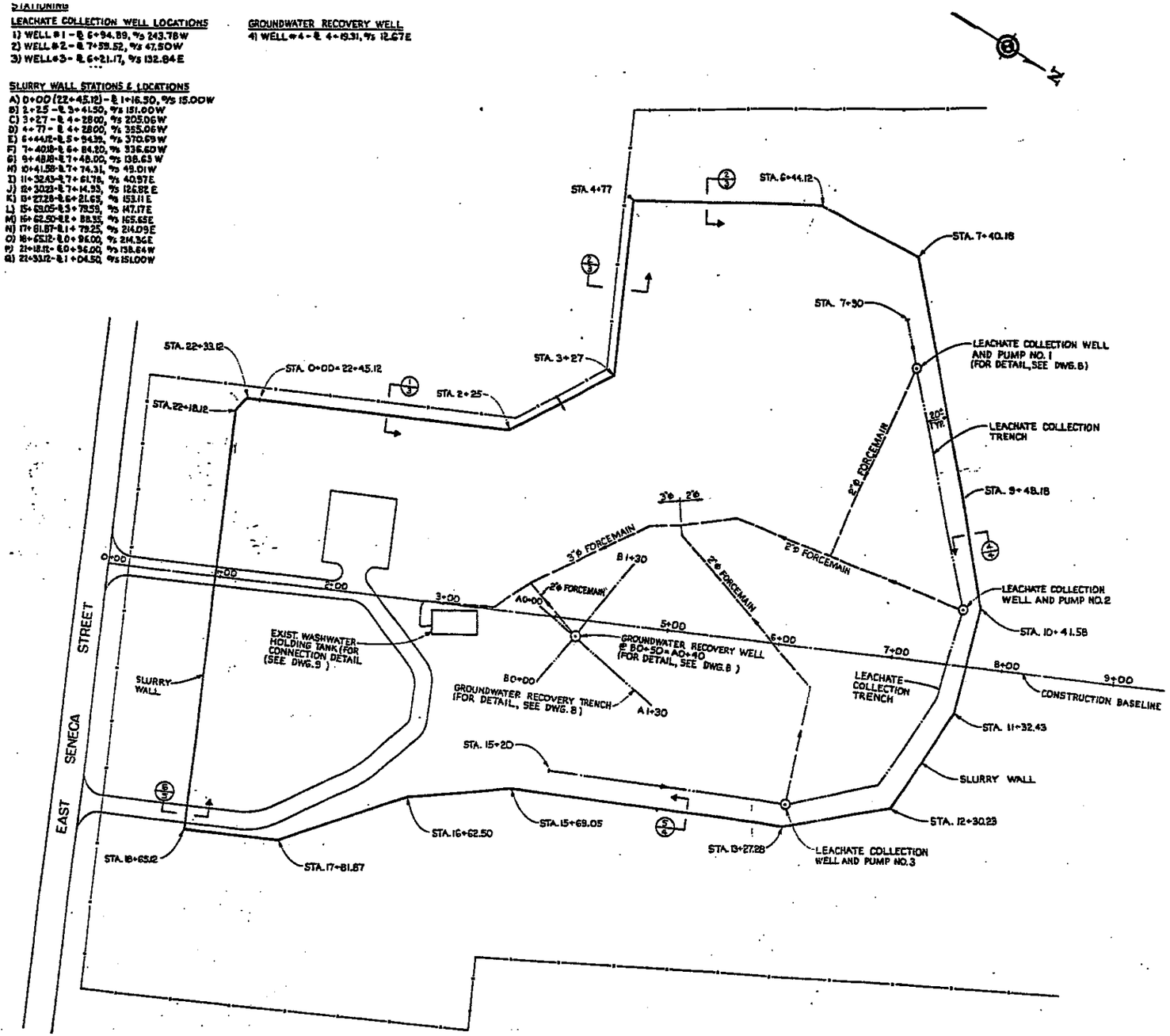
Scale: 1"=40' | Date: 1/7/88 | DWG. NO. 1

STATIONING

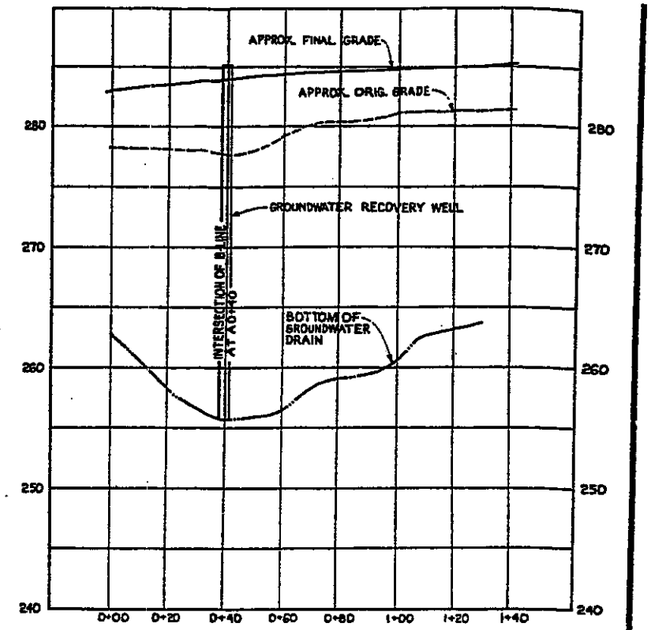
LEACHATE COLLECTION WELL LOCATIONS
1) WELL #1 - ℄ 6+94.89, 𝕡s 243.78W
2) WELL #2 - ℄ 7+59.52, 𝕡s 47.50W
3) WELL #3 - ℄ 6+21.17, 𝕡s 132.84E

GROUNDWATER RECOVERY WELL
4) WELL #4 - ℄ 4+19.31, 𝕡s 12.67E

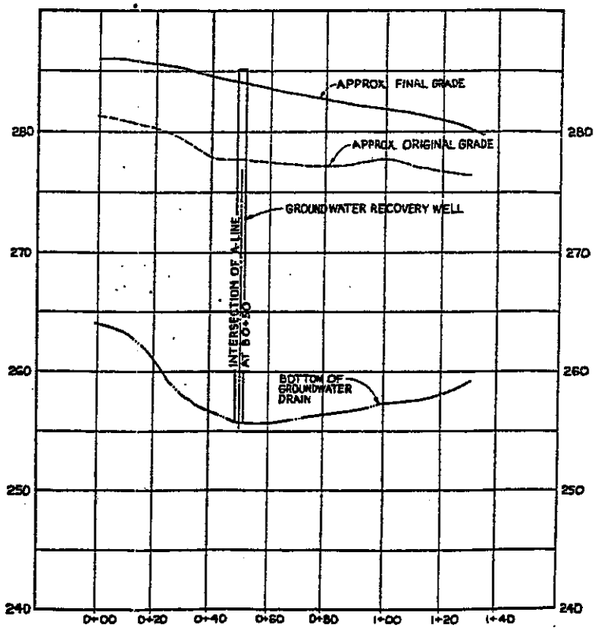
SLURRY WALL STATIONS & LOCATIONS
A) 0+00 (22+45.12) - ℄ 1+16.50, 𝕡s 15.00W
B) 2+25 - ℄ 3+41.50, 𝕡s 151.00W
C) 3+27 - ℄ 4+28.00, 𝕡s 205.06W
D) 4+77 - ℄ 4+28.00, 𝕡s 365.06W
E) 6+44.12 - ℄ 5+94.39, 𝕡s 370.69W
F) 7+40.18 - ℄ 6+84.20, 𝕡s 336.62W
G) 9+48.18 - ℄ 7+48.00, 𝕡s 138.63W
H) 10+41.58 - ℄ 7+74.31, 𝕡s 49.01W
I) 11+32.43 - ℄ 7+61.78, 𝕡s 40.97E
J) 12+30.23 - ℄ 7+14.93, 𝕡s 126.82E
K) 13+27.28 - ℄ 6+21.65, 𝕡s 153.11E
L) 15+69.05 - ℄ 7+79.59, 𝕡s 147.17E
M) 16+62.50 - ℄ 8+88.35, 𝕡s 165.65E
N) 17+81.87 - ℄ 9+79.25, 𝕡s 214.09E
O) 18+65.12 - ℄ 9+96.00, 𝕡s 214.34E
P) 21+18.12 - ℄ 9+96.00, 𝕡s 138.64W
Q) 22+33.12 - ℄ 9+04.50, 𝕡s 151.00W




PLAN
SCALE: 1"=40'




A-LINE PROFILE
SCALE: HORIZ.-1"=20'
VERT.-1"=5'




B-LINE PROFILE
SCALE: HORIZ.-1"=20'
VERT.-1"=5'

These plans are not to scale. All scales are reduced from indicated to approximately half size.

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JAN 9 1988

GROUNDWATER RECOVERY TRENCH

| NO. | DATE | DESCRIPTION | NO. | DATE | DESCRIPTION |
|---|---|---|---|---|---|
| REVISIONS | | | | | |

DESIGNED BY :
DRAWN BY : P.A.L.
CHECKED BY : R.E.M.
PROJ. ENGR. : D.W.R.

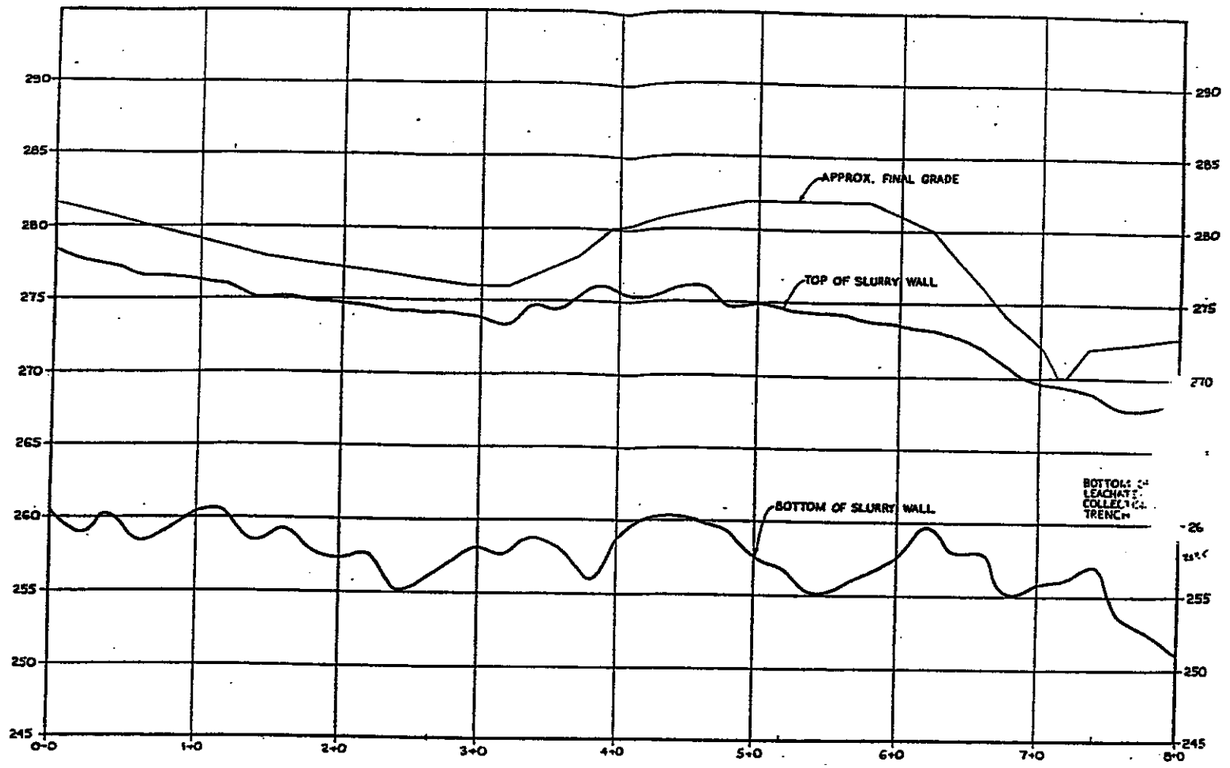
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CONSULTING ENGINEERS
NEW YORK NEW JERSEY

JOB No. 35070

DATE PRINTED

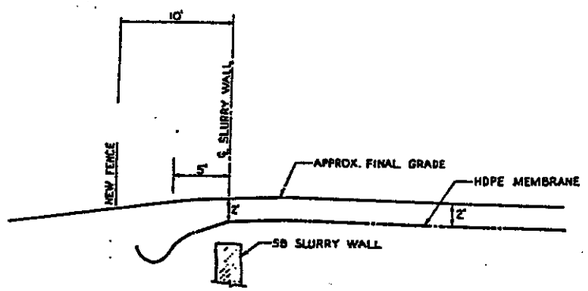
P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
LAYOUT OF SLURRY WALL, COLLECTION TRENCHES & FORCE MAINS

Scale: AS NOTED Date: 1/7/88 DWG. NO. 2

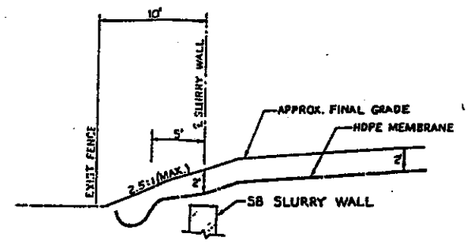



SLURRY WALL ℄ PROFILE
STA. 0+00 TO 8+00
SCALE: HORIZ. 1"=40'
VERT. 1"=4'

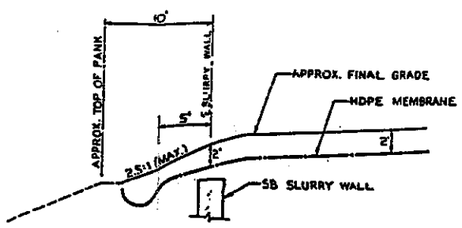
NOTE:
BOTTOM OF SLURRY WALL EXTENDED A MINIMUM OF 2 FEET INTO LODGEMENT TILL - ALL LOCATIONS




SLURRY WALL-SECTION 1-1
SCALE: HORIZ. 1"=5'
VERT. 1"=5'




SLURRY WALL-SECTION 2-2
SCALE: HORIZ. 1"=5'
VERT. 1"=5'




SLURRY WALL-SECTION 3-3
SCALE: HORIZ. 1"=5'
VERT. 1"=5'

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BUFFALO, NEW YORK
JAN 6 1986
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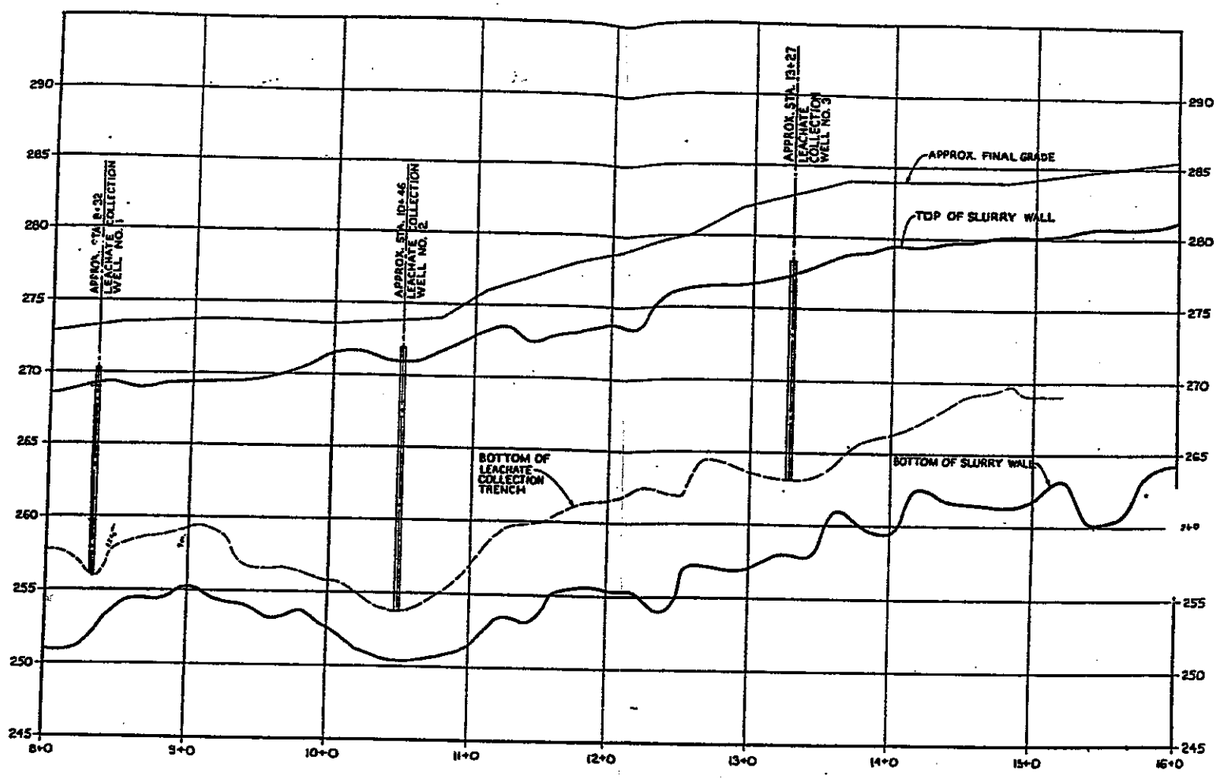
| NO. | DATE | DESCRIPTION | NO. | DATE | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |

DESIGNED BY :
DRAWN BY : R.A.L.
CHECKED BY : R.E.M.
FINAL CHK. : D.W.R.

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CONSULTING ENGINEERS
NEW YORK NEW JERSEY

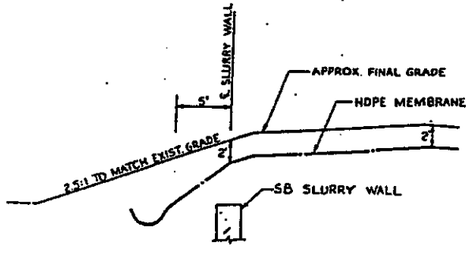
P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
SLURRY WALL PROFILE AND SECTIONS

DWG. NO. 3

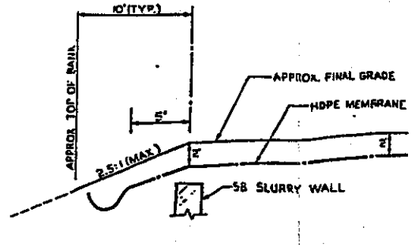



SLURRY WALL ℄ PROFILE
STA 8+00 TO 16+00
SCALE: HORZ. 1"=40'
VERT. 1"=4'

NOTE:
BOTTOM OF SLURRY WALL EXTENDED A MINIMUM OF 2 FEET INTO LODGEMENT TILL - ALL LOCATIONS




SLURRY WALL-SECTION 4-4
SCALE: HORZ. 1"=5'
VERT. 1"=5'



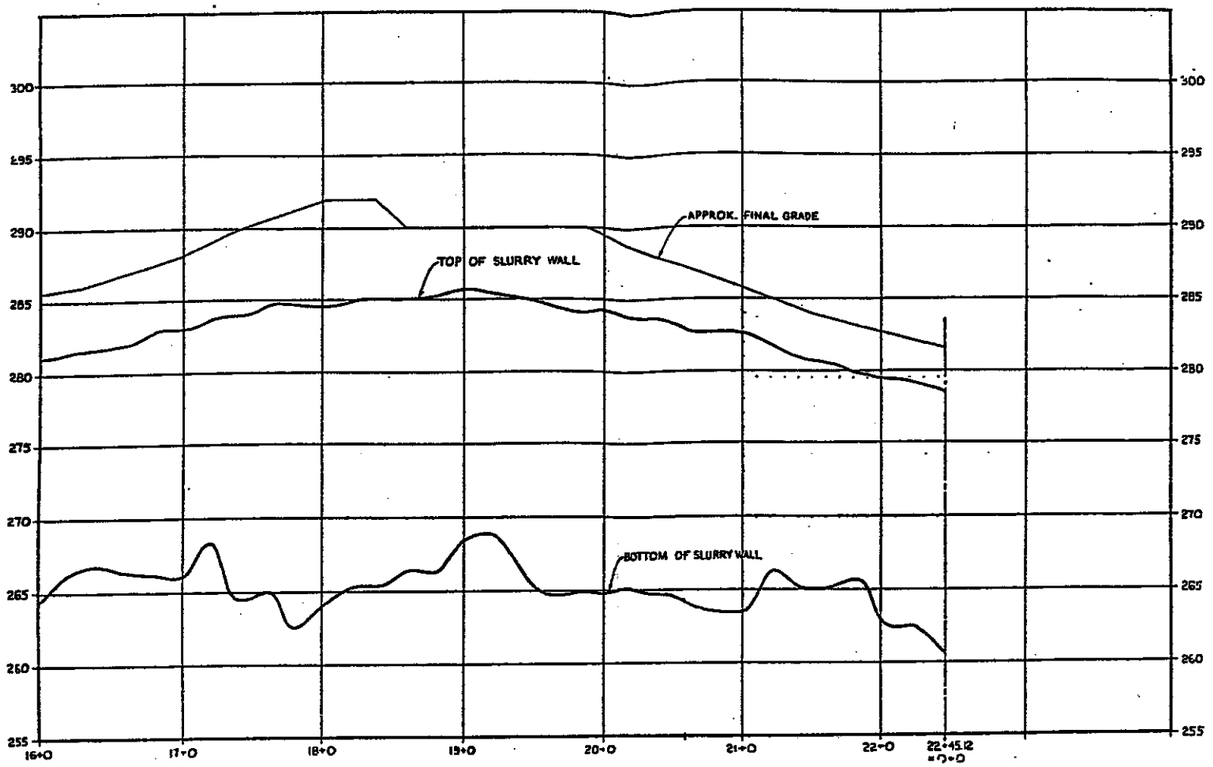

SLURRY WALL-SECTION 5-5
SCALE: HORZ. 1"=5'
VERT. 1"=5'

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URS Co., Inc.
BUFFALO, NEW YORK
JAN 8 1988
DATE PRINTED

DESIGNED BY :
DRAWN BY : R.A.L.
CHECKED BY : R.E.M.

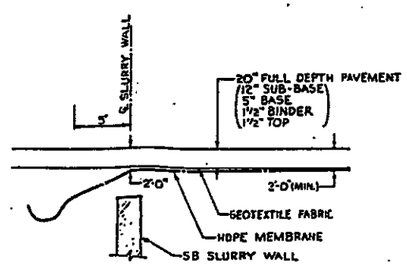
URS URS Company, Inc.
CONSULTING ENGINEERS
NEW YORK NEW JERSEY

P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
SLURRY WALL




SLURRY WALL ℄ PROFILE
STA. 16+00 TO 22+45.12
SCALE: HORIZ. 1"=40'
VERT. 1"=4'

NOTE:
BOTTOM OF SLURRY WALL EXTENDED A MINIMUM OF 2 FEET INTO LODGEMENT TILL- ALL LOCATIONS



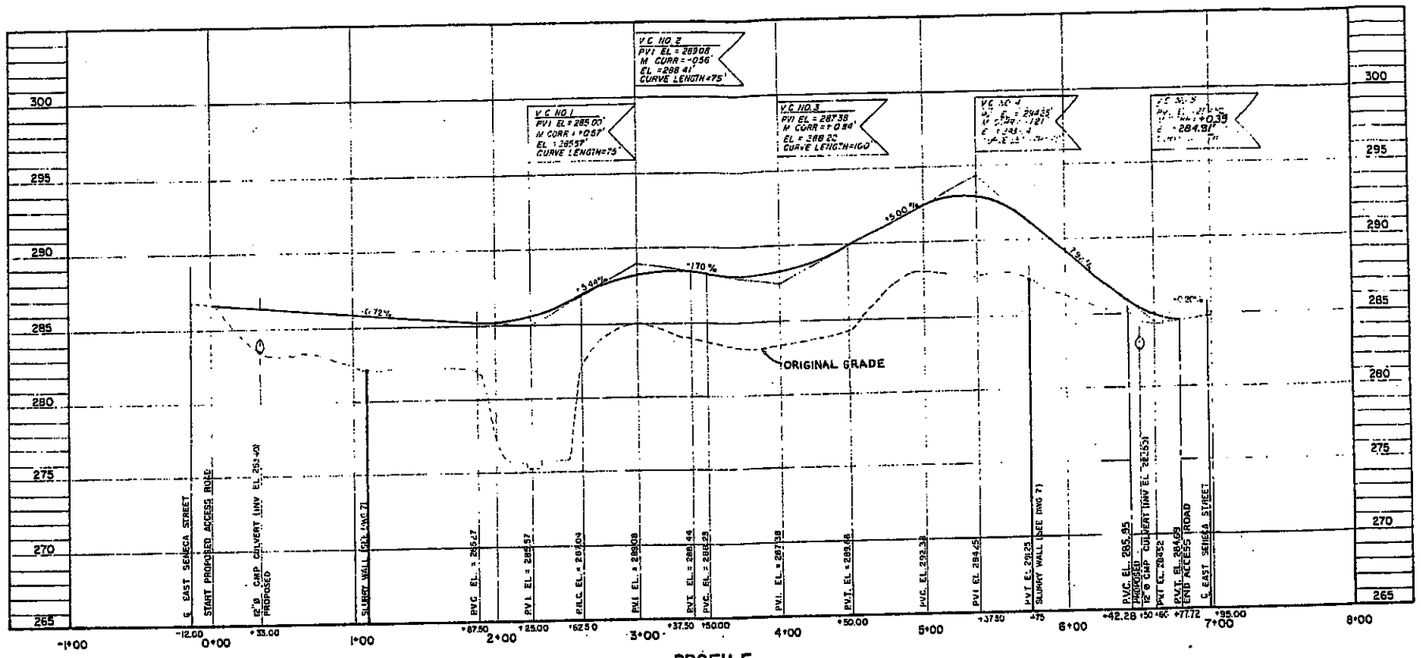

SLURRY WALL-SECTION 6-6
TYPICAL ROADWAY CROSSING
SCALE: HORIZ. 1"=5'
VERT. 1"=5'

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BUFFALO, NEW YORK
JAN 6 1988
DATE PRINTED

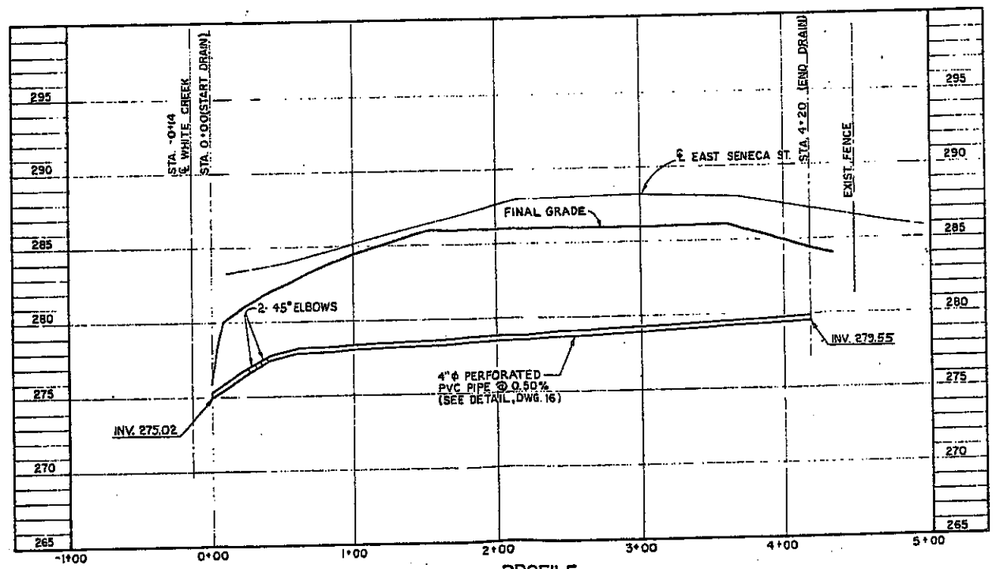
DESIGNED BY :
DRAWN BY : R.A.L.
CHECKED BY : R.E.M.

URS URS Company, Inc.
CONSULTING ENGINEERS
NEW YORK NEW JERSEY

P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
SLURRY WALL
PROFILE AND SECTIONS
DWG NO. 5




PROFILE
PERMANENT PAVED ROADWAY
SCALE: HORZ. 1"=40'
VERT. 1"=4'




PROFILE
EAST SENECA ST. FRENCH DRAIN
SCALE: HORZ. 1"=40'
VERT 1"=4'

NOTES

1. FOR PLAN VIEW AND STATIONING OF ROADWAY, REFER TO DWG. 1.
2. FOR PLAN VIEW OF FRENCH DRAIN, REFER TO DWG. 1.

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| NO. | DATE | DESCRIPTION | NO. | DATE | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
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REVISIONS

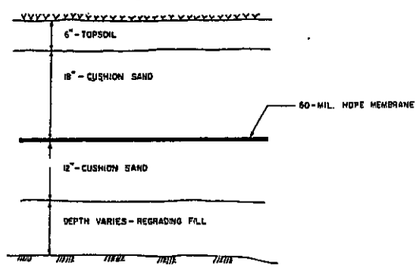
DESIGNED BY :
DRAWN BY : R.A.L.
CHECKED BY :
PROJ. ENGR. : D.W.R.

URS Company, Inc.
CONSULTING ENGINEERS
NEW YORK NEW JERSEY

JOB No. 35070

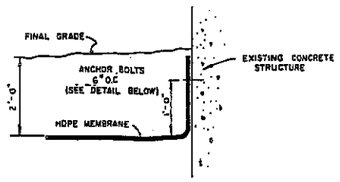
P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
ROADWAY AND
FRENCH DRAIN PROFILES

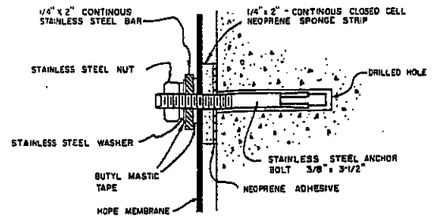
Scale: AS NOTED | Date: 1/7/88 | DWG. NO. 6




TYPICAL SITE CAP

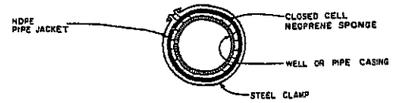
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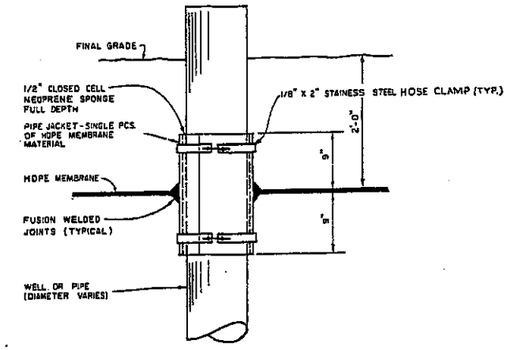




HDPE MEMBRANE ANCHORAGE TO CONCRETE STRUCTURE

NO SCALE

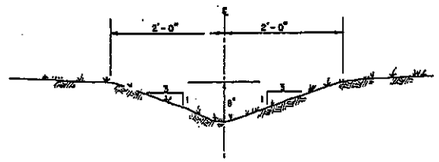



PLAN



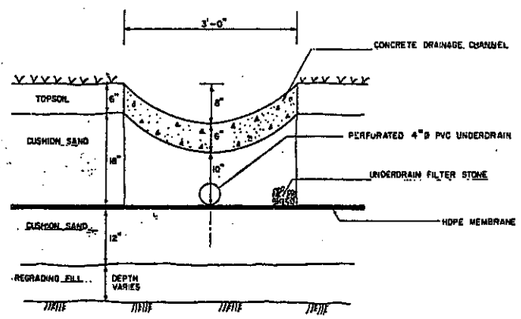

WELL/PIPE PENETRATION THROUGH HDPE MEMBRANE

NO SCALE



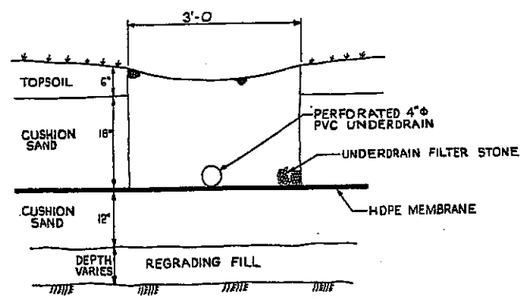

TYPICAL EARTH SWALE

NO SCALE




CONCRETE DRAINAGE CHANNEL LOOKING DOWNSTREAM

NO SCALE




SECTION 7-7 (DWG.1)

EARTH SWALE/ FRENCH DRAIN

NO SCALE

PRELIMINARY

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BUFFALO, NEW YORK
JAN 8 1988
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| NO. | DATE | DESCRIPTION | NO. | DATE | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |

REVISIONS

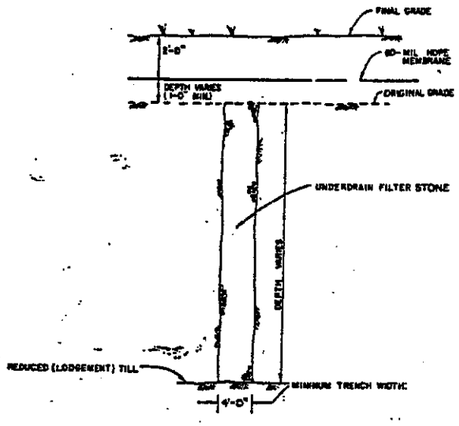
DESIGNED BY : P.M.B.
DRAWN BY : E.L.B.
CHECKED BY : R.E.M.
PROJ. ENGR. : D.W.R.

URS URS Company, Inc. CONSULTING ENGINEERS NEW YORK NEW JERSEY

JOB No. 35070

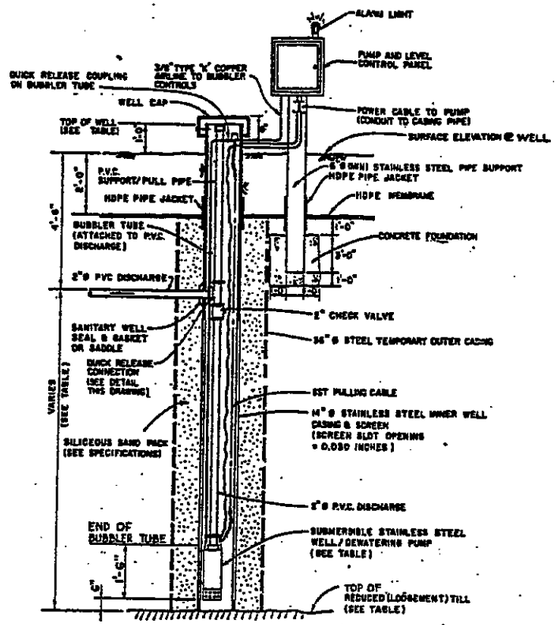
P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
GRADING & CAPPING DETAILS

Scale: NO SCALE | Date: 1/7/88 | DWG. NO. 7




TYPICAL LEACHATE DRAIN/GROUNDWATER RECOVERY TRENCH SECTION

NO SCALE

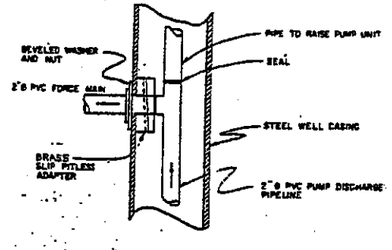



TYPICAL LEACHATE AND GROUNDWATER RECOVERY WELL

NO SCALE

## WELL INFORMATION

| WELL NUMBER | WELL DATA | | | LEVEL CONTROLS | |
|---|---|---|---|---|---|
| | BOT. TOP ELEVATION | TOP ELEVATION | SCREEN LENGTH | PUMP OFF ELEVATION | PUMP ON ELEVATION |
| 1 | 255.9 | 272.21 | 10 | 257.9 | 263.7 |
| 2 | 253.8 | 274.44 | 10 | 255.8 | 261.6 |
| 3 | 263.1 | 284.36 | 10 | 265.1 | 270.7 |
| 4 (GW. RECOVERY WELL) | 255.7 | 285.7 | 10 | 257.7 | 263.0 |




QUICK RELEASE CONNECTION DETAIL

NO SCALE

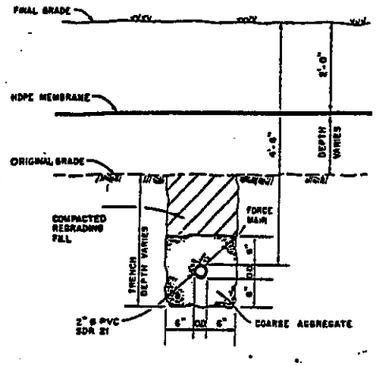
These plans are not to scale. All scales are reduced from indicated to approximately half size.

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URS Co., Inc.
BUFFALO, NEW YORK
JAN 5 1988

| | | | | | |
|---|---|---|---|---|---|
| | | | | DESIGNED BY : | P.M.B. |
| | | | | DRAWN BY : | R.A.L. |
| NO. | DATE | DESCRIPTION | | CHECKED BY : | R.E.M. |
| | | | | PROJ. ENGR. : | DWR. |

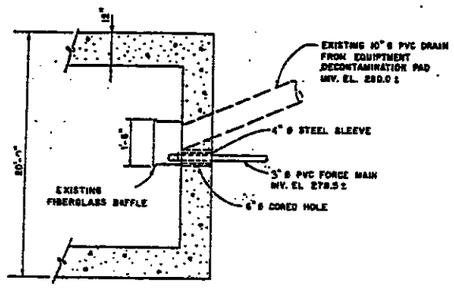
URS Company, Inc. CONSULTING ENGINEERS NEW YORK NEW JERSEY

P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
LEACHATE COLLECTION SYSTEM DETAILS

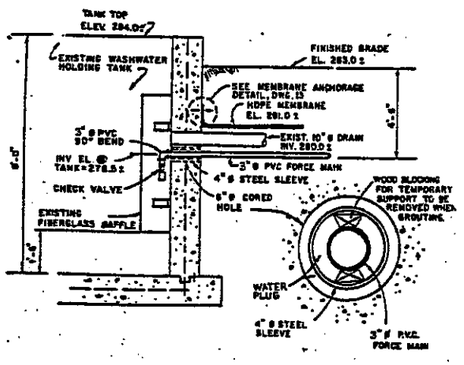



TYPICAL FORCE MAIN TRENCH SECTION

NO SCALE




PLAN




FORCE MAIN CONNECTION TO EXISTING WASHWATER HOLDING TANK

NO SCALE

## THRUST BLOCK ANCHORAGE SCHEDULE

| DIMENSION | 22 1/2° BEND | 30° BEND | 45° BEND | 90° BEND | TEE & VALVE |
|---|---|---|---|---|---|
| L | 1'-6" | 1'-6" | 1'-6" | 2'-0" | 1'-9" |
| H | 1'-0" | 1'-0" | 1'-3" | 1'-6" | 1'-6" |

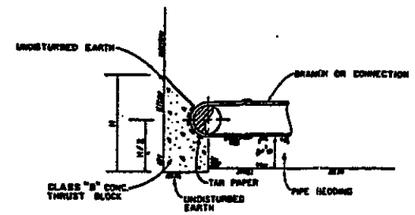
NOTES :

1.) DIMENSIONS ARE MINIMUMS

2.) WHERE 2 VIEWS ARE NOT SHOWN "H" DIMENSION REFERS TO DEPTH (INTO THE SHEET).

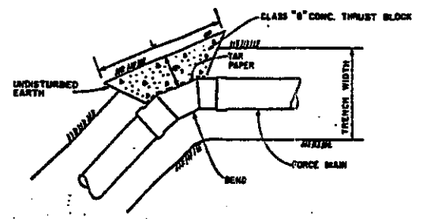
3.) JOINTS ARE _ CLEAR OF CONCRETE TO ALLOW FOR FREE ACCESS.

4.) THRUST BLOCKS AT ALL TEES, BENDS, AND VALVES, AS SHOWN ON THE THRUST BLOCK DETAILS



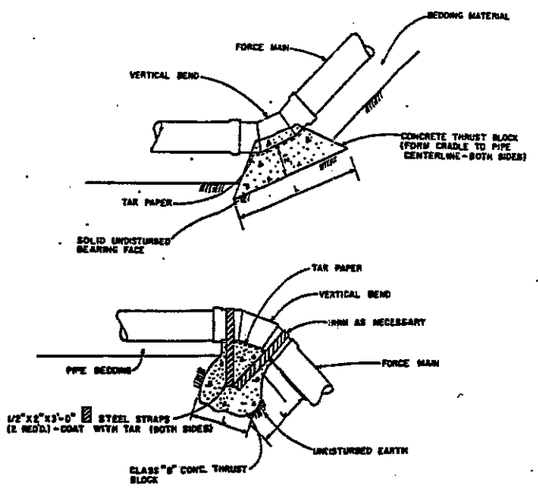

TYPICAL TEE THRUST BLOCK ANCHORAGE DETAIL

NO SCALE




TYPICAL HORIZONTAL BEND THRUST BLOCK ANCHORAGE DETAIL

NO SCALE




TYPICAL VERTICAL BEND THRUST BLOCK ANCHORAGE DETAILS

NO SCALE

These plans are not to scale. All scales are reduced from indicated to approximately half size.

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BUFFALO, NEW YORK
JAN 5 1998
DATE PRINTED

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| NO | DATE | DESCRIPTION |
|---|---|---|
| | | |

REVISIONS

DESIGNED BY : P.B.
DRAWN BY : P.T.B.
CHECKED BY : R.E.M.
PROJ. ENGR. : D.W.R.

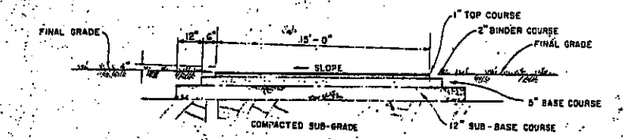
URS Company, Inc. CONSULTING ENGINEERS NEW YORK NEW JERSEY

JOB No. 35070

P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
FORCE MAIN DETAILS

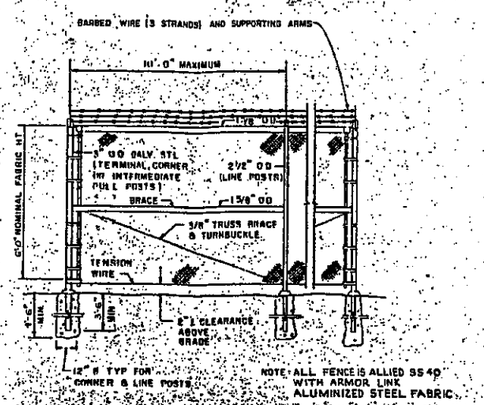
Scale: NO SCALE Date: 1/7/98 DWG. NO. 9

NOTES:
1. PAVEMENT SLOPED TOWARDS OUTSIDE.
2. WHEREVER ROADWAY PASSES OVER HDPE MEMBRANE (APPROXIMATELY FROM STATIONS 1+04 TO 5+77), GEOTEXTILE STABILIZATION FABRIC (MIRAFI 600 x OR EQUAL) IS PLACED UNDER FULL WIDTH OF SUB-BASE COURSE.




## PERMANENT PAVED ROADWAY SECTION

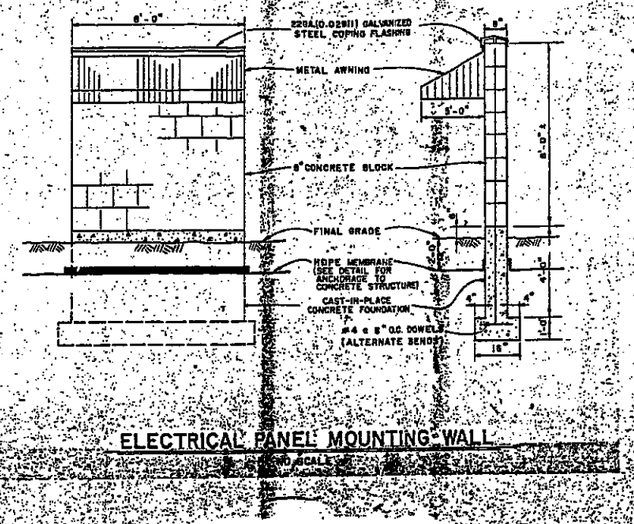
NO SCALE




NOTE: ALL FENCE IS ALLIED SS 40 WITH ARMOR LINK ALUMINIZED STEEL FABRIC.

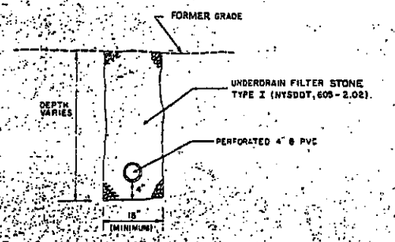
## TYPICAL PERMANENT EXTERIOR FENCE DETAIL

NO SCALE




## ELECTRICAL PANEL MOUNTING WALL

NO SCALE




## TYPICAL FRENCH DRAIN SECTION

NO SCALE

It is a violation of Section 7209 (2) of the Education Law of the State of New York for any person, unless he is acting under the direction of a licensed Professional Engineer to alter any item on this drawing and/or to take specification in any way. If any such item is altered, the altering professional engineer shall affix to the item his seal and the notation "altered by" followed by his signature and the date of such alteration together with a specific description of the alteration.

PRELIMINARY

URS Co., Inc.
BUFFALO, NEW YORK
JAN 8 1988

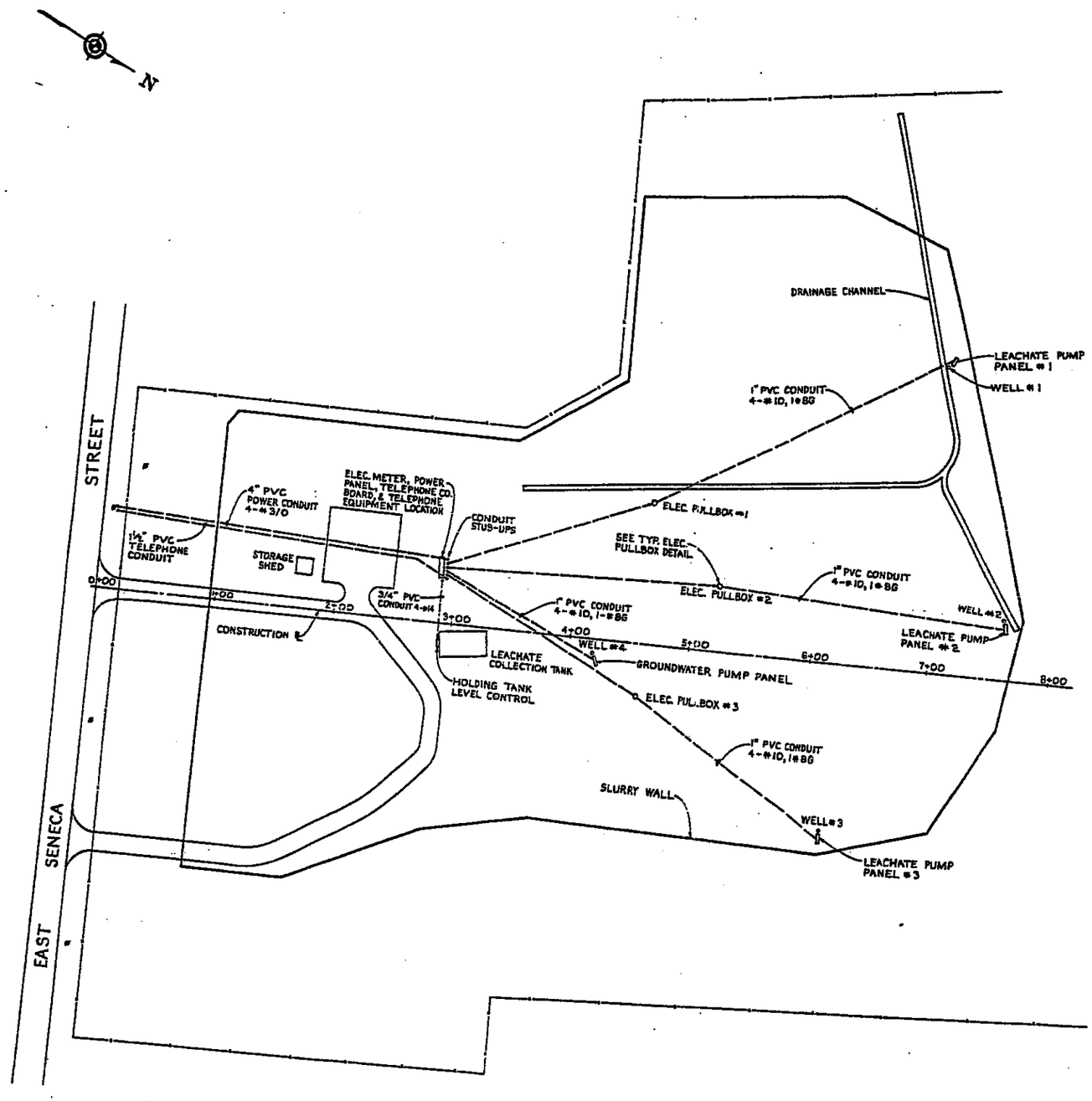
DATE PRINTED

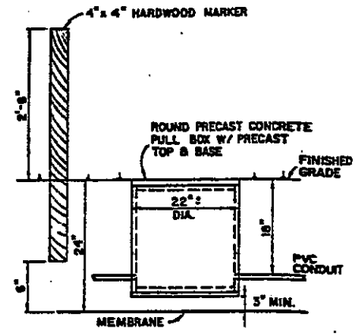
| NO. | DATE | DESCRIPTION | NO. | DATE | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

DESIGNED BY : P.M.B.
DRAWN BY : P.B.
CHECKED BY : D.W.R.

URS Company, Inc.
CONSULTING ENGINEERS
NEW YORK NEW JERSEY

P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
MISCELLANEOUS DETAILS




TYPICAL ELECTRICAL PULLBOX DETAIL
NO SCALE

**ELECTRICAL EQUIPMENT STATIONING**

- ELEC. PANEL MOUNTING WALL
  - ℄ WEST END - ℄ 2+85.84, 9's 50.81 W
  - ℄ EAST END - ℄ 2+85.42, 9's 42.79 W
- ELEC. PULLBOXES
  - #1 - ℄ 4+53.03, 9's 112.37 W
  - #2 - ℄ 5+20.93, 9's 51.96 W
  - #3 - ℄ 4+58.87, 9's 41.51 E

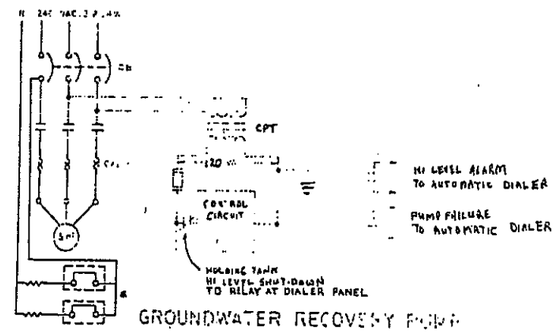
These plans are not to scale. All scales are reduced from indicated to approximately half size.

PRELIMINARY
URS Co., Inc.
BUFFALO, NEW YORK
JAN 8 1988
DATE PRINTED

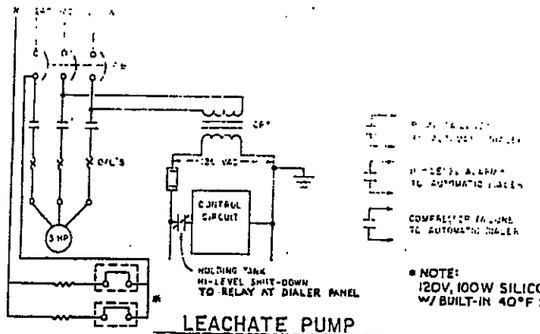
DESIGNED BY :
DRAWN BY : R.A.L.
CHECKED BY : R.E.M.

URS URS Company, Inc.
CONSULTING ENGINEERS
NEW YORK NEW JERSEY

P.A.S. OSWEGO, NEW YORK
SITE REMEDIAL MEASURES
ELECTRICAL PLAN
DWG NO. H



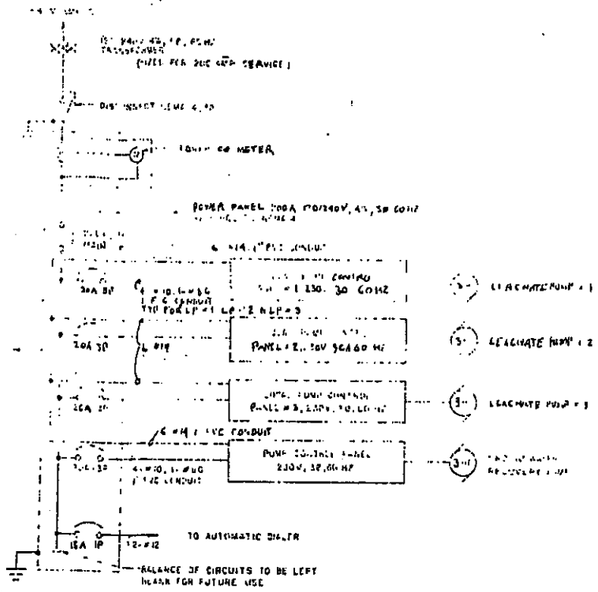

GROUNDWATER RECOVERY PUMP




* NOTE:
120V, 100W SILICONE RUBBER HEATERS
W/ BUILT-IN 40°F SNAP ACTION THERMOSTATS

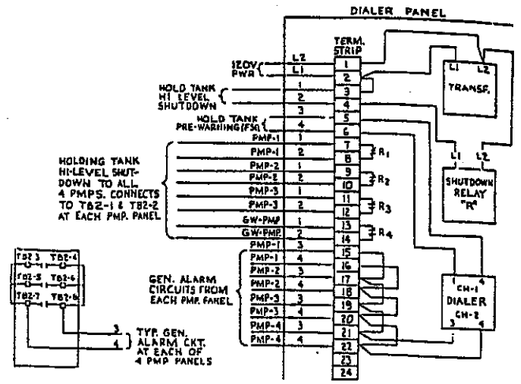
## LEACHATE PUMP
## (TYPICAL FOR PUMPS #1, #2, & #3)

NO SCALE



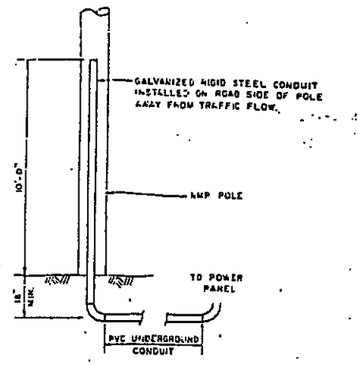

## ELECTRICAL POWER SCHEMATIC

NO SCALE



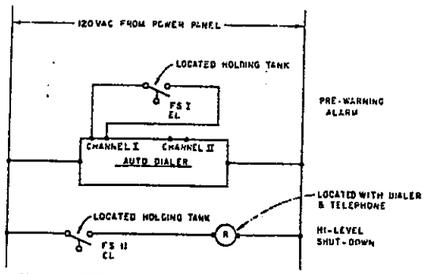

## WIRING DIAGRAM

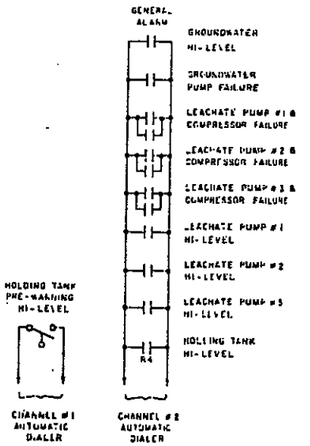
NO SCALE




## POLE DETAIL

NO SCALE

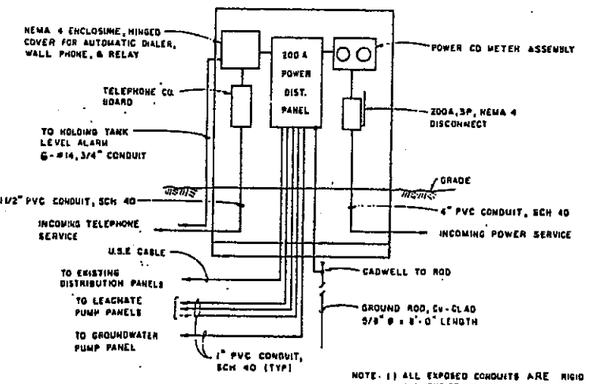



NOTE!
ALL ALARMS PARALLELED AT TERMINAL STRIP IN DIALER PANEL

## AUTOMATIC DIALER

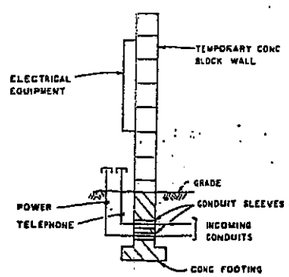
NO SCALE



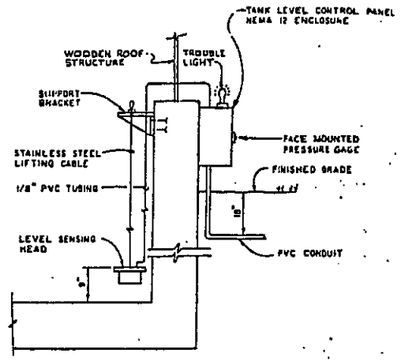

NOTE: 1) ALL EXPOSED CONDUITS ARE RIGID STEEL & GALVANIZED, ALL BURIED CONDUITS ARE PVC
2) ALL CONDUCTORS ARE THHN.
3) ALL UNDERGROUND CONDUITS INSTALLED ABOVE THE HDPE MEMBRANE @ MAXIMUM DEPTH 18" BELOW GRADE

## ELECTRICAL DISTRIBUTION PANEL ELEVATION

NO SCALE




NOTE: ALL ELECTRICAL/TELEPHONE EQUIPMENT, AND STUB UP OF ALL INCOMING AND OUTGOING CONDUITS ON THE NORTH SIDE OF WALL




## HOLDING TANK LEVEL CONTROL DETAIL

NO SCALE

These plans are not to scale. All scales are reduced from indicated to approximately half size.

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BUFFALO, NEW YORK
JAN 8 1988
DATE PRINTED

PRELIMINARY

If in the opinion of Section 7209 (2) of the Education Law of the State of New York, for any person, unless he is acting under the direction of a licensed Professional Engineer to alter any item on this drawing and/or to add specification to any item. If any such item is altered, the altering professional engineer shall affix to the item its seal and the notation "altered by" followed by his signature and the date of such alteration together with a specific description of the alteration.

| | | | | | |
|---|---|---|---|---|---|
| | | | | DESIGNED BY | NGD |
| | | | | DRAWN BY | PTB. |
| | | | | CHECKED BY | RGD |

URS URS Company, Inc. CONSULTING ENGINEERS
NEW YORK NEW JERSEY

**Drawing No. 12**

P.A.S. OSWEGO NEW YORK
SITE REMEDIAL MEASURES
ELECTRICAL DETAILS

# *Appendix B*
# *Ground-water and Leachate Quality Monitoring Logs*

# FORMER POLLUTION ABATMENT SERVICES (PAS OSWEGO) — GROUND WATER SAMPLING LOG

| | | | |
|---|---|---|---|
| **Date** | | **Weather** | |
| **Site Name** | **PAS Oswego** | **Well #** | |
| **Location** | **55 East Seneca St** | **Evacuation Method** | Grundfos Low Flow Equip. |
| **Project Number** | | **Sampling Method** | EPA Low Flow Method II |
| **Personnel** | | | |

## WELL INFORMATION

| | | | | |
|---|---|---|---|---|
| **Depth of Well** | ft | | | **Water Vol/ft for:** |
| **Depth of Water** | ft | **2" Diameter Well** | **= 0.163 X LWC** | |
| **Length of Water Column** | ft | **4" Diameter Well** | **= 0.653 X LWC** | |
| **Volume of Water in Well** | gal | **6" Diameter Well** | **= 1.469 X LWC** | |
| **3x Volume of Water in Well** | gal | **14" Diameter Well** | **= 2.282 X LWC** | |

| | |
|---|---|
| **Volume removed before Sampling** | gals |
| **Did Well go dry?** | |

| | | | |
|---|---|---|---|
| **Measurements Taken From:** | ☐ Well Casing | ☐ Protective Casing | ☐ Other: |

## INSTRUMENT CALIBRATION

| | | | |
|---|---|---|---|
| **pH Buffer Readings** | | **Conductivity Standard Ratings** | |
| **4.0 Standard** | | **84 S Standard** | |
| **7.0 Standard** | | **1413 S Standard** | |
| **10.0 Standard** | | | |

## TEST EQUIPMENT DEPTHS WITHIN WELL

| Time | Well Screen Depth | Depth of Intake Pump | Blank | BLANK | BLANK | BLANK | BLANK |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |

## WATER PARAMETERS

| Time | Depth to Water | Temperature | pH | Conductivity | ORP | DO (%) | Turbidity (NTU) | Flow Rate |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## WATER SAMPLE

**Time Collected:**

| Characteristics | Physical Appearance At Start | Physical Appearance At Sampling |
|---|---|---|
| Color | | |
| Odor | | |
| Turbidity <100 (NTU) | | |
| Sheen/Free Product | | |

## SAMPLES COLLECTED

| Container Size | Container Type | # Collected | Field Filtered | Preservative | Container pH |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## NOTES

## VOC Concentrations at M-21

## (PPB)

| DATE | 1.1-DICHLOROETHANE | BENZENE | TOLUENE | CHLOROBENZENE | ETHYLBENZENE | XYLENES |
|---|---|---|---|---|---|---|
| | | | | | | |
| Oct-91 | 0 | 39 | 5 | 12 | 59 | 250 |
| Oct-91 | 0 | 36 | 3 | 12 | 57 | 240 |
| Nov-91 | 0 | 100 | 10 | 34 | 180 | 670 |
| Sep-94 | 0 | 7 | 0 | 31 | 0 | 30 |
| May-96 | 0 | 5 | 0 | 2 | 0 | 0 |
| Nov-96 | 0 | 7 | 0 | 2 | 0 | 0.6 |
| May-97 | 0 | 9 | 0 | 4 | 0 | 1 |
| May-98 | 0 | 8.1 | 0 | 3.4 | 0 | 0.6 |
| Nov-98 | 0 | 10 | 0 | 0.3 | 0 | 0 |
| May-99 | 0 | 27 | 0 | 9 | 0 | 1 |
| Nov-99 | 0 | 19 | 0 | 6 | 0 | 0 |
| May-00 | 0 | 21 | 0 | 8 | 0 | 0 |
| Nov-00 | 0 | 26 | 0 | 9.8 | 0 | 0 |
| May-01 | 0 | 14 | 0.36 | 4.2 | 0 | 0.47 |
| Nov-01 | 1.3 | 18 | 0.48 | 6.1 | 0 | 0.91 |
| May-02 | 0.19 | 18 | 0.43 | 6.5 | 0 | 0.3 |
| Nov-02 | 0.32 | 0.13 | 0.34 | 4.3 | 0 | 0.33 |
| May-03 | 0 | 9.9 | 0.25 | 3.1 | 0 | 0.17 |
| Nov-03 | 0 | 4.2 | .14J | 1.8 | 0 | .15J |
| May-04 | 0 | 5.5 | .27J | 2.1 | 0 | 0 |
| Nov-04 | 0.5 | 4 | 0.5 | 1.2 | 0.5 | 0.5 |
| May-05 | 0 | 4.7 | 0 | 2.2 | 0 | 0 |
| Nov-05 | 0 | 2.87 | 0 | 1 | 0 | 0 |
| May-06 | 0 | 0.31 | 0 | 0.53 | 0 | 0 |
| Nov-06 | 0 | 2.08 | 0 | 1.47 | 0 | 0 |
| May-07 | 0 | 3.19 | 0.44 | 7.83 | 0 | 0.31 |
| Nov-07 | 0 | 0.63 | 0.26 | 4.43 | 0 | 0.35 |
| May-08 | 0 | 0.68 | 0.34 | 7.13 | 0 | 0 |
| Nov-08 | 0 | 0.89 | 0.36 | 6.69 | 0 | 0 |
| May-09 | .13J | .43J | .36J | 7.94 | 0 | .58J |
| Nov-09 | 0.13 | 0.13 | 0.11 | 2.91 | 0 | 0 |
| May-10 | 0.1 | 0.2 | 0.39 | 8.07 | 0 | 0 |
| Nov-10 | 0 | 0 | 0 | 3.75 | 0 | 0 |
| May-11 | 0.11J | 0.22J | 0.37J | 8.08 | 0 | 0 |
| Nov-11 | 0 | 0 | 0 | 1.77 | 0 | 0 |
| May-12 | 0 | 0 | 0.13 | 3.38 | 0 | 0 |
| Nov-12 | 0.15 | 0.5J | 0 | 1.57 | 0 | 0 |
| May-13 | 0 | 0.2J | 0.33J | 6.9 | 0 | 0 |

## VOC Concentrations at LR 8
## (PPB)

| DATE | 1.1-DICHLOROETHANE | BENZENE | TOLUENE | CHLOROBENZENE | ETHYLBENZENE | XYLENES |
|---|---|---|---|---|---|---|
| Nov-89 | 0 | 100 | 12 | 23 | 150 | 380 |
| May-90 | 0 | 32 | 11 | 7 | 69 | 200 |
| Nov-90 | 0 | 55 | 13 | 13 | 93 | 310 |
| May-91 | 0 | 67 | 9 | 16 | 110 | 370 |
| Nov-91 | 0 | 84 | 3 | 18 | 55 | 190 |
| May-92 | 0 | 82 | 1 | 22 | 24 | 270 |
| Nov-92 | 0 | 82 | 2 | 23 | 26 | 370 |
| May-93 | 0 | 84 | 7 | 22 | 87 | 390 |
| Nov-93 | 0 | 45 | 0.6 | 10 | 2 | 120 |
| May-94 | 0 | 36 | 1 | 20 | 1 | 54 |
| Nov-94 | 0 | 48 | 0 | 10 | 3 | 97 |
| May-95 | 0 | 42 | 0 | 9 | 0 | 29 |
| Nov-95 | 0 | 29 | 0 | 9 | 0 | 1 |
| May-96 | 0 | 20 | 0 | 5 | 0 | 0 |
| Nov-96 | 0 | 22 | 0.5 | 5 | 0 | 2 |
| May-97 | 0 | 33 | 0 | 6 | 0 | 3 |
| May-98 | 0 | 30 | 0.51 | 6.4 | 0 | 1.4 |
| Nov-98 | 0 | 23 | 0 | 6 | 0 | 0 |
| May-99 | 0 | 29 | 0 | 7 | 0 | 1 |
| Nov-99 | 0 | 34 | 0 | 8 | 0 | 0 |
| May-00 | 0 | 22 | 0 | 7 | 0 | 0 |
| Nov-00 | 0 | 33 | 0 | 8.2 | 0 | 1.1 |
| May-01 | 1.9 | 21 | 0.35 | 7.3 | 0 | 0.96 |
| Nov-01 | 0.15 | 21 | 0.41 | 6.3 | 0 | 1.2 |
| May-02 | 0.1 | 8.8 | 0.25 | 6.5 | 0 | 0.18 |
| Nov-02 | 0 | 14 | 0.35 | 4.9 | 0 | 1.2 |
| May-03 | 0 | 16 | 0.44 | 7.5 | 0 | 0.4 |
| Nov-03 | .10J | 21 | .47J | 9.7 | 0 | 1.4 |
| May-04 | 0 | 0.33 | 0 | 0 | 0 | 0 |
| Nov-04 | 0.5 | 0.3 | 0.5 | 0.5 | 0.5 | 0.5 |
| May-05 | 0 | 10 | 0 | 12 | 0 | 0 |
| Nov-05 | 0 | 0 | 0 | 0 | 0 | 0 |
| May-06 | .10J | 9 | .32J | 7.87 | 0 | .35J |
| Nov-06 | 0 | 0.31 | 0 | 0 | 0 | 0 |
| May-07 | 0 | 2.21 | 0.23 | 5.35 | 0 | 0.16 |
| Nov-07 | 0.14 | 14.2 | 0.49 | 14.6 | 0.12 | 1.31 |
| May-08 | 0.16 | 4.39 | 0.35 | 12.5 | 0 | 0 |
| Nov-08 | 0 | 4.83 | 0.29 | 7.82 | 0 | 0 |
| May-09 | 0 | .12J | 0 | 0 | 0 | 0 |
| Nov-09 | 1.55 | 12.6 | 0.61 | 15.8 | 0.12 | 0.34 |
| May-10 | 0.33 | 6.65 | 0.39 | 9.64 | 0 | 0 |
| Nov-10 | 0 | 12.5 | 0.76 | 18 | 0 | 0 |
| May-11 | 0.11J | 1.53 | 0.37J | 12.6 | 0 | 0 |
| Nov-11 | 0.9 | 5.88 | 0.88 | 18.3 | 0.14 | 0.36 |
| May-12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov-12 | 0.51 | 5.78 | 0.8 | 23.2 | 0.2J | 0.75J |
| May-13 | 0 | 3.24 | 0.44J | 13.1 | 0 | 0.4J |

## VOC CONCENTRATIONS AT LR 6
## (ug/L)

| DATE | 1.1-DICHLOROETHANE | BENZENE | TOLUENE | CHLOROBENZENE | ETHYLBENZENE | XYLENES |
|---|---|---|---|---|---|---|
| Nov-89 | 48 | 2J | 2J | ND | 1J | 1J |
| May-90 | 67 | ND | 2J | ND | ND | ND |
| Nov-90 | 49 | 1J | 2J | ND | 1J | 3J |
| May-91 | 34 | ND | ND | ND | .3J | ND |
| Nov-91 | 33 | ND | ND | ND | ND | ND |
| May-92 | 14 | ND | ND | ND | ND | ND |
| Nov-92 | 12 | ND | ND | ND | ND | ND |
| May-93 | 8 | ND | ND | ND | ND | ND |
| Nov-93 | 10 | ND | ND | ND | ND | ND |
| May-94 | 8 | ND | ND | ND | ND | ND |
| Aug-94 | 7J | ND | ND | ND | ND | ND |
| Nov-94 | 13 | ND | ND | ND | ND | ND |
| May-95 | 7 | ND | ND | ND | ND | ND |
| Nov-95 | 8 | ND | ND | ND | ND | ND |
| May-96 | ND | ND | ND | ND | ND | ND |
| Nov-96 | 8 | ND | ND | ND | ND | ND |
| May-97 | 5 | ND | ND | ND | ND | ND |
| May-98 | 4.2J | ND | ND | ND | ND | ND |
| Nov-98 | 6 | ND | ND | ND | ND | ND |
| May-99 | 3 | ND | ND | ND | ND | ND |
| Nov-99 | 9 | ND | ND | ND | ND | ND |
| May-00 | 2 | ND | ND | ND | ND | ND |
| Nov-00 | 4.2 | ND | ND | ND | ND | ND |
| May-01 | ND | ND | ND | ND | ND | ND |
| Nov-01 | 4.1 | ND | ND | ND | ND | ND |
| May-02 | 1.6 | ND | ND | ND | ND | ND |
| Nov-02 | .16J | ND | ND | ND | ND | ND |
| May-03 | 1.6 | ND | ND | ND | ND | ND |
| Nov-03 | 2.1 | ND | ND | ND | ND | .12J |
| May-04 | 2.1 | ND | ND | ND | ND | ND |
| Nov-04 | 2.9 | ND | ND | ND | ND | ND |
| May-05 | 2.2 | ND | ND | ND | ND | ND |
| Nov-05 | 2.66 | ND | ND | ND | ND | ND |
| May-06 | 3.28 | ND | ND | ND | ND | ND |
| Nov-06 | 2.83 | ND | ND | ND | ND | ND |
| May-07 | 1.88 | ND | ND | ND | ND | ND |
| Nov-07 | 0.73 | ND | ND | ND | ND | ND |
| May-08 | 2.26 | ND | ND | ND | ND | ND |
| Nov-08 | 3.21 | ND | ND | ND | ND | ND |
| May-09 | 2.09 | ND | ND | ND | ND | ND |
| Nov-09 | 3.43 | ND | ND | ND | ND | ND |
| May-10 | 1.66 | ND | ND | ND | ND | ND |
| Nov-10 | 2.2 | ND | ND | ND | ND | ND |
| May-11 | 1.66 | ND | ND | ND | ND | ND |

**PAS-OSWEGO-COMPARISON OF LCW2 LEACHATE ANALYTICAL DATA: MAY 2000 - MAY 2013**

| COMPOUND (PPB) | LCW-2 5/00 | LCW-2 11/00 | LCW-2 5/01 | LCW-2 11/01 | LCW-2 5/02 | LCW-2 11/02 | LCW-2 5/03 | LCW-2 11/03 | LCW-2 5/04 | LCW-2 11/04 | LCW-2 5/05 | LCW-2 11/05 | LCW-2 5/06 | LCW-2 11/06 | LCW-2 5/07 | LCW-2 11/07 | LCW-2 5/08 | LCW-2 11/08 | LCW-2 5/09 | LCW-2 11/09 | LCW-2 5/10 | LCW-2 11/10 | LCW-2 5/11 | LCW-2 11/11 | LCW-2 5/12 | LCW-2 11/12 | LCW-2 5/13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 DICHLOROETHANE | 18 | 41 | 48 | 53 | 32 | 61 | 23 | 39 | 27 | 49 | 32 | 95.7 | 83.5 | 59.6 | 36.5 | 55.9 | 62 | 39.1 | 9.75 | 30 | 18 | 28.4 | 26 | 24.5 | 27 | 63 | 20 |
| BENZENE | 220 | 230 | 250 | 330 | 140 | 160 | 55 | 200 | 230 | 100 | 220 | 13.6 | 265 | 13.5 | 12.4 | 144 | 414 | 97.2 | 401 | 345 | 578 | 106 | 55 | 193 | 93.2 | 164 | 215 |
| TOLUENE | <10 | 17 | 220 | 28 | 1.7J | 1.9J | .23J | 41 | 110 | 1.4J | 3J | 0 | 9.3 | 0 | 0 | 10 | 3.60J | 1.55J | 5.6 | 280 | 2.4 | <5.00 | <2.50 | 2.15 | <2.50 | 10 | 10.0 |
| CHLOROBENZENE | 34 | 52 | 120 | 78 | 41 | 38 | 17 | 72 | 120 | 30 | 53 | 4.2 | 50.9 | 9.9 | 6.4 | 45.8 | 73.4 | 31 | 93.2 | 90.4 | 142 | 44.4 | 14.1 | 63.6 | 22.6 | 33.2 | 56 |
| ETHYLBENZENE | 84 | 140 | 430 | 230 | 98 | 68 | 14 | 190 | 430 | 25 | 110 | 2.4 | 147 | 1.1 | 3.2 | 116 | 158 | 36.1 | 156 | 90 | 129 | 30.8 | 3.8 | 44.5 | 12.1 | 12.6J | 26.8 |
| XYLENES (TOTAL) | 72 | 220 | 810 | 280 | 68 | 15 | .56J | 200 | 760 | 5.4 | 70 | 0 | 81.8 | 0 | 1.6 | 33.3 | 65.8 | 23 | 108 | 122 | 161 | 49.4 | <5.00 | 18.3 | 6.5 | 8.4J | 20 |
| **TOTAL VOC'S** | **428** | **700** | **1878** | **999** | **379** | **342** | **109** | **742** | **1677** | **209.4** | **485** | **115.9** | **637.5** | **84.1** | **60.1** | **405** | **773.2** | **226.4** | **773.55** | **957.2** | **1030.4** | **259** | **98.9** | **346.05** | **161.4** | **270.2** | **347.8** |

F:\PROJECTS\3131\2013\LCWDAT.WB2 TAB: LCW2

**PAS-OSWEGO-COMPARISON OF LCW4 LEACHATE ANALYTICAL DATA: May 2000 - MAY 2013**

| COMPOUND (PPB) | LCW-4 5/00 | LCW-4 11/00 | LCW-4 5/01 | LCW-4 11/01 | LCW-4 5/02 | LCW-4 11/02 | LCW-4 5/03 | LCW-4 11/03 | LCW-4 5/04 | LCW-4 11/04 | LCW-4 5/05 | LCW-4 11/05 | LCW-4 5/06 | LCW-4 11/06 | LCW-4 5/07 | LCW-4 11/07 | LCW-4 5/08 | LCW-4 11/08 | LCW-4 5/09 | LCW-4 11/09 | LCW-4 5/10 | LCW-4 11/10 | LCW-4 5/11 | LCW-4 11/11 | LCW-4 5/12 | LCW-4 11/12 | LCW-4 5/13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1 DICHLOROETHANE | 110 | 45 | 76 | 48 | 79 | 81 | 62 | 60 | 36 | 72 | 69 | 59.5 | 0 | 55.5 | 17 | 3.6 | 0 | 0 | 11.5J | 36 | 18.2 | 31.8 | 26.2 | 7.6 | 11 | 2.6J | 2.2J |
| BENZENE | 440 | 300 | 410 | 300 | 510 | 410 | 360 | 350 | 290 | 470 | 540 | 379 | 843 | 513 | 328 | 350 | 678 | 422 | 360 | 546 | 394 | 239 | 271 | 386 | 445 | 491 | 539 |
| TOLUENE | 460 | 350 | 560 | 400 | 680 | 570 | 520 | 410 | 210 | 500 | 640 | 458 | 43.5 | 407 | 243 | 8.2 | 40 | 22.5 | 208 | 243 | 102 | 117 | 64.8 | 57 | 29.4 | 58.8 | 12.8 |
| CHLOROBENZENE | 220 | 200 | 230 | 230 | 330 | 370 | 360 | 320 | 170 | 260 | 350 | 388 | 330 | 382 | 412 | 251 | 343 | 283 | 278 | 512 | 282 | 213 | 220 | 278 | 275 | 315 | 292 |
| ETHYLBENZENE | 810 | 800 | 940 | 870 | 1200 | 1100 | 1100 | 860 | 640 | 810 | 1300 | 1190 | 260 | 1190 | 780 | 134 | 171 | 122 | 465 | 840 | 455 | 387 | 335 | 161 | 93.4 | 164J | 46 |
| XYLENES (TOTAL) | 1730 | 1800 | 1900 | 1700 | 2300 | 2100 | 2300 | 1700 | 1200 | 1600 | 2800 | 2380 | 2290 | 2530 | 1690 | 304 | 1900 | 1210 | 1890 | 2530 | 1410 | 1000 | 317 | 972 | 771 | 1100 | 1160 |
| **TOTAL VOC'S** | **3770** | **3495** | **4116** | **3548** | **5099** | **4631** | **4702** | **3700** | **2546** | **3712** | **5699** | **4855** | **3767** | **5078** | **3470** | **1050.8** | **3132** | **2059.5** | **3201** | **4707** | **2661.2** | **1987.8** | **1234.0** | **1861.6** | **1624.8** | **1964.8** | **2049.8** |

F:\PROJECTS\3131\ 2013\ LCWDAT.WB2 TAB: LCW4

# *Appendix C*
# *Ground-water Elevation Monitoring Log*

O'Brien & Gere Opera on (O'Brien & Gere)
PAS Oswego Site
Oswego, New York
Pre-Pumping Monitoring Well Levels

Date - Technician -

| Well | Ground | Riser | Within Range Veri ca on | | | | | Monthly Onsite Field Measurements | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | Eleva on | Eleva on | Average Well Level | Low Well Level | High Well Level | Within Range YES | NO | Current Well Level (1st) Check | Current Well Level (2nd) Check | Well Within Range (based on historical data) YES | NO | Veri ca on Well Level Check (if not within range) |
| SWW1 | 286.2 | 289.33 | | | | | | | | | | |
| SWW2 | 286.3 | 289.37 | | | | | | | | | | |
| SWW3 | 286.00 | 286.50 | | | | | | | | | | |
| SWW4 | 282.90 | 283.60 | | | | | | | | | | |
| SWW5 | 275.90 | 277.02 | | | | | | | | | | |
| SWW6 | 270.90 | 273.06 | | | | | | | | | | |
| SWW7 | 273.30 | 277.93 | | | | | | | | | | |
| SWW8 | 275.70 | 278.24 | | | | | | | | | | |
| SWW9 | 283.30 | 285.55 | | | | | | | | | | |
| SWW10 | 279.30 | 280.43 | | | | | | | | | | |
| SWW11 | 271.00 | 273.50 | | | | | | | | | | |
| SWW12 | 270.20 | 272.82 | | | | | | | | | | |
| LCW-1 | 271.40 | 272.21 | | | | | | | | | | |
| LCW-2 | 272.60 | 274.44 | | | | | | | | | | |
| LCW-3 | 283.30 | 284.36 | | | | | | | | | | |
| LCW-4 | 283.80 | 285.70 | | | | | | | | | | |
| LS-2 | 287.5 | 289.81 | | | | | | | | | | |
| OS-1 | 269.63 | 272.10 | | | | | | | | | | |
| OI-1 | 269.14 | 272.00 | | | | | | | | | | |
| OS-3 | 274.63 | 277.89 | | | | | | | | | | |
| OD-3 | 274.96 | 277.85 | | | | | | | | | | |
| LD-3 | 275.80 | 278.62 | | | | | | | | | | |
| LD-4 | 276.30 | 279.25 | | | | | | | | | | |
| LD-5 | 270.02 | 272.94 | | | | | | | | | | |
| LS-6 | 271.40 | 274.14 | | | | | | | | | | |
| LD-6 | 270.09 | 274.03 | | | | | | | | | | |
| LD-8 | 269.90 | 272.83 | | | | | | | | | | |
| LR-2 | 287.50 | 289.85 | | | | | | | | | | |
| LR-3 | 275.50 | 278.06 | | | | | | | | | | |
| LR-6 | 270.90 | 274.39 | | | | | | | | | | |
| LR-8 | 270.00 | 273.42 | | | | | | | | | | |
| M-21 | 270.28 | 272.32 | | | | | | | | | | |
| M-22 | 270.40 | 273.88 | | | | | | | | | | |
| M-23 | 267.98 | 270.49 | | | | | | | | | | |

**O'Brien Gere Operation**
**PAS Site**
**Oswego, New York**
**Pre-Pumping Monitoring Well Levels**

**March 7, 2012**

| Well | Ground | Riser | March 2011 | | | Within Range? | | | | Ground-Water |
|---|---|---|---|---|---|---|---|---|---|---|
| Number | Elevation | Elevation | Reading 1 | Reading 2 | Reading 3 | Average | Low | High | Y / N | Elevation |
| SWW1 | 286.20 | 289.33 | 9.16 | 9.16 | 9.16 | 8.85 | 8.30 | 9.48 | Yes | 280.17 |
| SWW2 | 286.30 | 289.37 | 15.10 | 15.10 | 15.10 | 15.49 | 15.02 | 16.02 | Yes | 274.27 |
| SWW3 | 286.00 | 286.50 | 16.64 | 16.64 | 16.64 | 16.84 | 16.52 | 17.38 | Yes | 269.86 |
| SWW4 | 282.90 | 283.60 | 14.16 | 14.16 | 14.16 | 14.38 | 12.94 | 15.33 | Yes | 269.44 |
| SWW5 | 275.90 | 277.02 | 12.32 | 12.32 | 12.32 | 12.82 | 12.33 | 13.46 | No | 264.70 |
| SWW6 | 270.90 | 273.06 | 8.40 | 8.40 | 8.40 | 8.38 | 7.68 | 8.92 | Yes | 264.66 |
| SWW7 | 273.30 | 277.93 | 7.58 | 7.58 | 7.58 | 7.84 | 7.28 | 8.20 | Yes | 270.35 |
| SWW8 | 275.70 | 278.24 | 3.82 | 3.82 | 3.82 | 3.97 | 3.66 | 4.31 | Yes | 274.42 |
| SWW9 | 283.30 | 285.55 | 16.38 | 16.38 | 16.38 | 16.82 | 16.12 | 17.75 | Yes | 269.17 |
| SWW10 | 279.30 | 280.43 | 10.08 | 10.08 | 10.08 | 10.56 | 9.54 | 12.26 | Yes | 270.35 |
| SWW11 | 271.00 | 273.50 | 8.24 | 8.24 | 8.24 | 8.84 | 8.20 | 9.60 | Yes | 265.26 |
| SWW12 | 270.20 | 272.82 | 8.42 | 8.42 | 8.42 | 8.54 | 7.80 | 9.00 | Yes | 264.40 |
| LCW-1 | 271.40 | 272.21 | 7.56 | 7.56 | 7.56 | 7.98 | 7.55 | 8.92 | Yes | 264.65 |
| LCW-2 | 272.60 | 274.44 | 9.80 | 9.80 | 9.80 | 10.22 | 9.80 | 11.15 | No | 264.64 |
| LCW-3 | 283.30 | 284.36 | 17.45 | 17.45 | 17.45 | 17.68 | 17.50 | 18.07 | No | 266.91 |
| LCW-4 | 283.80 | 285.70 | 17.83 | 17.83 | 17.83 | 18.18 | 17.48 | 19.16 | Yes | 267.87 |
| OS-1 | 269.63 | 272.10 | | | | | | | | |
| OI-1 | 269.14 | 272.00 | | | | | | | | |
| OS-3 | 274.63 | 277.89 | | | | | | | | |
| OD-3 | 274.96 | 277.85 | | | | | | | | |
| LD-3 | 275.80 | 278.62 | | | | | | | | |
| LD-4 | 276.30 | 279.25 | | | | | | | | |
| LD-5 | 270.02 | 272.94 | | | | | | | | |
| LS-6 | 271.40 | 274.14 | | | | | | | | |
| LD-6 | 270.09 | 274.03 | | | | | | | | |
| LD-8 | 269.90 | 272.83 | | | | | | | | |
| LR-2 | 287.50 | 289.85 | | | | | | | | |
| LR-3 | 275.50 | 278.06 | | | | | | | | |
| LR-6 | 270.90 | 274.39 | | | | | | | | |
| LR-8 | 270.00 | 273.42 | | | | | | | | |
| M-21 | 270.28 | 272.32 | | | | | | | | |
| M-22 | 270.40 | 273.88 | | | | | | | | |
| M-23 | 267.98 | 270.49 | | | | | | | | |
| | | | | | | | | | | |

# *Appendix D*
# *Site Inspection Checklist*

O'BRIEN & GERE

# Site Inspection Checklist

## Former Pollution Abatement Services (PAS Oswego)
## Oswego, NY

Date_____ Time_____

Field Technician _____ Weather Conditions_____

Check √ (tasks completed in each event)

| Inspection Features | Monthly | Quarterly | Remarks (indicate accomplishment of each maintenance task) |
|---|---|---|---|
| ***Land Cap*** | | | |
| Signs of burrowing vermin | | | |
| Land cap irregularities (note anomaly) | | | |
| French drainage system clear and function able | | | |
| Concrete trough clear and function able | | | |
| ***Leachate Discharge System*** | | | |
| City of Oswego sanitary discharge valve positioned "Open" | | | |
| Discharge Pump inspected & operational | | | |
| Discharge pump oil level verified prior to use. | | | |
| Discharge pump drained of residual water (drained upon completion of use) | | | |
| Heat trace system operational & verified in the "ON" position (during wintertime periods) | | | |
| Flow totalizer operational. Flow readings recorded onto "Leachate Discharge Form" | | | |
| ***Leachate Collection System*** | | | |
| Leachate holding tank visually inspected for structural integrity | | | |

| | | | |
|---|---|---|---|
| Leachate holding tank metal roof inspected for structural integrity | | | |
| Leachate tank access doors locked (post pump out) | | | |
| Pump power panel(s) secured | | | |
| | | | |
| Locks installed | | | |
| MW's marked & identifiable | | | |
| | | | |
| Trees & brush cleared off security fence | | | |
| Perimeter security fence intact & free of damage | | | |
| Site access driveway inspected | | | |
| Security access gates function able | | | |
| Site gate signage intact | | | |
| Interior & exterior of utility storage shed inspected for damage & secure with locks | | | |
| Fire extinguisher serviceable, inspected, and inspection recorded | | | |
| Spill control material inspected & adequate | | | |
| PPE available and utilized as required | | | |
| Emergency contact information posted within shed | | | |

Additional remarks (use separate sheet is required)

_____

_____

_____

_____

_____

# *Appendix E*
# *Leachate Disposal Checklist*

O'BRIEN & GERE

# Leachate Disposal Checklist

Former Pollution Abatement Services (PAS Oswego)
Oswego, NY

Date: _____ Time: _____

Field Technician _____ Weather Conditions _____

| Beginning Leachate Hold Tank Elevation (Inches) | Pre-Discharge Well Pumping | | | | | |
|---|---|---|---|---|---|---|
| | Pumping Well # | Pump Start Time | Pump Stop Time | Ending Tank Elevation | Flow Rate (est.) | Est. Leachate Pumped into Holding Tank (Gallons) |
| | LCW-1 | | | | | |
| | LCW-2 | | | | | |
| | LCW-3 | | | | | |
| | LCW-4 | | | | | |
| | | | | | Total | |

| Discharge # | Monthly Leachate Discharge Pumping (To the City of Oswego) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Start Time | Stop Time | pH | Temp | Totalizer Flow Total (Start) | Totalizer Flow Total (End) | Gallons Discharge |
| Discharge #1 | | | | | | | |
| Pump Info | Flow Rate (GPM) | Prime Time | Pump Pressure | Pump Vacuum | | | |
| | | | | | | | |

| | Semi-Annual Leachate Discharge Sampling (Per the City of Oswego Permit) | | | | | |
|---|---|---|---|---|---|---|
| | Date | Sample Location | Sample Volume | Sample Time | pH | Temperature |
| Sample #1 | | | | | | |

# *Appendix F*
# *Quality Assurance Project Plan*

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# 1. Project Description

## 1.1 Introduction

This Quality Assurance Project Plan (QAPP) represents Appendix K of the Operation and Maintenance and Long-Term Monitoring Plan (Work Plan) for the Pollution Abatement (PAS) Superfund Site (site), located in the City of Oswego, New York.

This QAPP presents analytical methods and procedures that will be used during performance of long-term and operational monitoring activities at the site. Field sampling requirements, frequency, methods, and procedures are presented in the Work Plan and will be referenced throughout this document.

This QAPP was prepared in a manner consistent with the following reference and guidance documents:

- United States Environmental Protection Agency's (USEPA's) "Test Methods for Evaluating Solid Waste, SW-846 " (USEPA, 1996);
- The USEPA's guidance document entitled "Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Environmental Monitoring" (USEPA, 1984);
- The National Enforcement Investigations Center (NEIC) Policies and Procedures Manual (NEIC, 1984); and
- The NEIC Manual for the Evidence Audit (NEIC, 1981).

Information contained in the QAPP has been organized into the following sections:

| Section | Content |
|---|---|
| 1 | Project Description |
| 2 | Project Organization and Responsibilities |
| 3 | Quality Assurance Objectives for Measurement of Data |
| 4 | Sampling Procedures |
| 5 | Sample and Document Custody |
| 6 | Calibration Procedures and Frequency |
| 7 | Analytical Procedures |
| 8 | Data Reduction, Review, and Reporting |
| 9 | Field and Laboratory Quality Control Checks |
| 10 | Performance and System Audits |
| 11 | Preventive Maintenance |

| Section | Content |
|---|---|
| 12 | Data Assessment Procedures |
| 13 | Corrective Action |
| 14 | Quality Assurance Reports to Management |

Details are provided in the subsequent sections. This document also contains pertinent information from the Work Plan related to the measurement and evaluation of the monitoring data.

### 1.1.1 Glossary of Terms

The list below presents abbreviations and the corresponding terms used in this QAPP (definitions of each term are provided with the body of the QAPP):

- ASTM - American Society for Testing and Materials;
- BBLES - BBL Environmental Services, Inc.;
- BOD5 - 5-Day Biochemical Oxygen Demand;
- CLP - Contract Laboratory Procedures;
- COD - Chemical Oxygen Demand;
- de maximis - de maximis, inc.
- DUP - Duplicate;
- DQOs - Data Quality Objectives;
- GC - Gas Chromatography;
- GC/MS - Gas Chromatography/Mass Spectrometry;
- HSCP - Health and Safety Contingency Plan;
- MS - Matrix spike;
- MSD - Matrix spike duplicate;
- NEIC - National Enforcement Investigations Center;
- OBG Laboratories - OBG Laboratories, Inc.
- PARCC - Precision, Accuracy, Representativeness, Completeness, and Comparability;
- QAM - Quality Assurance Manager;
- QAPP - Quality Assurance Project Plan;
- RPD - Relative percent difference;
- SDG - Sample delivery group;
- SOP - Standard operating procedures;
- TCL - Target Compound List;
- TDS - Total Dissolved Solids;
- TOC - Total Organic Carbon;
- TSS - Total Suspended Solids'
- USEPA - United States Environmental Protection Agency; and
- VOC - Volatile Organic Compound.

## 1.2 Work Plan Objectives

The overall objective of the Work Plan is to provide a detailed description of the requirements, methods, and procedures for conducting operation and maintenance and long-term monitoring, as set forth in the September 1997

Consent Decree, 1993 Record of Decision, and September 1996 Explanation of Significant Differences for the site (detailed site history and enforcement activity information is presented in Section 1.4 of the Work Plan). The results of the monitoring activities will be used to evaluate the effectiveness of the remedy, as well as to provide information to support site operations.

## 1.3 Data Quality Objectives

### 1.3.1 General

To obtain information necessary to meet the Work Plan objectives stated above, ground-water, leachate, and sediment samples will be collected. The results of laboratory analyses performed on ground-water and sediment will be compared with performance standards and other relevant criteria established in the Consent Decree Scope of Work to evaluate the effectiveness of the remedy. The results of laboratory analyses performed on leachate will evaluated and compared to results of previous monitoring activities to identify temporal changes in leachate constituent concentrations.

Data quality objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions made during site-related activities and are based on the end uses of the data to be collected. Preliminary DQOs were identified to ensure that the data generated during monitoring activities will be of adequate quality and sufficient quantity to form a sound basis for decision making purposed relative to the above objectives. Data quality objectives have been specified for each data collection activity. The DQOs presented herein address monitoring efforts only and do not cover health and safety issues, which are addressed in detail in the Health and Safety Contingency Plan (HSCP) for this project.

A DQO summary for the sampling investigation efforts is presented below. The summary consists of stated DQOs relative to the following items:

A. Data Uses;
B. Data Types;
C. Data Quality;
D. Data Quantity;
E. Sampling and Analytical Methods; and
F. Data Precision, Accuracy, Representativeness, Completeness, and Comparability Parameters (PARCC Parameters).

Three data categories have been defined to address various analytical data uses and the associated quality assurance/quality control (QA/QC) effort and methods required to achieve the desired levels of quality. These categories are:

Screening Data: Screening data afford a quick assessment of site characteristics or conditions. This objective for data quality is applicable to data collection activities that involve rapid, non-rigorous methods of analysis and quality assurance. This objective is generally applied to: physical and/or chemical properties of samples; degree of contamination relative to concentration differences; and preliminary health and safety assessment.

Screening Data with Definitive Confirmation: Screening data allow rapid identification and quantitation, although the quantitation can be relatively imprecise. This objective of data quality is available for data collection activities that require qualitative and/or quantitative verification of a select portion of sample findings (10 percent or more). This objective can also be used to verify less rigorous laboratory-based methods.

Definitive Data: Definitive data are generated using analytical methods, such as approved United States Environmental Protection Agency (USEPA) reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce raw data (e.g., chromatograms, spectra, digital values) in the form of paper printouts or computer-generated electronic files.

### 1.3.2 Ground-Water and Sediment Quality Monitoring

***Data Uses***

The ground-water and sediment quality monitoring activities will include the collection and analysis of samples from site monitoring wells and White and Wine Creeks, respectively. These media will be analyzed for selected volatile organic compounds (VOCs), including benzene, chlorobenzene, 1,1-dichloroethane, ethylbenzene, toluene, and xylenes.

The Work Plan provides the rationale for the chemical parameters selected for analysis.

**Data Quality**

Sample analyses for VOCs will be performed in accordance with USEPA SW-846 Method 8260B, Rev. 2 (12/96).

**Data Quantity**

The number and type of samples to be collected are summarized in Table 1.

**Sampling and Analytical Methods**

The Work Plan contains a description of the sampling procedures to be employed during implementation of the long-term monitoring activities. The laboratory analytical methods to be utilized are listed in Table 2 of this QAPP.

**PARCC Parameters**

Precision and accuracy quality control (QC) limits for chemical constituents used during data review to assess analytical performance are included in Table 3.

Data representativeness is addressed by the sample quantities and locations identified in the Work Plan. Data comparability is intended to be achieved through the use of standard USEPA-approved methods, which are presented in Table 2. Data completeness will be assessed at the conclusion of the analytical activities.

### 1.3.3 Leachate Quality Monitoring

***Data Uses***

The leachate quality monitoring activities will include the collection and analysis of leachate samples from site monitoring wells. This media will be analyzed for TCL VOCs, and may be analyzed for selected water-quality parameters.

The Work Plan provides the rationale for the chemical and water-quality parameters selected for analysis.

**Data Quality**

Sample analyses for VOCs will be performed in accordance with USEPA SW-846 Method 8260B, Rev. 2 (12/96). Sample analyses for water-quality parameters (if performed) will be conducted in accordance with Methods for Chemical Analysis of Water and Wastes, EPA-6001 4-79-020, March 1983.

**Data Quantity**

The number and type of samples to be collected are summarized in Table 1.

**Sampling and Analytical Methods**

The Work Plan contains a description of the sampling procedures to be employed during implementation of the monitoring activities. The laboratory analytical methods to be utilized are listed in Table 2 of this QAPP.

**PARCC Parameters**

Precision and accuracy QC limits for chemical constituents used during analytical data review to assess analytical performance are included in Table 3.

Data representativeness is addressed by the sample quantities and locations identified in the Work Plan. Data comparability is intended to be achieved through the use of standard USEPA-approved methods, which are presented in Table 2. Data completeness will be assessed at the conclusion of the analytical activities.

# 2. Project Organization and Responsibilities

## 2.1 Project Organization

The long-term monitoring activities will require integration of personnel from the organizations identified below, collectively referred to as the project team. A detailed description of the responsibilities of each member of the project team is presented below.

### 2.1.1 Overall Project Management

O'Brien and Gere (OBG), on behalf of the PAS Oswego Performing Settling Defendants, will serve as the prime contractor for the operation and maintenance and long-term monitoring program at the site. Prime contractor personnel will perform the monitoring activities. Project oversight will be provided by de maximis, inc. (de maximis), who will be responsible for maintaining contact and coordinating site-related activities with the USEPA. A listing of key project management personnel is provided below.

| Project Title | Company/Organization | Name | Phone Number |
|---|---|---|---|
| Project Coordinator | de maximis, inc. | Clay McClamon | (865) 691-5052 |
| Project Officer | O'Brien and Gere | Kenneth Jones | (484) 804-7200 |
| Project Manager | O'Brien and Gere | Kevin Stone | (315) 956-6032 |

### 2.1.2 Analytical Laboratory Services

Life Science Laboratories (LSL) will serve as the analytical laboratory. Laboratory Management personnel are listed below.

| Title | Company | Name | Phone Number |
|---|---|---|---|
| Laboratory Project Manager | Life Science Laboratories | Anthony Crescenzi | (315) 445-1105 |

### 2.1.3 Quality Assurance Staff

The following Personnel have been assigned to this project:

| Title | Company/Organization | Name | Phone Number |
|---|---|---|---|
| Quality Assurance Manager | O'Brien and Gere | Karen Storne | (315) 956-6032 |
| Quality Assurance Mannger | Life Science Laboratories | Anthony Stone | (315) 445-1105 |

## 2.2 Team Member Responsibilities

This section of the QAPP discusses the responsibilities and duties of the project team members.

### 2.2.1 Project Coordinator

Responsibilities and duties of the project coordinator include:

1. Overall direction of the operation and maintenance and long-term monitoring activities;
2. Direction of the prime contractor and its subcontractors;
3. Review of prime contractor work products, including data, memoranda, letters, and reports and documents transmitted to the USEPA.

### 2.2.2 Prime Contractor

General responsibilities of the prime contractor include:

1. Coordinate and execute the operation and maintenance and long-term monitoring activities defined in the Work Plan;
2. Transmit the results of long-term monitoring activities to the project coordinator; and
3. Coordinate data validation of the long-term monitoring results and transmit the validation results to the project coordinator.

*Project Officer*

Responsibilities and duties include:

1. Oversight of prime contractor work products; and
2. Provide approval for major project deliverables.

*Project Manager*

Responsibilities and duties include:

1. Management and coordination of the project as defined in the Work;
2. Review deliverables prepared by the prime contractor; and
3. Assure corrective actions are taken for deficiencies cited during audits of site activities.

*Field Personnel*

Responsibilities and duties include:

1. Perform field procedures associated with the monitoring activities, as set forth in the Work Plan;
2. Collect QA samples;
3. Calibrate, operate, and maintain field equipment;
4. Reduce field data;
5. Maintain sample custody; and
6. Prepare field records and logs.

*Quality Assurance Manager (QAM)*

Responsibilities and duties include:

1. Review laboratory data packages;
2. Oversee and interface with the analytical laboratory;
3. Coordinate field QA/QC activities, including audits of monitoring activities;
4. Review field reports and data;
5. Review audit reports; and
6. Prepare interim QA/QC compliance reports.

### 2.2.3 Analytical Laboratory

General responsibilities and duties of the analytical laboratory include:

1. Perform sample analyses and associated laboratory QA/QC procedures;
2. Supply sampling containers and shipping cartons;
3. Maintain laboratory custody of sample; and
4. Strictly adhere to protocols in the QAPP.

*Project Manager*

Responsibilities and duties include:

1. Serve as primary communication link between the prime contractor and laboratory technical staff;
2. Monitor work loads and ensure availability of resources;
3. Oversee preparation of analytical reports; and
4. Supervise in-house chain-of-custody.

*Quality Assurance Manager*

Responsibilities and duties include:

1. Supervise the group that reviews and inspects project-related laboratory activities; and
2. Conduct audits of laboratory activities.

### 2.2.4 USEPA

Responsibilities and duties include:

1. Provide USEPA approval of the Work Plan, supporting documents, and future deliverables; and
2. Review and approval of the QAPP;
3. Review of the QA/QC portion of any submitted report;
4. Ensure that project activities are performed in compliance with applicable federal and regional requirements;
5. Field and laboratory audit responsibilities, if determined necessary.

# 3. Quality Assurance Objectives for Measurement of Data

## 3.1 Selection of Measurement Parameters, Laboratory Methods, and Field Testing Methods

### 3.1.1 Field Parameters and Methods

During the ground-water sampling activities, field parameters consisting of turbidity, specific conductance, pH, redox potential, and dissolved oxygen will be measured to determine the point at which the monitoring well being sampled is stabilized. Associated field test methods are presented in the Work Plan.

During the leachate quality monitoring activities, field parameters consisting of turbidity and conductivity will be measured to provide general water-quality information. Associated field test methods are presented in the Work Plan.

### 3.1.2 Laboratory Parameters and Methods

As described in the Work Plan, ground-water, leachate, and sediment will be analyzed for TCL VOCs. Water quality parameters for leachate may be analyzed. The laboratory analyses that will be performed are set forth in Table 1. Table 2 presents the chemical constituents identified by matrix, along with the associated analytical methods and reporting limits.

## 3.2 Quality Assurance Objectives

The overall quality assurance objective for this QAPP is to develop and implement procedures for sampling, chain-of-custody, laboratory analysis, instrument calibration, data reduction and reporting, internal quality control, audits, preventive maintenance, and corrective action, such that valid data will be generated. These procedures are presented or referenced in the following sections of the QAPP. Specific QC checks are discussed in Section 9 of this QAPP.

Quality assurance objectives are generally defined in terms of five parameters:

1. Representativeness;
2. Comparability;
3. Completeness;
4. Precision; and
5. Accuracy.

Each parameter is defined below. Specific objectives for the site monitoring activities are set forth in other sections of this QAPP, as referenced below.

### 3.2.1 Representativeness

Representativeness is the degree to which monitoring data accurately and precisely represent site conditions, and is dependent on sampling, analytical, and measurement variability and the variability of environmental media at the site. The site monitoring program has been designed to assess the presence of the chemical constituents in ground water, leachate, and sediment at the time of sampling. The Work Plan presents the rationale for sample quantities and location, and field sampling and measurement methods. This QAPP presents laboratory analytical methodologies. The use of the prescribed laboratory analytical methods with associated holding times and

preservation requirements are intended to provide representative data. Further discussion of QC checks is presented in Section 9 of this QAPP.

### 3.2.2 Comparability

Comparability is the degree of confidence with which one data set can be compared to another. Comparability between monitoring events will be maintained through consistent use of the sampling and analytical methodologies set forth in the Work Plan and this QAPP through the use of established QA/QC procedures, and the utilization of appropriately trained personnel.

### 3.2.3 Completeness

Completeness is defined as a measure of the amount of valid data obtained from a monitoring event compared to the total amount that was obtained. This will be determined upon final assessment of the analytical and field measurement results, as discussed in Section 12 of this QAPP.

### 3.2.4 Precision

Precision is a measure of the reproducibility of monitoring results. The goal is to maintain a level of analytical precision consistent with the objectives of the monitoring program. To maximize precision, sampling and analytical procedures will be followed. All work for the site monitoring program will adhere to established protocols presented in the QAPP. Checks for analytical precision will include the analysis of matrix spike, matrix spike duplicates, laboratory duplicates, and field duplicates. Checks for field measurement precision will include obtaining duplicate field measurements. Further discussion of precision QC checks is provided in Sections 9 and 12 of this QAPP.

### 3.2.5 Accuracy

Accuracy is a measure of how close a measured result is to the true value. Both field and analytical accuracy will be monitored through initial and continuing calibration of instruments. In addition, reference standards, matrix spikes, blank spikes, and surrogate standards will be used to assess the accuracy of the analytical data. Further discussion of these QC samples is provided in Sections 9 and 12 of this QAPP.

# 4. Sample Designation System and Sampling Procedures

## 4.1 General

Ground-water, leachate, and sediment samples will be collected as described in the Work Plan. Detailed descriptions of the sample designation system, sample handling and documentation, and field quality assurance/quality control are presented below.

## 4.2 Sample Designation System

### 4.2.1 Sample Codes

A multi-digit sample designation code and the sample date will provide each sample with a unique "name." This alphanumeric system will apply to all samples collected that are to be transmitted to the analytical laboratory. The sample designation code system includes an alphabetic prefix describing the type of sample collection location, and a numeric suffix indicating the precise sampling location. The alphabetic prefix will be designated from the following:

- LCW-series monitoring wells - "LCW";
- LR-series monitoring wells - "LR";
- M-series monitoring wells - "M"; and
- SS-series sediment sampling locations - "SS".

The numeric sample location number will be based on the sampling location, as shown on Figure 2 and the ground-water, leachate, and sediment logs presented in the Work Plan.

Quality control samples will be designated with a specific suffix, as follows

- Rinse blank - "R";
- Trip blank - "T"; and
- Duplicate sample - "D".

Additional sample volumes collected for matrix spike (MS) and matrix spike duplicate (MSD) analysis will be noted on the chain-of-custody forms, and the associated additional sample containers will be labeled with the appropriate suffix ("MS" or "MSD"), as described above.

## 4.3 Sample Handling and Documentation

### 4.3.1 Sample Containers and Preservation

Appropriate sample containers, preservation methods, and laboratory holding times for monitoring program samples are shown in Table 4.

The analytical laboratory will supply appropriate sample containers in sealed cartons, as well as sample labels and preservatives. The field personnel will be responsible for properly labeling containers and preserving samples (as appropriate). Sample labeling procedures are described in Appendix A.

### 4.3.2 Packing, Handling, and Shipping Requirements

Sample custody seals and packing materials for filled sample containers will also be provided by the analytical laboratory. The filled, labeled, and sealed containers will be placed in a cooler on ice and carefully packed to eliminate the possibility of container breakage. All samples will be stored at or around 4°C after collection and maintained at this temperature until arrival at the laboratory. Trip blank(s) of analyte-free water will be provided by the laboratory and included in each cooler containing aqueous samples to be analyzed for VOCs.

All samples will be packaged by the field personnel and transported as low-concentration environmental samples. The packaged samples will be either shipped via express overnight carrier (Federal Express or courier), or hand delivered by the prime contractor's sampling personnel to the laboratory within 24 hours of sample collection. General procedures for packing, handling, and shipping environmental samples are included in Appendix A.

### 4.3.3 Documentation

Field personnel will provide comprehensive documentation covering the field sampling, field analysis, and sample chain-of-custody. This documentation constitutes a record that allows reconstruction of the field events to aid in the data review and interpretation process. Documents, records, and information relating to the performance of the field work will be retained in the project file.

The various forms of documentation to be maintained throughout the monitoring program include:

- Daily Production Documentation - A field notebook consisting of a waterproof, bound notebook that will contain a record of the monitoring activities performed at the site.

- Sampling Information - Detailed notes will be made as to the sampling location, notable physical observations, and weather conditions (as appropriate).

- Sample Chain-of-Custody - Chain-of-custody forms will provide the record of responsibility for sample collection, transport, and submittal to the laboratory. Chain-of-custody forms will be filled out at each sampling site, at a group of sampling sites, or at the end of each day of sampling by the prime contractor's field personnel designated to be responsible for sample custody. In the event that the samples are relinquished by the designated sampling person to other sampling or field personnel, the chain-of-custody form will be signed and dated by the appropriate personnel to document the sample transfer. The original chain-of-custody form will accompany the samples to the laboratory and copies will be forwarded to the project files. An example chain-of-custody form is included in Appendix A.

  Persons will have custody of samples when the samples are in their physical possession, in their view after being in their possession, or in their physical possession and secured so they cannot be tampered with. In addition, when samples are secured in a restricted area accessible only to authorized personnel, they will be deemed to be in the custody of such authorized personnel.

- Field Equipment, Calibration, and Maintenance Logs - To document the calibration and maintenance of field instrumentation, calibration and maintenance activities will be recorded as part of the Daily Production Documentation described above.

### 4.3.4 Management of Monitoring Material and Waste

The handling of monitoring material and waste is discussed below.

***Disposable Equipment and Debris***

Disposable equipment and debris, such as health and safety equipment, plastic sheeting, sampling equipment, and other equipment and/or sampling debris not reused for future monitoring activities will be collected in plastic bags during the monitoring activities and subsequently drummed to await proper disposal.

***Purged Ground-Water and Leachate***

Ground-water and leachate purged from site monitoring wells will be placed in the leachate collection tank, as described in the Work Plan.

## 4.4 Field Quality Assurance/Quality Control

This section summarizes the QA/QC requirements for the field investigation activities associated with the site monitoring activities.

### 4.4.1 Field Instrument Calibration and Preventative Maintenance

Field personnel are responsible for ensuring that calibration/maintenance records are maintained following the manufacturer-recommended procedures specified for each measuring device. The calibration/maintenance records will include, at a minimum where applicable:

- Name of device and/or instrument calibrated;
- Device/instrument serial/identification number;
- Frequency of calibration;
- Date(s) of calibration(s);
- Results of calibration(s); and
- Name of person(s) performing calibration(s).

Equipment to be used each day shall be calibrated prior to the commencement of the day's activities, or as suggested by the manufacturer. In addition, pH and conductivity meters will be calibrated at the beginning of the sampling day, and calibrations will be verified between each well.

Health and safety monitoring equipment will be calibrated and maintained in general accordance with the specifications in the manufacturer's manuals.

### 4.4.2 QA/QC Sample Collection

An estimate of QA/QC field samples to be collected is provided in Table 1. Guidance on the collection of the QA/QC samples is presented in the Work Plan and below.

***Trip Blanks***

When VOC samples are shipped to the analytical laboratory, a trip blank will be collected. A trip blank is an aliquot of demonstrated, analyte-free water, which is sealed in 40-millimeter (ml) glass vials with Teflon-lined septum caps prior to initiation of field work. This blank is applied in sample validation to determine if any cross-contamination has occurred among samples during shipment. These sealed bottles will be prepared by the analytical laboratory, and included with each shipment of sample bottles for aqueous media to and from the lab and the site.

***Rinse Blanks***

Rinse blanks will be prepared by pouring demonstrated, analyte-free water over decontaminated ground-water and sediment sampling equipment as a check that the decontamination procedure has been adequately performed and that cross-contamination of samples will not occur due to the equipment. One rinse blank will be collected for each type of equipment used each day that a decontamination event is performed.

Rinse blanks will be prepared in the field. Laboratory-supplied, demonstrated, analyte-free water will be poured into or over the sampling equipment and then directly into the laboratory-supplied sample bottles. The intent is for the water making up the blank to follow the same path, and therefore, come in contact with the same equipment as the samples.

It should be noted that rinse blank samples will not be collected for the leachate sampling equipment.

***Field Duplicate Samples***

Duplicate samples will be sent for laboratory analysis to evaluate the reproducibility of the sampling technique used. One duplicate sample will be collected for each round of ground-water and sediment samples.

It should be noted that no duplicate leachate samples will be collected.

***Matrix Spike/Matrix Spike Duplicate***

Triple sample volumes from designated sampling locations will be collected for each matrix to perform matrix spike/matrix spike duplicate analysis. One matrix spike/matrix spike duplicate sample will be collected for each round of ground-water and sediment samples. Table 1 specifies the frequency of collection for matrix spike/matrix spike duplicates.

It should be noted that no matrix spike/matrix spike duplicate leachate samples will be collected.

# 5. Sample and Document Custody

## 5.1 Field Procedures

The objective of field sample custody is to assure that samples are not tampered with from the time of sample collection through time of transport to the analytical laboratory. Persons will have "custody of samples" when the samples are in their physical possession, in their view after being in their possession, or in their physical possession and secured so they cannot be tampered with. In addition, when samples are secured in a restricted area accessible only to authorized personnel, they will be deemed to be in the custody of such authorized personnel. A discussion of sample custody and directions for the field use of chain-of-custody forms are provided in Section 4.

## 5.2 Laboratory Procedures

### 5.2.1 General

Upon sample receipt, laboratory personnel will be responsible for sample custody. The original field chain-of-custody form will accompany all samples requiring laboratory analysis. The laboratory will use chain-of-custody guidelines described in the USEPA guidance documents. Samples will be kept secured in the laboratory until all stages of analysis are complete. All laboratory personnel having samples in their custody will be responsible for documenting and maintaining sample integrity.

### 5.2.2 Sample Receipt and Storage

Immediately upon sample receipt, the laboratory sample custodian will verify the package seal, open the package, and compare the contents against the field chain-of-custody. If a sample container is received broken, the sample is in an inappropriate container, or has not been preserved by appropriate means, the prime contractor will be notified. The laboratory sample custodian will be responsible for logging the samples in, assigning a unique laboratory identification number to each sample, labeling the sample bottle with the laboratory identification number, and moving the sample to an appropriate storage location to await analysis. The project name, field sample code, date sampled, date received, analysis required, storage location and date, and action for final disposition will be recorded in the laboratory logbook. All relevant custody documentation will be placed in the project file.

### 5.2.3 Sample Analysis

Analysis of an acceptable sample will be initiated by worksheets that contain all pertinent information for analysis. The analyst will sign and date the laboratory chain-of-custody form when removing the samples from storage.

Samples will be organized into sample delivery groups (SDGs) by the laboratory. A SDG may contain up to 20 field samples (field duplicates, trip blanks, and rinse blanks are considered field samples for the purposes of SDG assignment). All field samples assigned to a single SDG shall be received by the laboratory over a maximum of fourteen calendar days, and must be processed through the laboratory (preparation, analysis, and reporting) as a group. Ground-water and sediment SDGs must include a minimum of one media-specific MS/MSD pair, which shall be received by the laboratory at the start of the SDG assignment.

Each SDG will be self-contained for all of the required quality control samples. All parameters within an SDG will be extracted and analyzed together in the laboratory. At no time will the laboratory be allowed to run any sample (including QC samples) at an earlier or later time than the rest of the SDG. These rules for analysis will ensure that

the quality control samples for an SDG are applicable to the field samples of the same SDG, and that the best possible comparisons may be made.

Information regarding the sample, analytical procedures performed, and the results of the testing will be recorded on laboratory forms or personal notebook pages by the analyst. These notes will be dated, and will also identify the analyst, the instrument used, and the instrument conditions.

### 5.2.4 Laboratory Project Files

The analytical laboratory will establish a file for all pertinent data. The file will include all correspondence, faxed information, phone logs, and chain-of-custody forms. The analytical laboratory will retain all project files and data packages for a period of five years.

### 5.2.5 Laboratory Documentation

***Documentation***

Workbooks, bench sheets, instrument logbooks, and instrument printouts, are used to trace the history of samples through the analytical process, and document and relate important aspects of the work, including the associated quality controls. As such, all logbooks, bench sheets, instrument logs, and instrument printouts are part of the permanent record of the laboratory.

Each page or entry is dated and initialed by the analyst at the time of entry. Errors in entry are crossed out in indelible ink with a single stroke, corrected without the use of white-out or by obliterating or writing directly over the erroneous entry, and initialed and dated by the individual making the correction. Pages of logbooks that are not used are completed by lining out unused portions.

Laboratory notebooks are periodically reviewed by the laboratory group leaders for accuracy, completeness, and compliance to this QAPP. All entries and calculations are verified by the laboratory group leader. If all entries on the pages are correct, then the laboratory group leader initials and dates the pages. Corrective action is taken for incorrect entries before the laboratory group leader signs.

***Computer Tape and Hard Copy Storage***

All electronic files are maintained on magnetic tape or diskette for five years, hard copy data packages are maintained in files for five years.

***Sample Storage Following Analysis***

Samples are maintained by the laboratory for one month after the final report is delivered to the prime contractor. After this period, the samples are disposed of in accordance with applicable rules and regulations.

## 5.3 Project File

Project documentation will be retained by the prime contractor. This file will consist of the following components:

1. Agreements (filed chronologically);
2. Correspondence (filed chronologically);

3. Memos (filed chronologically); and
4. Notes and Data (filed by topic).

Reports (including QA reports) will be filed with correspondence. Analytical laboratory documentation (when received) and field data will be filed with notes and data. Filed materials may be removed and signed out by authorized personnel on a temporary basis only.

# 6. Calibration Procedures and Frequency

## 6.1 Field Equipment Calibration Procedures and Frequency

Specific procedures for performing and documenting calibration and maintenance for the field equipment are provided in the Section 4.

## 6.2 Laboratory Equipment Calibration Procedures and Frequency

Instrument calibration will follow the specifications provided by the instrument manufacturer or specific analytical method used.

# 7. Analytical Procedures

## 7.1 Field Analytical Procedures

Field analytical procedures will include the measurement of turbidity, specific conductance, pH, redox potential, and dissolved oxygen for ground-water sampling, and turbidity and conductivity for leachate sampling. Specific field measurement protocols are provided in the Work Plan.

## 7.2 Laboratory Analytical Procedures

As part of the monitoring activities, ground water and sediment samples will be analyzed using laboratory analytical methods. Each of the above listed materials will be analyzed for total concentration of VOCs using methods presented in USEPA's Test Methods for Evaluating Solid Waste, SW-846 Method 8260B, Rev. 2 (12/96). In addition, leachate samples may be analyzed for total concentration of VOCs using methods presented in USEPA's Test Methods for Evaluating Solid Waste, SW-846 Method 8260B, Rev. 2 (12/96). Leachate water-quality parameters, if measured, will be analyzed using the following methods presented in Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1983: biochemical oxygen demand ($BOD_5$) (Method 405.1), chemical oxygen demand (COD) (Method 410.4), total dissolved solids (Method 160.1), total organic carbon (TOC) (Method 415.1), and total suspended solids (Method 160.2).

The specific analytical methods to be utilized and the project-specific reporting limits are presented in Table 2.

# 8. Data Reduction, Review and Reporting

## 8.1 General

After field and laboratory data are obtained, the data will be subject to the following:

1. Reduction or manipulation mathematically or otherwise into meaningful and useful forms;
2. Review;
3. Organization, interpretation, and reporting; and
4. Data Validation.

## 8.2 Field Data Reduction, Review, and Reporting

### 8.2.1 Field Data Reduction

Information collected in the field through visual observation, manual measurement and/or field instrumentation will be recorded in field notebooks and on the logs presented in the Work Plan. Such data will be reviewed for adherence to the Work Plan requirements and for consistency. Concerns identified as a result of this review will be discussed with the field personnel, corrected if possible, and as necessary, incorporated into the data evaluation process.

### 8.2.2 Field Data Review

Field data calculations, transfers, and interpretations will be conducted by the field personnel and reviewed for accuracy by the QAM. Logs and documents will be checked for:

1. General completeness;
2. Readability;
3. Usage of appropriate procedures;
4. Appropriate instrument calibration and maintenance;
5. Reasonableness in comparison to present and past data collected;
6. Correct sampling or measurement locations; and
7. Correct calculations and interpretations.

### 8.2.3 Field Data Reporting

Where appropriate, field data forms and calculations will be processed and included in the quarterly progress report. The original field logs, documents, and data reductions will be retained by the prime contractor.

## 8.3 Laboratory Data Reduction, Review, and Reporting

### 8.3.1 Laboratory Data Reduction

The calculations used for data reduction are specified in each of the analytical methods referenced previously. Whenever possible, analytical data is transferred directly from the instrument to a computerized data system. Raw data is entered into permanently-bound laboratory notebooks. The data entered are sufficient to document all factors used to arrive at the reported value.

Concentration calculations for chromatographic analyses (i.e., VOCs) are based on response factors. Quantitation is performed using either internal or external standards.

Non-aqueous values are reported on a dry-weight basis. Unless otherwise specified, all values are reported uncorrected for blank contamination.

### 8.3.2 Laboratory Data Review

All data are subject to multi-level review by the analytical laboratory. The group leader will review all data reports prior to release for final data report generation. The QAM will review a random sample of 5 percent of the final data reports, and the laboratory director will review a cross-section of the final data reports. All final data reports are reviewed by the analytical laboratory Department Manager prior to transmittal to prime contractor.

If discrepancies or deficiencies exist in the analytical results, then corrective action is taken as discussed in Section 13.0. Deficiencies discovered as a result of internal data review, as well as the corrective actions to be used to rectify the situation, will be documented on a Corrective Action Form (Attachment K-1). This form will be submitted to the prime contractor Project Manager.

### 8.3.3 Laboratory Data Reporting

The laboratory is responsible for preparing full "CLP-type" data packages and case narratives for all analyses.

All data reports for all parameters will include, at a minimum, the following items:

**Narrative:** Summary of activities that took place during the course of sample analysis, including the following information:

- Laboratory name and address;
- Date of sample receipt;
- Cross reference of laboratory identification number to prime contractor sample identification;
- Analytical methods used;
- Deviations from specified protocol; and
- Corrective actions taken.

Included with the narrative are any sample handling documents including field and internal COC forms, air bills, and shipping tags.

**Analytical Results:** Reported according to analysis type, and including the following information, as acceptable:

- Sample ID;
- Laboratory ID;
- Date of collection;
- Date of receipt;
- Date of extraction;
- Date of analysis; and
- Detection limits.

Sample results on the report forms will be collected for dilutions. Sediment sample results are reported on a dry weight basis. Unless otherwise specified, results will be reported uncorrected for blank contamination.

The data for all ground-water and sediment analyses will be expanded to the include all supporting documentation necessary to the provide a "CLP-equivalent" package. This additional documentation includes, but is not limited to, all raw data required to the recalculate any result including printouts, chromatograms, and quantitation reports. The report also will include: standards used in calibration and calculation of analytical results; sample extraction, digestion and other preparation logs; standard preparation logs; instrument run logs; and moisture content calculations. As leachate analytical results will not be validated, a "CLP-equivalent" data package will not be required.

## 8.4 Data Validation

Data validation entails a review of the QC data and the raw data to verify that the laboratory was operating within required limits, the analytical results are correctly transcribed from the instrument read outs, and which, if any, environmental samples are related to any out-of-control QC samples. The objective of data validation is to identify any questionable or invalid laboratory measurements.

The data validator will validate the ground-water and sediment VOC analytical data (note: leachate analytical data will not be validated) with "EPA Region II Contract Lab Program Organics Data Review and Preliminary Review (SOP #HW-6, Revision 11)", dated June 1996, or USEPA-approved equivalent procedures. Data validation will consist of data screening, checking, reviewing, editing, and interpretation to document analytical data quality and to determine if the quality is sufficient to meet the data quality objectives. Data validation will include a review of completeness and compliance including, but not limited to, the elements provided in Table 5.

The data validator will verify that reduction of laboratory measurements and laboratory reporting of analytical parameters is in accordance with the procedures specified for each analytical method and/or as specified in this QAPP. Any deviations from the analytical method or any special reporting requirements apart from that specified in this QAPP will be detailed on chain-of-custody forms.

Upon receipt of laboratory data, the following procedures will be executed by the data validator:

- Evaluate completeness of data package;
- Verify that field chain-of-custody forms were completed and that samples were handled properly;
- Verify that holding times were met for each parameter. Holding times exceedences, should they occur, will be documented. Data for all samples exceeding holding time requirements will be flagged as either estimated or rejected. The decision as to which qualifier is more appropriate will be made on a case-by-case basis;
- Verify that parameters were analyzed according to the methods specified;
- Review QA/QC data (i.e., make sure duplicates, blanks, and spikes were analyzed on the required number of samples, as specified in the method, verify that duplicate and matrix spike recoveries are acceptable);
- Investigate anomalies identified during review. When anomalies are identified, they will be discussed with the project manager and/or laboratory manager, as appropriate; and

- If data appears suspect, the specific data of concern will be investigated. Calculations will be traced back to raw data; if calculations do not agree, the cause will be determined and corrected.

Deficiencies discovered as a result of the data review, as well as the corrective actions implemented in response, will be documented and submitted in the form of a written report addressing the following topics as applicable to each method:

1. Assessment of the data package;
2. Description of any protocol deviations;
3. Failures to reconcile reported and/or raw data;
4. Assessment of any compromised data;
5. Laboratory case narrative;
6. Overall appraisal of the analytical data; and
7. Table of site name, sample quantities, matrix, and fractions analyzed.

It should be noted that the existence of qualified results does not automatically invalidate data. The goal to produce the best possible data does not necessarily mean producing data without QC qualifiers. Qualified data can provide useful information.

Resolution of any issues regarding laboratory performance or deliverables will be handled between the analytical laboratory and the data validator. Suggestions for reanalysis may be made to the prime contractor QAM at this point.

Data validation reports will be included in the quarterly progress reports, and retained by the prime contractor.

# 9. Field and Laboratory Quality Control Checks

## 9.1 General

Both field and laboratory quality control checks are proposed for the monitoring program. In the event that there are any deviations from these checks, the prime contractor QAM will be notified. The proposed field and laboratory control checks are discussed below.

## 9.2 Field Quality Control Checks

### 9.2.1 Field Measurements

To verify the quality of data using field instrumentation, duplicate measurements will be obtained and reported for field measurements. A duplicate measurement will involve obtaining measurements a second time at the same sampling location.

### 9.2.2 Sample Containers

Certified-clean sample containers (I-Chem 300 Series or equivalent) will be supplied by the analytical laboratory. Sample containers will be chosen, cleaned, and quality controlled according to protocols in the OSWER Directive #9240.0-05A. Specifications and Guidance for Contaminant Free Sample Containers, December 1992. Certificates of analysis will be filed in the project file.

### 9.2.3 Field Duplicates

Ground-water and sediment field duplicates will be collected to verify the reproducibility of the sampling methods. Field duplicates will be prepared as discussed in the Section 4.0. One field duplicate will be collected per ground-water and sediment sampling event. Table 1 provides information associated with field duplicate sample collection.

### 9.2.4 Rinse Blanks

Rinse blanks are used to monitor the cleanliness of the sampling equipment and the effectiveness of the cleaning procedures. One rinse blank sample will be prepared and submitted for analysis for each type of ground-water or sediment sampling equipment used each day that a decontamination event is carried out. Rinse blanks will be prepared by filling sample containers with demonstrated analyte-free water (supplied by the laboratory) that has been routed through a cleaned sampling device. Table 1 provides information associated with rinse blank sample collection.

### 9.2.5 Trip Blanks

Trip blanks will be used to assess whether site samples have been exposed to non-site-related volatile constituents during sample storage and transport. Trip blanks will be submitted at a frequency of once per shipment of aqueous samples to be analyzed for VOCs. A trip blank will consist of a container filled with demonstrated, analyte-free water (supplied by the laboratory) that remains unopened with field samples throughout the sampling event. Trip blanks will be analyzed for VOCs. Table 1 provides information associated with trip blanks.

## 9.3 Analytical Laboratory Quality Control Checks

### 9.3.1 General

Internal laboratory quality control checks will be used to monitor data integrity. These checks will include method blanks, matrix spikes (and matrix spike duplicates), spike blanks, internal standards, surrogate samples, calibration standards, and reference standards. Project QC limits for duplicates and matrix spikes are identified in Table 3. Laboratory control charts will be used to determine long-term instrument trends.

### 9.3.2 Method Blanks

Sources of contamination in the analytical process, whether specific analyses or interferences, need to be identified, isolated, and corrected. The method blank is useful in identifying possible sources of contamination within the analytical process. For this reason, it is necessary that the method blank is initiated at the beginning of the analytical process and encompasses all aspects of the analytical work. As such, the method blank would assist in accounting for any potential contamination attributable to glassware, reagents, instrumentation, or other sources which could affect sample analysis. One method blank will be analyzed with each analytical series associated with no more than 20 samples.

### 9.3.3 Matrix Spikes/Matrix Spike Duplicates

Matrix spikes and matrix spike duplicates will be used to measure the accuracy of organic analyte recovery from the sample matrices. All matrix spikes and matrix spike duplicates will be site-specific. One matrix spike/matrix spike duplicate pair will be analyzed for each round of ground-water and sediment samples. Table 1 presents matrix spike/matrix spike duplicate information.

### 9.3.4 Surrogate Spikes

Surrogates are compounds that are unlikely to occur under natural conditions that have properties similar to the analyses of interest. This type of control is primarily used for organic samples analyzed by gas chromatography/mass spectrometry (GC/MS) and GC methods and is added to the samples prior to purging or extraction. The surrogate spike is utilized to provide broader insight into the proficiency and efficiency of an analytical method on a sample specific basis. This control reflects analytical conditions which may not be attributable to sample matrix.

If surrogate spike recoveries exceed specified QC limits, then the analytical results need to be evaluated thoroughly in conjunction with other control measures. In the absence of other control measures (i.e., internal standard and matrix spikes), the integrity of the data may not be verifiable and reanalysis of the sample with additional controls may be necessary.

Surrogate spike compounds will be selected utilizing the guidance provided in the analytical methods summarized in Table 2.

### 9.3.5 Laboratory Duplicates

Laboratory duplicates are analyzed to assess laboratory precision. Laboratory duplicates are defined as duplicate aliquots of an individual sample that are analyzed as separate samples. Table 1 presents the frequency requirements for laboratory duplicates.

### 9.3.6 Calibration Standards

Calibration check standards analyzed within a particular analytical series provide insight regarding the instruments' stability. A calibration check standard will be analyzed at the beginning and end of an analytical series, or periodically throughout a series containing a large number of samples.

In general, calibration check standards will be analyzed after every 12 hours, or more frequently as specified in the applicable analytical method. In analyses where internal standards are used, a calibration check standard will only be analyzed in the beginning of an analytical series. If results of the calibration check standard exceed specified tolerances, then all samples analyzed since the last acceptable calibration check standard will be reanalyzed.

Laboratory instrument calibration standards will be selected utilizing the guidance provided in the analytical methods summarized in Table 2.

### 9.3.7 Internal Standards

Internal standard areas and retention times are monitored for organic analyses performed by GC/MS methods. Method-specified internal standard compounds are spiked into all field samples, calibration standards and QC samples after preparation and prior to analysis. If internal standard areas in one or more samples exceed the specified tolerances, then the cause will be investigated, the instrument recalibrated if necessary, and all affected samples reanalyzed.

The acceptability of internal standard performance will be determined using the guidance provided within the analytical methods summarized in Table 2.

### 9.3.8 Reference/Control Standards

Reference standards are standards of known concentration, and independent in origin from the calibration standards. The intent of reference standard analysis is to provide insight into the analytical proficiency within an analytical series. This includes the preparation of calibration standards, the validity of calibration, sample preparation, instrument set-up, and the premises inherent in quantitation. Reference standards will be analyzed at the frequencies specified within the analytical methods summary in Table 2.

# 10. Performance and Systems Audits

## 10.1 General

Performance and systems audits will be completed in the field and the laboratory during the monitoring program, as described below.

## 10.2 Field Audits

The following field performance and systems audits will be completed during this project.

Field performance audit summaries will contain an evaluation of field measurements and field meter calibrations to verify that measurements are taken according to established protocols. The prime contractor QAM will review field reports and communicate concerns to the prime contractor Project Manager. In addition, the prime contractor QAM will review the rinse and trip blank data to identify potential deficiencies in field sampling and cleaning procedures. In addition, systems audits comparing scheduled QA/QC activities from this document with actual QA/QC activities completed will be performed. The QAM will periodically confirm that work is being performed consistent with this QAPP, the Work Plan, and HSCP.

## 10.3 Laboratory Audits

The following laboratory performance and systems audits will be completed during this project.

The analytical laboratory's QA manager conducts a laboratory audit semi-annually and the analytical laboratory's corporate QA director also conducts a separate laboratory audit semi-annually. Between the QA Manager and the QA director, audits of the laboratory are conducted on a quarterly basis. As part of the audits, the overall performance of the laboratory staff is evaluated and compared to the performance criteria outlined in the analytical laboratory's quality assurance manual and standard operating procedures (SOPs). The results of the audits are summarized and issued to each department supervisor, the laboratory manager, the laboratory director, the corporate QA director, and the director of operations.

In addition to the laboratory's internal audits, a participant in state and federal certification programs, the laboratory sections at the analytical laboratory are audited by representatives of the regulatory agency issuing certification. Audits are usually conducted on an annual basis and focus on laboratory conformance to the specific program protocols for which the laboratory is seeking certification. The auditor reviews sample handling and tracking documentation, analytical methodologies, analytical supportive documentation, and final reports. The audit findings are formally documented and submitted to the laboratory for corrective action, if necessary.

The prime contractor reserves the right to conduct an on-site audit of the laboratory prior to the start of analyses for the project. Additional audits may be performed during the course of the project, as deemed necessary.

# 11. Preventative Maintenance

## 11.1 General

Preventive maintenance schedules have been developed for both field and laboratory instruments. A summary of the maintenance activities to be performed is presented below.

## 11.2 Field Instruments and Equipment

Prior to field activities, field equipment will be inspected to assure it is operational. If the equipment is not operational, it must be serviced prior to use. Meters that require charging or batteries will be fully charged or have fresh batteries. If instrument servicing is required, it is the responsibility of the field personnel to follow the maintenance schedule and arrange for prompt service.

A logbook will be kept for each field instrument. Each logbook contains records of operation, maintenance, calibration, and any problems and repairs.

Field equipment returned from a Site will be inspected to confirm it is in working order. This inspection will be recorded in the logbook or field notebooks as appropriate. It will also be the obligation of the last user to record any equipment problems in the logbook.

Non-operational field equipment will be either repaired or replaced. Appropriate spare parts will be made available for field meters.

## 11.3 Laboratory Instruments and Equipment

### 11.3.1 General

Laboratory instrument and equipment documentation procedures are provided in the analytical laboratory's quality assurance/quality control policy and program. Documentation includes details of any observed problems, corrective measure(s), routine maintenance, and instrument repair (which will include information regarding the repair and the individual who performed the repair).

Preventive maintenance of laboratory equipment generally will follow the guidelines recommended by the manufacturer. A malfunctioning instrument will be repaired immediately by in-house staff or through a service call from the manufacturer. Specific procedures used by the analytical laboratory are discussed below.

### 11.3.2 Instrument Maintenance

Maintenance schedules for the analytical laboratory's equipment adhere to the manufacturer's recommendations. Records reflect the complete history of each instrument and specify the time frame for future maintenance. Major repairs or maintenance procedures are performed through service contracts with manufacturer or qualified contractors. All paperwork associated with service calls and preventative maintenance calls are kept on file by the laboratory.

Laboratory Systems Managers are responsible for the routine maintenance of instruments used in the particular laboratory. Any routine preventative maintenance carried out is logged into the appropriate logbooks. The frequency of routine maintenance is dictated by the nature of samples being analyzed, the requirements of the method used, and/or the judgment of the Laboratory Systems Manager.

All major instruments are backed up by comparable (if not equivalent) instrument systems in the event of unscheduled downtime. An inventory of spare parts is also available to minimize equipment/instrument downtime.

# 12. Data Assessment Procedures

## 12.1 General

The analytical data generated during the monitoring program will be evaluated with respect to precision, accuracy, and completeness and compared to the data quality objectives set forth in Sections 1.0 and 3.0 of this QAPP.

The procedures utilized when assessing data precision, accuracy, and completeness are presented below.

## 12.2 Data Precision Assessment Procedures

Field precision is difficult to measure because of temporal variations in field parameters. However, precision will be controlled through the use of experienced field personnel, properly calibrated meters, and duplicate field measurements. Field duplicates will be used to assess precision for the entire measurement system including sampling, handling, shipping, storage, preparation, and analysis.

Laboratory data precision for organic analyses will be monitored through the use of matrix spike/matrix spike duplicate sample analyses. For other parameters, laboratory data precision will be monitored through the use of field duplicates and/or laboratory duplicates as identified in Table 1.

The precision of data will be measured by calculation of the relative percent difference (RPD) by the following equation:

$$RPD = \frac{(A-B)}{(A+B)/2} \times 100$$

Where:

A = Analytical result from one of two duplicate measurements
B = Analytical result from the second measurement.

Precision objectives for duplicate analyses are identified in Table 3.

## 12.3 Data Accuracy Assessment Procedures

The accuracy of field measurements will be controlled by experienced field personnel, properly calibrated field meters, and adherence to established protocols. The accuracy of field meters will be assessed by review of calibration and maintenance logs.

Laboratory accuracy will be assessed via the use of matrix spikes, surrogate spikes and reference standards. Where available and appropriate, QA performance standards will be analyzed periodically to assess laboratory accuracy. Accuracy will be calculated in terms of percent recovery as follows:

$$\% \text{ Recovery} = \frac{A-X}{B} \times 100$$

Where:

A = Value measured in spiked sample or standard
X = Value measured in original sample
B = True value of amount added to sample or true value of standard

This formula is derived under the assumption of constant accuracy between the original and spiked measurements. Accuracy objectives for matrix spike recoveries are identified in Tables 3 and 4.

## 12.4 Data Completeness Assessment Procedures

Completeness of a field or laboratory data set will be calculated by comparing the number of valid sample results generated to the total number of results generated.

$$\text{Completeness} = \frac{\text{Number Valid Results}}{\text{Total number of results generated}} \times 100$$

As a general guideline, overall project completeness is expected to be at least 90 percent. The assessment of completeness will require professional judgement to determine data useability for intended purposes.

# 13. Corrective Action

## 13.1 General

Corrective actions are required when field or analytical data are not within the objectives specified in this QAPP, or the Work Plan. Corrective actions include procedures to promptly investigate, document, evaluate, and correct data collection and/or analytical procedures. Field and laboratory corrective action procedures for the monitoring program are described below.

## 13.2 Field Procedures

When conducting the monitoring activity field work, if a condition is noted that would have an adverse effect on data quality, corrective action will be taken so as not to repeat this condition. Condition identification, cause, and corrective action implemented will be documented on a Corrective Action Form (Attachment K-1) and reported to the prime contractor QAM and Project Manager.

Examples of situations that would require corrective actions are provided below:

1. Protocols as defined by the QAPP and Work Plan have not been followed;
2. Equipment is not in proper working order or properly calibrated;
3. QC requirements have not been met; and
4. Issues resulting from performance or systems audits.

Project personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities.

## 13.3 Laboratory Procedures

### 13.3.1 General

In the laboratory, when a condition is noted to have an adverse effect on data quality, corrective action will be taken so as not to repeat this condition. Condition identification, cause, and corrective action to be taken will be documented, and reported to the appropriate project manager and QAM.

Corrective action may be initiated, at a minimum, under the following conditions:

1. Protocols as defined by this QAPP have not been followed;
2. Predetermined data acceptance standards are not obtained;
3. Equipment is not in proper working order or calibrated;
4. Sample and test results are not completely traceable;
5. QC requirements have not been met; and
6. Issues resulting from performance or systems audits.

Laboratory personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities. Additional details of corrective action procedures used by the analytical laboratory are provided below.

### 13.3.2 Analytical Laboratory Procedures

For all instrument systems in use at the analytical laboratory, corrective action is initiated at a point were the problem has been identified. At whatever level this occurs (analyst, supervisor, data review, or quality control), it is brought to the attention of the QA Manager and, ultimately, the Laboratory Director. Final approval of any action deemed necessary is subject to the approval of the Laboratory Director.

Any corrective action deemed necessary based on system or performance audits, the analytical results of split samples or the results of data review will be implemented. The corrective action may include sample re-extraction, re-preparation, re-analysis, cleanup, dilutions, matrix modifications, or other activities.

# 14. Quality Assurance Reports to Management

The final report will contain QA sections that summarize data quality information collected during the project. Quality control reports will be submitted as documentation of compliance with QA/QC objectives. The reports also serve to the update the status of the project and to the indicate any changes or deviations from the initial plan.

# *Tables*
# *Quality Assurance Project Plan*

## Table 1

BBL Environmental Services, Inc.
PAS Site
Oswego, New York

*Operation and Maintenance and Long-Term Monitoring Plan*
*Quality Assurance Project Plan*
*Environmental and Quality Control Analyses*

| Environmental Sample Matrix | Environmental Sample Quantity | Field QC Analyses | | | | | | | Laboratory QC Analyses | | | | | | Est. Overall Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trip Blank | | Field Duplicate | | Rinse Blank | | Est. Matrix Total | MS | | MSD | | Lab Duplicate | | |
| | | Freq | No. | Freq | No. | Freq | No. | | Freq | No. | Freq | No. | Freq | No. | |
| Ground Water | | | | | | | | | | | | | | | |
| VOCs | 5 | 1/day | 1 | 1/20 | 1 | 1/20 | 1 | 8 | 1/20 | 1 | 1/20 | 1 | 1/20[2] | 1 | 11 |
| Leachate | | | | | | | | | | | | | | | |
| VOCs | 2 | 1/day | -- | -- | -- | -- | -- | 3 | -- | -- | -- | -- | 1/20[2] | 1 | 4 |
| $BOD_5$ | 2 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | 1/20[2] | 1 | 3 |
| COD | 2 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | 1/20[2] | 1 | 3 |
| TDS | 2 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | 1/20[2] | 1 | 3 |
| TOC | 2 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | 1/20[2] | 1 | 3 |
| TSS | 2 | -- | -- | -- | -- | -- | -- | 2 | -- | -- | -- | -- | 1/20[2] | 1 | 3 |
| POTW Discharge | | | | | | | | | | | | | | | |
| BOD | 1 | -- | -- | N/A | -- | N/A | -- | 1 | 1/20 | 1 | 1/20 | 1 | 1/20[2] | 1 | 4 |
| Metals: Sb, As, Be, Cd, Cr, Cu, En, Pb, Hg, Ni, Se, Ag, Tc, Zn | 1 | -- | -- | N/A | -- | N/A | -- | 1 | 1/20 | 1 | 1/20 | 1 | 1/20[2] | 1 | 4 |
| Phenols (Total) | 1 | -- | -- | N/A | -- | N/A | -- | 1 | 1/20 | 1 | 1/20 | 1 | 1/20[2] | 1 | 4 |
| TSS | 1 | -- | -- | N/A | -- | N/A | -- | 1 | 1/20 | 1 | 1/20 | 1 | 1/20[2] | 1 | 4 |

Notes:

1. If additional environmental samples are to be collected for analysis, trip blank, field duplicate, rinse blank, matrix spike, matrix spike duplicate sample will be collected at a frequency of 1/20, or 1 per sampling event if additional samples are collected at greater than a 14-day interval.
2. Laboratory minimum requirement. No site-specific samples will be submitted for analysis.
3. VOCs = Volatile Organic Compounds, MS-Matrix Spike, MSD – Matrix Spike Duplicate, $BOD_5$ = 5-day biochemical oxygen demand, COD – chemical oxygen demand, TDS – total dissolved solids, TOC – total organic carbon, TSS – total suspended solids.
4. Leachate analysis will be performed at the discretion of the Performing Settling Defendants', or their representatives.
5. Priority Pollutants or equivalent performed every three years for POTW discharge

**Table 2**

BBL Environmental Services, Inc.
PAS Site
Oswego, New York

*Operation and Maintenance and Long-Term Monitoring Plan*
*Quality Assurance Project Plan*
*Parameters, Methods and Reporting Limits*

| Constituent | Analysis [4] | Reporting Limit |
|---|---|---|
| **Volatile Organic Compounds in Ground Water and Leachate** | | |
| Benzene | 8260B | 0.8 ug/L |
| Chlorobenzene | 8260B | 5 |
| 1,1-Dichloroethane | 8260B | 5 |
| Ethylbenzene | 8260B | 5 |
| Toluene | 8260B | 5 |
| Xylenes | 8260B | 5 |
| **Water-Quality Parameters In Leachate** | | |
| $BOD_5$ | 405.1 | 5 mg/1 |
| COD | 410.4 | 5 |
| TDS | 160.4 | 10 |
| TOC | 415.1 | 1 |
| TSS | 160.2 | 1 |
| **POTW Discharge** | | |
| $BOD_5$ | 405.1 | 5 mg/1 |
| TSS | 160.5 | 1 |
| Metals (Sb, As, Be, Cd, Cr, Cu, Cn, Pb, Hg, Ni) | | |
| Phenol (Total) | | |

**Notes:**

1. ug/L = micrograms per liter which equates to parts per billion (ppb).
2. mg/Kg = milligrams per kilogram which equates to ppm.
3. $BOD_5$ =5 day biochemical oxygen demand, COD = Chemical oxygen demand, TDS = total dissolved solids, TOC = total organic carbon, TSS = total suspended solids.
4. Analyses for volatile organic compounds to be performed in accordance with SW-846 Method 8260B, Rev.2 (12/96). Water-quality analyses to be performed in accordance with applicable method in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1993.
5. See Table 3 for matrix spike/matrix spike duplicate compound list.
6. Priority Pollutants or equivalent performed every three years for POTW discharge

**Table 3**

BBL Environmental Services, Inc.
PAS Site
Oswego, New York

*Operation and Maintenance and Long-Term Monitoring Plan*
*Quality Assurance Project Plan*
*Analytical Quality Control Limits* [1]

| Volatile Organic Compounds | Analysis | MS/MSD Accuracy, % Recovery | MS/MSD or Duplicate Precision, RPD |
|---|---|---|---|
| **Ground Water** | | | |
| Benzene | 8260B | 70-130 | 30 |
| Chlorobenzene | 8260B | 70-130 | 30 |
| Toluene | 8260B | 70-130 | 30 |
| **Leachate** | | | |
| Benzene | 8260B | 70-130 | 30 |
| Chlorobenzene | 8260B | 70-130 | 30 |
| Toluene | 8260B | 70-130 | 30 |
| $BOD_5$ | 405.1 | N/A | 30 |
| COD | 410.4 | N/A | 30 |
| TDS | 160.4 | N/A | 30 |
| TOC | 415.1 | N/A | 30 |
| TSS | 160.2 | N/A | 30 |
| **POTW Discharge** | | | |
| $BOD_5$ | 405.1 | N/A | 30 |
| TSS | 160.2 | N/A | 30 |
| Metals: Sb, As, Be, Cd, Cr, Cu, Cn, Pb, Hq, Ni, Se, Ag, Ti, Zn | | | |
| Phenol (Total) | | | |

**Notes:**

1. ug/L = micrograms per liter which equates to parts per billion (ppb).
2. mg/Kg = milligrams per kilogram which equates to ppm.
3. $BOD_5$ =5 day biochemical oxygen demand, COD = Chemical oxygen demand, TDS = total dissolved solids, TOC total organic carbon, TSS = total suspended solids.
4. Analyses for volatile organic compounds to be performed in accordance with SW-846 Method 8260B, Rev.2 (12/96). Water-quality analyses to be performed in accordance with applicable method in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1993.
5. See Table 3 for matrix spike/matrix spike duplicate compound list.
6. Priority Pollutants or equivalent performed every three years for POTW discharge

**Table 4**

PAS Site
Oswego, New York

*Operation and Maintenance and Long-Term Monitoring Plan*
*Quality Assurance Project Plan*
*Sample Containers, Preservation, and Holding Times*

| Parameter | Analysis | Sample Container | Preservation | Maximum Holding Time from Sample Collection |
|---|---|---|---|---|
| **Ground Water** | | | | |
| VOCs | 8260B | Two 40-ml glass vials with Teflon-lined lid | Cool to 4° C and adjust to pH <2 | 14 days |
| **Ground Water** | | | | |
| VOCs | 8260B | Two 40-ml glass vials with Teflon-lined lid | Cool to 4° C and adjust to pH <2 | 14 days |
| $BOD_5$ | SM 5210B | 1-liter plastic or glass | Cool, 4° C | 48 hours |
| COD | 410.4 | 100-ml plastic or glass | $H_2SO_4$ to pH <2, cool, 4° C | 28 days |
| TDS | SM 2540C | 500-ml plastic or glass | Cool, 4° C | 7 days |
| TOC | SM 5310B | 40-ml glass vial | $H_2SO_4$ to pH <2, cool, 4° C | 28 days |
| TSS | SM 2540D | 500-ml glass or plastic | Cool, 4° C | 7 days |
| **POTW Discharge** | | | | |
| $BOD_5$ | SM 5210B | 1-liter plastic or glass | Cool, 4° C | 48 hours |
| TSS | SM 2540D | 500-ml plastic or glass | Cool, 4° C | 7 days |
| Phenols | 420.1 | 1-liter glass | Cool to 4° C and adjust to pH <2 | 28 days |
| Metals | 200.7/245.1 | 250-ml plastic | HNO3 to pH <2 | 6 mo., Except for Hg which is 28 days |
| CN | 335.4 | 250-ml plastic | NaOH to pH >12 | 14 days |

Notes:

1. VOCs = volatile organic compounds.
2. Analyses for volatile organic compounds to be performed in accordance with SW-846 Method 8260B, Rev.2 (12/96). Water-quality analyses to be performed in accordance with applicable method in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1993., and Standard Methods for the Examination of Water and Waste Water 18 – 21 Ed.

**Table 5**

BBL Environmental Services, Inc.
PAS Site
Oswego, New York

*Operation and Maintenance and Long-Term Monitoring Plan*
*Quality Assurance Project Plan*
*Data Validation Checklist – Laboratory Analytical Data*

| | |
|---|---|
| **REVIEW FOR COMPLETENESS** | |
| 1. | All chain-of-custody forms included. |
| 2. | Case narratives. |
| 3. | QA/QC summaries of analytical data including supporting documentation. |
| 4. | All relevant calibration data including support documentation. |
| 5. | Instrument and method performance data. |
| 6. | Documentation showing laboratory's ability to attain specified method detection limits. |
| 7. | Data report forms of examples for calculations of concentrations. |
| 8. | Raw data used in identification and quantification of the analysis required. |
| **REVIEW OF COMPLIANCE** | |
| 1. | Data package completed as described above. |
| 2. | QAPP requirements for data production and reporting have been met. |
| 3. | QA/QC criteria have been met. |
| 4. | Instrument type and calibration procedures have been met. |
| 5. | Initial and continuing calibration have been met |
| 6. | Data reporting forms are complete. |
| 7. | Problems and corrective actions documented. |

# *Attachments*
# *Quality Assurance Project Plan*

# *Attachment F-1*
# *Corrective Action Form*

*Attachment 1*

***BBL Environmental Services, Inc.***
***PAS Site***
***Oswego, New York***

***Operation and Maintenance and Long-Term Monitoring Plan***
***Quality Assurance Project Plan***

***Corrective Action Form***

Corrective Action No. _____ Date: _____

To: _____ cc: Task Manager

You are hereby requested to take corrective actions indicated below and as otherwise determined by you (A) to resolve the noted condition, and (B) to prevent it from reoccurring. Your written response is to be returned to the Quality Assurance Manager (QAM).

Condition _____

Reference Documents _____

Recommended Corrective Actions _____

Originator _____ Date _____

QAM Approval Date _____ P.M. Approval Date _____

Response _____

Corrective Action _____

A. Resolution _____
B. Pretention _____
C. Affected Documents _____

*Attachment 1*

*BBL Environmental Services, Inc.*
*PAS Site*
*Oswego, New York*

*Operation and Maintenance and Long-Term Monitoring Plan*
*Quality Assurance Project Plan*

***Corrective Action Form***

Signature_____ Date:_____

_____

Followup

Corrective Action Verified:

By:_____ Date:_____

# *Appendices*
# *Quality Assurance Project Plan*

# *Appendix F-1*
# *Sample Handling, Packaging, and Shipping Procedures*

# APPENDIX 1

**Sample Handling, Packing, and Shipping Procedures**

**I. Sample Handling**

After collecting a sample, the following procedures are followed:

1. Record the following information on the daily field log sheets or in the field notebook, as appropriate:
   a. Project name and number;
   b. Sample number and depth;
   c. Sampling method;
   d. Date;
   e. Name of sampler(s);
   f. Sample collection time (military);
   g. Location (project reference);
   h. Analyses to be completed;
   i. Preservative;
   j. Organic vapor reading; and
   k. Any comments.
2. Fill in sample label with:
   a. Project number;
   b. Sample number;
   c. Sample interval (if applicable);
   d. Sample type (composite or grab);
   e. Sample matrix (soil/sediment or water);
   f. Date;
   g. Sample collection time (military);
   h. Analyses required;

i. Initials of the sampling personnel; and

j. Preservative added, if applicable.

3. Ensure that all sample containers have the sample labels securely affixed to the container with clear packing tape.

4. Check the caps on the sample containers to ensure that they are tightly sealed.

5. Complete the chain-of-custody form (Attachment C-1) with the required sampling information and ensure that the recorded information matches the sample labels. Initial the chain-of-custody after sampling or prior to sample packing. NOTE: If the designated sampling person relinquishes the samples to other sampling or field personnel for packing or other purposes, the samplers will complete the chain-of-custody prior to this transfer. The appropriate personnel will sign and date the chain-of-custody form to document the sample custody transfer.

## II. Packing

1. Using duct tape, secure the outside and inside of the drain plug at the bottom of the cooler that is used for sample transport.

2. Wrap bottles in bubblewrap or other cushioning material.

3. Place 1 or 2 inches of cushioning material at the bottom of the cooler.

4. Place the sealed sample containers in the cooler.

5. Repackage ice in sealed plastic bags and place loosely in the cooler.

6. Fill the remaining space in the cooler with cushioning material.

7. Place chain-of-custody forms in a sealed plastic bag, and tape the forms to the inside of the cooler lid.

8. Close the lid of the cooler and fasten with duct tape.

9. Wrap strapping tape around both ends of the cooler at least twice.

10. Mark the cooler on the outside with the following information: shipping address, return address, "Fragile" labels, and arrows indicating "This Side Up" (Attachment C-2). Cover the labels with clear plastic tape. Place a signed custody seal label over cooler lid (Attachment C-3).

## III. Shipping

1. All samples will be hand-delivered or delivered by an express carrier within 48 hours from the date of sample collection.

2. The following chain-of custody procedures will apply to sample shipping:

a. Relinquish the sample containers to the laboratory via express carrier. The signed and dated chain-of-custody form(s) should be included in the cooler. Place the form(s) in a plastic bag, and tape the bag to the inside lid of the cooler. The express carrier will not be required to sign the chain-of-custody forms. The sampler should retain the express carrier receipt of bill of lading.

b. When the samples are received by the laboratory, the laboratory personnel shall complete the chain-of-custody forms by recording receipt of samples, and compare the sample identification numbers on the containers with the chain-of-custody forms.

# *Appendix F-1-1*
# *Sample Label*

LSL

Preservatives:
Date:_____ Time:_____
Client ID:_____

EPA 8260
Preservative: (HCL) ~~None~~
Date:_____ Time:_____
Client ID:_____

Metals
[redacted] HNO3
Date:_____ Time:_____
Client ID:_____

# *Appendix F-1-2*
# *Chain-of-Custody Form*

**Life Sciences Laboratory, Inc.**
5854 Bu ernut Drive
East Syracuse, NY 13057

# Chain Of Custody / Analysis Request

AES Job #:
COC #: WA
LIMS Order #:
Lab Proj #:
Lab ID:

Privileged & Con den al
EDD To: Demaximis

Site Name: Former Pollu on Abatement Services (PAS Oswego)
Loca on of Site: 55 East Seneca St. Oswego, NY

Client Contact: (name, co., address)
Kevin.Stone@OBG.Com
O'Brien & Gere Opera ons, LLC (for de maximis Inc.)
7600 Morgan Road
Liverpool, NY 13090

Sampler: Mar n Koennecke
P O #
On le

Analysis Turnaround Time:
Standard - X
Rush Charges Authorized for -
2 weeks -
1 week -
Next Day -

Hardcopy Report To: See Special Instruc ons Below
Invoice To: Kevin Stone - OB&G Opera ons

Preserva ve

| Sample Iden ca on | | | | Sample Date | Sample Time | Sample Type | Sample Matrix | | | Grab/Composite? | Field Filtered Sample? | BOD / TSS / pH | Total Phenols | Cd, Cr, Cu, Cn, Pb, Hg, Ni, Ag, Zn | | | | | | | | | | Lab Sample Numbers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Loca on ID | Start Depth ( ) | End Depth ( ) | Field Sample ID | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Units | | | | | | | | | | | | | | |
| 1 | E uent Discharge Pump House Sample Port #1 | | | | | Mul -Grab | Water | | | G | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | |

| Sample Descrip on | pH | Temp (°C) | Flow | Free Chlorine |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

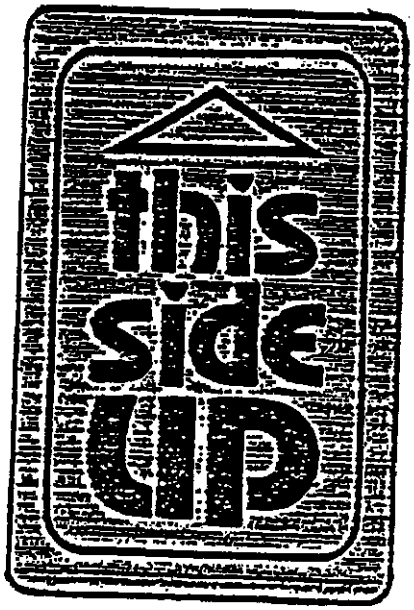
Notes:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Relinquished by | Company | O'Brien & Gere | Received by: | Company | | Condi on | Custody Seals Intact |
| | Date/Time | | | Date/Time | | Cooler Temp. | |
| Relinquished by | Company | | Received by: | Company | | Condi on | Custody Seals Intact |
| | Date/Time | | | Date/Time | | Cooler Temp. | |

Preserva ves: 0 = None; [1 = HCL]; [2 = HNO3]; [3 = H2SO4]; [4 = NaOH]; [5 = Zn. Acetate]; [6 = MeOH]; [7 = NaHSO4]; 8 = Other (specify):

# *Appendix F-1-3*
# *Packaging Labels*


fragile
HANDLE
WITH CARE


this
side
up

# *Appendix F-1-4*
# *Custody Seal*


CUSTODY SEAL
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE
SIGNATURE


CUSTODY SEAL
DATE
SIGNATURE
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

# *Appendix G*
# *Health and Safety Contingency Plan*

# Health and Safety Contingency Plan Acknowledgment

I have read this site-specific Health and Safety Contingency Plan, or its contents have been presented to me, and I understand the contents, and I agree to abide by its requirements.

| Name (Print) | Signature | Representing | Date |
|---|---|---|---|
| | | | |
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**PLAN**

# *Pollution Abatement Services Site*
# *Oswego, New York*

## *Operation and Maintenance and Long-Term Monitoring Plan*

## *Appendix G – Health and Safety Contingency Plan*

**Performing Settling Defendants**

**August 1998 – Modified July 2010**

**BBL**
**ENVIRONMENTAL SERVICES, INC.**

Remedial Action * Management and Construction

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# 1. Introduction

## 1.1 Objective

This Health and Safety Contingency Plan (HSCP) has been prepared for the performance of operation and maintenance and long-term monitoring activities at the Pollution Abatement Services (PAS) Superfund Site (Site) located in the City of Oswego, New York. A detailed description of the requirements, methods, and procedures for conducting operation and maintenance and long-term monitoring at the Site is presented in the Operation and Maintenance and Long-Term Monitoring Plan. As described in the Operation and Maintenance and Long-Term Monitoring Plan, Site activities may include the following components:

- Ground-water, leachate, surface water, and sediment monitoring;
- Leachate collection system operation, maintenance, and repair;
- Leachate flow and volume measurement;
- Leachate handling, loading, and transfer;
- Cap inspection;
- Cap mowing/seeding;
- Weed control;
- Inspection and maintenance of french drains;
- Inspection and maintenance of concrete drainage trough;
- Inspection and repair of damage by burrowing animals;
- Foliage control; and
- Snow removal.

The objective of this plan is to provide a mechanism for establishing safe working conditions at the Site. The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of accident or injury.

## 1.2 Site and Facility Description

The Operation and Maintenance and Long-Term Monitoring Plan was written by BBL Environmental Services, Inc. (BBLES), the United States Environmental Protection Agency (USEPA) approved prime contractor (the prime contractor) for Site operations, maintenance, and long-term monitoring at the Site, and provides a detailed description of the requirements, methods, and procedures for conducting operation and maintenance and long-term monitoring activities. Section 1 of the Operation and Maintenance and Long-Term Monitoring Plan provides a detailed description of the Site, Site history, and current operations.

## 1.3 Policy Statement

The policy of the prime contractor is to provide a safe and healthful work environment for all employees. No aspect of operations is of greater importance than injury and illness prevention. A fundamental principle of safety is that all accidents and injuries are preventable. The prime contractor will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or accident.

This HSCP prescribes the procedures that must be followed during Site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Regional Health and Safety Coordinator. This document will be periodically reviewed to ensure that it is current and technically correct. This HSCP shall be utilized as a

component of the prime contractor's Site health and safety program and in conjunction with the corporate health and safety manual presented in Appendix L-1. Any changes in Site conditions and/or the scope of work will require a review and modification to the HSCP. Such changes will be completed in the form of an addendum to this plan or a revision of the plan.

The provisions of this plan are mandatory for all prime contractor personnel and the prime contractor's subcontractors assigned to the project. All visitors to the work site must also abide by the requirements of the plan. It should be acknowledged that the employees of other consulting and/or contracted companies may work in accordance with their own independent HSCPs. Subcontractor HSCPs, if prepared, must meet the requirements of this HSCP.

## 1.4 References

This HSCP complies with applicable Occupational Safety and Health Administration (OSHA) regulations, USEPA regulations, and prime contractor health and safety policies and procedures. This plan follows the guidelines established in the following:

- *Standard Operating Safety Guides*, USEPA (Publication 9285.1-03, June 1992).
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH, OSHA, USCG, USEPA (86-116, October 1985).
- Title 29 of the Code of Federal Regulations (CFR), Part 1910.120.
- Title 29 of the Code of Federal Regulations (CFR), Part 1926.
- *Pocket Guide to Chemical Hazards*, DHHS, PHS, CDC, NIOSH (1994).
- *Threshold Limit Values*, ACGIH (1997).
- *Quick Selection Guide to Chemical Protective Clothing*, Forsberg, K. and S.Z. Mansdorf, 2nd Ed. (1993).
- *Health and Safety Policies and Procedures Manual*, BBL.

## 1.5 Definitions

The following definitions are applicable to this HSCP:

- ***BBLES*** - BBL Environmental Services, Inc., the prime contractor for the performance of Site operations, maintenance, and long-term monitoring activities. References in this HSCP to the prime contractor and prime contractors procedures, requirements, or documents refer to BBLES and those of BBLES, respectively.
- ***Site*** - the area where the work is to be performed by prime contractor personnel.
- ***Project*** - all on-site work performed under the scope of work for the operation and maintenance and long-term monitoring activities.

- ***Subcontractor*** - includes subcontractor personnel hired by BBLES, the prime contractor for Site operations, maintenance, and long-term monitoring.

- ***On-Site Personnel*** - all client personnel, prime contractor, and prime contractor subcontractor personnel at the Site and directly involved with the project.

- ***Visitor*** - all other personnel, except the on-site personnel. All visitors must receive approval to enter the Site.

# 2. Roles and Responsibilities

## 2.1 All Personnel

All prime contractor and subcontractor personnel must adhere to the following procedures during the performance of their work. Each person is responsible for completing tasks safely, and reporting any unsafe acts or conditions to his or her immediate supervisor or to the prime contractor Site Supervisor/Health and Safety Specialist (SS/HSS). No person may work in a manner that conflicts with these procedures. After due warnings, the PM or the SS/HSS will dismiss from the Site any person who violates safety procedures.

All on-site personnel will receive training in accordance with 29 CFR 1910.120 and other Site specific training (see Section 9.4) as required by applicable OSHA standards. In addition, project personnel will be familiar with the requirements and procedures contained in this document prior to the beginning of project operations.

The roles of key prime contractor personnel are outlined in the following sections. Key personnel and contacts are summarized in Table 2-1.

## 2.2 Corporate Health and Safety Associate

The prime contractor Corporate Health and Safety Associate (CSA) is responsible for all corporate health and safety aspects of the project. Inquiries regarding prime contractor corporate procedures, project procedures, and other technical or regulatory issues should be addressed to this individual.

## 2.3 Regional Health and Safety Coordinator

The prime contractor Regional Health and Safety Coordinator (RHSC) is also responsible for technical health and safety aspects of the project, including review and approval of this HSCP. Inquiries regarding prime contractor corporate procedures, project procedures, and other technical or regulatory issues also may be addressed to this individual. The RHSC will conduct semi-annual inspections/audits of the project Site, including a review of periodic inspections conducted by the SS/HSS and a comprehensive review of Site conditions. Any changes or addenda to this HSCP must be approved by the RHSC or the CSA.

## 2.4 Site Supervisor/Health and Safety Specialist (SS/HSS)

The SS/HSS is responsible for implementation of the HSCP, including communication of Site requirements to all on-site project personnel (including subcontractors). The SS/HSS will be responsible for informing the PM of any changes in the work plan or procedures so that those changes may be addressed in the HSCP. The SS/HSS will advise the PM on health and safety issues, and will establish and oversee the project air monitoring program. The SS/HSS is the primary Site contact on occupational health and safety matters. Other responsibilities include:

- Conduct periodic safety inspections of the Site during the operation and maintenance and long-term monitoring activities, and completing a periodic inspection form (Appendix G-2);
- Perform and document daily safety briefings when subcontractors are on site;
- Stop work, as required, to ensure personal safety and protection of property, or in cases of life- or property-threatening safety non-compliance;

- Obtain a Site map and determining and posting routes to medical facilities and emergency telephone numbers, and arranging emergency transportation to medical facilities;
- Notify local public emergency officers of the nature of the Site operations, and posting of their telephone numbers in an appropriate location;
- Observe on-site project personnel for signs of chemical or physical trauma;
- Verify that all Site personnel, including subcontractors, have received the proper medical clearances and training in accordance with the requirements of this HSCP;
- Verify that all on-site personnel are made aware of the provisions of the HSCP and have been informed of the nature of any physical, chemical, and biological hazards associated with the Site activities;
- Verify that on-site personnel and visitors have received the required training, including instructions for safety equipment and personal protective equipment (PPE) use;
- Suspend work if health- and/or safety-related concerns arise;
- Issue/obtain required work permits;
- Conduct Site and personal air monitoring, including equipment maintenance and calibration. Where necessary, submit samples to an American Industrial Hygiene Association (AIHA) accredited laboratory;
- Prepare material for Site safety orientation training and safety meetings;
- Verify that on-site personnel have received the required physical examinations and medical certifications;
- Review Site activities with respect to compliance with the HSCP; and
- Maintain required health and safety documents and records.

## 2.5 Project Manager

The PM is ultimately responsible for verifying that all project activities are completed in accordance with the requirements and procedures in this plan. The PM is responsible for providing the Site Supervisor (SS) with the equipment, materials, and qualified personnel to implement fully all safety requirements in this HSCP.

It is the responsibility of the PM to:

- Review safety inspection reports;
- Thoroughly investigate all accidents and incidents on the project;
- Approve, in writing, addenda or modifications of this HSCP; and
- Suspend work if health- and/or safety-related concerns arise.

## 2.6 Subcontractors

On-site subcontractors and their personnel must understand and comply with the Site requirements established in this HSCP. Subcontractors must provide documentation of training and enrollment in a medical surveillance program consistent with the requirements of this HSCP. Subcontractors may prepare their own task-specific HSCPs, which must be consistent with the requirements of this HSCP. Subcontractor personnel must attend and participate in the daily Safety Meetings and all other Site safety meetings.

## 2.7 On-Site Personnel and Visitors

All personnel must read and acknowledge their understanding of this HSCP, abide by the requirements of the plan, and cooperate with Site supervision in ensuring a safe work site. Site personnel will immediately report any of the following to the SS/HSS:

- Accidents and injuries, no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Symptoms of chemical exposure;
- Unsafe or malfunctioning equipment;
- Changes in Site conditions that may affect the health and safety of project personnel;
- Damage to equipment or property; and
- Situations or activities for which they are not properly trained.

**TABLE 2-1**
**KEY PERSONNEL**

| ***de maximis, inc.* Key Personnel** | | |
|---|---|---|
| **Title/Role** | **Name** | **Address/Telephone No.** |
| Project Coordinator | Mr. Clay McClarnon | 450 Montbrook Lane<br>Knoxville, TN 37919<br>Phone: (865) 691-5052 |
| ***O'Brien and Gere* Key Personnel** | | |
| **Role** | **Name** | **Address/Telephone No.** |
| Corporate Health and Safety Associate | Mr. Jeffrey Parson | 333 Washington Station<br>Syracuse, NY 13221<br>Phone: (315) 956-6871 |
| Project Manager | Mr. Kevin Stone | 7600 Morgan Road<br>Liverpool, NY 13090<br>Phone: (315) 956-6032 |
| Project Officer | Mr. Kenneth Jones | 301 East German Town Pike<br>East Norriton, NY 19401<br>Phone: (484) 804-7200 |

# 3. Project Hazards and Control Measures

## 3.1 Scope of Work

The scope of the operation and maintenance and long-term monitoring activities includes the following field activities:

- Ground-water, leachate, surface water, and sediment monitoring;
- Leachate collection system operation, maintenance, and repair;
- Leachate flow and volume measurement;
- Leachate handling, loading, and transfer;
- Cap inspection;
- Cap mowing/seeding;
- Weed control;
- Inspection and maintenance of french drains;
- Inspection and maintenance of concrete drainage trough;
- Inspection and repair of damage by burrowing animals;
- Foliage control; and
- Snow removal.

### 3.1.1 Job Hazard Assessment

The following job hazard assessment identifies potential safety, health, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the work site to identify hazards that may affect Site personnel, the community, or the environment. The SS must be aware of these changing conditions and discuss them with the PM whenever these changes impact employee health, safety, the environment, or performance of the project. The SS will keep prime contractor personnel and subcontractors informed of the changing conditions, and the PM will write or approve addenda or revisions to this HSCP as necessary.

## 3.2 Field Activities, Hazards, Control Procedures

The following sections present the hazards and safety procedures for activities outlined in the scope of work for the Site. Specific activities may be grouped into sections with other activities based on similar hazards and safety precautions for the activities.

### 3.2.1 Mobilization and Inspection Activities

Site mobilization and inspection activities may include setting up equipment and establishing a temporary Site facilities. Inspection activities may specifically include the following:

- Cap inspection;
- Inspection of the leachate collection system components;
- Inspection of french drains;
- Inspection of concrete drainage trough; and
- Inspection for damage by burrowing animals.

During these activities, project personnel will walk the Site to confirm the existence of anticipated hazards, and identify safety and health issues that may have arisen since the writing of this plan.

Manual materials handling and manual Site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitos, wasps, spiders, snakes, dogs, and deer; weather, such as sunburn, lightning, rain, and heat-related illnesses; and pathogens, such as rabies, lyme disease, and blood-borne pathogens. Control procedures for these hazards are discussed in Section 4.

Confined space hazards may be encountered if entry into the leachate collection tank is required. This work area has limited means of entry and exit, and is not designed for continuous employee occupancy. Potentially contaminated surfaces, leachate, and sediment pose additional hazards, and air contamination, flammable or explosive atmosphere, and oxygen deficiency are potentially present.

Chemical hazards may be encountered if a confined space entry is required into the leachate collection tank, or if leachate or ground water is removed from site monitoring wells or the leachate collection tank. The associated health hazards include dermal contact and inhalation.

### 3.2.2 Field Sampling Activities

Field sampling operations consist of the collection of ground-water, leachate, and sediment samples, and surface water elevation measurements for subsequent analysis and evaluation of potential Site impact. The physical hazards of these operations are primarily associated with the sample collection methods and procedures utilized.

Samples of ground water, leachate, and sediment will be obtained to evaluate the extent of potential Site impact and system efficiency. Inhalation and absorption of constituents (skin contact) are the primary routes of entry associated with ground-water, leachate, and sediment sampling due to the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. To control dermal exposure during sampling activities, a minimum of Modified Level D protection will be worn. Air sampling may be conducted during ground-water and leachate sampling to assess the potential for exposure to airborne constituents. If the results of air monitoring indicate the presence of organic vapors in a concentration exceeding the Site action level for Modified Level D, personnel will upgrade to Level C protection. Refer to Section 8 for a description of air monitoring requirements and action levels. A description of each level of protection is included in Section 5.

During the course of this project, several different sampling methodologies may be utilized based on equipment accessibility and the types of materials to be sampled. The primary hazards associated with the specific sampling collection procedures are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards of the sampling procedures are generally limited to strains/sprains and potential eye hazards resulting from sampling activities.

In addition to the safety hazards specific to sample collection, hazards associated with working over or near water will be a concern. The following section provides safety procedures for working near water.

### 3.2.3 Water Hazards

Prime contractor personnel working over, adjacent, or near water, where the danger of drowning exists, must wear an U.S. Coast Guard-approved life jacket or buoyant work vests. Prior to and after each use, the buoyant work vests or life preservers must be inspected for defects which would alter their strength or buoyancy. Defective units must be removed from service. Ring buoys or equivalent with at least 90 feet of line must be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet. At least one lifesaving boat must be immediately available at locations where employees are working over or adjacent to water or when personnel are conducting wading operations a lifeline and harness with a land-based tender may be substituted.

### 3.2.4 General Maintenance

Site maintenance activities may include the following:

- Cap mowing and seeding;
- Weed control;
- Maintenance of french drains and concrete drainage trough;
- Repair of damage caused by burrowing animals;
- Foliage control; and
- Snow removal.

These activities may involve a potential for exposure to numerous physical and health hazards. The hazards are primarily associated with the equipment used and the debris being removed.

***Physical Hazards*** - The physical hazards involved with clearing and construction relate to work done with heavy equipment, hand tools, and the environment itself. There exists a potential for incidents involving personnel struck by or struck against powered equipment, timber, or materials, resulting in fractures, cuts, punctures, or abrasions. Walking and working surfaces during construction activities may involve slip, trip, and fall hazards. Working at elevations may create a fall hazard. Confined spaces may present a hazard.

***Environmental Hazards*** - Overgrown areas present hazards of uneven walking surfaces, soft terrain, and biological hazards such as insects and snakes.

***Working Surfaces*** - Uneven terrain and slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, and slips and falls. All personnel should frequently inspect the area in which they are working, and keep the area as clear as possible.

***Powered Equipment Operations*** - Site workers are exposed to serious hazards during clearing when using powered equipment. Workers may be struck by blades or by material thrown by powered equipment.

***Materials Handling*** - The most common type of accident that occurs in material handling operations is the "caught between" situation when a load is being handled and a finger or toe gets caught between two objects. Extreme care must be taken when loading and unloading material. Proper lifting technique must be employed, and mechanical means must be used to lift objects whenever possible.

***Health Hazards*** - Due to the type of work involved in clearing and construction activities, the primary health hazards involve repetitive motion disorders, lifting, and other ergonomic stressors. Noise may also present a hazard. Operation of heavy equipment and power actuated and pneumatic hand tools frequently results in high noise levels.

***Fall Hazards*** - Site workers may perform work in the vicinity of unprotected sides and edges above surrounding surfaces. Work areas should be designed to support personnel, and unprotected sides and edges 6 feet above surrounding surfaces should have appropriate fall protection mechanisms.

***Control*** - Prior to initiating clearing and construction activities, the operation will be explained to all employees. Hazards will be identified and protective measures will be explained. Equipment will be inspected and in proper working condition. Employees should receive training to address the equipment, its operations, and care. Personnel should be scheduled in a manner to reduce the likelihood of performing repetitive tasks for prolonged periods. Mechanical assistance should be provided for large lifting tasks. Hearing protection is required for use when exposed to noise levels exceeding 85 dBA, or a level which commonly results in difficult conversation.

Confined space entry requirements are described in Section 3.5.1.

### 3.2.5 Routine Operation and Long-Term Monitoring Activities

Routine operation and maintenance and long-term monitoring activities include the following:

- Ground-water, leachate, surface water, and sediment monitoring;
- Leachate collection system operation;
- Routine operation and control procedures;
- Leachate flow and volume measurement; and
- Leachate loading and transfer.

Routine operation and maintenance and long-term monitoring activities involve potential exposures to numerous physical and health hazards. The hazards are primarily associated with the leachate, equipment, and activities being conducted.

***Physical Hazards*** - The physical hazards involved with inspection, cleaning, and repair relate to work done on equipment, use of hand tools, materials handling, and the work environment itself. There exists a potential for incidents involving personnel struck by or struck against moving equipment parts or materials, resulting in fractures, cuts, punctures, or abrasions. Walking and working surfaces during activities may involve slip, trip, and fall hazards. Working in or near confined spaces may present a hazard. Uncontrolled hazardous energy also is a potential hazard.

***Environmental Hazards*** - Outside work areas may present hazards of uneven walking surfaces, slick or slippery work surfaces, soft terrain, heat stress, and cold stress.

***Working Surfaces*** - Uneven terrain and slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, and slips and falls. All personnel should frequently inspect the area in which they are working, and keep the area as clear as possible.

***Equipment Operations, Maintenance and Repair*** - Site workers are exposed to serious hazards during activities on powered equipment. Workers may be struck by moving part or by flying material thrown by powered

equipment. The potential for exposure to hazardous energy or accidental start-up exists and must be controlled with appropriate lockout/tagout procedures outlined in Section 4.7.

***Materials Handling*** - The most common type of accident that occurs in material handling operations is the "caught between" situation when a load is being handled and a body part gets caught between two objects. Extreme care must be taken when loading and unloading material. Proper lifting technique must be employed, and mechanical means must be used to lift objects whenever possible.

***Health Hazards*** - Due to the type of work involved in the operation and maintenance and long-term monitoring activities, the primary health hazards involve repetitive motion disorders, lifting, and other ergonomic stressors. Noise may also present a hazard. Exposure to media containing Site constituents of concern is possible. During leachate collection and transfer, and Site monitoring activities, personnel may handle ground water, leachate, surface water, and sediment. These materials present a potential inhalation, skin contact, and eye contact hazard. PPE specified in Section 5 shall be utilized for handling leachate.

***Chemical Hazards*** - Workers performing routine operation and long-term monitoring activities may be exposed to VOC-contaminated media, such as leachate and ground water. Proper protective equipment should be worn to protect against dermal contact and, if necessary, appropriate levels of respiratory protection should be employed.

***Fall Hazards*** - Site workers may perform work in the vicinity of unprotected sides and edges above surrounding surfaces. Work areas should be designed to support personnel, and unprotected sides and edges 6 feet above surrounding surfaces should have appropriate fall protection mechanisms.

***Electrical Hazards*** - Site workers may perform work with portable electrical equipment, as well as leachate pump controls. The potential for electric shock exists. Proper electrical safety measures must be employed, as described in Sections 4.6 and 4.7.

***Control*** - Prior to initiating any operation and maintenance and long-term monitoring activities, the operations will be explained to all employees. Hazards will be identified and protective measures will be explained. Equipment will be inspected and in proper working condition. Employees should receive training to address the equipment, its operations, and care. Personnel should be scheduled in a manner to reduce the likelihood of performing repetitive tasks for prolonged periods. Mechanical assistance should be provided for large lifting tasks. Hearing protection is required for use when exposed to noise levels exceeding 85 dBA, or a level which commonly results in difficult conversation. Procedures for dealing with confined spaces are presented in the following sections.

### 3.2.5.1 Confined Space Entry

This section contains general requirements and procedures for working with confined spaces. In addition to the general information provided herein, prime contractor personnel must comply with the requirements of the prime contractor's policy and procedure requirements for Confined Space Entry. A confined space is defined as a space large enough and so configured that an employee can bodily enter and perform assigned work, has limited means for entry or exit, and is not designed for continuous employee occupancy. Some confined space work may pose additional hazards such as air contamination, flammable or explosive atmosphere, and oxygen deficiency. Confined space entry may pose the possibility of engulfment. Personnel must be properly trained in order to supervise and participate in confined space entry procedures or serve as standby attendants.

All confined spaces are initially considered permit-required and procedures for entry must be consistent with the requirements of prime contractor corporate policy and procedure requirements for Confined Space Entry (Appendix G-1).

### 3.2.5.2 Confined Space Identification and Designation

*Identification:* The prime contractor SS/HSS is responsible for identifying all confined spaces into which prime contractor employees or subcontractors will enter. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space. The client is responsible for identifying and providing information as to contents, expected atmosphere, and rescue procedures for all confined spaces on his/her property. If a space is not considered permit required by the client but meets the criteria of this procedure, it shall be considered permit required for prime contractor-managed entry. If a space does not meet the criteria in this procedure but is considered permit-required by the client, it will be considered a permit-required confined space by the prime contractor.

The permit-required confined spaces for this project may include, but are not limited to: catch basins, leachate collection tank, sumps, and drains.

### 3.2.6 Ground-water Monitoring Activities

The ground-water monitoring program will involve uncapping, purging (pumping water out of the well), sampling, and performing measurements at existing monitoring wells. A mechanical pump may be utilized to purge the wells and can be hand-, gas-, or electric-operated. Samples collected from the wells will be placed in containers and shipped to an analytical laboratory for analysis.

During the course of this project, several different sampling methodologies may be utilized based on equipment accessibility and the types of materials to be sampled. These sampling methods may include hand or mechanical bailing. The primary hazards associated with these specific sampling methods are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards of these types of sampling methods are generally limited to strains/sprains resulting from hand bailing and potential eye hazards resulting from water sampling activities.

In addition to the safety hazards specific to sampling operations, hazards associated with sample preservatives will be a concern. The work area presents slip, trip and fall hazards from scattered debris and irregular walking surfaces. Freezing-weather hazards include frozen, slick and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces and unstable soil.

Exposure to impacted water is possible. Organic vapors will be monitored according to Section 8, Air Monitoring. In accordance with Section 5, decisions on personal protective equipment (PPE) for the chemical hazards will be based on measurements made before and during work activities. Control procedures for environmental and general hazards are discussed in Section 4.0.

Exposure to concentrated acids is possible during sample preservation activities. Appropriate dermal and eye protection should be provided, as described in Section 5.

### 3.2.7 Equipment Decontamination

All equipment which comes in contact with ground water, leachate, and sediment will be decontaminated before leaving the Site. Personnel involved in decontamination activities may be exposed to skin contact with contaminated materials and chemicals brought to the Site as part of the project work. Personnel involved in decontamination activities must wear PPE specified in Section 5.

## 3.3 Chemical Hazards

The chemical hazards associated with Site operations are related to inhalation, ingestion, and skin exposure to ground-water, leachate, and sediment containing Site constituents of concern (COC). Site constituents of concern include benzene, trichloroethylene, methylene chloride, as well as other volatile organic compounds. Chemical hazards also include materials brought on the Site as part of the operation and maintenance and long-term monitoring activities. Operation and maintenance and long-term monitoring-related chemicals include, but may not be limited to the following: pump oil and lubricants, and sample preservatives.

Airborne concentrations of COCs may be measurable during tasks involving ground water, leachate, and sediment, and will require air monitoring of potentially airborne COC during such operations. Air monitoring requirements for Site tasks are outlined in Section 8.1.

The potential for inhalation of COC during Site tasks is low to moderate. The potential for dermal contact with ground water, leachate, and sediment during sampling and tasks involving leachate collection, removal, and disposal operation and maintenance activities is moderate.

The Material Safety Data Sheets (MSDS) for COC and chemicals brought on to the Site for the operation and maintenance and long-term monitoring activities are included in Appendix G-3.

**TABLE 3-1**
**CHEMICAL HAZARD INFORMATION**

| Substance [CAS] | IP[a] (eV) | Odor Threshold (ppm) | Route[b] | Symptoms of Exposure | Treatment | TWA[c] | STEL[d] | Source[e] | IDLH (NIOSH)[f] |
|---|---|---|---|---|---|---|---|---|---|
| Benzene<br>[71-43-2] | 9.24 | 34–119 | Inh<br>Abs<br>Ing<br>Con | Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic. | Eye: Irrigate immediately<br>Skin: Soap wash promptly<br>Breath: Respiratory support<br>Swallow: Immediate medical attention | 1 ppm<br>(10 ppm)<br>NIC–0.1 skin<br>0.1 ppm | 5 ppm<br><br>C1 ppm<br>(Ca) | PEL<br>TLV<br><br>REL | Ca<br>[500 ppm]*<br><br>*OSHA |
| Methylene chloride (dichloromethane)<br>[75-09-2] | 11.32 | ? | Inh<br>Ing<br>Con | Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin. | Eye: Irrigate immediately<br>Skin: Soap wash promptly<br>Breath: Respiratory support<br>Swallow: Immediate medical attention | 25 ppm<br>50 ppm | C125 ppm;<br>C2,000 mg/m³<br>(5 min in 2 hrs) | PEL<br>TLV<br><br>REL | Ca<br>(2,300 ppm) |
| Trichloroethylene (TCE, trichloroethene)<br>[79-01-6] | 9.45 | 21.4 | Inh<br>Ing<br>Con | Headache, vertigo; visual disturbance, tremors, somnolence, nausea, vomiting; irritated eyes; dermatitis; cardiac arrhythmia, paresthesia. Carcinogenic. | Eye: Irrigate immediately<br>Skin: Soap wash promptly<br>Breath: Respiratory support<br>Swallow: Immediate medical attention | 100 ppm<br>50 ppm<br>25 ppm | 200 ppm<br>100 ppm<br>Ca | PEL<br>TLV<br>REL | Ca<br>[1,000 ppm] |



Refer to footnotes at end of table.

**TABLE 3-1 (CONT'D)**
**CHEMICAL HAZARD INFORMATION**

[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.
[d]STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
[e]PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).
TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.
REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.
[f]IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 90-117, 1990).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.
$LC_{50}$ = Lethal concentration for 50 percent of population tested.
$LD_{50}$ = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1991, compiled by the American Conference of Governmental Industrial Hygienists.
Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 5th ed., 1986.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1990, No. 90-117, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschuseren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.



Refer to footnotes at end of table.

# 4. General Safety Practices

## 4.1 General Practices

General safety procedures for Site activities include, but are not limited to the following:

- At least one copy of this plan must be at the project Site, in a location readily available to all personnel, and reviewed by all project personnel prior to starting work.
- Food, beverages, or tobacco products must not be present or consumed in work zones on the Site. Cosmetics must not be applied in work zones on the Site.
- Waste, debris, and used protective clothing must be properly contained and labeled.

### 4.1.1 Buddy System

All on-site personnel must use the buddy system. Visual contact must be maintained between crew members at all times, and crew members must observe each other for signs of chemical exposure, heat or cold stress. Indications of adverse effects include, but are not limited to:

- changes in complexion and skin coloration;
- changes in coordination;
- changes in demeanor;
- excessive salivation and pupillary response; and
- changes in speech pattern.

- Team members must also be aware of potential exposure to possible safety hazards, unsafe acts, or non-compliance with safety procedures.
- Employees must inform their fellow team members of non-visible effects of exposure to toxic materials. The symptoms of such exposure may include:
  - headaches;
  - dizziness;
  - nausea;
  - blurred vision;
  - cramps; and/or
  - irritation of eyes, skin, or respiratory tract.

- If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

### 4.1.2 Emergency Equipment

Adequate emergency equipment for the activities conducted on-site and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926. Personnel will be provided with access to emergency equipment including but limited to the following:

- Emergency eyewash and shower meeting ANSI Z358.1-1990.
- Fire extinguishers of adequate size, class, number, and location as required by applicable sections of 29 CFR 1910 and 29 CFR 1926.
- Industrial First Aid Kit of adequate size for number of personnel on-site.

## 4.2 Heat Stress

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

***Heat rashes*** are the one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

***Heat cramps*** are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much and too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

***Heat exhaustion*** occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

***Heat stroke*** is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict.

Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of work load and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should not be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

### *Heat Stress Safety Precautions*

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in the Table 4-1.

**TABLE 4-1**
**WORK/REST SCHEDULE**

| *Adjusted Temperature*[b] | *Work-Rest Regimen Normal Work Ensemble*[c] | *Work-Rest Regimen Impermeable Ensemble* |
|---|---|---|
| 90°F (32.2°C) or above | After each 45 minutes of work | After each 15 minutes of work |
| 87.5°-90°F (30.8°-32.2°C) | After each 60 minutes of work | After each 30 minutes of work |
| 82.5°-87.5°F (28.1°-30.8°C) | After each 90 minutes of work | After each 60 minutes of work |
| 77.5°-82.5°F (25.3°-28.1°C) | After each 120 minutes of work | After each 90 minutes of work |
| 72.5°-77.5°F (30.8°-32.2°C) | After each 150 minutes of work | After each 120 minutes of work |

[a] For work levels of 250 kilocalories/hour (Light-Moderate Type of Work)
[b] Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)
[c] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.
[d] The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

In order to determine if the work rest cycles are adequate for the personnel and specific Site conditions additional monitoring of individuals heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one-third and maintain the same rest period

Additional one or more of the following control measures can be used to help control heat stress and are mandatory if any Site worker has a heart rate (measure immediately prior to rest period) exceeding of 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-site drinking water will be kept cool (50 to 60°F).
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Employees must not be assigned to other tasks during breaks.
- Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.
- All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

## 4.3 Cold Stress Hazards

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body which have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is

equivalent in chilling effect to still air at -18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in Table 4-2.

**TABLE 4-2**
**CHILL TEMPERATURE CHART**

| Estimated Wind Speed (in mph) | Actual Temperature Reading (°F) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 50 | 40 | 30 | 20 | 10 | 0 | -10 | -20 | -30 | -40 | -50 | -60 |
| | Equivalent Chill Temperature (°F) | | | | | | | | | | | |
| calm | 50 | 40 | 30 | 20 | 10 | 0 | -10 | -20 | -30 | -40 | -50 | -60 |
| 5 | 48 | 37 | 27 | 16 | 6 | -5 | -15 | -26 | -36 | -47 | -57 | -68 |
| 10 | 40 | 28 | 16 | 4 | -9 | -24 | -33 | -46 | -58 | -70 | -83 | -95 |
| 15 | 36 | 22 | 9 | -5 | -18 | -32 | -45 | -58 | -72 | -85 | -99 | -112 |
| 20 | 32 | 18 | 4 | -10 | -25 | -39 | -53 | -67 | -82 | -96 | -110 | -121 |
| 25 | 30 | 16 | 0 | -15 | -29 | -44 | -59 | -74 | -88 | -104 | -118 | -133 |
| 30 | 28 | 13 | -2 | -18 | -33 | -48 | -63 | -79 | -94 | -109 | -125 | -140 |
| 35 | 27 | 11 | -4 | -20 | -35 | -51 | -67 | -82 | -98 | -113 | -129 | -145 |
| 40 | 28 | 10 | -6 | -21 | -37 | -53 | -69 | -85 | -100 | -116 | -132 | -148 |
| (Wind speeds greater than 40 mph have little additional effect.) | LITTLE DANGER Maximum danger of false sense of security. | | | | INCREASING DANGER Danger from freezing of exposed flesh within one minute. | | | GREAT DANGER Flesh may freeze within 30 seconds. | | | | |
| | Trench foot and immersion foot may occur at any point on this chart. | | | | | | | | | | | |

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- ***Frost Nip or Incipient Frostbite*** - characterized by suddenly blanching or whitening of skin.
- ***Superficial Frostbite*** - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- ***Deep Frostbite*** - tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment. To avoid cold stress, Site personnel must wear protective clothing appropriate for the level of cold and physical

activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

***Safety Precautions for Cold Stress Prevention***

- For air temperature of 0°F or less, the hands should be protected by mittens. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.
- At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.
- If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must ensure that their clothing is not wet as a consequence of sweating. If wet, field personnel must change into dry clothes prior to entering the cold area.
- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.
- Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

***Safe Work Practices***

- Direct contact between bare skin and cold surfaces (≤ 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.
- For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.
- Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing.
- Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

## 4.4 Noise

Exposure to noise over the OSHA action level (85 dBA) can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with

the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

***Control*** - All personnel must wear hearing protection - with a Noise Reduction Rating (NRR) of at least 20 - when noise levels exceed 85 dBA. The treatment building is a posted hearing conservation area. When the treatment system is operating inside the treatment building hearing protection is required. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All Site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 8.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

### 4.5 Sanitation

Site sanitation will be maintained according to OSHA and Department of Health requirements.

#### 4.5.1 Break Area

Breaks must be taken away from the active work area. There will be no smoking, eating, drinking, or chewing gum or tobacco in any work area on the Site.

### 4.6 Electrical Hazards

Electricity may pose a particular hazard to Site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, it must be performed by a qualified electrician.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by UL, Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.
- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or United States Coast Guard regulations.
- Portable and semi portable tools and equipment must be grounded by a multiconductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- All circuits must be protected from overload.

- Temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension outlets must be equipped with ground fault circuit interrupters (GFCI).
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.
- Extension cords or cables must be inspected prior to each use, and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

### 4.7 Lockout/Tagout Procedures

Maintenance procedures will only be performed by fully qualified and trained individuals. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 and the prime contractor Lockout/Tagout Control of Hazardous Energy/Materials corporate health and safety procedures (Appendix G 1) will be followed.

Lockout is the placement of a device that uses a positive means (such as a lock) to secure an energy or material-isolating system such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system will be used. Tagout is the placement of a warning tag on an energy or material-isolating device indicating that the equipment controlled may not be operated until the tag is removed.

Equipment-specific information concerning lockout procedures is located in the operations and maintenance manual for Site equipment requiring routine maintenance. If equipment-specific procedures are not in the operations and maintenance manual for an on-site piece of equipment, procedures outlined in the prime contractor Lockout/Tagout Control of Hazardous Energy/Materials corporate health and safety procedures (Appendix G 1) will be followed.

### 4.8 Lifting Hazards

Back strain or injury may be prevented by using proper lifting techniques. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points which could crush or pinch them, especially when putting an object down.

- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.
- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

## 4.9 Biological Hazards

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, and other pests.

### 4.9.1 Tick-Borne Diseases

Lyme disease, erlichiosis, and Rocky Mountain Spotted Fever (RMSF) are diseases transmitted by ticks and occur throughout the United States during spring, summer, and fall.

***Lyme Disease*** - The disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Few cases have been identified in other states.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, swelling and pain in the joints, and eventually, arthritis. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

***Rocky Mountain Spotted Fever (RMSF)*** - This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

***Control*** - Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

### 4.9.2 Poisonous Plants

Poison ivy may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

*Control* - The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water, and observed for signs of reddening.

### 4.9.3 Snakes

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snake bites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

*Control* - To minimize the threat of snake bites and insect hazards, all personnel walking through vegetated areas must aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snake bite occurs, an attempt should be made to kill the snake for identification. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

# 5. Personal Protective Equipment

## 5.1 General

Personal protective equipment is required to safeguard Site personnel from various hazards. Varying levels of protection may be required depending on the level of contaminants and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level.

## 5.2 Levels of Protection

Protection levels are determined based upon contaminants present in the work area. A summary of the levels is presented in this section.

### 5.2.1 Level D Protection

The minimum level of protection that will be required of prime contractor personnel and subcontractors at the Site will be Level D, which will be worn in support areas. The following equipment will be used:

- Work clothing as prescribed by weather;
- Steel toe work boots, meeting ANSI Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Hard hat, meeting ANSI Z89;
- Hearing protection (If noise levels exceed 85 dBA, then hearing protection with a US EPA NRR of at least 20 dBA must be used);

### 5.2.2 Modified Level D Protection

Modified Level D will be used when airborne constituents are not present at levels of concern, but Site activities are causing an increased potential for skin contact with subsurface liquids, sediments, and soil. Modified Level D consists of:

- Polyethylene-coated Tyvek® coveralls or equivalent;
- Safety-toe work boots meeting ANSI Z41;
- Latex booties over steel-toe work boots;
- Safety glasses or goggles meeting ANSI Z87;
- Hard hat meeting ANSI Z89;
- Face shield in addition to safety glasses or goggles when projectiles or splashes pose a hazard;
- Heavy nitrile (outer) gloves over Silvershield® gloves (inner); and
- Hearing protection (if necessary).

### 5.2.3 Level C Protection

Level C protection will be required when the airborne concentration of suspected constituents is known to Site action levels. Level C protection will be used for operations when air monitoring instruments indicate an upgrade is necessary. See Section 8.

The following equipment will be used for Level C protection:

- Full-face or half-face air-purifying respirator with organic vapor/acid gas cartridges in combination with high efficiency particulate filters (HEPA) which are NIOSH/MSHA approved;
- Polyethylene-coated Tyvek® suit or equivalent, ankles and cuffs taped to boots and gloves;
- Heavy nitrile (outer) gloves over Silvershield® gloves (inner) gloves;
- Safety toe work boots, ANSI Z41 approved;
- Chemical resistant Neoprene boots with steel toes; or disposable latex booties over safety toe shoes;
- Hard hat, ANSI Z89 approved; and
- Hearing protection (if necessary).

### 5.2.4 Level B Protection

Level B protection will be required when the airborne concentration of suspected chemicals is unknown or is known but exceeds the maximum use concentrations for Level C PPE.

The following equipment will be used for Level B protection:

- Positive pressure-demand, full-face piece self-contained breathing apparatus (SCBA), or positive pressure-demand supplied air respirator with escape SCBA (NIOSH approved);
- Polyethylene-coated Tyvek® coverall with attached boots or equivalent;
- Nitrile outer gloves over Silvershield® inner gloves;
- Steel toe work boots, ANSI Z41 approved;
- Chemical resistant Neoprene boots with steel toes; or latex booties over safety toe shoes;
- Hard hat, ANSI Z89 approved; and
- Hearing protection (if necessary).

### 5.2.5 Selection of PPE

Equipment for personal protection will be selected based on the potential for contact, Site conditions, ambient air quality, and the judgment of supervising Site personnel and HS professionals. The PPE used will be chosen to be effective against the compound(s) present on the Site.

## 5.3 Site Respiratory Protection Procedures

Respiratory protection is an integral part of employee health and safety at the Site due to the potential for airborne constituents.

Site respiratory protection procedures will consist of the following:

- All Site personnel who may use respiratory protection will have an assigned respirator.

- All Site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air purifying respirator within the past 12 months.

- All Site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the HSS, prior to commencement of Site work.

- Only cleaned, maintained, NIOSH/MSHA-approved respirators are to be used on this Site.

- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn on-site.
- All Site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.
- Respirators will be inspected, and a negative pressure test performed prior to each use.
- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

## 5.4 Using PPE

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory when Modified Level D, Level C, or B PPE is used.

All people entering the exclusion zone (EZ) must put on the required PPE in accordance with the requirements of this plan. When leaving the exclusion zone (EZ), PPE will be removed in accordance with the procedures listed, to minimize the spread of contamination.

### 5.4.1 Donning Procedures

These procedures are mandatory when Modified Level D or higher PPE is used on the project:

- Remove bulky outerwear. Remove street clothes and store in clean location;
- Put on work clothes or coveralls;
- Put on the required chemical protective coveralls or rain gear;
- Put on the required chemical protective boots or boot covers;
- Tape the legs of the coveralls to the boots with duct tape;
- Put on the required chemical protective gloves;
- Tape the wrists of the protective coveralls to the gloves;
- Don the required respirator (Level C or higher) and perform appropriate fit check;
- Put hood or head covering over head and respirator straps (Level C or higher) and tape hood to facepiece; and
- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, one person must remain outside the work area to ensure that each person entering has the proper protective equipment.

### 5.4.2 Doffing Procedures

The following procedures are mandatory when Modified Level D or higher PPE is required for this project. Whenever a person leaves a Modified Level D or higher work site, the following decontamination sequence will be followed:

- Upon entering the contamination reduction zone, rinse contaminated materials from the boots or remove contaminated boot covers;
- Clean reusable protective equipment;
- Remove protective garments, equipment, and respirator (Level C or higher). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels;
- Wash hands, face and neck or shower (if necessary);
- Proceed to clean area and dress in clean clothing; and
- Clean and disinfect respirator (Level C or higher) for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags, labeled for disposal. See Section 7 for detailed information on decontamination stations.

## 5.5 Selection Matrix

The level of personal protection selected will be based upon real-time air monitoring of the work environment and an assessment by the SS/HSS of the potential for skin contact with impacted materials. The PPE selection matrix is given in Table 5-1. This matrix is based on information available at the time this plan was written. The Airborne Constituent Action Levels in Table 8-1 should be used to verify the need for upgrade and downgrade of PPE.

**TABLE 5-1**
**PPE SELECTION MATRIX**

| Task | Anticipated Minimum Level of Protection for Task Initiation |
|---|---|
| Site inspection, data collection, observation activities, mobilization | Level D with boots and gloves as necessary |
| Activities requiring handling of ground water, leachate, surface water, and sediment | Modified Level D |
| Leachate loading and transfer | Modified Level D |
| Leachate system maintenance, pump removal, repair, and replacement, and leachate collection tank maintenance activities | Modified Level D |
| Cap, french drain, drainage trough, and fence line maintenance | Level D |

| Task | Anticipated Minimum Level of Protection for Task Initiation |
|---|---|
| Snow removal | Level D |
| Confined space entry activities | Modified Level D |
| Ground-water Sampling/Elevation Measurement Activities | Modified Level D |
| Equipment Cleaning/Chemical Handling | Modified Level D |

# 6. Site Control

## 6.1 Authorization to Enter

All personnel who are potentially exposed to hazardous substances must have completed hazardous waste operations initial training as defined under OSHA Regulation 29 CFR 1910.120, have completed their training or refresher training within the past 12 months, and have been certified by a physician as fit for hazardous waste operations in order to enter a Site area designated as an EZ or CRZ. Personnel without such training or medical certification may enter the designated SZ only. The SS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed within the EZ or CRZ.

## 6.2 Site Orientation and Hazard Briefing

No person will be allowed in the general work area during Site operations without first being given a Site orientation and hazard briefing. This orientation will be presented by the HSS, and will consist of a review of this HSCP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. In addition to this meeting, Daily Safety Meetings will be held each day before work begins.

All people on the Site, including visitors, must document their attendance to this briefing as well as the Daily Safety Meetings on the forms included with this plan.

## 6.3 Certification Documents

A training and medical file may be established for the project and kept on site during all Site operations. The 24 or 40-hour training, update, and specialty training [first-aid/cardiopulmonary resuscitation (CPR)] certificates, as well as current medical clearance for all project field personnel, will be maintained within that file. All prime contractor and subcontractor personnel must provide their training and medical documentation to the HSS prior to the start of field work.

## 6.4 Entry Log

A log-in/log-out sheet will be maintained at the Site by the SS. Personnel must sign in and out on a log sheet as they enter and leave the CRZ, and the SS may document entry and exit in the field notebook.

## 6.5 Entry Requirements

In addition to the authorization, hazard briefing and certification requirements listed above, no person will be allowed on any prime contractor field Site unless he or she is wearing the minimum SZ PPE as described in Section 5. Personnel entering the EZ or CRZ must wear the required PPE for those locations.

## 6.6 Emergency Entry and Exit

People who must enter the Site on an emergency basis will be briefed of the hazards by the SS. All hazardous activities will cease in the event of an emergency and any sources of emissions will be controlled, if possible.

People exiting the Site because of an emergency will gather in a safe area for a head count. The SS is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

## 6.7 Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas. Contamination control zones will be established in the field and based on prevailing site and work conditions. Contamination control zones may be established during leachate handling operation, monitoring activities, or maintenance activities. Figure 1 presents a map of the various site features, including areas where contamination reduction zones may be established during site activities.

### 6.7.1 Exclusion Zone

The EZ consists of the specific work area, or may be the entire area of suspected contamination. All employees entering the EZ must use the required PPE, and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. The location of each exclusion zone may be identified by cones, caution tape, or other appropriate means.

### 6.7.2 Contamination Reduction Zone

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the SZ.

### 6.7.3 Support Zone

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to Site requirements.

### 6.7.4 Posting

Where necessary, the EZ, CRZ, and SZ will be prominently marked and delineated using cones, caution tape, or other suitable means.

## 6.8 Site Inspections

The Site supervisor will conduct a daily inspection of Site activities, equipment, and zone set up to verify that the required elements are in place. The inspection form in Appendix G-2 may be used as a guide for daily inspections.

# 7. Decontamination

## 7.1 Personnel Decontamination

All personnel wearing Modified Level D or Level C protective equipment in the contaminated zone must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations.

***Station 1***: Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.

***Station 2***: Personnel will remove their outer garment and gloves and deposit them in the lined waste receptacles. Personnel will then decontaminate their hard hats, and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.

***Station 3***: Personnel will thoroughly wash their hands and face before leaving the decontamination zone. Respirators will be sanitized and then placed in a clean plastic ziplock bag.

The SS/HSS will verify that appropriate decontamination procedures have been performed for personnel entering the SZ after wearing Modified Level D or Level C protective equipment during site activities.

## 7.2 Equipment Decontamination

All vehicles that have entered the contaminated zone will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

## 7.3 Personal Protective Equipment Decontamination

Where and whenever possible, single use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers.

Reusable protective clothing will be rinsed at the Site with detergent and water. The rinsate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves and covers must be thoroughly cleaned at the end of each work shift, and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water, or by using a spray disinfectant.

# 8. Site Monitoring

## 8.1 Air Monitoring

Air monitoring will be conducted to evaluate airborne contaminant levels. Personal exposure monitoring may be necessary to evaluate employee exposures. The monitoring results will dictate work procedures and the selection of PPE. The monitoring devices to be used, at a minimum, are a photo ionization detector (PID). Colorimetric tubes (Drager or equivalent) shall be utilized to screen for methylene chloride and benzene. During confined space entry and excavation entry activities a combustible gas/oxygen (LEL/$O_2$) meter and hydrogen sulfide/carbon monoxide monitor must be utilized.

If the prime contractor and one or more prime contractor subcontractors are working in an area, one subcontractor may conduct direct-reading air monitoring and share the results with the other subcontractors working in the area. In this situation all subcontractors must coordinate air monitoring through a mutually-agreed upon air monitor. The prime contractor HSS will be responsible for utilizing the air monitoring results to determine appropriate health and safety precautions for prime contractor personnel only.

Monitoring for organic vapors for the purpose of estimating worker exposure level will be conducted in the breathing zone with the PID (note: an 11.7 eV probe shall be used for methylene chloride monitoring) during all field activities with the potential for organic vapor generation. At a minimum, readings will be recorded at least hourly or more frequently as determined by the HSS. Air monitoring data must be recorded on an air monitoring log (Appendix G-4) or in the field notebook by the HSS.

## 8.2 Personal Air Monitoring for Methylene Chloride and Benzene

To quantify the potential exposure of Site personnel to methylene chloride and benzene in air during this project, a personal air sampling plan to determine airborne concentrations of methylene chloride and benzene will be implemented by each employer on-site. The following paragraphs outline the frequency, sampling, analytical, and record-keeping requirements associated with personal air sampling during this project. The requirements of 29 CFR 1910.1052 must also be met for methylene chloride. The requirements of 29 CFR 1910.1028 must also be met for benzene.

If the action level of 12.5 ppm for methylene chloride and 0.5 ppm for benzene, as determined with colorimetric tube monitoring, is exceeded, personal air sampling will be conducted in the areas of the Site where the action level for the respective material was exceeded. Methylene chloride will be monitored using an 11.7 eV probe. Personal air samples for methylene chloride or benzene will be collected for at least 20% of representative employees working in or around the Site activities. Additional personal sampling may be required during on-site activities based on the results of the initial personal air monitoring assessment. Monitoring frequency for methylene chloride will be based on the requirements of 29 CFR 1910.1052 and benzene based on the requirements of 29 CFR 1910.1028.

Personal samples for methylene chloride will be collected according to NIOSH Method #1005 or equivalent. Personal samples for benzene will be collected according to NIOSH Method #1501 or equivalent with a dosimeter badge. Methylene chloride samples will be collected utilizing a personal sample pump equipped with two charcoal tubes. The sample pump must be calibrated prior to and following sample collection to a flow rate between 0.01-0.2 liters/minute with a representative sampler in place. Organic vapor dosimeter badges do not require calibration prior to use.

All personal samples will be submitted to an independent, American Industrial Hygiene Association-accredited laboratory for analysis. Accompanying media blanks also will be submitted to the laboratory for analysis at a rate of one blank for every five samples. Holding time requirements and field preparation procedures as specified in the respective NIOSH method will be followed.

### 8.3 Noise Monitoring

Noise monitoring will be conducted as required to profile noise exposure on the Site. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

### 8.4 Monitoring Equipment Maintenance and Calibration

All direct reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments which are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the HSS and maintained by the SS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturers' procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturers' procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the HSS must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The HSS will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

### 8.5 Action Levels

Table 8-1 presents airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the Site.

**TABLE 8-1**
**AIRBORNE CONTAMINANT ACTION LEVELS**

| Parameter | Reading | Action |
|---|---|---|
| Total Organic Vapors (TOV) | 0 ppm to ≤ 1 ppm | Normal operations; continue hourly breathing zone monitoring |
| | > 1 ppm to 50 ppm | Upgrade to Level C; collect Drager Tube samples for benzene; if these constituents are not present above action levels, utilize Level C PPE |
| | > 12.5 ppm | Collect colorimetric tube for methylene chloride |
| | > 50 ppm | Stop work; evacuate area; investigate cause of reading or Upgrade to level B; determine level at downwind property boundary and Site control zone |
| Methylene Chloride | > 12.5 ppm | Initiate personal sampling for methylene chloride |
| | < 25 ppm | Modified Level D or Level C PPE-Based on TOV action Levels |
| | > 25 ppm to < 500 ppm | Level B PPE |
| | >500 ppm | Cease operations implement vapor source controls |
| Benzene | < 0.5 ppm | Modified Level D or Level C PPE-Based on TOV action Levels |
| | > 0.5 ppm to < 10 ppm | Level C PPE, Initiate personal sampling for benzene |
| | > 10 ppm | Cease operations implement vapor source controls |
| Flammable Vapors (LEL) During confined space entry. | < 10% LEL | Normal operations |
| | ≥ 10% LEL | Stop work; ventilate area; investigate source of vapors |
| Oxygen During confined space entry. | > 19.5%, < 23.5% | Acceptable Condition, Normal Operations |
| | < 19.5%, > 23.5% | Stop work; evacuate area; ventilate |
| Carbon Monoxide During confined space entry. | < 20 ppm | Normal operations |
| | ≥ 20 ppm | Stop work; ventilate area; investigate source |
| Hydrogen Sulfide During confined space entry. | < 5 ppm | Normal operations |
| | ≥ 5 ppm | Stop work; ventilate area; investigate source |

Notes:

1) Readings for TOV are for two consecutive minutes, at breathing zone height, measured with a calibrated photoionization detector.

# 9. Employee Training

## 9.1 General

All on-site project personnel who work in areas where they may be exposed to Site constituents must be trained as required by OSHA Regulation 29 CFR 1910.120. Such field employees also receive a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their training more than 12 months prior to the start of the project must have completed an 8-hour refresher course within the past 12 months. The prime contractor SS must have completed an additional 8 hours of training for supervisors, and must have a current first-aid/CPR certificate.

## 9.2 Basic 40-Hour Course

The following is a list of the topics typically covered in a 40-hour training course:

- general safety procedures;
- physical hazards (fall protection, noise, heat stress, cold stress);
- names and job descriptions of key personnel responsible for Site HS;
- safety, health, and other hazards typically present at hazardous waste sites;
- use, application and limitations of PPE;
- work practices by which employees can minimize risks from hazards;
- safe use of engineering controls and equipment on site;
- medical surveillance requirements;
- recognition of symptoms and signs which might indicate overexposure to hazards;
- worker right-to-know (Hazard Communication OSHA 1910.1200);
- routes of exposure to constituents;
- engineering controls and safe work practices;
- components of a Site HS program and HSCP;
- decontamination practices for personnel and equipment;
- confined-space entry procedures; and
- general emergency response procedures.

### 9.3 Supervisor Course

Management and supervisors receive an additional eight hours of training which typically includes:

- general Site safety and health procedures;
- PPE programs; and
- air monitoring techniques.

### 9.4 Site-Specific Training

Site-specific training will be accomplished by each Site worker reading this HSCP, or through a Site briefing by the PM, SS, or HSS on the contents of this HSCP before work begins. The review must include a discussion of the chemical, physical, and biological hazards, the protective equipment and safety procedures, and emergency procedures.

### 9.5 Daily Safety Meetings

Daily Safety Meetings will be held to cover the work to be accomplished, the hazards anticipated, the protective clothing and procedures required to minimize Site hazards, and emergency procedures. These meetings should be presented by the SS or HSS prior to beginning the day's field work. No work will be performed in an EZ before the Daily Safety Meeting has been held. The Daily Safety Meeting must also be held prior to new tasks, and repeated if new hazards are encountered. The Daily Safety Meeting Log is included in Appendix L-5.

### 9.6 First Aid and CPR

Employees current in first aid/CPR will be assigned to the work crew and will be on the Site during operations. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

# 10. Medical Surveillance

## 10.1 Medical Examination

All personnel who are potentially exposed to Site constituents must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

### 10.1.1 Preplacement Medical Examination

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable OSHA Regulations. The preplacement and periodic medical examinations typically include the following elements:

- medical and occupational history questionnaire;
- physical examination;
- complete blood count, with differential;
- liver enzyme profile;
- chest X-ray, at a frequency determined by the physician;
- pulmonary function test;
- audiogram;
- electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination;
- drug and alcohol screening, as required by job assignment;
- visual acuity; and
- follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project Site work.

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Subcontractors will supply copies of the medical examination certificate for each on-site employee.

### 10.1.2 Other Medical Examination

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- at employee request after known or suspected exposure to toxic or hazardous materials;

- at the discretion of the client, HS professional, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials; and

- at the discretion of the occupational physician.

### 10.1.3 Periodic Exam

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 18 months.

## 10.2 Medical Restriction

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the HSS. The terms of the restriction will be discussed with the employee and the supervisor.

# 11. Emergency Procedures

## 11.1 General

Prior to the start of operations, the work area will be evaluated for the potential for fire, constituent release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the SS/HSS immediately.

The SS/HSS will establish evacuation routes and assembly areas for the Site. All personnel entering the Site will be informed of this route and the assembly area.

Additional emergency response procedure information is presented in Section 6 of the Work Plan.

## 11.2 Emergency Response

If an incident occurs, the following steps will be taken:

- the SS/HSS will evaluate the incident and assess the need for assistance and/or evacuation;
- the SS/HSS will call for outside assistance as needed;
- the SS/HSS will ensure the PM is notified promptly of the incident; and
- the SS/HSS will take appropriate measures to stabilize the incident scene.

### 11.2.1 Fire

In the case of a fire on the Site, the SS/HSS will assess the situation and direct fire-fighting activities. A fire extinguisher is maintained in the equipment storage shed on site. The SS/HSS will ensure that the client Site representative (as appropriate) is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that Site personnel are unable to safely extinguish, the local fire department will be summoned.

### 11.2.2 Constituent Release

In the event of a constituent release, the following steps will be taken:

- notify SS/HSS immediately;
- evacuate immediate area of release;
- conduct air monitoring to determine needed level of PPE; and
- don required level of PPE and prepare to implement control procedures.

The SS/HSS has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

In the event of a release, the occurance will be reported to the SS/HSS, who will notify the Project Manager. The Project Manager will notify de maximis, inc., who will notify the appropriate regulatory agencies. If de maximis, inc., who will notify the appropriate regulatory agencies, is not available, the USEPA Remedial Project Manager will be notified.

The area affected by the release will be restricted to access by only those personnel involved in its characterization or cleanup. All others will be required to maintain a safe distance from the area of the release, as determined in the field. If Site evacuation is necessary, either the east or west gate can be used, provided that egress from these locations is determined to be safe.

Site personnel will periodically review emergency procedures with subcontractors, and establish appropriate protocols for emergency response and evacuation.

## 11.3 Medical Emergency

All employee injuries must be promptly reported to the HSS/SS, who will:

- ensure that the injured employee receives prompt first aid and medical attention;
- in emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room); and
- EMR is to be notified by Site personnel as soon as possible after the worker has left the Site. The caller should dial 1-800-229-3674 and follow the instructions for reaching the Injury Management office. When the Case Manager answers, the caller should provide the information requested by the Case Manager.

### 11.3.1 First Aid - General

All persons must report any near-miss incident, accident, injury, or illness to their immediate supervisor or the SS. First aid will be provided by trained personnel. Injuries and illnesses requiring medical treatment must be documented. The SS must conduct an accident investigation as soon as emergency conditions no longer exist and first-aid and/or medical treatment has been ensured. These two reports must be completed and submitted to the PM within 24 hours after the incident.

If first-aid treatment is required, first aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured should be transported to the medical facility. If the injured is not ambulatory, or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

- ***Survey the scene.*** Determine if it is safe to proceed. Try to determine if the conditions which caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.
- ***Do a primary survey of the victim.*** Check for **airway** obstruction, **breathing**, and **pulse**. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- ***Phone Emergency Medical Services (EMS).*** Give the location, telephone number used, caller's name, what happened, number of victims, victims' condition, and help being given.

- ***Maintain airway and perform rescue breathing*** as necessary.
- ***Perform cardiopulmonary resuscitation (CPR)*** as necessary.
- ***Do a secondary survey of the victim.*** Check **vital signs** and do a **head-to-toe exam.**
- ***Treat other conditions as necessary.*** If the victim can be moved, take him to a location away from the work area where EMS can gain access.

### 11.3.2 First Aid - Inhalation

Any employee complaining of symptoms of chemical overexposure as described in Section 3 will be removed from the work area and transported to the designated medical facility for examination and treatment.

### 11.3.3 First Aid - Ingestion

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information, if recommended. If unconscious, keep the victim on his side and clear the airway if vomiting occurs.

### 11.3.4 First Aid - Skin Contact

Project personnel who have had skin contact with constituents will, unless the contact is severe, proceed through the decontamination zone, to the wash-up area. Personnel will remove any contaminated clothing, and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he shows any sign of skin reddening, irritation, or if he requests a medical examination.

### 11.3.5 First Aid - Eye Contact

Project personnel who have had constituents splashed in their eyes or who have experienced eye irritation while in the contaminated zone, must immediately proceed to the eyewash station, set up in the decontamination zone. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

## 11.4 Reporting Injuries and Illnesses

All injuries and illnesses, however minor, will be reported to the SS immediately. The SS will complete an Accident Investigation Report (Appendix L-6) and submit it to the PM within 24 hours.

## 11.5 Emergency Information

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the Daily Safety Meeting. These agencies are identified in the following table.

## 11.6 Emergency Medical Care

The route to Oswego Hospital is presented on Figure 2. This route should be used if it is necessary to transport personnel requiring emergency medical care to the hospital.

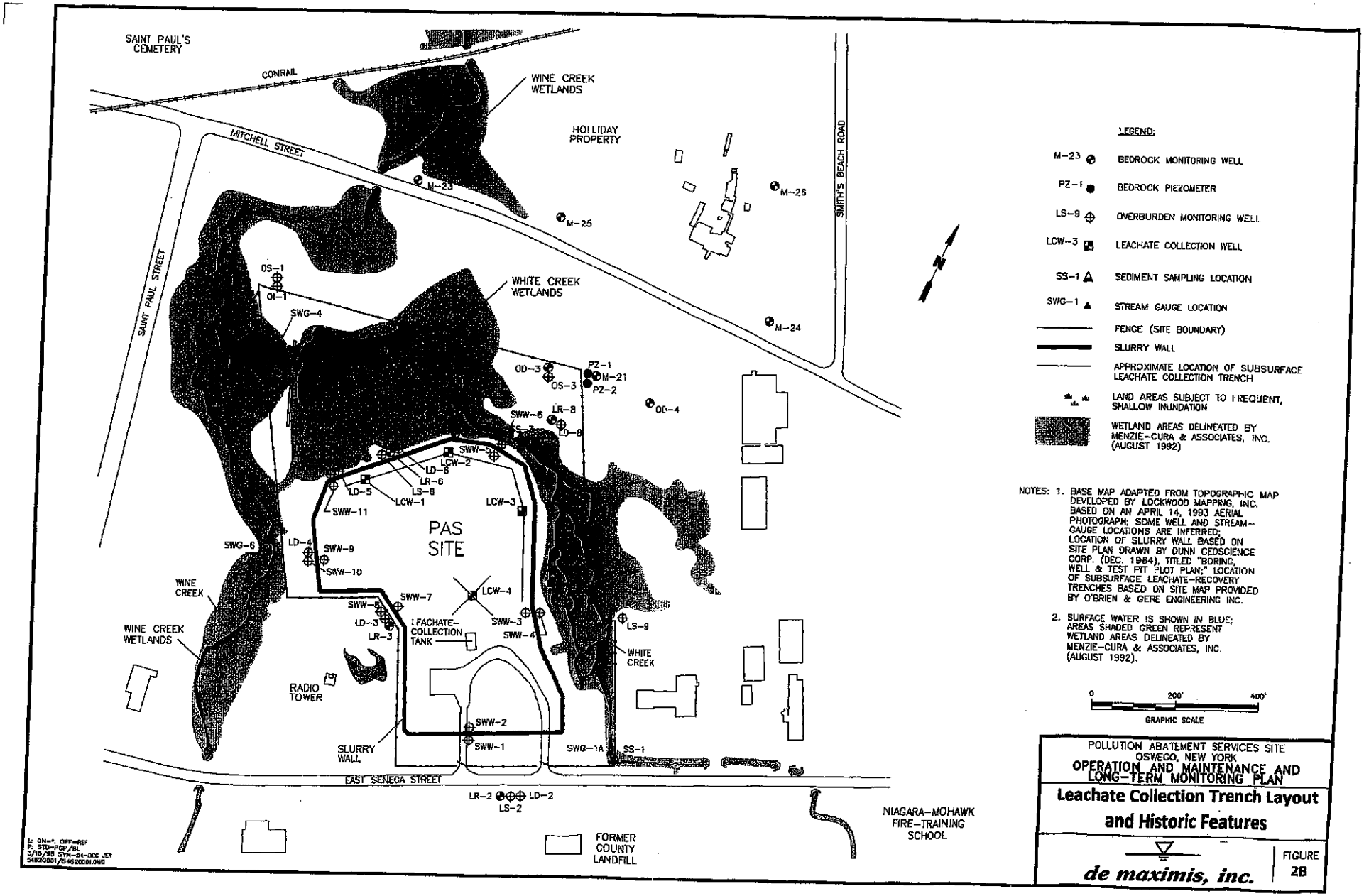
**TABLE 11-1**

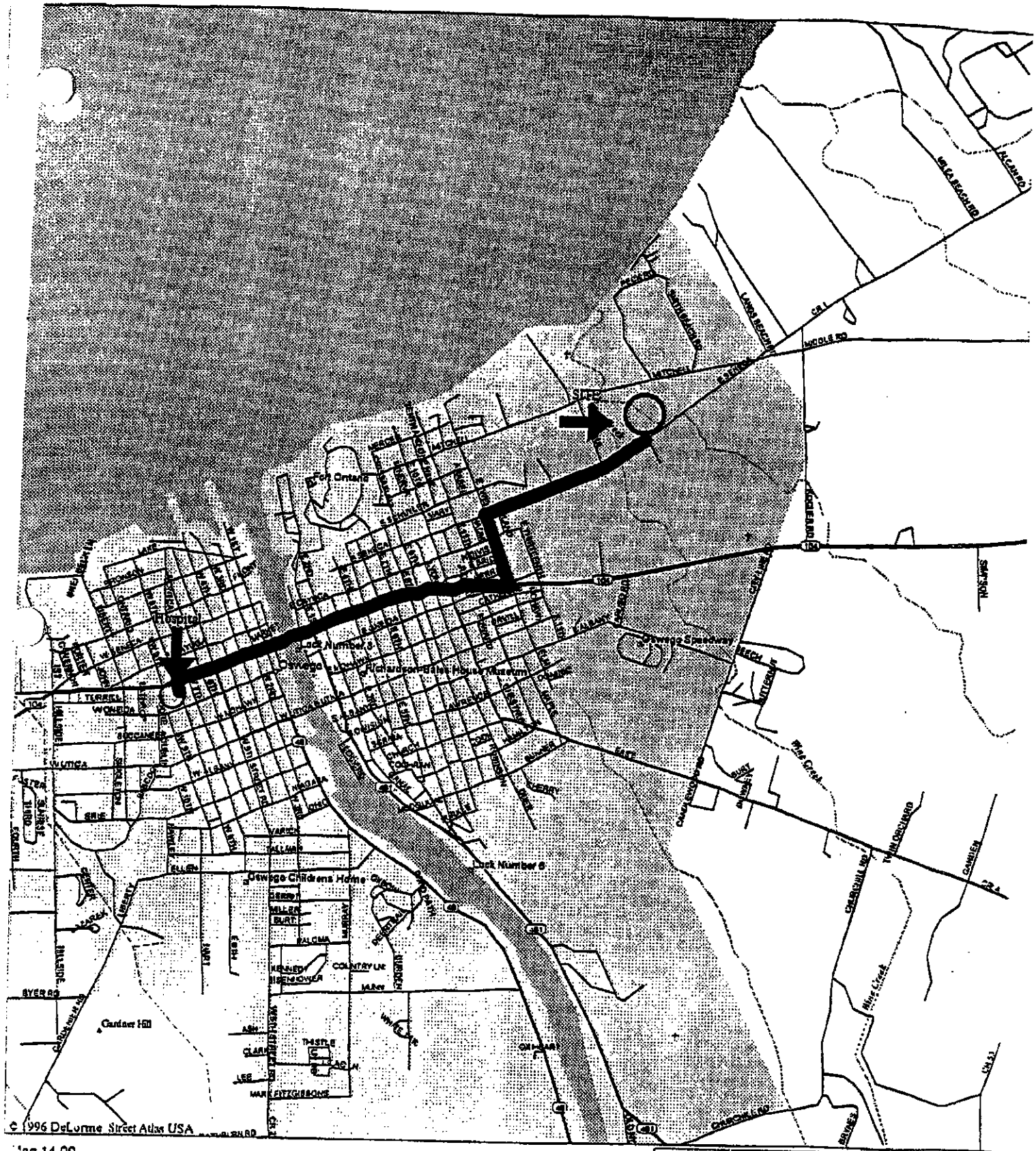
**Health and Safety Plan**
**Emergency Response Contact List**

| Agency | Contact/Function | Phone Number |
|---|---|---|
| Oswego Town Fire | Report Fire | (315) 343-0220 |
| | If busy or no answer | (315) 343-8571 |
| Oswego County Ambulance | Ambulance | (315) 343-1313 |
| Oswego Hospital<br>West Bridge Street<br>Oswego, NY | Hospital | (315) 349-5511 |
| **Contingency Plan Contact List** | | |
| Oswego County Sheriffs Dept. | Report Incidents | (315) 343-5490 |
| State Police | Report Incidents | (315) 593-1223 |
| **National Emergency Contact List** | | |
| USEPA Emergency Response Team, Region 2 | | (732) 548-8730 |
| Chemtrec - Chemical Emergencies<br>(Washington, D.C.) | | (800) 424-9300 |
| National Poison Control | | (800) 252-5655 |
| National Foam Center - Emergency Response<br>(Pennsylvania) | | (215) 363-1400 |
| **Utility Telephone Contact List** | | |
| Niagara Mohawk Power Corporation | | (315) 474-1511 |
| Oswego Town Supervisor | | (315) 343-2424 |
| New York Telephone Company | Emergency | (607) 272-1834<br>(800) 722-2300 |
| Underground Utility (UFPO)<br>3650 James Street<br>Syracuse, New York | | (800) 962-7962 |
| **New York State Department of Environmental Conservation Contact List** | | |
| Oil Spill or Hazardous Material Spill | | (800) 457-7362 |

Note: See Table 2-1 of this HSCP for telephone numbers of key client and prime contractor personnel associated with this project.

# *Figures*
# *Health and Safety Contingency Plan*


SAINT PAUL'S CEMETERY
CONRAIL
WINE CREEK WETLANDS
HOLLIDAY PROPERTY
MITCHELL STREET
SMITH'S BEACH ROAD
SAINT PAUL STREET
M-23
M-25
M-26
M-24
OS-1
OI-1
SWG-4
WHITE CREEK WETLANDS
OD-3
OS-3
PZ-1
M-21
PZ-2
OD-4
LR-8
LD-8
SWW-6
SWW-5
LCW-2
LD-6
LR-6
LS-8
LD-5
LCW-1
SWW-11
LCW-3
PAS SITE
SWG-6
LD-4
SWW-9
SWW-10
WINE CREEK
SWW-8
SWW-7
LCW-4
LD-3
LR-3
LEACHATE-COLLECTION TANK
SWW-3
SWW-4
LS-9
WHITE CREEK
WINE CREEK WETLANDS
RADIO TOWER
SWW-2
SWW-1
SLURRY WALL
SWG-1A
SS-1
EAST SENECA STREET
LR-2
LD-2
LS-2
NIAGARA-MOHAWK FIRE-TRAINING SCHOOL
FORMER COUNTY LANDFILL
LEGEND:
M-23 BEDROCK MONITORING WELL
PZ-1 BEDROCK PIEZOMETER
LS-9 OVERBURDEN MONITORING WELL
LCW-3 LEACHATE COLLECTION WELL
SS-1 SEDIMENT SAMPLING LOCATION
SWG-1 STREAM GAUGE LOCATION
FENCE (SITE BOUNDARY)
SLURRY WALL
APPROXIMATE LOCATION OF SUBSURFACE LEACHATE COLLECTION TRENCH
LAND AREAS SUBJECT TO FREQUENT, SHALLOW INUNDATION
WETLAND AREAS DELINEATED BY MENZIE-CURA & ASSOCIATES, INC. (AUGUST 1992)
NOTES: 1. BASE MAP ADAPTED FROM TOPOGRAPHIC MAP DEVELOPED BY LOCKWOOD MAPPING, INC. BASED ON AN APRIL 14, 1993 AERIAL PHOTOGRAPH; SOME WELL AND STREAM-GAUGE LOCATIONS ARE INFERRED; LOCATION OF SLURRY WALL BASED ON SITE PLAN DRAWN BY DUNN GEOSCIENCE CORP. (DEC. 1984), TITLED "BORING, WELL & TEST PIT PLOT PLAN;" LOCATION OF SUBSURFACE LEACHATE-RECOVERY TRENCHES BASED ON SITE MAP PROVIDED BY O'BRIEN & GERE ENGINEERING INC.
2. SURFACE WATER IS SHOWN IN BLUE; AREAS SHADED GREEN REPRESENT WETLAND AREAS DELINEATED BY MENZIE-CURA & ASSOCIATES, INC. (AUGUST 1992).
0 200' 400'
GRAPHIC SCALE
POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK
OPERATION AND MAINTENANCE AND LONG-TERM MONITORING PLAN
Leachate Collection Trench Layout and Historic Features
de maximis, inc.
FIGURE 2B


SITE
Fort Ontario
Hospital
Oswego
Richardson-Bates House Museum
Lock Number 8
Oswego Childrens Home
Gardner Hill
Oswego Speedway
WEST SIDE
EAST SIDE
WEST
EAST
NORTH
SOUTH
MAIN
BRIDGE
WATER
CENTER
BRIDGE
BRIDGE
BRIDGE

# *Appendices*
# *Health and Safety Contingency Plan*

# *Appendix G-1*
# *Prime Contractor Corporate Health and Safety Policy And Procedure Manual*

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# Health & Safety Manual - Vol. 3


## *1.00 HEALTH & SAFETY*

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# 1.01 Administration

| | TOPIC: | PPM# |
|---|---|---|
| Policy & Procedure Memo | POLICY | 1.01.01 |
| | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

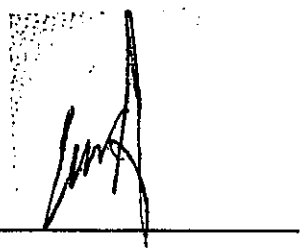
It is the policy of the Firm to provide a safe and healthful work environment for all of its employees.

A fundamental principle of safety and loss prevention is that accidents that cause personal injury or illnesses as well as property damage can be prevented. Such accident prevention is both a moral obligation and a sound business practice. In fulfilling the commitment to prevent accidents, the Firm will strive to provide and maintain a safe and healthful work environment as indicated by acceptable industry standards and compliance with legislative requirements. The Firm will strive to eliminate or control any foreseeable hazards which may result in fires, security losses, property damage/accident losses, and personal injuries and illnesses.

The active support and participation of every employee is required to achieve the best results in safety and health. To accomplish this, management and supervisory personnel must set the example and be scrupulous in their observation of good safety and health practices. Employees, in turn, are equally responsible for minimizing accidents and property losses while conducting their work activities.

We trust that each and every employee will join us in a personal commitment to accident prevention as a way of life.

**- END OF PROCEDURE -**

Executive Authorization: 

Date: 11/10/93

| BBL | TOPIC: | PPM# |
|---|---|---|
| | ORGANIZATION AND RESPONSIBILITIES | 1.01.03 |
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees and will abide by applicable state and federal agency regulations governing occupational health and safety. In order to effectively implement the Corporate Health and Safety Program and associated operating procedures, a corporate health and safety organizational structure for health and safety personnel has been established.

## DESCRIPTION OF PROCEDURE:

### 1. ROLES

#### A. Corporate Industrial Hygiene/Environmental Safety Associate

The Corporate Industrial Hygiene/Environmental Safety Associate (CSA) administers all corporate health and safety policies, procedures and activities. The CSA reports to the Divisional Executive Vice President. The CSA in association with divisional and departmental personnel implement, maintain and enforce the corporate health and safety program. The CSA is assisted in each region by a Regional Health and Safety Coordinator and in each division by a Divisional Health and Safety Coordinator.

#### B. Regional Health and Safety Coordinator

The Regional Health and Safety Coordinators (RHSC) are responsible for Corporate Health and Safety program implementation and activities on a regional basis (North and Central Region, South and West Region). The RHSCs report to the CSA and serve as a liaison between the Divisional Health and Safety Coordinators and the CSA. Responsibilities include:

- Health & Safety Plan preparation, review, and approval;
- Injury investigation and case management;
- Training of internal staff;
- Technical support of projects;
- Medical Program implementation; and
- Industrial hygiene/health and safety consulting.

#### C. Division Health and Safety Coordinator

Division Health and Safety Coordinators (DHSC) assist in implementing health and safety programs, procedures and policies for their respective divisions, and not responsible for communicating those policies and procedures to the division staff. The DHSC coordinates health and safety training, maintains divisional health and safety records, and assists project managers in compliance with established policies and procedures. They are also responsible for the implementation of the company's hazard communication program and providing newly hired divisional personnel with safety orientation. The DHSC reports to the RHSC on health and safety matters.

#### D. Manager, Human Resources

The Manager, Human Resources works in cooperation with Health & Safety Division staff to ensure that specific aspects of the corporate health and safety program are fulfilled. Generally, the HR Manager assists

in pre-placement and termination activities to ensure fulfillment of medical monitoring program requirements.

### E. Company Officers/Division Heads

Company officers and division heads support—and are ultimately responsible for—the corporate health and safety program by insuring that the necessary personnel, materials and financial resources are available to support program elements. These elements include such items as initial health and safety training, medical clearances, policies and procedures, and personal protective equipment.

### F. Medical Program Coordinators

The Medical Program Coordinators (MPCs) are responsible for assisting the DHSC with medical monitoring program components. This includes scheduling and coordinating medical examinations for newly hired employees and existing staff. MPCs also prepare the Medical Summary report for review by the Corporate Safety Associate.

### G. Health and Safety Supervisor

The Health and Safety Supervisor (HSS) serves as the designated health and safety representative on the project site. Responsibilities include the communication of site-specific health and safety plan requirements to all BBL site personnel and enforcement of the health and safety requirements for BBL employees.

## 2. POSITION-SPECIFIC HEALTH AND SAFETY QUALIFICATIONS AND RESPONSIBILITIES

The following are specific responsibilities associated with the above health and safety program positions.

### A. Divisional Health and Safety Coordinator

1) Qualifications

Divisional Health and Safety Coordinators must meet or maintain the following Qualifications:

- Possess a degree in a technical discipline;
- Current 40-hour, 24-hour or equivalent health and safety training;
- Current 8-hour supervisory or equivalent health and safety training;
- Attend a BBL in-house training session for DHSCs;
- Attend a BBL in-house training session for confined space entry or equivalent;
- Current CPR/First Aid Training;
- Successfully complete 29 CFR 1926 Subpart P "Competent Person" training; and
- Be a BBL employee for at least one year or have equivalent previous health and safety experience as determined by Corporate Safety Associate.

2) Responsibilities

Divisional Health and Safety Coordinators are responsible for:

- Participation in the monthly H&S conference call;

- Presenting the following health and safety orientation to new employees and documenting attendance on the New Employee Health & Safety Orientation Checklist:

  - General Health & Safety Rules
  - New employee health & safety orientation
  - Respiratory protection
  - Hazard Communication
  - Hearing Conservation
  - General Office Safety

- Maintaining health & safety training and fit testing documentation for the divisional employees;
- Informing the DHSC of project needs for HASP development/review/approval;
- Providing guidance regarding respirator selection and purchasing, coordinates respirator fit testing and documentation;
- Reviewing requests for prescription safety glasses, respirator inserts and safety shoes/boots and consulting with the employee's supervisor as appropriate regarding their purchase;
- Reviewing and signing accident investigation forms received from the HSS;
- Forwarding copies of accident investigation reports and associated medical clearances to the RHSC, CSA, Manager, Human Resources and Corporate Counsel within 48 hours of occurrence;
- Performing accident investigations for office accidents, or field accident investigations in support of the site HSS;
- Conducting a chemical inventory of hazardous substances used in the division location, laboratory or on divisional work sites;
- Approving the purchase of chemicals, adding them to the chemical inventory and maintaining the required MSDSs and labels for the chemical;
- Informing divisional employees of hazard communication requirements and enforcing hazard communication procedures;
- Assisting in the selection of proper hearing protectors for field use. On projects where a HSS has not been assigned, the DHSC assumes HSS responsibilities;
- Reviewing PPM 16.02.08 with trained permit-space entrants and attendants on a project-specific basis;
- Verifying that all confined space entrants and attendants have received Confined Space Entry training;
- Verifies that the project confined space entry supervisor fulfills all required responsibilities and completes an entry permit as required by 16.02.08;
- Reviewing copies of completed and canceled Confined Space Entry Permits and verifying that they are properly distributed and retained with the appropriate project files as specified in Section 11 of the Confined Space Entry PPM (Health & Safety Manual PPM 1.02.08), "Posting and Recordkeeping"; and
- Acts as HSS, if necessary.

## B. Manager, Human Resources

Specific health and safety activities include:

- Verifying pre-placement medical examinations are performed on all prospective field staff prior to employment, and successful examination results are obtained as a condition of employment;
- Reviewing the conditional clearance received from EMR on all prospective employees and notifying the hiring division of the conditional results;
- Discussing a suggested course of action with the employee's supervisor in the event of a medical condition that precludes field work;
- Notifying the MPC that a medical program participant is either terminating employment or is being reassigned to a new job activity which no longer requires medical program participation;
- Maintaining all H&S-related records with personnel records; and
- Jointly maintaining, along with the Corporate Safety Associate, accident investigation reports and jointly reviewing the records on an annual basis.

## C. Medical Program Coordinators

Position-specific activities include:

- Attending initial program coordination and examination scheduling training conducted by EMR;
- Scheduling and coordinating initial medical examinations for new hires, annual or biennial examinations for existing staff, termination examinations, and retesting at the direction of EMR;
- Scheduling and coordinating audiometric testing in compliance with the corporate hearing conservation program and informing employees of the need to avoid excessive noise for a period of 14 hours prior to audiometric testing;
- Scheduling First Aid/CPR Training courses, as necessary, to maintain all field personnel with current First Aid and CPR Training;
- Maintaining lists of medically cleared employees within the respective division or department; and
- Maintaining records of Medical Summaries signed by the respective employee's supervisor.

## D. Health and Safety Supervisors

1) Qualifications

Health and Safety Supervisors must maintain the following:

- Current 40-hour or equivalent health and safety training;
- Current 8-hour supervisory or equivalent health and safety training;
- Current CPR/First Aid Training;
- Attend a BBL in-house training session for HSSs; and
- Current medical qualification and respirator qualification.

### 2) Responsibilities

Health and Safety Supervisors are responsible for:

- Implementing and enforcing the site Health and Safety Plan and Corporate health and safety procedures on project sites;
- Conducting daily safety meetings and site orientations;
- Verifying that all BBL site personnel working on sites governed under 29 CFR 1910.120 are currently certified in CPR/First Aid and have received current OSHA training;
- Reviewing applicable site health and safety requirements and all components of the site-specific health and safety plan;
- Immediately reporting all accidents verbally to the RHSC, DHSC, and EMR:
- Conducting an accident investigation to determine the cause(s) of a personal injury or illness, completing the accident investigation and medical clearance forms, and forwarding the completed forms to the Corporate Safety Associate within 48 hours of the accident. All major accidents must be reported to the Corporate Safety Associate and Manager, Human Resources immediately;
- Assisting the CSA and DHSC in the development and implementation of techniques to mitigate future risk during similar operations;
- Coordinating site-specific needs with emergency response personnel and medical providers; and
- In emergency situations, assuring that the examining medical facility is adequately apprised of site conditions that caused or may have caused a medical emergency. This may include providing appropriate parties with copies of the applicable Material Safety Data Sheets (MSDS) for the chemical(s) involved.

## F. Project Managers

1) Qualifications: Project managers must meet standard BBL requirements for training and experience.

2) Responsibilities

Project Managers must:

- Direct the preparation of a project Health & Safety plan is written, and approved by Division 61 prior to commencement of project activities;
- Verify that appropriate PPE is provided to project personnel;
- Verify that project personnel are properly trained;

- Verify that an adequate number of employees are assigned duties safely;
- Verify that the "buddy system" is utilized on all sites;
- Verify that adequate equipment and materials are available to conduct work safely; and
- Verify that work hours/shifts are established so employee can conduct work safely.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** _____

| TOPIC: NEW EMPLOYEE ORIENTATION | | PPM# 1.01.04 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

This procedure sets forth the requirements for providing all new employees with an initial health and safety orientation. This applies to all new employees-temporary as well as permanent.

## DESCRIPTION OF PROCEDURE:

1. RESPONSIBILITIES

   A. Officers/Division heads are responsible for assuring that all new employees receive the initial health & safety orientation within five (5) working days of starting employment.

   B. The Divisional Health & Safety Coordinator (HSC) is responsible for presenting the initial health & safety orientation. Attendance at the initial health & safety orientation must be documented in the form of the New Employee Health & Safety Orientation Checklist. A copy of the checklist must be retained in the employee's office file, and the original forwarded to Manager, Health & Safety, along with training documentation. **[A standard form follows this procedure.]**

   C. The Divisional HSC is responsible for collecting all health & safety training documentation [i.e. OSHA 24/40-hour, supervisory, refresher, respiratory protection (fit test form), and first aid/CPR training].

2. CONTENT OF ORIENTATION

   A. As a minimum, all new employees must receive the following health & safety orientation:

      1) Review of the Health & Safety Policy Statement;
      2) General Health & Safety Rules;
      3) Office Safety;
      4) Emergency (Alarm) System, Location of Fire Alarm Boxes & Building Evacuation Routes; and
      5) Fire Extinguisher Training.

   B. In addition to the training provisions, all new employees who are hired for work on Hazardous Substance Contaminated Sites (HSCS) must receive the following as a component of their health & safety orientation:

      1) An overview of all health & safety PPMs with emphasis on Organization and Responsibilities, Health & Safety Training, Medical Surveillance, Respiratory Protection, Hazard Communication, Hearing Conversation, and Confined Space Entry.

      2) Respirator fit testing. All fit test forms must be completed and returned to the Manager, Health & Safety.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

C. All new employees who will operate a company owned or leased motor vehicle, and/or who will rent a motor vehicle while on company business must receive Motor Vehicle Safety training.

**- END OF PROCEDURE -**

Executive Authorization: 

Date: 11/10/93

| TOPIC: NEW EMPLOYEE ORIENTATION | | PPM# 1.01.04 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

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   C. The Divisional HSC is responsible for collecting all health & safety training documentation [i.e. OSHA 24/40-hour, supervisory, refresher, respiratory protection (fit test form), and first aid/CPR training].

2. CONTENT OF ORIENTATION

   A. As a minimum, all new employees must receive the following health & safety orientation:

      1) Review of the Health & Safety Policy Statement;
      2) General Health & Safety Rules;
      3) Office Safety;
      4) Emergency (Alarm) System, Location of Fire Alarm Boxes & Building Evacuation Routes; and
      5) Fire Extinguisher Training.

   B. In addition to the training provisions, all new employees who are hired for work on Hazardous Substance Contaminated Sites (HSCS) must receive the following as a component of their health & safety orientation:

      1) An overview of all health & safety PPMs with emphasis on Organization and Responsibilities, Health & Safety Training, Medical Surveillance, Respiratory Protection, Hazard Communication, Hearing Conversation, and Confined Space Entry.

      2) Respirator fit testing. All fit test forms must be completed and returned to the Manager, Health & Safety.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

C. All new employees who will operate a company owned or leased motor vehicle, and/or who will rent a motor vehicle while on company business must receive Motor Vehicle Safety training.

**- END OF PROCEDURE -**

Executive Authorization: _____

Date: 11/10/93

# NEW EMPLOYEE HEALTH & SAFETY ORIENTATION CHECKLIST

Employee: _____
First Name Middle Initial Last Name

Employee No. _____ Division _____ Office _____

Job Title _____ Social Security No. _____

## FIELD & NON-FIELD STAFF

- ☐ Health & Safety Policy Statement
- ☐ General Health & Safety Rules
- ☐ Office Safety
- ☐ Emergency (Alarm) System, Location of Fire Alarm Boxes and Building Evacuation Routes
- ☐ Fire Extinguisher Training
- ☐ Other (describe): _____

## FIELD STAFF

- ☐ Organization and Responsibilities
- ☐ Health & Safety Training
- ☐ Medical Surveillance
- ☐ Health & Safety Plan Development and Review
- ☐ Respiratory Protection
- ☐ Hazard Communication
- ☐ Confined Space Entry
- ☐ Motor Vehicle Safety
- ☐ Issue Health & Safety Guidance Manual
- ☐ Collect Prior Health & Safety Training Certifications
- ☐ Complete Field Training Acknowledgment Form
- ☐ Respirator Fit Test Form
- ☐ Other (describe): _____

_____
Employee Signature Date

_____
Instructor Signature Date

***Return Original to Manager, Health & Safety***

| TOPIC: TRAINING | | PPM# 1.01.05 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

This procedure sets forth the assignment of responsibility for ensuring that the necessary health and safety training, including the various categories of training required for all employees, is fulfilled. Copies of all health & safety training documentation must be furnished to the Manager, Health & Safety immediately upon hiring a new staff member and/or as such training is completed after employment. Such documentation includes, but is not limited to, OSHA 24/40-hour, supervisory, refresher, the Field Training Acknowledgment Form, respiratory protection, and first aid/CPR training.
All employees will be required to sign-in for each in-house health and safety training program attended.

## DESCRIPTION OF PROCEDURE:

1. RESPONSIBILITIES

   A. Officers/Division heads are responsible for assuring that employees either possess or receive the appropriate training prior to assuming the duties for which the training is required.

   B. The Divisional Health & Safety Coordinator (HSC) is responsible for presenting the following in-house training to all divisional employees:

      1) General Health & Safety Rules;
      2) New Employee Health & Safety Orientation;
      3) Respiratory Protection (field staff) including fit-testing;
      4) Hazard Communication;
      5) Hearing Conservation; and
      6) Office Safety.

   C. The Divisional HSC is responsible for documenting attendance at the above training program in the form of a sign-in sheet. A copy of the sign-in sheet must be retained in the employees' office file, and the original sign-in sheet forwarded to the Manager, Human Resources. **[Copy of sign-in sheet follows this procedure.]**

   D. Respirator fit testing must be performed on employees and fit test forms must be completed and returned to Manager, Health & Safety.

2. HAZARDOUS SUBSTANCE CONTAMINATED SITE (HSCS) OPERATIONS

   A. Basic Training Requirements

      1) All field employees must receive the appropriate combination of off-site as well as on-site training before working on any HSCS. The training is required by the Occupational Safety & Health Administration (OSHA) in 29 CFR 1910.120-Hazardous Waste Operations and Emergency Response (HAZWOPER) for all employees engaged in or supervising those engaged in the following:

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

a) Clean-up operations required by a governmental body (Federal, state, local or other) involving hazardous substances. These sites include, but are not limited to: Environmental Protection Agency (EPA) National Priority Site List (NPL), state NPL, sites recommended for the NPL, and initial investigations of government identified sites which are conducted before the presence, or absence of, hazardous substances has been ascertained;

b) Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act (RCRA); and/or

c) Voluntary clean-up operations at sites recognized by Federal, state, local and/or other governmental bodies as uncontrolled hazardous waste sites.

2) Required training consists of attendance at an 40-hour off-site health & safety training program. Following completion of the 40-hour training program, the employee must complete an additional 24-hour on-the-job training orientation under the direct supervision of a trained and experienced supervisor.

3) Reduced training consisting of attendance at an 24-hour off-site health & safety training program is acceptable for employees who are on-site only occasionally for the purpose of conducting a limited task, and/or who are unlikely to be exposed to health hazards in excess of their established occupational exposure limits. Following completion of the 24-hour training program, the employee must complete an additional 8-hour on-the-job training orientation under the direct supervision of a trained and experienced supervisor.

4) On-the-job training specified in 2 and 3 above must be documented on the Field Training Acknowledgment Form. **[Copy of the Field Training Acknowledgment Form follows this procedure].**

5) As per #3 above, 24-hour trained employees must not don respiratory protection unless additional training requirements have been met. At no time may a 24-hour trained employee don an air-supplied or self-contained breathing apparatus (SCBA) without completion of an additional 16-hours of formal off-site training.

6) Employees who can demonstrate by documentation or certification that their work experience (minimum 5-years) and/or training is equivalent to that training received by attendance at either a 24/40-hour training program may apply for equivalent training status. These individuals will be required to complete a work history questionnaire, attend an 8-hour up-date training program, and take and satisfactorily pass, a written examination. Application for equivalent training can be made by contacting the Manager, Health & Safety.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

B. Management & Supervisory Training

1) In order to qualify as a Site Health & Safety Supervisor (HSS), and/or to manage or supervise on-site activities and employees, the individual must have completed the requisite 40-hour training program (# B2 above), and have attended an additional 8-hour off-site management/supervisory training program. The additional management/supervisory training program must include the following topics:

a) The Firm's health and safety policies and procedures;
b) Site health & safety plan development and management;
c) Calculation of doses and action levels;
d) Selection and use of personal protective equipment (PPE);
e) Hazard evaluation and risk assessment;
f) Selection, use, and care of monitoring equipment;
g) Accident causation and prevention; and
h) Accident investigation.

C. Refresher Training

1) Each employee who has received the 24/40-hour training as well as those certified as having equivalent training must attend an 8-hour refresher training program at least annually. As a minimum, refresher training must include the following topics:

a) Hazard review;
b) Review of the use and care of PPE;
c) Requirements for, use of, and proper care of respiratory protective equipment; and,
d) Selected topics such as actual field experiences, accident review, health & safety task analysis, etc.

2) No employee is permitted to perform field activities unless their training is current.

D. First Aid/CPR Training

1) Employees working on HSCS, subject to 29 CFR 1910.120, and in particular, the site HSS, should have current first aid/CPR training.

2) First aid training requires updating every 3-years while CPR must be updated annually. Training in first aid and CPR will be done by American Red Cross qualified instructors or an equivalent program.

3) All first aid/CPR training programs will be coordinated by the existing Divisional Medical Program Coordinators (MPC).

[Cont'd]

## DESCRIPTION OF PROCEDURE: [Cont'd]

E. Site Specific Training

1) Prior to site entry onto a HSCS, the HSS must review pertinent site health & safety requirements as well as complete a review of the site Health & Safety Plan (HASP).

3. TRAINING RECORDS

A. A record of training must be maintained in each employees personnel file to document that the individual has received the necessary training and that the training is up-to-date.

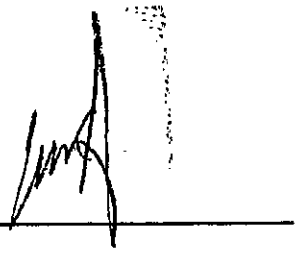
B. Training records for all employees consist of sign-in sheets for those in-house training programs listed in 1b. These sign-in sheets must be retained and disseminated as outlined in 1c.

C. Training records for field employees working on HSCS consists of those listed in (b) above as well as the 24/40-hour, supervisory, and refresher training certifications, the Field Training Acknowledgment Form, training certificates for first aid/CPR and respirator fit test forms. This training documentation must be forwarded to the Manager, Health & Safety.

D. Information on 24/40-hour, supervisory, and refresher training as well as first aid/CPR and respirator fit testing will be entered in the Corporate Training Database. Certificate of Completion in the form of wallet-sized training cards will be issued to those employees entered in the database. The wallet-sized training cards will be updated and re-issued on an annual basis as the refresher course is completed.

E. All field employees are required to carry the wallet-sized training cards on their person whenever on a HSCS as proof of training. Expired training will require that the employee be requested to leave the site and not perform field work until attendance at a refresher is completed.

**- END OF PROCEDURE -**

Executive Authorization: 

Date: 11/10/93

# 8-HOUR OSHA SUPERVISORY/REFRESHER SIGN-IN SHEET

Date

| Name | Signature | Social Security No. | Division | Office |
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# FIELD TRAINING ACKNOWLEDGEMENT FORM

As per the requirements of OSHA 1910.120, Paragraph (e) Training, on-the-job field training was provided for the duration of ☐ 8 hours ☐ 24 hours (check one) while engaged in actual on-site activities. The training consisted of the following:

- ☐ Site-Specific Health & Safety Plan
- ☐ Donning/Doffing Personal Protective Equipment
- ☐ Use of Respiratory Protective Equipment
- ☐ Chemical/Physical Hazard Recognition and Avoidance
- ☐ Site Control
- ☐ Decontamination Protocol
- ☐ Injury/Illness Reporting
- ☐ Health & Safety Reporting Relationships
- ☐ Emergency/Contingency Planning
- ☐ Spill Control & Response
- ☐ Confined Space Entry (where applicable)
- ☐ Other (describe): _____

_____

_____

8 List Site Name(s) and Dates:

_____

_____

_____

_____

_____

_____

_____
Employee Signature Date

_____
Trainer Signature and/or Employer's Name Who Provided the Field Training Date

## STATEMENT OF POLICY:

This procedure details the necessary provisions for administering and coordinating the medical surveillance program. Also provided are guidelines for identifying the employee population to be included in the medical surveillance program.

Environmental Medicine Resources, Inc. (EMR) is identified as the management consulting group for our medical surveillance program. As such, EMR has the responsibility to establish the examination protocol, occupational and medical history questionnaires, and negotiate with and establish quality clinics for administering the medical examination.

Only the procedures, medical clinics, and protocols established by EMR and contractually agreed to by the Firm will be utilized in the medical surveillance program. No additional medical examinations, clinics, protocols, etc., for the purpose of fulfilling the requirements of the medical provisions outlined in the Occupational Safety and Health Administration (OSHA), 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER) are permitted unless necessary to meet site-specific conditions. Such conditions must first be discussed with the Manager, Health & Safety.

The medical surveillance program applies to employees working on Hazardous Substance Contaminated Sites (HSCS), and includes pre-placement, annual or periodic, site specific biological monitoring, emergency medical care, and termination examinations.

## DESCRIPTION OF PROCEDURE:

1. Employee Population

   A. All employees who will be performing activities on any HSCS must be included in the medical surveillance program, and have the appropriate medical clearances prior to performing any field activity on a HSCS.

   B. Any employee not having the appropriate medical clearances, are not permitted to enter an Exclusion Zone (EZ) or Contaminant Reduction Zone (CRZ) on any HSCS. Employees not having the appropriate medical clearances may, however, enter the Support Zone of a HSCS unless otherwise prohibited by the client.

2. Responsibilities

   A. Division heads/supervisors have the following responsibilities:

      1) Ensure that their Divisional employees have the proper medical clearances prior to assuming the duties for which the clearance is required.

      2) Ensure that an individual employee does not exceed, or is subjected to, a condition which would comprise any medical restriction identified by the medical surveillance program.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

B. Divisional Medical Program Coordinators (MPC) have the following responsibilities:

1) Receive the initial training in program coordination and medical examination scheduling conducted by EMR.

2) Schedule and coordinate the medical examinations for both new hires (pre-placement) and existing employees (periodic and termination).

3) Schedule and coordinate follow-ups for re-testing employees as recommended by EMR.

4) Schedule additional appointments for the purpose of collecting biological specimens as required for meeting site specific parameters.

5) Ensure that medical clearances for employees within their Division are current.

6) Provide the employees' manager/supervisor with the Medical Summary for review and signature.

C. Employees have the following responsibilities:

1) Complete the EMR medical and occupational questionnaires provided by the MPC prior to the medical examination.

2) Honor the scheduled medical examination appointment. At least 24-hour notice is expected if the appointment must be cancelled.

3) Ensure that his/her medical and respiratory clearances are current before entry on a site which requires such clearances.

4) Ensure that their field activities are within the constraints of any identified medical restriction.

D. The Manager, Health & Safety has the following responsibilities in the medical surveillance program:

1) Overall program coordination, including maintaining necessary communications with both EMR and MPC.

2) Arrange for the training of new MPC, and ensuring that each Division has a trained MPC.

3) Review Medical Summaries, including following-up on those indicating a medical restriction requiring a re-test.

4) Maintain the Corporate Medical Surveillance Tracking System.

[Cont'd]

## DESCRIPTION OF PROCEDURE: [Cont'd]

5) Issue medical/respiratory clearance cards to medically cleared employees.

6) Review and reconcile the medical invoices received from EMR.

E. The Manager, Human Resources has the following responsibilities in the medical surveillance program:

1) Ensuring that pre-placement medical examinations are performed on all prospective field staff prior to employment, and that successful passage of the examination is a condition of employment.

2) Review the Conditional Clearance received from EMR on all prospective employees, and notify the hiring office of the conditional results.

3) In the event of a medical restriction which precludes an existing employee from conducting additional field work, communicate to the employee's supervisor the recommended course of action.

4) Notify the MPC that a medical program participant is either terminating employment and/or is being reassigned to a new job activity which no longer requires medical program participation.

3. Pre-Placement and Periodic Medical Examinations

A. Medical examinations for both new hires (pre-placement) and existing employees (periodic and termination) as well as any necessary follow-up examinations will be scheduled by the Divisional MPC. Scheduling, authorization, notification, and re-scheduling any necessary follow-up examinations must follow the protocol established by EMR and communicated during the initial training program.

B. Periodic examinations must be scheduled and completed prior to the anniversary of the annual due date.

4. Site Specific Biological Parameters

A. Any additional biological monitoring, (i.e. blood leads, serum PCBs, cholinesterase, etc.) for the purpose of determining body burden both before and after site activity must be included in the site specific Health & Safety Plan (HASP).

B. Collection of biological specimens must be performed by the same medical provider established by EMR for the pre-placement and periodic examination. For remote job sites, and/or when other circumstances mandate an alternate clinic, the use of the alternate clinic must be discussed with the Manager, Health & Safety. The Manager, Health & Safety will coordinate the collection and subsequent analysis of the specimen with the MPC and EMR.

## DESCRIPTION OF PROCEDURE: [Cont'd]

C. The MPC has the responsibility for scheduling and coordinating the appointments for collection of biological specimens whenever specified in a site specific HASP.

5. Exposure/Injury Medical Emergency

A. In the event of an on-site injury or illness, employees are encouraged to seek the appropriate medical attention. The Site Health & Safety Supervisor (HSS) or designated alternate must be appraised of the emergency and the need to seek medical attention.

B. During and immediately following the emergency situation, the HSS or designated alternate have the following responsibilities:

1) Ensure that the medical facility is fully appraised of the site condition and/or hazard which caused the emergency;

2) Conduct an investigation of the site condition which caused the medical situation prior to reassigning the task;

3) Ensure that the injured/ill employee receives written medical clearance prior to return to the site; and

4) Provide a copy of the accident investigation form and medical clearance to the Manager, Health & Safety.

6. TERMINATION/REASSIGNMENT MEDICAL EXAMINATIONS

A. All employees assigned to the medical surveillance program must be offered an exit examination immediately prior to or concurrent with termination of employment.

B. All employees assigned to the medical surveillance program, and, who are reassigned to a job (i.e. promotion, transfer, etc.), which would eliminate the need for them to continue in the medical surveillance program, must have an exit examination prior to or concurrent with the reassignment.

C. Upon notification of termination and/or reassignment as described in A and B above, the MPC must provide the employee with the standard exit medical examination form letter. **[The form letter follows this procedure].**

D. Termination or exit examinations are not necessary if the prior medical examination (i.e. pre-placement and/or periodic) occurred within the preceding 6-months.

7. RESPIRATOR CERTIFICATION

A. All employees must have the appropriate medical clearance prior to donning respiratory protective equipment.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

8. MEDICAL SUMMARY REPORTS/CLEARANCE CARDS

A. A Medical Summary will be provided directly to the MPC by EMR. The MPC must provide the original Medical Summary to the employee's immediate manager/supervisor. The manager/supervisor and the employee must jointly review the Medical Summary, and acknowledge that the Medical Summary has been reviewed by signing the back of the summary letter.

B. The MPC should retain a copy of the signed Medical Summary in the employee's home office. The original signed Medical Summary must be forwarded to the Manager, Health & Safety. The Manager, Health & Safety will enter the summary information into the Corporate Medical Surveillance Tracking System, and forward the signed Medical Summary to the Manager, Human Resources.

C. Information from the Medical Summary, including medical and respiratory clearances and any medical restrictions, will be recorded on a wallet-sized Medical Clearance card and issued to the employee. The wallet-sized medical/respiratory clearance card will be updated and re-issued on an annual basis as the periodic examination is administered.

D. All employees in the medical program are <u>required</u> to carry the wallet-sized medical/respiratory clearance cards on their person whenever on a site which requires medical clearance. Expired clearance cards will require that the employee be requested to leave the site and not re-enter until proper medical clearance is re-issued.

8. <u>Medical Records</u>

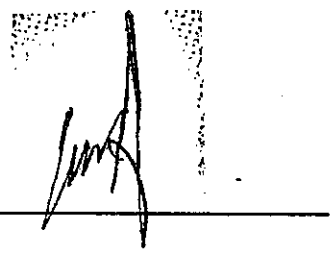
A. Comprehensive medical records will be maintained by EMR in compliance with the Occupational Safety and Health Act (OSHA) 29 CFR 1910.20 Access To Employee Exposure And Medical Records.

B. Employees may obtain a copy and/or release of their complete medical record by requesting a Release Form from the MPC and forwarding the signed release form to EMR.

C. The Medical Summary must be retained by the MPC for the period of one year, and/or discarded when replaced by a more current Medical Summary.

D. The Medical Summary will be retained by Human Resources for duration of employment, plus 30-years.

- END OF PROCEDURE -

Executive Authorization: 

Date: 11/10/93

# MEMORANDUM

**To:** EMPLOYEE NAME

**From:** PROGRAM COORDINATOR

**Re:** Exit Medical Examination

**Date:** 10/12/92

**File No:**

**cc:** M. B. Evans

[SAMPLE]

Please be advised that your last company sponsored medical examination was provided on ____DATE____. As a component of Blasland, Bouck & Lee's (BB&L) Medical Surveillance Program, an exit medical examination is being offered to each medical program participant who has not had an examination within the last six months. Offering this exit medical examination is a regulatory requirement specified in 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER).

The purpose of this letter is to inform you of our legal obligation to provide this exit examination. You are encouraged to participate in this component of our medical program, and are being requested to contact me for scheduling the exit examination. The exit examination should be scheduled prior to your last day at BB&L.

Please acknowledge your intentions regarding your participation in this component of our Medical Surveillance Program by checking the appropriate line and signing below. Please return the signed statement to me as soon as possible.

Thank you for your continued cooperation.

____ I elect to participate in the exit medical examination protocol being offered as a component of BB&L's Medical Surveillance Program. I will notify the Division Program Coordinator for scheduling the exit medical examination.

____ I have been informed of the necessity for and legal obligation of BB&L to provide me an exit medical examination. I elect not to participate in the exit medical examination protocol being offered as a component of BB&L's Medical Surveillance Program.

Signed: _____

Date: _____

| BBL Blasland, Bouck & Lee, Inc. engineers & scientists | TOPIC: HEALTH & SAFETY PLANS | PPM# 1.01.07 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

The purpose of this procedure is to establish standard requirements for the development, approval, and implementation of project-specific health and safety plans. Specific requirements include:

- All field projects subject to potential hazardous conditions require a health and safety plan.
- Health and safety plans must be prepared using the standard BBL format.
- Health and Safety Plans must be consistent with project work plans.
- All health and safety plans and addenda require the approval of a Division 61 Health and Safety professional and the Project Manager.

## DESCRIPTION OF PROCEDURE:

### Definitions:

**Health and Safety Plan (HASP)**
The name of choice for the project document that assesses project-specific hazards and prescribes appropriate control measures, including assignment of safety management responsibilities. Also known by other names such as site safety plan, safety health and emergency response plan, project safety plan, etc.

**PPE**
This abbreviation stands for personal protective equipment.

**PSE**
This abbreviation stands for Process Safety Management.

### 1. Requirement for Health and Safety Plan

All field projects with potential exposure to safety hazards, health hazards, or hazardous substances require the development, approval, and implementation of a project-specific HASP. It is the responsibility of the project manager on a project to obtain the HASP, with all required approvals, prior to commencement of field operations. The PM must also require that all project personnel read, understand, and sign the HASP. A site-specific training session may be presented in lieu of each person reading the HASP separately.

### 2. HASP Preparation

All BBL HASPs shall follow the standard format, unless the client requires a specific format which complies with applicable regulations and is at least as comprehensive in scope as the BBL format. HASPS may be drafted by operating staff personnel provided this standard format is used. A HASP which must deviate from standard format must be written by a Health & Safety Division staff member.

A. **Process Safety Management (PSM)** - BBL employees will periodically enter areas of client facilities which are regulated under the PSM standard. In this situation, specific client-driven health

and safety requirements must be incorporated in the BBL project HASP. When BBL employees will be working in a client facility which is chemical process or industrial in nature, or where the applicability of the PSM standard cannot otherwise be confirmed, a BBL Health and Safety professional shall contact the client's Health and Safety department to verify PSM applicability.

When PSM is **NOT** applicable, the information listed below shall be included in the Job Hazard Analysis section, PSM Applicability subsection of the HASP:

- Name/title of the BBL Health and Safety professional contacting the client;
- Name/title of the client Health and Safety representative;
- A statement that the client representative advised BBL that PSM is not applicable; and
- Date of the contact.

When PSM is applicable, the appropriate hazard analysis information shall be entered in the Job Hazard Analysis section of the project HASP. The site control procedures required by the client such as required safety equipment, work practices, or other hazard control methods shall be described in the Hazard Control Program section of the project HASP.

## 3. Site-Specific Standard Operating Procedures (SOP)

Certain projects may need to establish site-specific SOPs covering a number of operational issues, including safety. All SOPs covering safety issues shall be documented in the project HASP. The following issues shall be covered for each SOP:

**A. Approval Authority** - SOPs covering safety are part of the project HASP, therefore, the approval authority shall apply. This also requires complete compliance with approved SOPs until/unless an approved revision is issued.

**B. Responsible Person(s)** - The individual(s) responsible for verifying that SOP provisions are followed shall be identified.

**C. Training Requirements** - Personnel training requirements shall be established, giving consideration to those who can directly or indirectly impact operations. All required training must be completed prior to commencement of operations.

## 4. HASP Approvals

All Health and Safety Plans that will control the activities of BBL employees shall be reviewed and approved, in order, according to the approval authorities described below. Each such HASP shall have a fully executed approval page placed at the beginning of the plan to document that required approvals have been obtained.

Health and Safety Plans require specific approvals as described below. Note that all plans require the approval of a Health & Safety Division professional.

| CATEGORY | APPROVALS |
|---|---|
| **Level A or B PPE, IDLH, variance from BBL procedures, special circumstances** | **Project Manager**<br>**Regional HS Coordinator**<br>**Corporate Industrial Hygiene/Env. Safety Associate** |
| **Level C or D PPE** | **Project Manager**<br>**Project/Location HS Staff**<br>**Regional HS Coordinator/other Division 61 staff** |

Note that all Level A and B PPE HASPs shall be reviewed and approved by the Corporate Industrial Hygiene/Environmental Safety Associate.

### 5. Review of HASP by Project Staff

All project HASPs must be provided to project staff and subcontractors early enough to allow sufficient time to read and sign the HASP. New site personnel shall be given a copy of the HASP and shall be required to read and sign the HASP prior to being granted site access. Attendance at a site-specific H&S training session which covers the contents of the HASP may be substituted for reading the HASP.

### 6. HASP Review and Amendment

All project HASPs shall be reviewed and revised whenever work conditions change or a new task is added. To verify that the HASP is consistent with site activities, it should be reviewed periodically during the project. A formal review should take place every six months for ongoing projects. Whenever the plan must be modified to fit current site conditions, these changes shall be made as an amendment to the HASP. The original text shall not be deleted, but can be lined through to indicate that it is no longer applicable.

All site personnel shall receive a briefing on the amended HASP, and general refresher information on the unchanged provisions of the HASP.

All HASP amendments shall be subject to the same review and approval requirements as the original HASP.

### 7. Subcontractor HASPs

Subcontractors may work under a BBL HASP or may write their own task-specific HASPs. All subcontractor HASPs shall be reviewed by the Project Manager and the Health & Safety Division member

who wrote/reviewed the BBL HASP. Subcontractor HASPs must be consistent with the requirements of the BBL HASP.

8. **Filing of HASPs**
All project HASPs shall be retained in a project file after field work is completed. In addition, an executed copy of all project HASPs will be provided to Health & Safety Division.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 9/1/96

| TOPIC: SUBSTANCE ABUSE IN THE WORKPLACE | | PPM# 1.01.08 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: ALL |

## STATEMENT OF POLICY:

Substance abuse in the workplace impairs work productivity and morale, and can pose a serious risk of injury to people and damage to property. In order to minimize these deleterious effects, it is the policy of this Firm to maintain a drug-free workplace, and to prohibit the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance at the Firm's workplaces. This provision applies to employees while at their workplace(s), and while conducting Firm business, whatever the location. A "workplace," for purposes of this PPM, refers to wherever work is performed by an employee on behalf of the Firm, and includes both the office and any remote field site.

The use, sale, transfer or possession of alcohol or illicit drugs in or at any workplace, is prohibited, except that the use and possession of alcohol is permitted at certain social Firm functions with the prior approval of an appropriate Vice President or Executive Vice President, or the President.

No employee will be permitted to remain at a workplace when performance is affected by alcohol, illicit drugs, or other controlled substances.

Violation of this policy may result in disciplinary action, up to and including discharge.

## DESCRIPTION OF PROCEDURE:

1. As a condition to employment, or of continuing employment, as the case may be, and in accordance with the requirements of the Drug-Free Workplace Act of 1988, all employees are to provide written notice to the Firm's Manager of Human Resources, of any criminal substance abuse conviction for a violation occurring in the workplace. This notice is to be given no later than five days after such a conviction. In the event of the absence or other unavailability of the Manager of Human Resources, notification should be made to the General Counsel of the Firm.

2. If the employee has been working on any government contracts, the recipient of any such notification will along with the appropriate project manager, promptly advise the government representatives for such contracts, of the situation.

3. In addition, such recipient will promptly, after consultation with the employee, the employee's supervisor, and other appropriate personnel of the Firm:

   A. Take appropriate action concerning the employee, up to and including substance abuse testing and/or termination; and/or

   B. Require the employee to participate satisfactorily in a substance abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency.

4. In furtherance of this policy, each employee will be asked to sign a statement containing substantially the language found in the attached Exhibit "A". Employment applicants will be required to sign the statement as a condition to an offer of employment.

5. A copy of this policy is to be given to each employee who is engaged in the performance of a contract which contains a provision requiring the Firm to maintain a drug-free workplace.

[Cont'd]

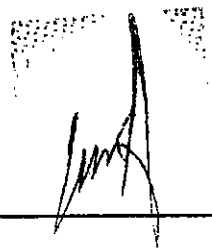
## DESCRIPTION OF PROCEDURE: [Cont'd]

6. The annual health and safety refresher training program for employees will provide a summary of the terms of this policy.

7. Employee Assistance Program

   A. The Firm provides an employee assistance program for the use of employees who require counseling and rehabilitation, including substance-related counseling and rehabilitation. As always, services are provided on a confidential basis, with some costs covered by insurance.

**- END OF PROCEDURE -**

Executive Authorization: 

Date: 11/10/93

| BBL | TOPIC: ACCIDENT REPORTING, INVESTIGATION, AND ANALYSIS | PPM#: 1.01.09 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

It's the policy of the Firm to provide a safe and healthful work environment for its employees. In the unlikely event of an accident it is essential for timely reporting, investigation, and analysis to occur in order to protect employees from future injuries and illness. Accident reporting, investigation, and analysis assists the Firm with the implementation of a proactive accident prevention and loss control program. This procedure details the necessary provisions for reporting accidents and recording investigation and analysis results. All employees of the Firm who witness or are involved in an occupational accident are required to report the accident as outlined in this procedure.

## DESCRIPTION OF PROCEDURE:

### 1. OFFICERS/DIVISION HEADS

A. Enforce all provisions of this Policy & Procedure.

### 2. CORPORATE INDUSTRIAL HYGIENE/ENVIRONMENTAL SAFETY ASSOCIATE (CSA)

A. Immediately conduct an accident investigation for any reported major accident.
B. Immediately report major accident status to Principals of the Firm and the Legal Division.
C. Review and maintain records of all accident investigation reports received from Regional Health and Safety Coordinators (RHSC).
D. Record and maintain injury and illness data for the Firm.
E. Review and coordinate involvement of the Firm's occupational physician during injury follow-up

### 3. REGIONAL HEALTH AND SAFETY COORDINATOR (RHSC)

A. Participate in accident investigation and analysis for regional personnel.
B. Provide training on accident investigation and analysis.
C. Coordinate with CSA, notification of proper authorities as required for a major accident.
D. Review and maintain records of all accident investigation reports received from Divisional Health & Safety Coordinators (DHSC) and Health & Safety Supervisors (HSS).
E. Develop corrective measures to prevent future accidents.
F. Annually review all accident investigation reports, to assist in safety program development and revision.

### 4. DIVISION HEALTH AND SAFETY COORDINATORS (DHSC)

A. Review and sign all accident investigation reports received from the HSS.
B. Immediately notify by phone the RHSC, project manager, CSA, and Human Resources in the event of an accident, an incident, a motor vehicle accident, or a major accident as defined in this procedure.
C. Forward copies of all accident investigation reports and medical clearance to the RHSC, CSA, Project Manager, Human Resources, and the Legal Division within 48 hours of occurrence.
D. Coordinate and participate in accident investigation and analysis for accidents and incidents involving divisional personnel.

E. In situations where a HSS is not assigned or available to a location or project and/or where the accident occurs within an office environment, the DHSC will assume the HSS's responsibilities listed below with respect to this procedure.

## 5. SITE SUPERVISORS

A. For any occupational injury or illness requiring treatment at a medical facility, (treatment beyond first aid), the site supervisor must arrange for transportation and prompt medical treatment.

B. Immediately after an injured employee is removed from the site for transport to the medical facility, EMR must be contacted at 1-800-229-3674 and provided with the following:

- Site Supervisor's name and phone number;
- The injured person's name;
- Nature of the injury;
- The name and phone number of the treatment facility to which the injured employee is being transported.

C. Verify that accident is investigated according to this PPM.

D. Verify that the DHSC, RHSC, project manager, Human Resources, and the Legal Department are notified of the accident.

## 6. HEALTH AND SAFETY SUPERVISORS (HSS)

A. Immediately report all accidents via phone to the DHSC, RHSC, Project Manager, and Human Resources.

B. Immediately investigate all accidents occurring directly under their control, and complete and sign an accident investigation report for each accident, incident, and/or injured person. **[A copy of the Accident Investigation Report follows this procedure]**

C. Select and implement corrective action(s) to prevent future accidents.

D. Ensure that the examining medical facility is fully appraised of the site condition and/or hazard which caused the medical emergency (i.e., if appropriate, supply medical personnel with MSDS for chemical exposures).

E. Ensure injured employees receive written medical clearance from the attending physician prior to returning to work.

F. Report all accidents to their Divisional Health and Safety Coordinator (DHSC) the same day.

G. Retain copies of the medical clearance and accident investigation report with project records.

H. Forward copies of all accident investigation reports and medical clearances to the DHSC and RHSC for review.

## 7. PROJECT MANAGERS

A. Verify that the client is informed of any accidents occurring on its project site.

B. Verify that all accidents occurring on projects under their control, are investigated according to the requirements of this PPM and the client.

C. Coordinate accident investigation activities with client representatives, if necessary.

D. Coordinate implementation of corrective action(s) to prevent future accidents.

## 8. EMPLOYEES

A. Immediately report all accidents to the HSS, project manager, or DHSC as appropriate.
B. Notify HSS or DHSC if unsafe condition(s) exist.
C. Implement corrective action(s) to prevent future accidents.

## 9. TRAINING

A. All employees will be trained concerning accident reporting through the distribution and review of this Policy & Procedure.
B. All employees will be trained, as needed, regarding their responsibilities within this procedure.
C. HSS and DHSC will receive additional training concerning accident investigation methods.
D. Training will be provided as needed to keep employees informed of changes in this procedure.

## 10. RECORDKEEPING

A. Accident investigation reports will be jointly maintained by the CSA and Manager, Human Resources for annual review.
B. Accident investigation reports and injury data will be maintained for five years after the year of occurrence.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 10/10/96

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

# ACCIDENT INVESTIGATION REPORT

Date of Report _____ Date of Accident _____ Time of Accident _____

Employee's Name _____ Title _____

Address _____ Employee # _____

City _____ State _____ Zip Code _____

Age _____ Sex _____ Marital Status _____

Date of Hire _____ Social Security # _____ # of Dependents _____

**Description of Accident:** _____

_____

_____

**Description of Injuries:** _____

_____

_____

**Witnesses:** _____

Injuries Required:

☐ First Aid (At Scene) ☐ Emergency Room Treatment ☐ Hospitalization

First Aid Provided By _____

Medical Facility/Address _____

Attending Physician _____

Did Employee Return to Work?

☐ Yes ☐ No If Yes, Give Date _____

Did Employee Lose Time at Work?

☐ Yes ☐ No If Yes, Give Amount _____

**Actions or Conditions Causing Accident:** _____

_____

**Corrective Actions:** _____

_____

**Further Comments:** _____

_____

Employee Signature _____ Date _____

| BBL | TOPIC: ORGANIZATION AND RESPONSIBILITIES | PPM# 1.01.10 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees and will abide by applicable state and federal agency regulations governing occupational health and safety. In order to effectively implement the Corporate Health and Safety Program and associated operating procedures, a corporate health and safety organizational structure for health and safety personnel has been established.

## DESCRIPTION OF PROCEDURE:

### 1. ROLES

#### A. Corporate Industrial Hygiene/Environmental Safety Associate

The Corporate Industrial Hygiene/Environmental Safety Associate (CSA) administers all corporate health and safety policies, procedures and activities. The CSA reports to the Divisional Executive Vice President. The CSA in association with divisional and departmental personnel implement, maintain and enforce the corporate health and safety program. The CSA is assisted in each region by a Regional Health and Safety Coordinator and in each division by a Divisional Health and Safety Coordinator.

#### B. Regional Health and Safety Coordinator

The Regional Health and Safety Coordinators (RHSC) are responsible for Corporate Health and Safety program implementation and activities on a regional basis (North and Central Region, South and West Region). The RHSCs report to the CSA and serve as a liaison between the Divisional Health and Safety Coordinators and the CSA. Responsibilities include:

- Health & Safety Plan preparation, review, and approval;
- Injury investigation and case management;
- Training of internal staff;
- Technical support of projects;
- Medical Program implementation; and
- Industrial hygiene/health and safety consulting.

#### C. Division Health and Safety Coordinator

Division Health and Safety Coordinators (DHSC) assist in implementing health and safety programs, procedures and policies for their respective divisions, and not responsible for communicating those policies and procedures to the division staff. The DHSC coordinates health and safety training, maintains divisional health and safety records, and assists project managers in compliance with established policies and procedures. They are also responsible for the implementation of the company's hazard communication program and providing newly hired divisional personnel with safety orientation. The DHSC reports to the RHSC on health and safety matters.

#### D. Manager, Human Resources

The Manager, Human Resources works in cooperation with Health & Safety Division staff to ensure that specific aspects of the corporate health and safety program are fulfilled. Generally, the HR Manager assists

in pre-placement and termination activities to ensure fulfillment of medical monitoring program requirements.

### E. Company Officers/Division Heads

Company officers and division heads support—and are ultimately responsible for—the corporate health and safety program by insuring that the necessary personnel, materials and financial resources are available to support program elements. These elements include such items as initial health and safety training, medical clearances, policies and procedures, and personal protective equipment.

### F. Medical Program Coordinators

The Medical Program Coordinators (MPCs) are responsible for assisting the DHSC with medical monitoring program components. This includes scheduling and coordinating medical examinations for newly hired employees and existing staff. MPCs also prepare the Medical Summary report for review by the Corporate Safety Associate.

### G. Health and Safety Supervisor

The Health and Safety Supervisor (HSS) serves as the designated health and safety representative on the project site. Responsibilities include the communication of site-specific health and safety plan requirements to all BBL site personnel and enforcement of the health and safety requirements for BBL employees.

## 2. POSITION-SPECIFIC HEALTH AND SAFETY QUALIFICATIONS AND RESPONSIBILITIES

The following are specific responsibilities associated with the above health and safety program positions.

### A. Divisional Health and Safety Coordinator

1) Qualifications

Divisional Health and Safety Coordinators must meet or maintain the following Qualifications:

- Possess a degree in a technical discipline;
- Current 40-hour, 24-hour or equivalent health and safety training;
- Current 8-hour supervisory or equivalent health and safety training;
- Attend a BBL in-house training session for DHSCs;
- Attend a BBL in-house training session for confined space entry or equivalent;
- Current CPR/First Aid Training;
- Successfully complete 29 CFR 1926 Subpart P "Competent Person" training; and
- Be a BBL employee for at least one year or have equivalent previous health and safety experience as determined by Corporate Safety Associate.

2) Responsibilities

Divisional Health and Safety Coordinators are responsible for:

- Participation in the monthly H&S conference call;

- Presenting the following health and safety orientation to new employees and documenting attendance on the New Employee Health & Safety Orientation Checklist:
  - General Health & Safety Rules
  - New employee health & safety orientation
  - Respiratory protection
  - Hazard Communication
  - Hearing Conservation
  - General Office Safety
- Maintaining health & safety training and fit testing documentation for the divisional employees;
- Informing the DHSC of project needs for HASP development/review/approval;
- Providing guidance regarding respirator selection and purchasing, coordinates respirator fit testing and documentation;
- Reviewing requests for prescription safety glasses, respirator inserts and safety shoes/boots and consulting with the employee's supervisor as appropriate regarding their purchase;
- Reviewing and signing accident investigation forms received from the HSS;
- Forwarding copies of accident investigation reports and associated medical clearances to the RHSC, CSA, Manager, Human Resources and Corporate Counsel within 48 hours of occurrence;
- Performing accident investigations for office accidents, or field accident investigations in support of the site HSS;
- Conducting a chemical inventory of hazardous substances used in the division location, laboratory or on divisional work sites;
- Approving the purchase of chemicals, adding them to the chemical inventory and maintaining the required MSDSs and labels for the chemical;
- Informing divisional employees of hazard communication requirements and enforcing hazard communication procedures;
- Assisting in the selection of proper hearing protectors for field use. On projects where a HSS has not been assigned, the DHSC assumes HSS responsibilities;
- Reviewing PPM 16.02.08 with trained permit-space entrants and attendants on a project-specific basis;
- Verifying that all confined space entrants and attendants have received Confined Space Entry training;
- Verifies that the project confined space entry supervisor fulfills all required responsibilities and completes an entry permit as required by 16.02.08;
- Reviewing copies of completed and canceled Confined Space Entry Permits and verifying that they are properly distributed and retained with the appropriate project files as specified in Section 11 of the Confined Space Entry PPM (Health & Safety Manual PPM 1.02.08), "Posting and Recordkeeping"; and
- Acts as HSS, if necessary.

## B. Manager, Human Resources

Specific health and safety activities include:

- Verifying pre-placement medical examinations are performed on all prospective field staff prior to employment, and successful examination results are obtained as a condition of employment;
- Reviewing the conditional clearance received from EMR on all prospective employees and notifying the hiring division of the conditional results;
- Discussing a suggested course of action with the employee's supervisor in the event of a medical condition that precludes field work;
- Notifying the MPC that a medical program participant is either terminating employment or is being reassigned to a new job activity which no longer requires medical program participation;
- Maintaining all H&S-related records with personnel records; and
- Jointly maintaining, along with the Corporate Safety Associate, accident investigation reports and jointly reviewing the records on an annual basis.

## C. Medical Program Coordinators

Position-specific activities include:

- Attending initial program coordination and examination scheduling training conducted by EMR;
- Scheduling and coordinating initial medical examinations for new hires, annual or biennial examinations for existing staff, termination examinations, and retesting at the direction of EMR;
- Scheduling and coordinating audiometric testing in compliance with the corporate hearing conservation program and informing employees of the need to avoid excessive noise for a period of 14 hours prior to audiometric testing;
- Scheduling First Aid/CPR Training courses, as necessary, to maintain all field personnel with current First Aid and CPR Training;
- Maintaining lists of medically cleared employees within the respective division or department; and
- Maintaining records of Medical Summaries signed by the respective employee's supervisor.

## D. Health and Safety Supervisors

1) Qualifications

Health and Safety Supervisors must maintain the following:

- Current 40-hour or equivalent health and safety training;
- Current 8-hour supervisory or equivalent health and safety training;
- Current CPR/First Aid Training;
- Attend a BBL in-house training session for HSSs; and
- Current medical qualification and respirator qualification.

### 2) Responsibilities

Health and Safety Supervisors are responsible for:

- Implementing and enforcing the site Health and Safety Plan and Corporate health and safety procedures on project sites;
- Conducting daily safety meetings and site orientations;
- Verifying that all BBL site personnel working on sites governed under 29 CFR 1910.120 are currently certified in CPR/First Aid and have received current OSHA training;
- Reviewing applicable site health and safety requirements and all components of the site-specific health and safety plan;
- Immediately reporting all accidents verbally to the RHSC, DHSC, and EMR:
- Conducting an accident investigation to determine the cause(s) of a personal injury or illness, completing the accident investigation and medical clearance forms, and forwarding the completed forms to the Corporate Safety Associate within 48 hours of the accident. All major accidents must be reported to the Corporate Safety Associate and Manager, Human Resources immediately;
- Assisting the CSA and DHSC in the development and implementation of techniques to mitigate future risk during similar operations;
- Coordinating site-specific needs with emergency response personnel and medical providers; and
- In emergency situations, assuring that the examining medical facility is adequately apprised of site conditions that caused or may have caused a medical emergency. This may include providing appropriate parties with copies of the applicable Material Safety Data Sheets (MSDS) for the chemical(s) involved.

## F. Project Managers

1) Qualifications: Project managers must meet standard BBL requirements for training and experience.

2) Responsibilities

Project Managers must:

- Direct the preparation of a project Health & Safety plan is written, and approved by Division 61 prior to commencement of project activities;
- Verify that appropriate PPE is provided to project personnel;
- Verify that project personnel are properly trained;

- Verify that an adequate number of employees are assigned duties safely;
- Verify that the "buddy system" is utilized on all sites;
- Verify that adequate equipment and materials are available to conduct work safely; and
- Verify that work hours/shifts are established so employee can conduct work safely.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 9/1/96

# 1.02 Loss Prevention

BLASLAND, BOUCK & LEE, INC.
*engineers & scientists*

## STATEMENT OF POLICY:

This procedure contains the necessary instructions for the selection, use, and care of respiratory protective equipment (respirators), including both air purifying (e.g., chemical cartridge, gas mask, dust/mist) and air-supplied (e.g. self-contained breathing apparatus (SCBA) and airline respirators). This applies to all employees who use respirators.

## DESCRIPTION OF PROCEDURE:

1. Medical Clearance

   A. Prior to issuing a respirator, a determination must be made by Environmental Medicine Resources (EMR) of each individual's physical condition and ability to don such equipment. Only those employees who have received medical clearance from EMR may be issued a respirator.

   B. Medical recertification must be performed at least annually.

   C. Records of medical certification and recertification must be retained by Human Resources.

2. Selection

   A. Employees must use only respirators selected, supplied, and/or approved by the Firm. The Divisional Health & Safety Coordinator (HSC) has the responsibility to ensure that the proper respirator is selected and purchased.

   B. Air purifying respirators must be full-face piece, *dual* cartridge respirators.

   C. Respirators must have a NIOSH/MSHA approval.

   D. Respirator cartridge selection must be based on the site-specific hazards anticipated project-by-project as identified in the site specific Health & Safety Plan (HASP). The following points must be considered when selecting air purifying cartridges or canisters:

      1) The potential for a contaminant(s) to be present in concentrations which present an immediate danger to life and health (IDLH) and/or an oxygen deficient atmosphere;

      2) The nature of the air contaminant (e.g. gas, vapor, or particulate);

      3) The anticipated contaminant concentration;

      4) The odor characteristics, including odor threshold;

      5) Irritant properties;

      6) The Occupational Safety and Health Administration, Permissible Exposure Limit (OSHA, PEL), The American Conference of Governmental Industrial Hygienist, Threshold Limit Value (ACGIH, TLV), and/or the National Institute for Occupational Safety and Health, Recommended Exposure Limit (NIOSH, REL); and

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

7) Anticipated duration of respirator usage.

An Outline for Selecting Respiratory Protective Devices provides additional selection criteria. **[A copy follows this procedure.]**

3. Training

A. All employees must be trained in the proper use, care, storage, and limitations of respiratory protective equipment. Initial respirator training will be provided during the OSHA mandated 40-hour hazardous waste site training.

B. Employees having 24-hour OSHA training must attend a supplemental respiratory protection training program provided in-house.

C. Annual training will be provided during the 8-hour refresher training program.

4. Fit Testing

A. Initial and periodic qualitative fit testing must be performed. These tests must be performed at least annually. Additional fit testing can be performed by trained and qualified individuals in the remote offices.

B. Respirators must be properly fitted and not worn when facial conditions prevent a good respirator-to-face seal. This includes the presence of facial hair, beards, head coverings, and eyeglass temple bars.

C. Only those respirators which have been properly fitted may be worn by the individual. Alternative respirator makes and models will require additional fit testing.

D. All fit test forms must be forwarded to Manager, Health & Safety for inclusion in the Corporate Training Tracking System.

E. Records of fit-testing must be retained in the employee's home office and by Human Resource.

The attached Qualitative Respirator Fit Test Form must be used to document all fit testing. **[A copy of the form follows this procedure.]**

5. Usage

A. Employees must wear and properly use all respirators in accordance with instruction and training.

B. Respirators must be assigned to each individual for their exclusive use.

C. Wearing contact lenses while wearing a respirator is not permitted.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

D. No attempt must be made to make adjustments or repairs beyond the respirator manufacturers' recommendation.

E. Respirator users must vacate the contaminated area immediately upon notice of physical symptoms, such as nausea, dizziness, odor breakthrough or any other condition, which indicates respirator failure.

F. Respirators cartridges must be discarded and replaced whenever damaged, defective, dirty, odor is detected, or at least daily.

G. Airline respirator users must be equipped with an escape SCBA of at least five minute's duration at all times.

6. Maintenance

A. Respirators must be inspected by the user both before and after each use, for defects in the facepiece, headbands, and cartridge retaining mechanism.

B. Respirators must be cleaned and disinfected by the user after each use. Following cleaning and disinfecting, the respirator must be reinspected and placed in a plastic bag or sanitary container for storage.

C. After each use of a SCBA, the user is responsible for arranging to have the unit(s) serviced and cylinder fully recharged.

D. All SCBA and airline equipment must be inspected and maintained for use on a monthly basis.

7. Storage

A. Respirators must be stored so as to protect against dust, sunlight, extreme heat and cold, excessive moisture, and damaging chemicals.

B. Respirators must be packed and stored so that the facepiece and exhalation valve will retain a normal position and function.

C. Unused filters and cartridges must be stored in a contaminant-free environment.

8. Limitations

A. The following restrictions apply to the use of all respirators:

1) Employees must use only those respirators for which he/she has been properly fit tested.

2) Employees must not enter an atmosphere that is known or suspected to be dangerous without wearing the appropriate respiratory protection.

[Cont'd]

## DESCRIPTION OF PROCEDURE: [Cont'd]

3) Air-purifying, negative pressure respirators must not be used when one or more of the following conditions is known or suspected to exit:

a) Airborne concentrations of contaminants exceed the calculated Maximum Use Concentration (MUC) for the respirator in use (e.g., MUC equals the Assigned Protection Factor (APF) multiplied by the applicable PEL, TLV or REL).

b) In atmospheres which are IDLH or oxygen deficient (e.g., less than 19.5% oxygen).

c) For protection against contaminants having inadequate warning properties, (e.g., poor odor or irritation threshold) unless specifically permitted by an OSHA substance specific standard.

d) For protection against chemicals which the cartridge is inappropriate, and/or where a cartridge is not available for the contaminant of concern.

4) Employees must not enter a confined space (e.g., tank, sewer, closed vessel, etc.) without consulting either the Health & Safety Plan (HASP) written for the project and/or the designated Site Health and Safety Supervisor (HSS).

9. Recordkeeping

A. Records of medical certification and recertification must be retained by Human Resources.

**- END OF PROCEDURE -**

Executive Authorization: _____

Date: 11/10/93

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

# QUALITATIVE RESPIRATOR FIT TEST RECORD

Employee Name _____

Office _____ Division _____ Employee No. _____

Social Security No. _____ Title _____

Spect Kit Required? ☐ Yes ☐ No Clean Shaven? ☐ Yes ☐ No

Have you had in the past, or do you currently have any respiratory problems? ☐ Yes ☐ No

If Yes, explain _____

Have you received respiratory clearance from EMR within the last 12 months? ☐ Yes ☐ No

Provide an estimate of respirator usage during the last 12 months _____

| | Respirator Information | | | |
|---|---|---|---|---|
| Type of Respirator | Full Facepiece | Full Facepiece | Full Facepiece | Full Facepiece |
| Manufacturer | MSA | AO | North | |
| Model | Ultra-Twin | OMNI Star 53002 | 76008A | |
| Cartridge | GMC-H | R53HE | N7500-83 | |
| Size | S, M, L | One Size | One Size | |

| | Fit Test Information | | | |
|---|---|---|---|---|
| Atmosphere Testing | Test 1 | Test 2 | Test 3 | Test 4 |
| Isoamyl Acetate | Pass/Fail | Pass/Fail | Pass/Fail | Pass/Fail |
| Atmosphere | Pass/Fail | Pass/Fail | Pass/Fail | Pass/Fail |
| Recognized | Pass/Fail | Pass/Fail | Pass/Fail | Pass/Fail |
| Irritant Smoke | | | | |
| Comments | | | | |

I certify that I have been trained in the use of respirators and fit tested with the respirator(s) listed above. I have also had the opportunity to ask questions and that those questions have been answered to my satisfaction. I understand that the above qualitative fit test is voided if the respirator is worn when conditions prevent a good face seal, i.e., facial hair, or if the respirator or limitations are not followed.

_____

Employee Signature Date

The above information is true to the best of my knowledge

_____

Instructor Signature Date

| BBL | TOPIC: PERSONAL PROTECTIVE EQUIPMENT | PPM# 1.02.02 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

The Firm will provide the personal protective equipment necessary for its employees to perform their work safely. The requirements for personal protective equipment (PPE) are established by the Health and Safety Division. Head, eye, body, and foot procedure. Purchasing procedures for respiratory equipment, hearing protection, prescription safety glasses and safety shoes are also described. The use of respiratory protection and hearing protection are described in detail in separate PPMs.

Employees are required to wear PPE to minimize hazards encountered on the job. When PPE is required, it will be provided pursuant to this procedure. It is the responsibility of other parties involved (e.g. subcontractors) to provide PPE for their personnel.

## DESCRIPTION OF PROCEDURE:

The Firm will provide employees with PPE required for the job being performed. Such equipment includes but is not limited to: boots, protective clothing, respirators, face shields, safety eyewear, respirator ophthalmic hanger devices, hard hats, and gloves. Personal protective equipment will be approved by the Health and Safety Division (61) prior to use.

Employees of the Firm shall only use protective equipment approved by the Health and Safety Division. PPE will be used on any task where there is potential exposure to: physical hazards such as equipment operation, objects dropping from above, or flying particles; or exposure to toxic or irritating gases, fumes, vapors, liquids, or other materials which might cause respiratory distress or skin irritation. PPE will be prescribed in the site-specific Health and Safety Plan (HASP).

Minimal protective equipment for employees shall be hard hats, eye protection, and steel-toed foot protection (chemical resistant when required) at all BBL job sites (excluding field offices) and client facilities, unless HASP/site rules provide exemption. Personnel will also utilize, as a minimum level of protection, any additional site-specific personal protective equipment required by the client or facility in which they are conducting activities.

### 1 Eye Protection

All employees engaged in or working in areas adjacent to eye-hazardous activities or operations shall wear appropriate eye protection.

- Safety glasses are required for impact protection, and shall meet ANSI Standard Z87.1 requirements.
- Chemical goggles are required for protection against chemical splash.
- Face shields are required for face protection from chemical splash and are not a substitute for primary eye protection.
- Full-face respirators can provide eye and face protection in lieu of safety glasses, goggles, or face shields.
- Shaded eye protection meeting the minimum shade requirements established in 29 CFR 1910.133 is required for employees exposed to sources of injurious light radiation (i.e. welding, cutting, lasers, etc.).

### A Prescription Eye Protection

The Firm will provide prescription safety glasses (meeting ANSI Standard Z87.1) for field/lab personnel, and computer glasses for computer users, as required by their individual vision status and job. The employee is responsible to provide a copy of a current (less than 1-year old) prescription. Glasses will be replaced by the Firm as needed, usually every two years unless damaged on-the-job, or the employee exhibits a significant change of prescription.

Lenses shall be clear, special tints or dark lenses can be obtained for special applications (e.g., extended outdoor work) with prior written approval from the Health and Safety Division and the employee's Division head.

Employees requiring corrective lenses inside of respirator face pieces will be provided with safety lenses and frames sized for respirators and the respirator insert, in addition to conventional prescription safety glasses.

Employees will arrange for the eye examination through the company-provided vision care program. The employee will be responsible for providing a copy of his/her prescription that is less than one (1) year old. The company will pay for fitting services and the safety glasses.

The Firm has established discount services with several eyewear providers. Employees should contact their Divisional Health and Safety Coordinator prior to purchasing prescription safety eyeglasses. Employees will be reimbursed up to $70 for safety glasses after the Divisional Health and Safety Coordinator has verified the glasses meet the ANSI Standard requirements. Reimbursement will be handled as a non-billable cash expense under account # 633.53.

## 2 Foot Protection

Basic foot protection is required for all BBL job sites and industrial locations. Specialized footwear will be provided as required by the nature of the work. Special foot protection may include, but is not limited to, chemically resistant, thermally shielded, metatarsal guards, etc.

### A Leather Safety Boots

For full-time field employees and maintenance employees, one pair of leather safety boots will be provided every year by the Firm. For part-time field employees, one pair of leather safety boots will be provided every two years by the Firm. The employee purchasing the footwear is required to ensure that it meets ANSI Standard Z41.

The maximum expenditure or reimbursement for approved safety shoe purchases will be $80. Reimbursement will be handled as a non-billable cash expense under account # 633.53. Reimbursement requests must be approved by the employee's Division, and after the Health and Safety Staff has verified that the shoes meet ANSI requirements.

Athletic-style safety shoes ("safety sneakers") are prohibited (due to the difficulties created by these styles in supervising proper use of protective footwear).

### B Contaminated Boots

Boots contaminated or damaged on the job will be replaced as a direct cost to the project, if allowed by contract prior to expiration of the one (1) or two (2) year replacement period. Damaged boots must be returned to the Firm for disposal. Contaminated boots will be disposed of with the site waste. Disposal must be documented by a report submitted by the individual and signed by the Site Health and Safety Supervisor (HSS) and Project Manager.

## 3 Head Protection

Hard hats meeting ANSI Z89.1 will be provided to protect employees from impact, penetration, falling objects, and/or limited electrical shock and burn, as appropriate for work site hazards. A hard hat must be replaced when it becomes damaged, contaminated (and contamination cannot be removed) or it has been struck by an object of sufficient size to potentially compromise its integrity.

## 4 Respiratory Protection

Respirators will be provided and used in accordance with the Respiratory Protection PPM.

## 5 Hearing Protection

Hearing protection will be provided and used in accordance with the Hearing Conservation PPM.

## 6 Body Protection

Protective clothing, gloves, boots, and other protective equipment will be provided as appropriate for the hazards associated with the tasks being performed.

## 7 Providing PPE to Non-BBL Personnel

The following PPE may be provided to site/project visitors as required for compliance with the site health and safety plan or facility safety requirements:

- Hard hats
- Chemical goggles
- Safety glasses (non-prescription)
- Face shields
- Chemical resistant boots
- Chemical resistant gloves
- Disposable hearing protectors
- Disposable chemical resistant personal protective clothing

## 8 Specialized Equipment

All other specialized safety equipment required for an assignment (e.g., work gloves, specialized protective clothing, hip boots, field rain gear, personal floatation devices, etc.) will be provided by the Firm as specified in the HASP.

Use of specialized equipment will be charged to projects in accordance with established policy and rental rates.

## 9 PPE Selection

PPE must be selected according to the hazards present, degree of protection required for the job task and the level of protection specified in the HASP.

The level of protection selected must be based on the anticipated and/or measured concentration of contaminant(s) of concern, their physical and chemical properties, toxicity, exposure pathways, and the potential for exposure.

Specific criteria for selecting the level of protection are outlined in the standard HASP package.

## 10 Training

All employees must be trained in the proper use, care, storage, and limitations of PPE. This training is provided during the initial 40-hour off-site health & safety training program, site orientation and Daily Safety Meetings.

Employees having 24-hour health & safety training are limited to the use of level D protection, unless additional training on the use of respiratory protective equipment is provided.

Annual re-training will be provided in-house during the 8-hour refresher training course.

## 11 PPE Usage

Employees must wear and properly use all PPE in accordance with instruction and training. Employees must only use PPE for which they have been properly trained.

Employees must wear and properly use all PPE in accordance with the Firm's Health and Safety procedures and the site HASP. Employees must not wear and use PPE beyond the limitations set by the manufacturer.

Disposable PPE must not be reused if it becomes contaminated, torn, or otherwise damaged. PPE must fit the employee. PPE which greatly decreases dexterity, agility, and vision, or is bulky and cumbersome should not be worn. Selection and use of PPE must consider the context of need vs. the creation of a greater hazard by donning PPE in the specific environment.

## 12 PPE Maintenance and Disposal

PPE must be inspected by the user before and after each use for defects, rips, tears, and/or damaged parts. PPE must be disposed of according to the site HASP and other project plans for the site. PPE destined for disposal must be secured in drums or other containers and labeled appropriately.

If non-disposable, PPE must be decontaminated and sanitized before being reused according to the site HASP and related PPMs. Contaminated PPE which cannot be properly decontaminated by normal procedures must be disposed of accordingly.

## 13 PPE Storage

All PPE must be stored to protect against dust, sunlight, extreme heat and cold, excessive moisture, and damaging chemicals. Storage must be in accordance with the manufacturer's specifications.

## 14 Management Duties

It is the responsibility of the Health and Safety staff to specify safety equipment requirements for each project or activity.

It is the responsibility of project managers, project officers, and management to provide adequate quantities of safety equipment required for their job(s) or project(s).

It is the responsibility of supervisors to verify that required safety equipment is properly used.

## 15 Record Keeping

Records of the PPE training, medical certification and recertification are retained by Human Resources.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 9/1/96

| TOPIC: HAZARD COMMUNICATION | | PPM# 1.02.03 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

This procedure details the necessary provisions for complying with 29 CFR 1910.1200 Hazard Communication (HAZCOM) by specifying the protocol for conducting a chemical inventory, compiling a chemical inventory list, obtaining Material Safety Data Sheets (MSDS), and training employees on the health and physical hazards of listed chemicals. This procedure applies to chemical procurement, use, and storage whether in the office laboratory, for actual use or storage, as well as for all chemical materials transported to the field for site use.

Although HAZCOM specifically exempts hazardous waste from the hazard communication program, 29 CFR 1910.120 Hazardous Waste Operation and Emergency Response (HAZWOPER) mandates that an informational program be developed as a component of the written health and safety program. The purpose of the informational program is to ensure that employees, contractors, and subcontractors engaged in hazardous waste operations are appraised of site hazards. Protocol is established for communicating health and physical hazard information to all site employees, including contractor and subcontractor employees.

## DESCRIPTION OF PROCEDURE:

1. Chemical Inventory and Listing

   A. The Divisional Health & Safety Coordinator (HSC) has the responsibility to conduct a chemical inventory and compile a listing of all chemicals used or stored in the office or Divisional laboratory. The master chemical listing is to include all chemical materials purchased, such as, but not limited to, chemical materials purchased for sample preparation, equipment calibration and decontamination, etc., whether used in the office laboratory, used by maintenance, or temporarily stored for transport to the field. Not included in the master chemical listing would be items such as:

      1) Foods, drugs, or cosmetics intended for personal consumption by employees;

      2) Any consumer product or hazardous substance used in the workplace in the same manner as normal consumer use, and which use results in a duration and frequency of exposure which is not greater than exposures experienced by consumers; and,

      3) Office products to which office workers would have non-route exposure.

   B. The purchase of any new or addition chemical materials must be approved by the Divisional HSC. New chemical purchases must be added to the master chemical listing.

2. Material Safety Data Sheets (MSDS)

   A. A MSDS for each material listed in the master chemical listing must be obtained from the chemical supplier. **[A standard form letter follows this procedure].**

   B. All chemical purchases must be accompanied by a request for a MSDS. No chemical materials will be received, used, or stored without having an accompanying MSDS.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

C. Once received, all MSDSs must be retained with the master chemical listing in a hardbound (3-ring) binder. The binder containing the master chemical listing and MSDSs must be retained at each office location and be readily available for staff access.

D. Chemical materials purchased for field use, stored in the office laboratory, and than transported to the field for actual use must have a MSDS accompany the material to the field. The MSDS must be retained on-site with the site specific health & safety plan (HASP).

E. The Divisional HSC has the responsibility to maintain the master chemical list and corresponding MSDS binder.

3. Container Labels

A. All containers of chemical materials identified on the master chemical listing must be labeled as per the hazard information provided in the MSDS. No unlabelled containers of chemical materials should be accepted from the chemical supplier. The label must contain the following information:

1) Identity of the hazardous chemical(s);

2) Appropriate hazard warning (e.g. toxic, flammable, corrosive, irritating, etc.); and

3) Name and address of the chemical manufacturer.

B. Existing labels on in-coming containers of hazardous chemicals must not be removed or defaced.

C. Containers transported to the field must be labelled at all times as per Item A above.

D. Chemicals dispensed on-site into a portable container which are intended only for the **immediate** use of the employee who dispensed the chemical will not require additional labelling.

4. Information and Training

A. All new employees hired to work on Hazardous Substance Contaminated Sites (HSCS) must receive training in hazard communication. Attendance at the HAZCOM training must be documented. Training must include the following:

1) A review of the Firm's written HAZCOM program;

2) Information on the location and availability of the master chemical listing and MSDS binder;

[Cont'd]

## DESCRIPTION OF PROCEDURE: [Cont'd]

3) A review of the physical and health hazards of the chemicals on the master chemical listing; and

4) Measures that the employee must take to protect themselves from the physical and health hazards, such as, appropriate work practices, emergency procedures, and personal protective equipment to be used whenever handling the hazardous chemicals.

B. In addition to the above office training, all employees as well as all contractor and subcontractor personnel retained directly by the Firm to enter a HSCS must, prior to initial site entry, receive formal training in the health and physical hazards specific to the site. Training of both employees and contractor/subcontractor personnel must include the following:

1) Names of all site health & safety personnel and alternates;

2) Site chemical & physical hazards and signs and symptoms of chemical exposure;

3) Work rules and safe work practices;

4) Use of personal protective equipment and the levels of protection specified for the site;

5) Medical surveillance requirements;

6) Site control measures;

7) Decontamination procedures;

8) Location of the site-specific HASP and any accompanying MSDSs;

9) Provisions of the emergency response plan; and

10) Standard operating procedures (i.e. confined space entry, spill containment, etc.).

C. The Site Health & Safety Supervisor (HSS) has the responsibility to conduct the field training of all employees as well as contractor/subcontractor personnel.

D. Provisions to implement and document the above field training requirements must be included in the HASP in Section 5.1.1-Site Orientation (See Guidelines for Health & Safety Plan Development).

5. Chemical Storage

A. All MSDSs must be reviewed for ascertaining storage requirements and precautions. Storage requirements must be strictly followed both in the field as well as the office laboratory.

[Cont'd]

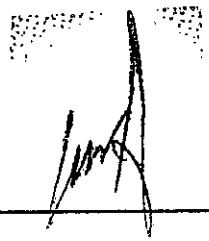
## DESCRIPTION OF PROCEDURE: [Cont'd]

B. All chemical materials must be stored as per the MSDS regarding compatibility, corrosivity, flammability, reactivity, etc.

C. No flammable or combustible liquid may be stored in an office environment.

D. All office laboratory and field storage of flammable an combustible liquids must be in closed metal containers (glass or approved plastic container is permitted up to a one gallon capacity if contact with a metal container would render the liquid unfit for its intended use or would corrode a metal container so as to create a leakage hazard) and stored in a properly designed and constructed storage cabinets.

**- END OF PROCEDURE -**

Executive Authorization: 

Date: 11/10/93

# STANDARD LETTER FOR REQUESTING A MATERIAL SAFETY DATA SHEET

NAME
ADDRESS

Re:

File:

DEAR:

Pursuant to the requirements of 29 CFR 1910.1200 Hazard Communication, we are requesting a current Material Safety Data Sheet (MSDS) for _____ _____. We would appreciate receipt of the MSDS as soon as possible.

Additionally, we would appreciate receipt of any updates MSDS which reflects new or additional toxicological information, a change in regulatory practice or permissible exposure, reclassification of any chemical components as potential or listed carcinogens, and/or any other information we should be made aware of in regards to handling the above listed chemical material.

Sincerely,

COMPANY NAME

NAME
TITLE

## STATEMENT OF POLICY:

This procedure details the necessary provisions for administering and coordinating the hearing conservation program. Also provided are guidelines for the use of hearing protective devices.

The hearing conservation program applies to employees enrolled in the medical surveillance program (PPM #1.01.06).

The Firm requires all employees with potential exposure to excessive noise (levels in excess of 85 dBA or equivalent over an 8-hour period) to use hearing protective devices. The Firm defines excessive noise as any noise environment that requires speech levels above those used for normal conversation.

Hearing protection is supplied and/or approved by the Firm for use by employees in carrying out their assignments. For reasons of liability, such hearing protection is not to be used by others (e.g., subcontractor personnel, drilling contractors, plant personnel, etc.). It is the responsibility of other parties to provide hearing protection for their personnel.

## DESCRIPTION OF PROCEDURE:

1. Administration

   A. All employees enrolled in the Firm's medical surveillance program are covered by this procedure.

   B. The hearing conservation program is administered concurrent with and as a component of the Firm's medical surveillance program.

2. Responsibilities

   A. Divisional Health and Safety Coordinator (HSC):

      1. Provides initial employee orientation regarding this program.

      2. Informs the Manager, Health & Safety of excessive noise exposures and/or problems encountered concerning the implementation of this program.

      3. Selects the proper hearing protection for employee use.

      4. On projects where a Health and Safety Supervisor (HSS) is not required, the HSC assumes the HSS's responsibilities, listed below, with respect to this program.

   B. Health and Safety Supervisor (HSS):

      1. Determines areas on the work site where hearing protection is required to prevent exposure to excessive noise, as defined above.

      2. Monitors the employees' use of hearing protection.

      3. Reports to the HSC any excessive noise exposures and/or problems associated with the implementation of this program.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

4. Provides any required site specific training or orientation concerning use of hearing protection.

C. The Manager, Health and Safety:

1. Responsible for overall program coordination, including necessary communications between all parties involved.

2. Conducts training of the HSC with respect to hearing conservation program.

3. Evaluates and revises the hearing conservation program and training on an annual basis.

D. Employee:

1. Properly uses hearing protection when deemed necessary by the HSC or HSS.

2. Only uses hearing protective devices supplied or approved by the Firm.

3. Reports any potential noise exposures or problems to the HSS or HSC.

4. Avoids both non-occupational or occupational noise exposure for 14 hours prior to audiometric testing.

E. Divisional Medical Program Coordinators (MPC):

1. Schedule and coordinate audiometric testing in conjunction with medical surveillance examinations.

2. Schedule and coordinate follow-up testing as recommended by Environmental Medicine Resources Inc. (EMR).

3. Notify scheduled employees to avoid exposure to loud noise for 14 hours prior to audiometric testing.

3. <u>Audiometric Testing</u>

A. Audiometric tests will be scheduled in conjunction with pre-placement, periodic, and termination medical examinations as required by the medical surveillance program (PPM #1.01.06).

B. Additional audiometric testing may be conducted at the discretion of EMR or the Manager, Safety and Health.

C. Audiometric testing is conducted at locations and according to protocols established by EMR and contractually agreed to by the Firm.

D. Employees will be informed of the requirement that they avoid both non-occupational and occupational noise exposure for 14 hours prior to audiometric testing.

**[Cont'd]**

## DESCRIPTION OF PROCEDURE: [Cont'd]

4. Training

   A. All employees required to wear hearing protection will receive training by their Divisional HSC concerning selection, use, maintenance, and limitations of the hearing protective devices.

   B. All employees covered by this program will be trained concerning the contents of this program.

   C. All employees will be trained concerning site specific noise hazards and hearing protection by the HSS as applicable.

5. Hearing Protective Devices

   A. Employees must use hearing protection selected, supplied, and/or approved by the Firm.

   B. Requests for hearing protective devices must be directed to the Divisional HSC.

   C. Employees are required to properly use and maintain hearing protective devices.

   D. Hearing protective devices are required to be selected by the Divisional HSC based on the potential level of noise exposure.

6. Recordkeeping

   A. All noise exposure measurement records are to be maintained for the duration of employment, plus 30 years.

   B. The Firm will maintain audiometric test records in an employee's medical surveillance file for the duration of the employee's employment, plus 30 years.

**- END OF PROCEDURE -**

Executive Authorization: 

Date: 11/10/93

| BBL | TOPIC: CONFINED SPACE ENTRY | PPM#: 1.02.08 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

The Firm is committed to operate in a manner that will protect the health and safety of its employees. Employees of the Firm will abide by applicable local, state, and federal regulations while conducting activities for the Firm. Entry into enclosed or confined areas presents unique hazards to employees of the Firm. To reduce the potential for injury, personnel will avoid entering confined spaces whenever feasible. If entry is required into a confined space, the safety and engineering controls outlined in this procedure must be implemented by authorized personnel prior to entry.

To effectively mitigate or eliminate the hazards presented by entry into confined spaces, this procedure sets forth the accepted practice for confined space entry and establishes the requirement for a Confined Space Entry Permit protocol. This procedure, protocol, and Confined Space Entry Permit and Checklist applies to all employees of the Firm. Only trained and authorized personnel are permitted to enter confined spaces, supervise confined space activities, and perform rescue from confined spaces.

## DESCRIPTION OF PROCEDURE:

1. **DEFINITIONS**

A. Attendant means a trained authorized individual stationed outside the confined space who's sole duty is to monitor authorized entrants inside the confined space.

B. Confined space means any enclosed space which is large enough and so configured that an employee can bodily enter and perform work, has limited or restricted means for entry or exit, and is not intended for continuous employee occupancy. Confined spaces include, **but are not limited to**, storage tanks, vessels, pits, boilers, flues, manholes, ventilation system duct work, sewers, vaults, pipelines, silos, storage hoppers, and diked areas.

1) **Permit-required confined space (permit space)** means a confined space that has one or more of the following characteristics:

a) Contains or has a known potential to contain a hazardous atmosphere;

b) Contains a material with the potential for engulfment of an entrant;

c) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; and/or

d) Contains any recognized safety or health hazard capable of causing injury or death.

2) **A Non-permit confined space** means a confined space that does not contain or have the potential to contain any hazards capable of causing death or serious physical harm.

C. **Entry** means the act by which a employee intentionally passes through an opening into a permit-required confined space. Entry is considered to have occurred as soon as any part of the employee's body breaks the plane of the opening into the space.

D. **Entry Permit** means the document which defines the conditions of confined space entry, the reasons for entering the confined space, the anticipated hazards of the entry, a listing of atmospheric monitoring equipment and acceptable atmospheric conditions. The entry permit identifies the rescue and other contacts which must be summoned in the case of an emergency, provides a listing of authorized attendants and entrants, the date of entry to the confined space, and the expiration of the entry permit. For the purposes of this PPM, the Confined Space Entry Permit consists of both the Confined Space Entry Permit and the Confined Space Entry Checklist and/or the Confined Space Entry Permit and the Sewer System Manhole Entry Checklist **{Copies of the Confined Space Entry Permit and Checklist follow this procedure}.**

E. **Entry Supervisor** means the trained, authorized employee responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry. The entry supervisor may also serve as an authorized attendant.

F. **Entrant** means an employee who is trained and authorized to enter a confined space.

G. **Hazardous atmosphere** means an atmosphere which exposes employees to a risk of death, incapacitation, injury or acute illness from one or more of the following:

1) An atmospheric concentration of any substance in excess of 50% of its established permissible exposure limit (PEL), or in absence of a PEL, its assigned threshold limit value (TLV), or other value listed on the Material Safety Data Sheet (MSDS) for the chemical constituent;

2) A flammable gas, vapor, or mist in excess of 10 percent (%) of its lower explosive limit (LEL);

3) An airborne combustible dust at a concentration that obscures vision at a distance of 5 feet or less;

4) An atmospheric oxygen concentration below 19.5% (oxygen deficient atmosphere) or above 23.5% (oxygen enriched atmosphere); and/or

5) An atmosphere which is immediately dangerous to life and health.

H. **Immediately dangerous to life and health (IDLH)** means any condition which poses an immediate threat to loss of life; may result in irreversible or immediate-severe health effects; may result in eye damage, irritation or other conditions which could impair escape from the confined space.

I. **Isolation** means removing equipment/systems in and around the space from service. This includes lockout and tagout, double blanking and bleeding, disconnecting, and securing or restraining equipment.

## 2. RESPONSIBILITIES

A. Officers/Division Heads/Project Managers have the following responsibilities:

1) Verify that all confined spaces and entry protocols are properly identified and addressed within the project work plan, project health & safety plan, and/or other project related documents.

2) Verify that their Divisional employees have received the proper confined space training provided by Corporate Health & Safety prior to conducting confined space entry activities.

3) Verify that the proper confined space entry equipment, including personal protective equipment, atmospheric testing equipment, and safety equipment, is available for use by their Divisional employees.

B. Corporate Health & Safety has the following responsibilities:

1) Provide the initial confined space entry training and retraining, as needed, to all entry supervisors, entrants and attendants;

2) Provide technical assistance regarding confined space entry protocol, atmospheric testing equipment, personal protective equipment, hazard assessment, and research information on unusual hazards;

3) Audit project specific confined space entry for compliance with this PPM;

4) Retain a file of cancelled Confined Space Entry Permits for annual review; and

5) Conduct annual review of this PPM and all cancelled permits.

C. The Divisional Health & Safety Coordinators (HSC) have the following responsibilities:

1) Review this PPM with all trained entrants and attendants on a project specific basis;

2) Verify that all entry supervisors, entrants and attendants have received the training offered by Corporate Health & Safety prior to conducting confined space entry activities;

3) Review completed entry permits and verify that the project specific entry supervisor fulfills his/her responsibilities (listed in D below) and properly completes the Entry Permit; and

4) Verify that copies of the completed and canceled Confined Space Entry Permit are properly disseminated and retained with the project files as specified in Section 13-Posting and Recordkeeping.

D. Entry supervisors (also see Training and Duties of Entry Supervisor) have the following responsibilities:

1) Interface with the client representative to identify hazards associated with the client's confined space;

2) Review existing confined space data (if any) recorded by the client;

3) Review the client's confined space procedure;

4) Review the lock-out/tag-out and isolation measures implemented by the client;

5) Immediately report any unusual or unforeseen confined space entry hazard to both the Divisional HSC, Regional Health and Safety Coordinator, or Corporate Industrial Hygiene/Environmental Safety Associate prior to authorizing entry;

6) Verify that all tests and precautionary measures identified on the permit have been performed prior to authorizing the entry permit;

7) Issue, authorize, and post the Entry Permit prior to any confined space entry; and

8) Upon completion of the entry covered by the permit, and after all entrants have exited the permit space, cancel the Entry Permit.

E. Employees of the Firm have the following responsibilities:

1) Receive the initial training provided by Corporate Health & Safety;

2) Participate in entry operations only if trained and authorized to do so;

3) Never enter a confined space without an authorized attendant, entry supervisor, and an Entry Permit;

4) Never attempt entry rescue within a confined space, unless trained in entry rescue; and

5) If unexpected conditions arise during entry, immediately evacuate the space and inform the entry supervisor.

## 3. CONFINED SPACE ENTRY PERMIT

A. Prior to entry into any identified confined space, the entry supervisor must complete and sign the Entry Permit as defined above.

B. A separate Entry Permit must be generated for each confined space.

C. A single Entry Permit may be generated for entry into multiple sewer system manholes in a continuous sewer system.

The Confined Space Checklist and/or the Sewer System Manhole Entry Checklist must be completed, signed, and attached as part of the entry permit. As example, for entry into several separate manholes for the purpose of collecting effluent samples, recording water depth, flow, etc., one Entry Permit may be generated for entry into all project specific manholes. The permit must, however, be accompanied by the Sewer System Manhole Entry Checklist which will facilitate entry into as many as 20 manholes per checklist.

D. The completed and signed Entry Permit and Checklist is valid for one shift only. A new completed and signed Entry Permit must be issued for each new crew of entrants and attendants.

E. All entrants must be evacuated and the Entry Permit must be revoked whenever conditions in the space are no longer acceptable as indicated by the direct reading instruments being used to monitor atmospheric conditions in the confined space or some other circumstance either within or outside the confined space.

## 4. ENTRY PERMIT PROGRAM

A. Prior to authorizing the Entry Permit, the entry supervisor must verify that the confined space has been properly isolated, ventilated, and tested, and that the Confined Space Checklist or Sewer System Manhole Entry Checklist is completed. In completing the appropriate Checklist, the following items are required:

1) All mechanical apparatus (such as agitators) within or connected to the confined space must be de-energized, locked-out, and tagged. This specific activity may be performed by the client, therefore the entry supervisor must review the lock-out procedure with the client and place a separate lock(s) on all multiple lock-out devices. The entry supervisor must retain possession of the key(s) during the entire confined space entry.

2) All lines connected to the confined space where the nature of the service could present a hazard, such as nitrogen, steam, solvent, acid, or hot water, must be isolated from the confined space. Acceptable isolation methods include removing a valve, spool piece, or expansion joint, and blanking or capping the opened end; inserting a suitable full-pressure blank in the piping between connecting flanges; and/or closing and locking at least two valves in the pipeline and locking open to atmosphere a chain valve between the two closed and locked valves. As in #1 above, this activity may be performed by the client. The entry supervisor must review the isolation/blanking and lock-out procedure with the client. The entry supervisor must attach separate lock(s) to any lock-out device installed. The entry supervisor must retain possession of the key(s) during the entire confined space entry.

3) All electrical equipment around and in the confined space must be deenergized and locked out.

4) For confined spaces which have contained a known hazardous chemical, eg., vessels, storage tanks, etc., the client must verify that the vessel has been thoroughly cleaned by appropriate means, eg., overflowing with water, steaming, etc.

5) For confined spaces containing known atmospheric hazards, mechanical ventilation may be utilized to maintain atmospheric hazards within permit parameters. Section 11 - Mechanical Ventilation lists the procedure for confined space ventilation.

6) The atmosphere of the confined space must be initially checked to verify that it contains an acceptable level of oxygen (19.5 to 23.5%) and is free of combustible or toxic gases or vapors. Section 10-Atmospheric Testing of this procedure lists the air quality specifications which must be met. These specifications are also listed on the Entry Permit. Continuous air monitoring may be required, depending on the nature of the confined space as well as the activity(ies) to be conducted within the confined space.

7) Verify that all necessary entry equipment, eg., retrieval lines, personal protective equipment, respiratory protective equipment, etc., are available, in good condition, and functional.

8) Verify that all entrants and attendants have received the appropriate confined space entry training.

9) Verify that all rescue arrangements are in-place as per Section 9-Outside Rescue Assistance, and that an adequate means of communicating with outside assistance is immediately available to the attendant.

B. The Entry Permit must be canceled and all entrants ordered to evacuate the confined space when any one of the following conditions arises:

1) A change in initial atmospheric conditions which may jeopardize the continued safety and health of entrants is detected;

2) The attendant must leave the work station;

3) The attendant is called on to perform duties which do not allow him/her to fulfill his/her duties as an attendant;

4) Whenever ordered by the attendant due to factors external to the confined space which may jeopardize the continued safety and health of entrants;

5) At the end of the work shift and/or whenever a different group of entrants and attendants will take charge of the confined space;

6) Whenever entrants self-perceive danger and self-initiate evacuation;

7) At the termination of confined space entry; and

8) At the end of the workshift in which the entry occurs.

## 5. TRAINING AND DUTIES OF ENTRY SUPERVISOR

A. 29 CFR 1910.146-Permit Required Confined Spaces assigns specific responsibilities to the client (client or owner of the confined space). These responsibilities include communicating pertinent information regarding the hazards associated with their identified confined space(s) to contractor employees who will enter those spaces. In order to verify that the required information regarding the confined space is properly communicated to employees of the Firm, the entry supervisor must:

1) Investigate the clients' permit entry protocol, ensuring that any identified hazards and previous experience with the confined space is properly communicated;

2) Coordinate rescue assistance with either the client's in-house rescue team and/or the off-site rescue assistance specified by the client. The off-site rescue assistance specified by the client must have direct experience in rescue in the clients' identified confined space; or be provided an opportunity to examine the space and practice a rescue.

3) Verify that the client takes the necessary precautions in notifying their employees that our employees will be entering the confined space;

4) Coordinate entry operations with the employees of the client when both client and employees of the Firm will be working in or near a permit space; and,

5) Inform the client of this permit space program and any additional precautions that will be taken by employees of the Firm during the entry procedure.

B. In addition to acting as the liaison with the client representative, the entry supervisor has the following assigned duties:

1) Recognize the hazards involved with the entry as well as the signs and symptoms of exposure to the hazards;

2) Verify the that both the entry permit and checklist are completed and required equipment is in use prior to entry; and,

3) Monitor entry operations and verify that they remain consistent with the terms of the entry permit and that acceptable entry conditions are maintained.

C. The entry supervisor may also function as either the attendant and/or as an entrant, therefore, the entry supervisor must have the training specified for an attendant and/or an entrant, and will assume the duties listed below for either the attendant and/or the entrant.

## 6. TRAINING AND DUTIES OF AUTHORIZED ENTRANTS

A. Entrants must have training and instruction in their duties and responsibilities regarding confined space entry. The following are assigned duties:

1) Recognize the hazards which may be faced during entry, as well as the signs and symptoms of exposure to the hazard(s);

2) Maintain visual contact and/or verbal communications with the attendant at all times;

3) Use the personal protective equipment (PPE) provided;

4) Maintain an awareness of all external barriers required to protect from external hazards, eg., blanking, blocking, lockout, etc., and the proper use of those barriers; and

5) Obey evacuation orders given by either the attendant, entry supervisor, automatic alarm activation, or when self-perceived.

## 7. TRAINING AND DUTIES OF ATTENDANTS

A. An attendant must be stationed and remain stationed outside the permit space at all times during entry operations. The attendant may have no other duties besides those listed in this section.

B. All attendants must have training and instruction in their duties and responsibilities regarding confined space entry. The following are assigned duties:

1) Maintain an accurate count of all entrants in the confined space;

2) Monitor activities both inside and outside the confined space to verify the continued safety of entrants;

3) Maintain visual contact or verbal communications with all entrants in the confined space at all times;

4) Order evacuation of the confined space if an uncontrolled hazard develops, either within or outside the confined space, or upon observing a behavioral effect of hazard exposure among entrants;

5) Warn unauthorized persons away from the confined space;

6) Participate in non-entry rescue; and

7) Summon rescue and other emergency services.

D. Attendants must maintain current certification in basic first aid and cardiopulmonary resuscitation (CPR).

E. **Under no circumstances should the attendant attempt rescue of entrants by entering the confined space.**

8. **TRAINING CERTIFICATION**

A. Training provided to the entry supervisor, attendant, and entrant must be certified by the Firm. Such training certification will be provided by Corporate Health & Safety.

B. Documentation of training certification received by attendance at an outside training course must be provided to Corporate Health & Safety.

9. **OUTSIDE RESCUE ASSISTANCE**

A. For any project involving a confined space entry, the entry supervisor must address rescue coordination efforts. Such rescue assistance must be coordinated with either the client's designated confined space rescue team and/or with a local emergency response team.

B. Confined space entry shall progress only after proper notification of outside rescue assistance prior to the actual entry activity.

C. An adequate means of communication., eg., cellular telephone for contacting off-site emergency assistance, air horn or two-way radio for summoning a client's rescue team, etc., must be immediately available to the attendant.

10. **ATMOSPHERIC TESTING**

A. All confined spaces will be tested for atmospheric hazards as follows:

1) Each confined space will initially be tested prior to the entry supervisor authorizing entry.

2) Each confined space will also be tested continuously or at intervals as specified by the entry supervisor.

B. The Entry Supervisor will select continuous or interval monitoring, and specify length of the interval to be implemented during entry. Selection of continuous or interval monitoring will be based on the nature of the confined space hazards present in the permit space, activity during entry, and potential for hazards developing in the confined space.

C. All confined spaces must be tested for atmospheric hazards prior to each entry, and as entry proceeds. **The following are the testing sequence and acceptable air quality criteria:**

1) Oxygen content for all confined space entry must be 19.5 to 23.5%;

2) Combustible gas or vapor must not exceed 10% of its lower explosive limit (LEL);

3) Toxic gas or vapor must not exceed 50% of the Permissible Exposure Limit (PEL) or other published exposure guideline;

4) Carbon monoxide must not exceed 20 ppm; and

5) Hydrogen sulfide must not exceed 5 ppm.

D. If it is necessary to enter a confined space where any of the following atmospheric conditions exists, all entrants must wear either a self-contained breathing apparatus (SCBA) of at least 60-minute duration or an air line respirator with emergency SCBA:

1) Initial atmospheric testing indicates conditions outside the parameters listed on the Entry Permit;

2) Initial atmospheric testing indicates conditions within permit parameters but where the quality of the atmosphere remains questionable; and/or

3) Despite initial atmospheric testing results, activities to be performed while in the confined space would endanger entrants by a creating a sudden change in atmospheric conditions within the space.

4) Mechanical ventilation will not maintain atmospheric hazards within permit limits.

E. Under no circumstances is entry into a confined space having an IDLH condition (less than 19.5% oxygen or > 10% LEL) permitted by any employee of the Firm.

F. Results of all atmospheric testing must be recorded on the Confined Space Entry Permit.

## 11. MECHANICAL VENTILATION

A. Mechanical ventilation may be utilized to maintain confined space atmospheric hazards within entry limits.

B. Ventilation can be used to force clean air into a confined space or to remove contaminated air from the confined space.

C. Ventilation systems must be set up to adequately ventilate all areas of the confined space.

D. Ventilation systems must be locked in the "on" position. The confined space must have evacuated if the system fails.

E. **Continuous air monitoring** must be implemented when ventilation is utilized to maintain atmospheric hazards within entry permit limits.

F. Air intake must be positioned to prevent the introduction of air contamination into the confined space (i.e. away from vehicle exhaust, tank vents, etc.).

## 12. WORK PRACTICES

A. All entrants must wear a retrieval line secured on one end to the entrant by a full-body harness, or parachute harness, and the end secured outside the space for vertical-entry confined spaces, the lifeline must be secured to a lifting or other mechanical retrieval device. **Reliance on manually lifting an entrant from a vertical confined space is prohibited.** If more than one entrant is entering the space, each line shall be clearly marked to identify the entrant and the mechanical retrieve system must be rated for multiple entrant use.

B. Where mechanical ventilation will be relied upon for eliminating an actual or potential hazardous atmosphere, the atmosphere of the space must be continually monitored to verify that the continuous forced air ventilation is preventing the generation or accumulation of a hazardous atmosphere.

C. Whenever a ladder is required for confined space entry, the ladder must be secured and not withdrawn while anyone remains within the confined space except as necessary to permit extraction during rescue.

D. Adequate illumination must be provided for all confined space entry. An approved type (explosion-proof) lighting device must be used.

E. All electrical equipment used within a confined space must be explosion-proof and must be inspected prior to use to verify good working condition. The equipment must utilize a ground fault interrupt and/or be properly grounded.

F. Whenever the confined space is structured such that visual contact can not be maintained between entrants and the attendant, intrinsically-safe two-way radios must be utilized to maintain continuous contact between entrants and attendants.

G. All confined spaces must be isolated prior to entry.

H. Prior to opening or removing lids, covers, access doors, or hatches of a confined space, precautions must be taken to determine if it is safe to do so.

I. Whenever entering manholes or other confined spaces with permanent ladders, all rungs must be inspected to verify they are in safe and useable condition.

J. When working in a vertical confined space, precautions must be taken to prevent equipment and personnel from falling into the confined space opening. Tools should be lowered and removed from the space using a basket or sling to prevent falls and falling objects.

## 13. POSTING AND RECORDKEEPING

A. The Entry Permit(s), must be initially posted at the entrance to the confined space, and remain posted for the duration of the entry. **All permits must be weather protected to maintain integrity.**

B. The original, canceled Entry Permit(s) must be retained within the project file.

C. Copies of the canceled Confined Space Entry Permit(s) must be forwarded to the Divisional HSC and Corporate Safety Division for quality assurance checks and record retention.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 10/10/96

BBL
BLASLAND, BOUCK & LEE, INC.
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# CONFINED SPACE ENTRY CHECKLIST

All Copies of Permit Must Remain at Job Site Until the Entry is Completed

Permit # _____

Project _____ Date _____ Time _____

Location and Description of Confined Space: _____

_____

| Checklist | Yes | No | NA |
|---|---|---|---|
| All lines to and from confined space blanked, capped, or isolated | | | |
| Electrical service locked out (entrant with key) | | | |
| Mechanical devices/systems are restrained and locked out | | | |
| Explosion-proof electrical equipment in use | | | |
| Ladders secured at top | | | |
| Ground fault circuit interrupter checked and functioning | | | |
| All ignition sources identified and isolated | | | |
| Respirators and air supply equipment in proper condition | | | |
| Safety harnesses and lifelines in proper condition | | | |
| Required personal protective equipment being utilized | | | |
| Monitoring equipment calibrated and functioning properly | | | |
| Atmospheric testing completed | | | |
| Trained attendant on standby | | | |
| Emergency equipment ready for use | | | |
| Rescue provisions in place | | | |
| Warning signs posted | | | |
| Ventilation equipment functioning properly | | | |
| Retrieval system functioning properly (tripod with life lines) | | | |
| Communication device for entrants and attendants | | | |
| Area secured to eliminate unauthorized entry | | | |
| Entry personnel trained for confined space entry | | | |
| Confined space entry permit completed and posted | | | |
| Permanent ladder rungs in safe condition | | | |

Monitoring Frequency: ☐ Continuous ☐ 5 min. ☐ 10 min. ☐ 15 min. ☐ 30 min.

Monitors Name: _____ Initials _____

| | Confined Space Air Monitoring Parameters | | | | |
|---|---|---|---|---|---|
| | % Oxygen | % LEL | $H_2S$ | CO | Other _____ |
| Time of Reading | >19.5% | <10% | <5 ppm | <20 ppm | <50% of PEL |
| Pre-Entry | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Entry Supervisor _____
Print

Signature _____ Date _____ Time _____

Air Monitor _____
Print

Signature _____ Date _____ Time _____

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# CONFINED SPACE ENTRY PERMIT

All Copies of Permit Must Remain at Job Site Until the Entry is Completed

Permit # _____

Project _____ Date _____ Time _____

Location and Description of Confined Space: _____

_____

Rescue Contact and Phone Number: _____

Entry Objectives: _____

_____

Equipment/Materials required for Entry : _____

_____

Time of Entry: _____ Expiration of Entry: _____

Required Respirator for Entry: _____

Required Protective Clothing for Entry: _____

| Air Monitoring Requirements | | | |
|---|---|---|---|
| | | Calibrated | |
| Monitor For | Monitoring Equipment | Date/Time | By |
| $\%O_2$ | | | |
| % of LEL | | | |
| $H_2S$ | | | |
| CO | | | |
| Other: | | | |
| Other: | | | |

Monitoring Frequency: ☐ Continuous ☐ 5 min. ☐ 10 min. ☐ 15 min. ☐ 30 min.

| Number of Entrants: | | Number of Attendants: | |
|---|---|---|---|
| Names of Entrants | | Names of Attendants | |
| | | | |
| | | | |
| | | | |
| | | | |

Entry Supervisor Authorizing Confined Space Entry Permit _____
Print

_____
Signature Date Time

Entry Supervisor Cancelling Confined Space Entry Permit _____
Print

_____
Signature Date Time

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TOPIC:

# DAILY SAFETY MEETINGS

PPM#

1.02.09

| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |
|---|---|---|

## STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees, and will abide by applicable state and federal agency regulations when performing field work. In order to effectively implement site-specific procedures and verify that all on site personnel understand hazards and the methods to detect them, protective measures, and emergency procedures, a Daily Safety Meeting (DSM) will be held each day prior to commencement of field activities.

## DESCRIPTION OF PROCEDURE:

The Site Supervisor or Health and Safety Supervisor will hold a meeting with all site workers to discuss the day's activities, and the safety and health issues related to those activities. This meeting must be attended by all BBL employees, all subcontractors, and any other site personnel who could benefit from the information presented. Topics which must be covered include, as a minimum:

- A description of the work to be done and how it is to be done;
- The chemical, physical, and biological hazards posed by the activities to be conducted;
- The methods used to detect the presence of chemical, physical, and biological hazards, including action levels or conditions for upgrade/downgrade of PPE, or site evacuation;
- The protective equipment required to protect against the hazards;
- The work practices necessary to minimize exposure potential;
- The emergency procedures to be followed, including the phone numbers of police, fire, and ambulance;
- The means of communication to be used, including hand signals, horn blasts, etc.;
- The names of personnel and alternates responsible for site safety;
- Safe use of engineering controls and equipment on the site; and
- Hazards associated with site weather conditions.

The meeting must be documented and all participants must sign the documentation indicating their participation. This meeting is an excellent time to verify project participants have the proper protective equipment, and they understand the work to be done and the procedures to be followed. **This meeting must be repeated for newcomers to the site or if site conditions or the nature of the work changes.** A standard form for documenting the meeting is attached to this procedure.

## ROLES AND RESPONSIBILITIES

A. Project Manager

The Project Manager (PM) must require Daily Safety Meetings on all field projects. The PM should review DSM documentation to verify that the meetings are held, that all field personnel attend the meetings, and that the meetings present the appropriate information.

B. Health and Safety Supervisor

The Health and Safety Supervisor (HSS) serves as the designated health and safety representative on the project site. Responsibilities include the communication of site-specific health and safety plan requirements to all BBL site personnel and enforcement of the health and safety requirements for BBL employees. The HSS typically presents the DSM, and must document the DSM and include the documentation in the project file.

C. Site Supervisor

The Site Supervisor (SS) must verify that the DSM is held, and that all field staff participate. The SS may conduct the meeting, or may participate to the extent necessary to inform field staff of the work to be done and the procedures and protective equipment necessary to safely perform the work.

## RECORDKEEPING REQUIREMENTS

A. On Site

All topics covered during the meeting must be documented. All attendees must review and sign the form, and DSM documents must be kept on site until the completion of field activities.

B. Project Records

The records of DSMs must be filed with other project records, and must be maintained for the same period of time as other field records.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 9/1/96

| BBL | TOPIC: | PPM# |
|---|---|---|
| | BLOODBORNE PATHOGENS | 1.02.10 |

| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |
|---|---|---|

## STATEMENT OF POLICY:

The firm is committed to operate in a manner that will protect the safety and health of its employees and will abide by applicable state and federal agency regulations. In order to protect employees of the Firm from the hazards posed by bloodborne pathogens, this procedure presents health and safety requirements for personnel who may be exposed to these hazards, particularly voluntary first aid and cardiopulmonary resuscitation (CPR) care providers. In order to meet the requirements of Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) §1910.151, at least one person on a project site will be adequately trained in first aid and CPR, in the requirements of the Bloodborne Pathogens Standard as listed in 29 CFR §1910.1030, and in the contents of this procedure.

## DEFINITIONS:

### *Bloodborne Pathogens*

Bloodborne pathogens are agents (i.e., bacteria, virus, fungi) found in blood, blood components, and certain body fluids. Exposure may result from direct contact with blood and body fluids, or contact with materials, objects, or surfaces that have had contact with blood or body fluids. Bloodborne pathogens are capable of causing human disease or death to unprotected people who come into contact with blood or blood-affected items. Diseases caused by bloodborne pathogens include, but are not limited to, hepatitis B virus (HBV), human immunodeficiency virus (HIV), hepatitis C, malaria, and syphilis.

### *Exposure*

Any contact with blood or body fluids, or contact with equipment/surfaces contaminated by blood or other potentially infectious materials is considered exposure. Significant exposure involves contact or absorption of blood or blood-contaminated objects through open or broken skin (i.e., cuts, scratches, rashes), punctures through the skin with a contaminated sharp object , or blood splashes to the eyes, nose, or mouth.

### *Hepatitis B Virus (HBV)*

HBV is the major bloodborne pathogenic hazard that first aid/CPR care providers are likely to encounter. The HBV can remain infectious for up to 10 days even in dried blood. The virus adversely affects 8,000 to 10,000 workers annually resulting in approximately 200 deaths each year.

### *HBV Exposure Symptoms*

Hepatitis means "inflammation of the liver", and can cause severe liver damage or cirrhosis. Exposure symptoms include fever, fatigue, nausea, vomiting, muscle aches, loss of appetite, and jaundice (yellowing of the eyes or skin). Hepatitis diagnosis is difficult because some symptoms are similar to the flu and may remain mild for an extended period of time. Presently, no cure exists for hepatitis. It can be prevented with a vaccination.

### *Human Immunodeficiency Virus (HIV)*

HIV attacks and deteriorates the body's immune system and eventually weakens it to the point that infection sets in, causing the disease Acquired Immune Deficiency Syndrome (AIDS). HIV is transmitted through contact with blood and body fluids. HIV is not transmitted by touching or working with people who are HIV-positive.

### *HIV Exposure Symptoms*

HIV can lead to suppression of the immune system to a degree sufficient to permit the onset of neurological problems, cancer, pneumonia, and death. People may carry the virus for many years without experiencing any symptoms. Upon

development, symptoms may include weight loss, skin lesions, dry cough, fever, fatigue, diarrhea, or swelling of the lymph glands. Presently, no cure exists for HIV or AIDS, and no vaccination is currently available.

***Voluntary First Aid Provider***
An individual trained in first aid/CPR who may be called on to render first aid/CPR.

## RESPONSIBILITIES:

A. The Corporate Industrial Hygiene/Environmental Safety Associate (CSA) administers this procedure. The CSA is assisted in each region by a Regional Health and Safety Coordinator and in each division by a Divisional Health and Safety Coordinator.

B. The Regional Health and Safety Coordinators (RHSC) are responsible for implementation of this procedure on a regional basis (North and Central Region, South and West Region). The RHSCs review all reports of potential exposures and coordinate the appropriate action.

C. Division Health and Safety Coordinators (DHSC) assist in implementing the procedure for their respective divisions and communicating the procedure to the division staff. The DHSC reports all incidents involving potential exposure to the RHSC.

D. The Project Health and Safety Supervisor (HSS) assists in implementing the procedure for individual projects and communicates the requirements to the project staff. The project HSS reports all incidents involving potential exposure to the DHSC or RHSC.

E. Trained providers of first aid/CPR are responsible to follow this procedure when rendering first aid. Providers are responsible to report all potential exposure incidents to the DHSC or RHSC.

## DESCRIPTION OF PROCEDURE:

This procedure is designed to limit occupational exposure of site workers to blood materials and body fluids which may contain infectious pathogenic agents. The contents of this procedure are intended to protect employees trained in first aid and CPR who may administer medical assistance to site workers.

### *1) Means of Transmission*
The primary activity that may expose site employees to bloodborne pathogens is the response and care of on-site personal injuries, or decontamination of equipment/surfaces contaminated by blood or other potentially infectious materials during an incident. Employees could be subject to bloodborne pathogens during rendering of first aid or CPR by accidental exposure due to:

- Punctures through the skin with a contaminated sharp object;
- Contact with blood or blood-contaminated objects which may permit absorption through open or broken skin (i.e., cuts, scratches, rashes); or
- Blood splashes to the eyes, nose, or mouth.

Workers can reduce their risk of exposure by implementing the work practices outlined in this plan before, during, and after responding to emergency medical incidents involving personal injuries.

### 2) Protective Measures

The establishment of work practice controls is an integral part of an effective exposure control plan. These work practices are designed to protect employees from reasonably foreseeable occupational exposures to bloodborne pathogens from blood and other potentially infectious material. The work practice controls outlined in this section are applicable to the administration of first aid in emergency situations and subsequent cleanup.

#### A) Universal Precautions

Universal precautions is an approach to infection control which operates on the assumption that all human blood, bodily fluids, and sharps or other medical waste are to be treated as if they are known to be contaminated with HIV, HBV, or other infectious diseases. Universal precautions shall be implemented whenever there exists a foreseeable potential for contact with blood or bodily fluids.

#### B) Personal Protective Equipment

The following are specific personal protective equipment items that shall be utilized:

- Always wear hand (i.e. latex or nitrile surgical gloves) and eye (i.e. safety glasses, goggles) protection when administering first aid or CPR.
- Always use an appropriate mouthpiece or ventilation device when administering rescue breathing or CPR.
- Inspect all PPE prior to use to ensure it is intact and is in good working order.
- After use, remove gloves from top to bottom inside-out, not allowing unprotected skin to contact the exterior of the gloves.
- Do not reuse gloves once removed; use different gloves for each patient.

#### C) Work Practice Controls

Work practice controls shall be instituted whenever foreseeable potential contact with, or exposure to, blood and bodily fluid exists. Examples of situations in which these controls are to be implemented include, but are not limited to, accidents or injuries in which administration of first aid is required, application of bandages to minor cuts and abrasions of another person, and contact with sores, wounds, or broken skin.

Since many worksites are in remote locations, providing hand washing facilities is difficult. For instances where hand washing facilities cannot be provided, BBL will provide employees with antiseptic towelettes or an antiseptic hand cleaner and clean cloth or paper towels.

The following are specific work practice controls that shall be implemented:

- Open wounds or cuts will be promptly bandaged.
- Wash hands and face as soon as possible after administering first aid or CPR. If wash facilities are not readily available, disposable one-time use towelettes are acceptable.
- PPE must be removed immediately upon leaving the work area and placed in an appropriate container for storage, washing, decontamination, or disposal.
- No eating, drinking, or smoking is allowed in any work area where a potential exists for occupational exposure to bloodborne pathogens.

- Non-disposable equipment or materials that have or may have blood or infectious fluid contact must be washed immediately after their use. A solution of bleach and water (one to ten percent) is recommended for proper decontamination.
- Any clothing that comes in contact with blood or infectious fluids shall be removed as soon as possible after administering first aid or CPR. Clothing must be placed in an appropriate container for storage until it can be laundered.
- No personal clothing that comes in contact with blood or infectious fluids shall be laundered off-site.
- Equip first-aid kits with two pairs of surgical gloves and CPR mouth pieces.

#### *D) Minimization of Contact*

Direct contact with blood and bodily fluids should be kept to an absolute minimum, as required in a particular situation. In situations where direct contact is likely, personal protective equipment shall be worn to help prevent infection.

Based upon professional judgment, an employee may choose to temporarily forego the use of PPE if he determines that the use of PPE will further jeopardize his well-being or that of the injured worker. This limited application must be carefully evaluated by the employee.

### *3) Waste Handling & Disposal*

Disposable items that have or may have blood contact must be bagged separately from other trash. These wastes must be placed in leak proof containers or bags and labeled as a "BIOHAZARD."

Wastes used in medical emergency treatment (i.e. gloves, towels, gauze) must be disposed in an infectious waste container(s). The container will be replaced as needed; if the outside of the container becomes contaminated, an additional outside container will be used.

The waste will remain on site in approved container(s) until an approved disposal facility capable of receiving medical wastes is identified. Disposal of the infectious waste container(s) shall be in accordance with applicable local, state, and federal regulations.

### *4) Medical Requirements*

A Hepatitis B vaccination shall be given to all exposed employees and a post-exposure procedures and evaluation.

#### *A) Hepatitis B Vaccination*

All employees whose job duties present the likelihood of exposure will have made available to them, at no cost, a Hepatitis B vaccination. The employee will also receive training as to the vaccine's efficacy, safety, benefits, and consequences prior to administration. For personnel assigned to duties where contact with bloodborne pathogens is likely, the vaccination series shall be initiated prior to assignment and shall be administered under the supervision of a licensed physician. For voluntary first aid providers, the vaccination series shall be initiated within 24 hours of providing first aid/CPR in an incident and shall be administered under the supervision of a licensed physician. Employees may at their own discretion decline the vaccination, in which case documentation of declination will be completed. If an employee covered by this exposure plan decides to accept the vaccination at a later date, the vaccination will be offered at that time at no cost to the employee.

### B) Post-Exposure Procedures and Evaluation

Subsequent to all reported exposure incidents, a confidential medical evaluation and follow-up shall be made available to each employee exposed in an incident. If a responder has not been vaccinated, an HBV vaccination series will be offered within 24 hours.

## 5) Documentation Procedures

Documentation of the exposure incident shall be recorded as soon as possible, and include the route(s) of exposure, the circumstances surrounding the incident, identification of the source individuals, and identification of potentially exposed persons. Additionally, each incident involving voluntary first aid providers shall be placed on the "first aid incident list" attached to the location OSHA Log of Occupational Injuries and Illnesses.

## 6) Blood Testing

### A) Source Individuals

As soon as feasible, the source individual in an exposure incident will be asked to consent to a blood test to determine HBV and HIV infectivity. Where applicable laws require employee consent, documented consent shall be obtained prior to testing. If an employee refuses the blood test, documentation of the refusal will be made. Documentation of the test results shall be made available to the exposed employee(s). All results will be kept confidential.

### B) Exposed Employees

Exposed employees will be asked to consent to a blood test for HBV and HIV serological status. If consent to HIV testing is denied, the blood sample will be preserved for 90 days, within such time the employee may elect to consent to the HIV test.

### C) Post-Exposure Medical Evaluations

Exposed employees shall receive a healthcare professional's written opinion for post-exposure evaluations. The written opinion shall include the results of the evaluation and any medical conditions resulting from the exposure incident which requires further medical treatment.

## 6) Hazard Communication

### A) Warning Labels

Containers used for disposal of blood contaminated supplies and waste will be labeled in accordance with the word "biohazard."

### B) Warning Signs

There are no designated areas for medical treatment on site, since first aid will be provided on an emergency basis only, and therefore warning signs are not applicable. In cases of potential exposure, observers and non essential personnel should be verbally warned to keep a safe distance from injured personnel.

## 7) Employee Training Program - Voluntary Providers

All employees who are first aid/CPR trained and may provide assistance shall be trained in the requirements for voluntary providers as described in this procedure. The training program includes the following elements:

- A copy of 29 CFR §1910.1030 for review;

- A review of this PPM;
- Explanations of bloodborne diseases, modes of transport, symptoms of infection;
- Explanation of the exposure control plan, methods used to recognize tasks with potential exposure;
- Explanations of use and limitations of control measures;
- Information on the Hepatitis B vaccination, medical evaluation, and post-exposure exam;
- Explanation of warning signs and labels; and
- Explanation of requirements for notification and documentation.

### *8) Medical Records*

Medical records for employees must include documentation on HBV vaccination status, medical follow-up, post-exposure testing, and a medical professional's written evaluation.

### *9) Incident Recording*

An incident that occurs as a result of rendering emergency medical care will be recorded on the OSHA 200 log as OSHA defines work-related injuries and illnesses.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 9/1/96

| BBL | TOPIC: EXCAVATION AND TRENCHING | PPM#: 1.02.11 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

The Firm is committed to operate in a manner which protects the health and safety of its personnel. Employees of the Firm must abide by applicable local, state, and federal regulations while conducting activities for the Firm. To maintain a safe and healthful workplace, employees of the Firm must utilize the procedures outlined in this PPM for any excavation activity conducted as part of the Firm's business.

This PPM sets forth standard procedures to be utilized by employees of the Firm when working with open excavations made in the earth's surface. This procedure also establishes administrative roles and responsibilities to meet the requirements and definitions of 29 CFR 1926 Subpart P.

To reduce the potential for injury, personnel must avoid entering excavations whenever feasible alternatives exist. If entry into an excavation cannot be avoided, the safety and engineering controls outlined in this procedure must be implemented by authorized personnel under direct supervision of personnel competent with respect to potential hazards present and regulatory requirements of 29 CFR 1926 Subpart P.

## DESCRIPTION OF PROCEDURE:

### 1. OSHA DEFINITIONS FOR EXCAVATION ACTIVITIES

A. *Aluminum Hydraulic Shoring* means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wailers). Such system is designed to support the sidewalls of an excavation and prevent cave-ins.

B. *Benching* (Benching system) means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

C. *Cave-in* means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

D. *Competent person* means one who, through education, training, and/or experience, is capable of identifying existing and predictable hazards or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

E. *Excavation* means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

F. *Failure* means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

G. *Hazardous atmosphere* means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause illness, injury, or death.

H. *Protective system* means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide protection.

I. *Ramp* means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

J. *Registered Professional Engineer* means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

K. *Sheeting* means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

L. *Shield* (Shield system) means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shield can be either premanufactured or job-built in accordance with 1926.652 (c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields".

M. *Shoring* (Shoring system) means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

N. *Sloping* (Sloping system) means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

O. *Stable rock* means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

P. *Support system* means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

Q. *Trench* means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 meters). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 meters) or less (measured at the bottom of the excavation), the excavation is considered to be a trench.

## 2. ADMINISTRATIVE ROLES AND RESPONSIBILITIES

A. Officers/Division Heads

1) Verify that all excavation activities are properly identified and addressed within a project work plan, site health and safety plan and/or other project documents.

2) Verify that employees designated as "competent person" for excavation activities have experience, training, and authority to fulfill the requirements of the position.

3) Verify that proper excavation and personal protective equipment is available for use by divisional employees.

B. Corporate Health and Safety Associate

1) Review and revise this procedure as required to meet regulatory requirements.

2) Provide technical assistance regarding excavation procedures, hazard identification, "competent person" designation, and personal protective systems.

3) Audit project specific excavation activities for compliance with this procedure.

4) Review and revise, as appropriate, site-specific health and safety plans to include requirements for excavation activities.

5) Verify that all employees assigned as a "competent person" for excavation activities meet the OSHA definition as such with respect to training and authority.

C. Regional Health and Safety Coordinators

1) Verify that all employees assigned as a "competent person" for excavation activities meet the OSHA definition as such with respect to training and authority.

2) Provide technical assistance regarding excavation procedures, hazard identification, "competent person" designation, and personal protective systems.

3) Audit project-specific excavation activities for compliance with this procedure.

4) Review and revise, as appropriate, site-specific health and safety plans to include requirements for excavation activities.

D. Divisional Health and Safety Coordinators

1) Review this PPM with all employees involved with excavation activities on a project specific basis;

2) Verify that all employees assigned as a "competent person" for excavation activities meet the OSHA definition as such with respect to training and authority.

3) Audit project-specific excavation activities for compliance with this PPM.

E. Site Designated "Competent Person"

1) Must be capable of identifying existing or predictable hazards in surroundings and/or working conditions associated with excavation activities.

2) Must be authorized to take prompt corrective measures to eliminate hazardous conditions associated with excavation activities.

3) Verify that the safety procedures identified in this PPM and 29 CFR 1926 Subpart P are utilized when required to protect employees during excavation activities.

4) Conduct and document daily inspections of all excavations and protective systems.

5) Conduct and document inspections of all excavations after any event (e.g., thunderstorm) that may affect excavation stability.

6) Attend "Competent Person" training for excavation and trenching activities.

7) Attend 8-Hour Supervisory training.

8) Attend Confined Space Entry training.

F. Employees Required to Work Around or In Excavations

1) Must be capable of recognizing existing or predictable hazards in surroundings and/or working conditions associated with excavation activities.

2) Understand all safety requirements outlined in this PPM and 29 CFR 1926 Subpart P to be utilized to protect employees during excavation activities

3) Attend annual OSHA refresher training.

4) Attend Confined Space Entry training.

## 3. GENERAL SAFETY REQUIREMENTS FOR ALL EXCAVATIONS

A. All surface obstructions must be moved or supported so as to protect employees and equipment.

B. Prior to excavation, all underground installations (water, electric, telephone, gas, etc.) must be located and documented. Proper procedures for locating underground objects may include interviews with utility or facility personnel, contacting locator services (e.g., Dig Safe), reviewing site drawings, and/or using geomagnetic sensing instrumentation. (See Section 6)

C. When excavating in areas near underground installations, proper precautions must be taken to determine the exact location of the installations and to adequately protect and support them. While an excavation is open, underground installations shall be protected, supported or removed as necessary to protect employees.

D. Structural ramps used as a means of access and egress to/from excavations must be designed by a "competent person", constructed of uniform materials, securely attached, and treated to prevent slipping.

E. If personnel are working in a location exposed to vehicular traffic they must be provided with and be required to wear reflective safety vests.

F. Personnel are not permitted to be beneath elevated loads handled by equipment.

G. Mobile equipment located near open excavations must be adequately protected from falling or rolling into excavations by the use of barricades or warning devices.

H. All excavations over 4 feet in depth must be tested for hazardous atmospheres whenever personnel are required to enter and a potential exists for the existence of hazardous contaminants or oxygen deficiency. Excavations under 4 feet in depth must be evaluated by the competent person and, at the competent person's discretion, tested for hazardous atmospheres whenever personnel are required to enter and a potential exists for the existence of hazardous contaminants or oxygen deficiency.

I. Means of rescue including a lifeline and body harness must be used by personnel entering excavations with a potential for air hazards. A standby person must be stationed outside the excavation to tend the lifeline(s).

J. Water must not be allowed to accumulate in open excavations where employees are working. When necessary, means such as diverting natural drainage around the excavation or actively pumping water must be used to prevent or control water accumulation.

K. All structures adjacent to an open excavation must be supported, or a registered professional engineer must determine that the structure will not be affected by the excavation activities.

L. Excavated materials (spoil) must be placed no closer than 2 feet from the edge of an open excavation, and otherwise retained to prevent loose material from falling into the excavation.

M. Protection such as guardrails, barricades, or covers must be in place to protect personnel from possible falls into open excavations, pits, wells, and shafts.

N. Work tasks will be designed to limit the number of personnel required to enter any excavation. All tasks that can be completed remotely from outside the excavation (such as soil sampling) will be conducted in such a manner.

O. Personnel will not be allowed to enter any excavation unless adequate protective systems and procedures are utilized to prevent accidents and injury.

P. All excavations over four feet in depth shall be provided with a stairway, ladder, ramp, or other safe means of egress so as to require no more than 25 feet of lateral travel. As deemed necessary by the competent person, excavations under four feet in depth will be provided with a stairway, ladder, ramp, or other safe means of egress so as to require no more than 25 feet of lateral travel.

## 4. EXCAVATIONS REQUIRING PROTECTIVE SYSTEMS

A. The following excavations require protective systems:

1) All excavations into which employees will enter, regardless of depth where the potential for cave-in exists.

2) Any excavation over 5 feet in depth into which employees will enter that is not entirely in stable rock as defined in this procedure.

3) Any excavation near a structure, (e.g. foundations, piers, footers, walls, sidewalks, tanks, roadways, etc.), as required by the registered professional engineer reviewing the stability of the excavation and the structure.

B. All excavations over 20 feet in depth must be designed by a registered professional engineer regardless of whether personnel will enter it or not.

C. All excavations with adjacent structures which are located a distance less than 4 to 6 times the depth of the excavation away shall be reviewed by a registered professional engineer to determine if the stability of the structure will be affected by the excavation.

D. Support systems for an adjacent structure must be designed by a registered professional engineer.

## 5. SELECTION AND USE OF PROTECTIVE SYSTEMS

A. <u>Shoring or Shielding</u>

1) If shoring or shielding is selected as the protective system for an excavation, soil classification in accordance with 1926 Subpart P Appendix A (see Section 10 of this procedure) is required; and

2) One of the following options must be utilized for all excavations which will be shored or shielded:

a. Timber shoring as specified in 1926 Subpart P Appendix C must be utilized;

b. Hydraulic shoring, trench jacks, air shores, or shields as required in 1926.652 (c)(2) must be utilized following the system manufacturer's data;

c. A system which follows other tabulated data (approved by a registered professional engineer) must be utilized; or

d. The excavation must be designed by a registered professional engineer.

B. Sloping

1) If sloping is selected as the protective system for an excavation, the excavation sides must be sloped at a maximum of 34° (1 1/2 Horizontal: 1 Vertical), uness the procedure in #2 is followed.

2) Soil classification in accordance with Section 10 of this procedure) is required for all excavations with sides which will be sloped greater than 34° (1 1/2 Horizontal: 1 Vertical) and

a. Sloping, based on soil classification, as specified in 1926 Subpart P Appendix B must be utilized;

b. A sloping system which follows other tabulated data (approved by a registered professional engineer) must be utilized; or

c. The excavation must be designed by a registered professional engineer.

## 6. ATMOSPHERIC TESTING FOR ENTRY

A. Any excavation over 4 feet in depth with a potential for hazardous contaminants or oxygen deficiency must be tested for hazardous atmospheres prior to and during activities involving entry.

B. The site designated "competent person" will document initial and periodic air monitoring results for all activities requiring entry into the excavation.

C. All atmospheric testing of excavations must be conducted in the following sequence and meet the following air quality criteria:

1) Oxygen content must be 19.5 to 23.5%;

2) Combustible gas or vapor must not exceed 10% of its lower explosive limit (LEL);

3) Toxic air contaminant levels must not exceed 50% of the permissible exposure limit for the specific contaminant;

4) Carbon monoxide must not exceed 20 ppm; and

5) Hydrogen sulfide must not exceed 5 ppm.

## 7. LOCATION OF UNDERGROUND/OVERHEAD UTILITIES

A. The competent person and the project manager shall both verify that local underground facilities location/protection agencies are notified within the required time frame prior to the initiation of excavation activities.

B. Prior to initiation of excavation or trenching operations the competent person shall verify that all utilities have been located.

C. The competent person shall verify that the Overhead/Underground Utilities Checklist (A copy of the checklist is attached to this PPM ) is completed and authorized prior to the commencement of excavation and trenching activities.

## 8. DAILY/PERIODIC INSPECTIONS

A. Prior to initiation of daily excavation or trenching operations the competent person shall verify that a daily inspection of the excavation has been conducted.

B. During excavation or trenching operations the competent person shall verify that periodic inspections of all excavations are conducted after any event (e.g., thunderstorm) that may affect excavation stability.

C. The competent person shall verify that a daily/periodic inspection checklist (A copy of the checklist is attached to this PPM ) is completed for each inspection of excavation and trenching activities.

## 9. TRAINING

A. "Competent Person" Training

In order to be assigned duties as a competent person with respect to excavation and trenching personnel must complete the firm's training course including but not limited to the following topics:

1) Soil classification techniques
2) Excavation hazard recognition
3) Protective systems
4) Requirements of 1926 subpart P and appendices
5) Procedures for addressing safety hazards.

B. General Hazard Awareness Training

1) New Employees

a) Provided general orientation training with respect to this procedure at time of hire.

2) Existing Employees will be provided with excavation and trenching awareness training:

a) Through DHSC at initiation of this procedure.

b) As part of other safety training (i.e., 8-Hour Refresher, Confined Space, and 8-Hour Supervisory.

C. Project - Specific Training

1. Site orientation on excavation projects shall include a discussion of:

a) Site excavation hazards and procedures;
b) Requirements for conducting activities remotely whenever possible;
c) Client requirements and procedures for excavation activities; and
d) This PPM.

2. Daily Safety Meetings on projects involving excavation activities shall include a discussion of:

a) Site excavation hazards and procedures;
b) requirements for conducting activities remotely whenever possible;
c) Client requirements and procedures for excavation activities; and
d) This PPM.

## 10. SOIL CLASSIFICATION FOR SELECTION OF PROTECTIVE SYSTEMS

A. Soil Classification

1) This section describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. This section contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

2) This section applies when a sloping, benching or shoring system is utilized as a method of protection for employees from cave-ins.

3) Soil Classification Definitions

a) **Cemented soil** means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.
b) **Cohesive soil** means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sides, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.
c) **Dry soil** means soil that does not exhibit visible signs of moisture content.
d) **Fissured** means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.
e) **Granular soil** means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

f) **Layered system** means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

g) **Moist soil** means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

h) **Plastic** means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

i) **Saturated soil** means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or sheer vane.

j) **Soil classification system** means, for the purpose of this procedure, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

k) **Submerged soil** means soil which is underwater or is free seeping.

l) **Unconfined compressive strength** means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

m) **Wet soil** means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

4) Types/Classes of Soil

a) **Type/Class A Soils** are cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

(1) The soil is fissured;
(2) The soil is subject to vibration from heavy traffic, pile driving, or similar effects;
(3) The soil has been previously disturbed;
(4) The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4 Horizontal:1 Vertical) or greater; or
(5) The material is subject to other factors that would require it to be classified as a less stable material.

b) **Type/Class B Soils** are:

(1) Cohesive soils with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa);

(2) Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam;
(3) Previously disturbed soils, except those which would otherwise be classed as Type C soil;
(4) Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration;
(5) Dry rock that is not stable; or
(6) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4 Horizontal:1 Vertical), but only if the material would otherwise be classified as Type B.

c) **Type/Class C Soils** are:

(1) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less;
(2) Granular soils including gravel, sand, and loamy sand; or
(3) Submerged soil or soil from which water is freely seeping; or
(4) Submerged rock that is not stable; or
(5) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4 Horizontal:1 Vertical) or steeper.

5) Methods for Classifying Soils

a) Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in this section.
b) The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis conducted by a competent person using tests described below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.
c) The visual and manual analyses, such as those noted as being acceptable in this section, shall be designed and conducted to provide sufficient quantitative and qualitative information as may be necessary to identify properly the properties, factors, and conditions affecting the classification of the deposits.

(1) Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

(a) Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

(b) Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

(c) Observe the side of the open excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

(d) Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

(e) Observe the open side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

(f) Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

(g) Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

2) Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

(a) **Plasticity.** Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

(b) **Dry strength.** If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

(c) **Thumb penetration.** The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large

clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

(d) **Other strength tests.** Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

(e) **Drying test.** The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:

(1) If the sample develops cracks as it dries, significant fissures are indicated.

(2) Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material, and the unconfined compressive strength should be determined by using the thumb penetration or other test.

(3) If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

6) Layered system

a) A layered system shall be classified in accordance with its weakest layer.
b) Each layer may be classified individually where a more stable layer lies under a less stable layer.

7) Reclassifying Soils

a) If, after classifying a soil, the properties, factors, or conditions affecting its classification change in any way, the changes shall be evaluated by a competent person.
b) The soil shall be reclassified as necessary to reflect the changed circumstances.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 10/10/96

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

# DAILY/PERIODIC EXCAVATION INSPECTION CHECKLIST

Project Name _____ Date _____

Location _____ Time _____

Prepared By _____ Project Manager _____

**This checklist must be completed for all excavations. It documents that daily and post event/periodic inspections are conducted.**

Soil Classified As: Stable Rock ☐ Type A ☐ Type B ☐ Type C ☐

Soil Classified On _____ By _____

Type of Protective System in Use: Sloping ☐ Shoring ☐ Other ☐

Description _____

| Inspection Item | YES | NO | Comments |
|---|---|---|---|
| Is the underground/overhead utilities checklist completed? | | | |
| Are underground installations protected from damage? | | | |
| Adequate means of entry/exit available in the excavation? | | | |
| If exposed to traffic, are personnel wearing reflective vests? | | | |
| Barriers to prevent equipment rolling into excavation? | | | |
| Air monitoring conducted prior and during excavation entry? | | | |
| Stability of adjacent structures reviewedby registered P.E.? | | | |
| Are spoil piles at least 2 feet from the excavation edge? | | | |
| Fall protection in use near excavations deeper that 6'. | | | |
| Are work tasks completed remotely if feasible? | | | |
| Protective system in place and in good repair? | | | |
| Emergency rescue (lifeline/body harness) equipment utilized due to potential atmospheric hazard? | | | |
| Is excavation exposed to vibration? | | | |
| Are employees protected from falling/elevated material? | | | |
| Is soil classification adequate for current environmental/weather conditions? | | | |
| Portable ladders extend at least 4' above excavation? | | | |
| Portable ladders or ramps secured in place? | | | |
| All personnel ahave attended safety meeting on excavation hazards? | | | |
| Support systems foir adjacent structures are in place? | | | |
| Is excavation free from standing water? | | | |
| Water control and diversion of surface runoff is adequate? | | | |
| Are employees wearing required protective equipment? | | | |

Comments _____

BBL Excavation Competent Person _____ Date/Time _____

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# UNDERGROUND/OVERHEAD UTILITY CHECKLIST

Project Name_____ Date_____

Location_____

Prepared By_____ Project Manager_____

This checklist must be completed for any intrusive subsurface work such as excavation or drilling. It documents that overhead and underground utilities in the work are identified and located. The Project Manager shall request utility markouts before that start of field operations to allow the client and utility companies sufficient time to provide them. If complete information is not available, a magnetometer or other survey shall be performed to locate obstacles prior to intrusive subsurface activities.

***Procedure***

A diagram of the work area depicting the proposal location of intrusive subsurface work sites (i.e., boring locations, excavation locations) must be attached to this form. The diagram must clearly indicate the areas checked for underground structures/utilities, and overhead power lines. This form and the diagram must be signed by the BBL Project Manager, the BBL Site Supervisor, and the client representative.

***Checklist***

| Type of Structure | Present | Not Present | Method of Markout |
|---|---|---|---|
| Electric Power Line | | | |
| Natural Gas Line | | | |
| Telephone Line | | | |
| Water Line | | | |
| Product Line | | | |
| Sewer Line | | | |
| Steam Line | | | |
| Drain Line | | | |
| Underground Tank | | | |
| Underground Cable | | | |
| Overhead Power Line | | | |
| Overhead Product Line | | | |
| Other (Specify) | | | |

Client Representative_____ Date_____

BBL Project Manager_____ Date_____

BBL Site Supervisor_____ Date_____

| BBL | TOPIC: LOCKOUT/TAGOUT CONTROL OF HAZARDOUS ENERGY/MATERIALS | PPM#: 1.02.12 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

It is the policy of the Firm to provide a safe and healthful workplace for its employees. An integral component of the Firm's health and safety program is the Lockout/Tagout Control of Hazardous Energy/Materials PPM. This procedure details the administration and necessary provisions for protecting employees of the Firm from injuries associated with hazardous energy, unexpected start-up of equipment, and hazardous materials. This procedure will be implemented by project personnel in conjunction with other policies and procedures, as part of the Firm's comprehensive safety program. This policy delineates guidelines for employees to follow when performing work in, on, and around energized equipment as defined in the Occupational Health and Safety Administration Standard, 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout). This procedure also assigns responsibility for administration and training with respect to lockout/tagout procedures.

## DESCRIPTION OF PROCEDURE:

1. **DEFINITIONS**

**An affected employee** is a person who operates or uses a machine and/or equipment that receives servicing or maintenance under lockout and/or tagout, or who works in an area where such servicing or maintenance is being performed.

**An authorized employee** is a person who locks out and/or tags out a machine and/or equipment in order to perform servicing or maintenance on the machine. An affected employee becomes an authorized employee when that employee's duties include performing service and/or maintenance under lockout/tagout.

**An energy isolating device** is a mechanical device that physically prevents the transmission or release or energy, including but not limited to the following: A manually operated electrical circuit breaker, a disconnect switch, a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a line valve; a block; a chain; restraining device to prevent the movement of equipment; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

**Lockout** is the placement of a lock or lockout device on an energy-isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

**Tagout** is the placement of a tag on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tag is removed.

**Restraint** is the application of a chain, block, or other similar mechanical means to prevent movement of a part of a system/device.

2. **ADMINISTRATION**

A. All employees of the Firm are covered by this procedure.

B. Employees of the Firm are required to follow all health and safety rules developed for lockout/tagout.

C. Any lockout/tagout situations encountered by employees of the Firm, which are not specifically covered by policies and procedures of the Firm, will be addressed on a case-by-case basis by the Corporate Health and Safety Division.

D. This PPM applies to all field, servicing, and maintenance activities which require:

1) Removal or by-passing of a machine guard or protective enclosure; or
2) Personnel to place any part of their body in a place where the accidental energization of equipment, release of stored energy, or release of stored hazardous materials may cause injury.

F. Hazardous Energy covered by this procedure includes but is not limited to:

1) Electrical;
2) Mechanical;
3) Hydraulic;
4) Pneumatic;
5) Chemical;
6) Thermal;
7) Gravitational (stored);
8) Pressure (stored); and
9) Hazardous materials.

## 3. ROLES AND RESPONSIBILITIES

A. Officer Responsibilities

1) Verify that all provisions of this procedure are enforced for divisional employees.

2) Verify that client contract requirements are consistent with the provisions of this procedure with respect to lockout/tagout procedures.

3) Verify that required lockout/tagout equipment is available for divisional employees.

B. Project Manager Responsibilities

1) Review project work scope to ensure it is consistent with the requirements of this procedure with respect to lockout/tagout procedures.

2) Notify the Corporate Industrial Hygiene/Environmental Safety Associate (CSA) or Regional Health and Safety Coordinators (RHSC) of any site-specific need for development of additional lockout/tagout procedures.

3) Determine if a client currently has lockout/tagout procedures for a site. If the client does currently have lockout/tagout procedures, then corporate health and safety must review the procedures to determine if they are consistent with the Firm's procedures, and the most protective of the procedures will be followed.

C. Corporate Industrial Hygiene/Environmental Safety Associate (CSA)

1) Communicates with RHSC, DHSC, and HSS concerning the addition of any new lockout/tagout procedures;

2) Enforces lockout/tagout procedures;

3) Reviews project health and safety plans to assure they are consistent with the provisions of this procedure;

4) Communicates changes in current lockout/tagout regulations and changes in this procedure to employees; and

5) Reviews and updates this procedure at least annually to assure compliance with regulatory requirements.

D. Regional Health & Safety Coordinators Roles and Responsibilities

1) Provide DHSC support and training required to execute Lockout/Tagout responsibilities;

2) Provide employee Lockout/Tagout training in lieu of DHSC as necessary;

3) Reviews project health and safety plans to assure they are consistent with the provisions of this procedure;

4) Provides required orientation regarding lockout/tagout procedures to Division Health and Safety Coordinators (DHSCs) and Health and Safety Supervisors (HSSs); and

5) Verify that Lockout/Tagout procedures are being implemented.

E. Divisional Health and Safety Coordinators (DHSC) Responsibilities

1) Provide initial employee orientation concerning lockout/tagout procedures;

2) Communicate need for additional lockout/tagout procedures to CSA;

3) Enforce all applicable lockout/tagout procedures; and

4) Communicate changes in this procedure to divisional employees.

F. Health and Safety Supervisors (HSS) Responsibilities

1) Communicate need for additional lockout/tagout procedures to the DHSC;

2) Communicate changes in this procedure to employees; and

3) Enforce applicable lockout/tagout procedures.

G. Employees Responsibilities

1) Must understand and follow lockout/tagout procedures;

2) Inform HSS or DHSC of any non-compliance with required lockout/tagout procedures; and

3) Inform HSS or DHSC of need for additional lockout/tagout procedures.

## 4. TRAINING

A. New Employees

1) Receive orientation from the DHSC concerning lockout/tagout policies and procedures;

2) Receive orientation concerning responsibilities outlined in this procedure; and

3) Receive update training concurrent with other safety training programs on an as-needed basis.

B. Existing Employees

1) Receive initial information concerning lockout/tagout procedures through the distribution and review of this procedure; and

2) Receive updated training concurrent with other safety training programs on an as-needed basis.

C. Training Documentation

1) Training will be documented on a Lockout/Tagout Training Certification Form. (A copy of the form follows this PPM)

2) Training certification will be maintained by the Corporate Health and Safety Division under direction of the CSA.

## 5. LOCKOUT/TAGOUT MATERIALS AND EQUIPMENT

A. The Firm will provide, as necessary to execute project work, locks, tags, chains, wedges, key blocks, plug lockouts, adapter pins, self-locking fasteners, or other hardware for isolating, securing or blocking of machines or equipment to prevent energy sources.

B. Lockout devices and tags are color coded red, and are the only device(s) used for controlling energy. Locks and tags must not be used for other purposes. All locks and tags provided by the Firm are capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected. Locks and tags are of substantial construction in order to prevent inadvertent or accidental removal. All tags are required to be marked to identify the employee applying the lock(s)/tag(s).

C. Tags are of standard print and format. Tags are constructed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible. Tags will warn against hazardous conditions if the machine or equipment is energized, and will include a legend such as the following:"Do Not Start"." Do Not Open"." Do Not Close"." Do Not Energize" or " Do Not Operate", depending on application.

D. When replacement or major repair, renovation or modification of a machine or equipment is performed, and when new machines or equipment are installed, energy isolating devices designed to accept a lockout device for such machines or equipment will be installed.

## 6. SAFETY PROCEDURES FOR LOCKOUT/TAGOUT AND ISOLATION

A. The Firm requires the use of a lockout device and an attached tag on all isolating devices capable of being locked out or accepting lockout devices. If an energy isolating device is not capable of being locked out, the Firm requires the use of a tagout system designed to provide full employee protection against equipment start-up. When a tagout device is used on an energy isolating device, the tag shall be attached at the same location that the lockout device would have been attached. Additional precautions will be implemented to provide a level of safety equivalent to that obtained by using a lockout device. Additional safety measures may include such steps as the removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

B. Lockout/tagout isolation procedures will be initiated only by authorized personnel. Personnel not trained in lockout/tagout procedures are not authorized to install, inspect, repair, adjust, remove, maintain, or service equipment where the potential for injury due to accidental start-up, energization, or release of stored energy exists.

C. All affected personnel must be notified prior to equipment deactivation and isolation.

D. All affected personnel must be notified prior to equipment reactivation after isolation measures have been removed.

E. Personnel involved with lockout/tagout isolation of equipment shall receive information concerning the specific type and magnitude of energy or hazardous material involved, the hazards involved, and the method of control to be utilized.

F. Authorized personnel shall de-energize equipment by following a procedure developed specifically for the equipment involved and consistent with 29 CFR 1910.147.

G. Prior to performing any work on equipment, all isolation devices shall be in place. Locks and tags shall be affixed to each energy isolating device by authorized personnel. Devices include hasps, locks, tags, circuit breaker locks, locking covers, and chains. These must secure the isolated equipment in the "off" position. Each person involved with servicing the isolated equipment shall attach a lock to the isolating device. In situations involving two or more persons, multiple lock hasps shall be utilized. Tags shall be attached with all locks and must identify the authorized individual responsible for each lock.

H. All potentially stored or residual energy must be released, relieved, or disconnected. If there is a potential of accumulation, verification of isolation shall be conducted and documented throughout the project.

I. Prior to work, authorized personnel shall verify and document that the equipment has been disengaged, de-energized, and isolated.

K. Release of lockout/tagout isolation:

1) The work area and equipment shall be inspected to ensure that nonessential items (i.e., tools) are not left in the work area and to ensure that the equipment is intact.

2) The work area shall be checked to ensure that all personnel are clear. Before lockout/tagout devices are removed, affected personnel shall be notified.

3) Removal of lockout/tagout devices shall be performed by the authorized personnel who attached the devices.

L. If a machine must be re-energized after initial isolation (i.e., for testing or repositioning), then lockout/tagout procedures must be followed as outlined to re-isolate the equipment.

M. During shift or personnel changes, transfer of control will occur between authorized personnel only. If an authorized person must leave the site, then he/she must remove his/her locks and tags. The new authorized person will then immediately place his/her locks and tags on the equipment and complete the entire lockout/tagout procedure as outlined above.

N. Use of tagout procedures without the use of locks can only be utilized if the equipment to be de-energized will not accept a lock and the following conditions are met:

1) Tagout procedures will provide protection to personnel equivalent to the use of locks.

2) Additional measures, sufficient to ensure protection of employees, are taken to prevent accidental start-up or energization.

## 7. AUDIT OF LOCKOUT/TAGOUT PROCEDURES

A. The Corporate Health and Safety Division reviews the written Lockout/Tagout SOPs on an annual basis.

B. The CSA or RHSC will select an authorized person to conduct an audit to review any equipment-specific SOPs and the general SOP. A designated individual will review the lockout/tagout procedure for a specific machine or general application and complete the Periodic Inspection Form.

C. The CSA and RHSC will review and maintain documentation of each lockout/tagout procedure audit.

D. Each SOP and this PPM must be audited at least once every calendar year.

## 8. GENERAL LOCKOUT/TAGOUT STANDARD OPERATING PROCEDURE (SOP)

A. If a client has specific written lockout/tagout procedures for its facility equipment with which employees of the Firm are working then the SOP will be reviewed and the more protective of the SOP or this PPM will be utilized.

B. This standard operating procedure is applicable to maintenance and servicing activities that are not covered by a client's SOP or require the use of lockout/tagout procedures for which an equipment-specific written lockout/tagout SOP does not exist or is under development.

1) Only employees who have received training as authorized employees under the Company Lockout/Tagout Program are authorized to implement this lockout/tagout procedure. Only authorized employees may affix locks/tags to energy-isolating devices on the referenced equipment/machines and conduct the above-referenced service and maintenance activities. Authorized employees have received lockout/tagout training concerning the implementation of this standard operating procedure. Unauthorized employees shall not conduct the above-referenced service and maintenance activities or affix locks/tags to energy-isolating devices on the referenced equipment/machines. All employees, upon observing a machine and/or equipment that is locked and/or tagged out, shall not attempt to start, energize, or use the machine and/or equipment.

2) All employees affected by implementation of this SOP must be notified by the authorized employee(s) prior to equipment/machine shutdown and isolation.

3) Locate and Identify Type of Energy Requiring Lockout/Tagout:

☐ Electrical ☐ Hydraulic ☐ Chemical
☐ Mechanical ☐ Pneumatic ☐ Thermal
☐ Hazardous Material ☐ Other:_____

4) Lockout/Tagout Sequence

a. The authorized employee(s) shall notify all affected employees prior to the shutdown and isolation of the equipment/machine. Affected employees should be informed of the reason for shutdown and approximate length of time required for servicing or maintenance.

b. The authorized employee(s) shall review the type(s) and magnitude(s) of energy present and the hazards present.

c. If the machine/equipment is operating, the authorized employee(s) shall have the machine/equipment operator explain the standard shutdown procedure and then shut it down according to the procedure.

d. The energy isolating devices shall be deactivated so the machine/equipment is isolated from the energy source(s).

e. Each isolating device shall be locked out and tagged out. If lockout is not feasible, only tagout of the isolating device will be conducted, and additional precautions will be required to provide employee protection equivalent to the protection provided when lockout procedures are utilized. Each authorized person conducting activities on the equipment/machine shall attach a(n) [individually assigned] safety lock to each isolating device. A standard tag shall also be attached to each individual's lock that identifies, by name, the authorized employee responsible for each lock. For the activities covered by this SOP, safety locks and/or multi-lock hasps must be attached to all energy isolation devices.

f. Stored or residual energy must be released or dissipated from each system to reach a zero energy state. Visual inspection shall be made to confirm that all moving parts have stopped. Any stored or residual energy shall be drained, blocked, repositioned, restrained, or bled. Electrical circuits shall be grounded to discharge electricity stored in capacitors.

g. To ensure that the equipment is completely isolated from the energy source(s), it is necessary to test the equipment to make certain that it will not operate. The following methods shall be used to test the equipment:

(1) Check the area and equipment to assure that no personnel are exposed to the start-up of equipment;

(2) Activate all start-up devices and operating controls;

(3) Use tic-tracers or voltage indicators to test electrical circuits; and

(4) Return all operating control(s) to the neutral or off position after verifying the isolation of the equipment.

h. Equipment/machine is locked and tagged out.

5) Release of Lockout/Tagout and Return of Equipment to Service

a. When the equipment/machine is ready to be returned to service at the conclusion of work activities, the following steps shall be taken to safely return equipment to service:

(1) Check the machine/equipment and immediate area to ensure that non-essential items and tools have been removed;

(2) Check to ensure that all guards and covers have been replaced;

(3) Check to ensure that all employees are safely positioned or have left the area;

(4) Check to ensure that all operating controls are in the neutral or off position;

(5) All authorized employees shall personally remove their individual locks and tags from the isolation devices; and

(6) All affected employees must be notified that the work activities are completed and the equipment/machine is ready for use.

b. If work activities are not completed prior to a shift ending( or other personnel change), then the procedures in Section 6 must be followed.

6) Transfer of Lockout/Tagout During Shift and Personnel Changes

a. The supervisor shall designate an authorized employee who shall control the lockout/tagout devices at the end of a shift and shall be responsible for transferring lockout/tagout authority to the next shift.

b. The designated authorized employee shall not remove his/her lock from any of the isolation devices until at least one of the arriving authorized employees has locked out and tagged out all of the isolation devices.

c. If the arriving authorized employees assuming responsibility for lockout/tagout do not attach locks prior to the previous shift employees removing all of their locks, then the employees assuming lockout/tagout authority shall repeat the entire lockout/tagout sequence.

## 9. GROUP LOCKOUT/TAGOUT

A. When more than two employees are involved in work activities on the machine or equipment covered by this PPM, each authorized employee will attach a lock to a multi-lock hasp on each isolation device.

B. When group lockout/tagout is utilized, the last authorized employee with a lock attached to isolation devices will be responsible for removing isolation devices and restoring equipment to use conditions according to the equipment-specific or general SOP.

**- END OF PROCEDURE -**

**Executive Authorization:** _____ **Date:** 10/10/96

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# STRAIGHT BILL OF LADING

Date _____

| Carrier Name: |
| --- |
| Carrier Address: |

***Consignment***

| Proper Shipping Description | LQ | Number of Units | Total |
| --- | --- | --- | --- |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |

***Emergency Response Information***

1. ERG #:
2. ERG #:
3. ERG #:
4. ERG #:

**This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.**

| | |
| --- | --- |
| Shipper: | |
| Per: | |
| Carrier: | |
| Per: | |

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# LOCKOUT/TAGOUT PERIODIC INSPECTION

Date _____

Machine/Equipment Name _____ Location _____

Authorized Inspector (print) _____ Client _____

The identified machine/equipment requires a periodic inspection of the energy control procedures according to 1910.147(6) - The Control of Hazardous Energy (Lockout/Tagout). Check all elements of this form that apply to and were completed during the Periodic Inspection.

***ENERGY SOURCES***

☐ Electrical ☐ Hydraulic ☐ Chemical ☐ Other _____

☐ Mechanical ☐ Pneumatic ☐ Thermal

***ENERGY ISOLATING DEVICES***

☐ Manually operated electrical circuit breaker.

☐ A disconnect switch.

☐ Manually operated switch by which the circuit's conductors can be disconnected from all supply conductors.

☐ A valve.

☐ Block or similar device.

☐ Other _____

☐ Other _____

** Push buttons, selector switches, and other circuit type devices are not energy-isolating devices.

☐ Do the authorized employees understand the energy control procedures for specific machine/ equipment?

☐ Do the authorized employees understand the requirements of the standard for specific machine/equipment?

☐ Do the authorized employees understand which locks/tags are to be used on specific machine/ equipment?

☐ Are the lockout/tagout procedures being followed?

☐ Do employees understand their responsibilities in the energy control procedure?

☐ Have any deviations or inadequacies been identified during this inspection that require attention? List below:

_____

_____

☐ Have tagout procedures been reviewed when tagout alone is the only means of energy isolation?

☐ Have you reviewed the removal of an isolating circuit breaker?

☐ Have you reviewed blocking of a controlling switch?

☐ Have valve handle removal procedures been removed?

☐ Have you reviewed the opening of an extra disconnect switch?

☐ Have all parts of the equipment which could move or release potential energy been restrained?

The items checked above have been reviewed/discussed with the authorized employees at the time of the Periodic Inspection.

Authorized Employee (Signature) and Date

_____

_____

Authorized Employee (Signature) and Date

_____

_____

I hereby certify period inspection for compliance with lockout/tagout standards (29 CFR 1910.147) on the machine/equipment ha been satisfactorily completed with authorized employees identified above.

Authorized Inspector _____ Title _____ Date _____

| BBL | TOPIC: HAZARDOUS MATERIALS TRANSPORTATION | PPM#: 1.02.13 |
|---|---|---|
| Policy & Procedure Memo | SECTION: Health & Safety | COMPANY LOCATIONS AFFECTED: All |

## STATEMENT OF POLICY:

The Firm is committed to operate in a manner that will protect the health and safety of its employees. Employees of the Firm will abide by all applicable local, state, and federal regulations while conducting activities for the Firm. In order to comply with the United States Department of Transportation (USDOT) Hazardous Materials Regulations (HMR), all employees involved in the packaging, labeling, shipping, and transportation of hazardous materials will do so in accordance with this procedure.

This procedure details the necessary provisions for complying with 49 CFR Parts 171 - 178 (HMR) by specifying the protocol for:

1. determining the applicability of small and limited quantity restrictions;
2. proper packaging, marking and labeling packages containing hazardous materials;
3. completion and use of shipping papers;
4. proper classification of environmental samples intended for either laboratory testing or project-related storage; and
5. training of BBL employees involved in the packaging, labeling, shipping, transportation of hazardous materials.

This procedure applies only to those hazardous materials which are either transported by BBL employees, or offered for transport (e.g., to a carrier such as UPS, Federal Express, etc.). In the case of materials to be transported by a carrier, consult the carrier regarding any special requirements they may have. Please note that it is a federal offense subject to fine and/or imprisonment if you attempt to carry a hazardous material onto a passenger aircraft without proper packaging, and without declaring said material.

## DESCRIPTION OF PROCEDURE:

### 1. ADMINISTRATION

A. All employees of the firm are covered by this procedure.

### 2. DEFINITIONS

**Combination packaging** means a combination of packaging, for transportation purposes, consisting of one or more inner packaging secured in a non-bulk outer packaging. It does not include composite packaging.

**Composite packaging** means packaging consisting of an outer package and an inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, shipped and emptied as such.

**Consumer commodity** means a material that is packaged and distributed in a form intended or suitable for sale through retail sales agencies or instrumentalities for consumption by individuals for purposes of personal care or household use. This term also includes drugs and medicines.

**Hazard class** means the category of hazard assigned to a hazardous material under the definitional criteria of Part 173 and the provisions of the HMT. A material may meet the defining criteria for more than one hazard class but is assigned to only one hazard class.

**Hazardous material** means a substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated.

**Hazardous Substance** for the purposes of this subchapter, means a material, including its mixtures and solutions, that -

A. Is listed in the appendix to §172.101;
B. Is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in the appendix to §172.101; and
C. When in a mixture or solution -
   1) For radionuclides, conforms to paragraph 6 of the appendix to §172.101.
   2) For other than radionuclides, is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material, as shown in the following table:

| RQ | Concentration Percent | Concentration PPM |
|---|---|---|
| 1 Pound | 0.002 | 20 |
| 10 Pounds | 0.02 | 200 |
| 100 Pounds | 0.2 | 2,000 |
| 1000 Pounds | 2.0 | 20,000 |
| 5000 Pounds | 10.0 | 100,000 |

This definition does not apply to petroleum products that are lubricants or fuels.

**Inner packaging** means a packaging for which an outer packaging is required for transport. It does not include the inner receptacle of a composite packaging.

**Inner receptacle** means a receptacle which requires outer packaging in order to perform its containment function. The inner receptacle may be the inner package of a combination package, or the inner receptacle of a composite package.

**Limited quantity** — when specified for a particular material, means the maximum amount of hazardous material for which there is a specific labeling or packaging exception.

**Marking** — means a descriptive name, identification number, instructions, cautions, weight, specification, or UN marks, or combinations thereof, required by this subchapter on outer packaging of hazardous materials.

**Mode** — means any of the following transportation methods; rail, highway, air, or water.

**Motor vehicle** — includes a vehicle, machine, tractor, trailer, or semitrailer, or any combination thereof, propelled or drawn by mechanical power and used upon the highways in the transportation of passengers or property. It does not include a vehicle, locomotive, or car operated exclusively on a rail or rails, or a trolley bus operated by electric power derived from a fixed overhead wire, furnishing local passenger transportation similar to street-rail-way service.

**Non-bulk packaging** — means a package which has:

A. A maximum capacity of 450 L (119 gallons) or less (as a receptacle for a liquid);
B. A maximum net mass of 400 kg (1000 pounds) or less and a maximum capacity of 450 L or less (as a receptacle for a solid); or
C. A water capacity of 454 kg or less (as a receptacle for a gas as defined in §173.115).

**n.o.s.** — means not otherwise specified.

**n.o.s. description** — means a shipping description from the HMT which includes the abbreviation n.o.s., and as contained in the lists in §172.203(k)(3), regarding additional description requirements.

**Outer packaging** — means the outermost enclosure of a composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packaging.

**Packaging** — means a receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this subchapter. For radioactive materials packaging, see §173.403.

**Packing group** — means a grouping according to the degree of danger presented by hazardous materials. Packing Group I indicates great danger; Packing Group II, medium danger; Packing Group III, minor danger. See §172.101(f).

**Person** means an individual, firm, copartnership, corporation, company, association, government, or instrumentality of any government when it offers hazardous materials for transportation in commerce or transports hazardous materials in furtherance of a commercial enterprise, but such term does not include:

A. The United States Postal Service; or
B. For the purposes of sections 110 and 111 of the Hazardous Materials Transportation Act (49 App. U.S.C. 1809-1810), any agency or instrumentality of the Federal Government.

**Proper shipping name** means the name of the hazardous material shown in Roman print (not italics) in the HMT.

**Shipping paper** means a shipping order, bill of lading, manifest or other shipping document serving a similar purpose and containing the information required by §§172.202, 172.203 and 172.204.

**Specification packaging** means a packaging conforming to one of the specifications or standards for packaging in part 178 or part 179.

**Table** in §172.101 or §172.101 table means the Hazardous Materials Table (HMT).

**Transport vehicle** means a cargo-carrying vehicle such as an automobile, van, tractor, truck, semitrailer, tank car or rail car used for the transportation of cargo by any mode. Each cargo carrying body (trailer, rail car, etc.) is a separate transport vehicle.

## 3. RESPONSIBILITIES

A. Officers/Division Heads

1) Enforce all provisions of this Policy and Procedure.

B. Corporate Industrial Hygiene/Environmental Safety Associate (CSA)

1) Responsible for development, implementation, and update, as necessary, of this procedure.

C. Regional Health and Safety Coordinator (RHSC)

1) Provide hazardous materials transportation training.

2) Review completed shipping papers during office visits.

D. Divisional Health and safety Coordinator (DHSC)

1) Perform initial hazardous materials survey. Update survey as necessary (any time a chemical is to be transported which is not listed in Table 2, or transported as a small quantity).

## 4. HAZARDOUS MATERIAL TRANSPORTATION BY BBL EMPLOYEES

A. Small Quantities

Any BBL employee who, during the course of employment, transports hazardous materials in a vehicle from one location to another using commercial roadways is required by regulation to properly package and label the material. The employee must also have shipping papers for the materials being transported, unless the hazardous material is being transported as a small quantity.

Per 49 CFR §173.4, "small quantities of Class 3 (flammable/combustible liquids), Division 4.1 (flammable solid), Division 5.1 (oxidizer), Class 8 (corrosive materials), Division 6.1 (poisonous materials), Class 9 (miscellaneous), and Class 7 (radioactive) materials that also meet the definition of one or more of these hazard classes, are not subject to any other requirements of this subchapter (HMR) if:

1. The maximum quantity of material per inner receptacle is limited to:

   a. Thirty mL (one ounce) for authorized liquids other than Division 6.1, PGI materials;
   b. Thirty grams (one ounce) for authorized solids, other than Division 6.1, PGI materials;
   c. One gram (0.04 ounces) for authorized materials classed as Division 6.1, PGI; and
   d. Any activity level not exceeding that specified in §173.421, 173.422 or 173.424, as appropriate, for a package containing a Class 7 material.

2. With the exception of temperature sensing devices, each inner receptacle:

   a. Is not liquid full at 55 °C (131 °F), and
   b. Is constructed of plastic having a minimum thickness of no less than 0.2 mm (0.008 inch), or earthenware, glass or metal.

3. Each inner receptacle with a removable closure has its closure held securely in place with wire, tape, or other positive means.

4. Unless equivalent cushioning and absorbent material surrounds the inside packaging, each inner receptacle is securely packed in an inside packaging with cushioning and absorbent material that:

   a. Will not react chemically with the material, and
   b. Is capable of absorbing the entire contents (if a liquid) of the receptacle.

5. The inside packaging is securely packed in a strong outside packaging.

6. The completed package, as demonstrated by prototype testing, is capable of sustaining free drops on all sides made from a height of 1.8 meters (5.9 feet) directly onto a solid unyielding surface without breakage or leakage from any inner receptacle and without a substantial reduction in the effectiveness of the package. The package must also sustain a comprehensive load as specified in 49 CFR §178.606(c).

7. The gross mass of the completed package does not exceed 29 kg (64 pounds).

8. The shipper marks the outside of the package with the statement:

   *"This package conforms to conditions and limitations specified in 49 CFR Part 173.4."*

9. The package is not opened or otherwise altered until it is no longer in commerce.

If the hazardous material being transported meets **all** of the above requirements, then shipping papers, labels, placards, and specification packaging are not required.

If you are not sure of the hazard class of the material you are transporting, then refer to Table 1 which lists all the previously identified hazardous materials transported by BBL personnel. If the material you will be transporting is not listed in Table 1, then contact your Regional Health and Safety Coordinator (Herrick Teeter/Brian Stillings), or Jay Keough to confirm whether the material is regulated. If the material you are transporting cannot be transported as described in Section 4, then proceed to the next step.

B. Limited Quantities

The most likely scenario involving hazardous materials transportation by BBL employees involves limited quantities. If a shipment does meet a limited quantity exception, then the shipment is excepted from labeling, placarding, and specification packaging requirements. The shipment is not, however, excepted from shipping paper requirements.

Find the material you are transporting in Table 1. As described above, if the material is not listed in Table 1, contact one of the three people listed to confirm whether the material is regulated by DOT. Once you have located the material, read across to the limited quantity description. If you can transport the material as described in Table 1, then the material is excepted from most DOT regulations, except the requirement for a shipping paper. Shipping paper requirements are described in Section 6.

## 5. PROPER PACKAGING, MARKING, AND LABELING

A. Refer to Table 2 for a master list of shipping information requirements for various field solvents and equipment calibration chemicals. If a hazardous material is not listed in Table 2, please contact Corporate Health and Safety in Cranbury, New Jersey.

B. The proper shipping name of the hazardous material as shown in Column 2 of Table 2 must be shown on non-bulk packaging (119 gallon capacity or less) . These packaging also must be marked with the proper UN/NA Identification Number (Column two of Table 2) of the material. The identification number is not required on packaging containing hazardous materials packaged according to Limited Quantity provisions, or materials reclassed as ORM-D.

   As long as the package is shipped by highway only, and not transferred from one motor carrier to another, the name and address of the shipper is not required as part of the package marking.

C. The proper container label for each hazardous material is listed in Column Three of Table 2. In general, the prescribed label must be affixed to the package on the same surface and near the marked proper shipping name of the contents. In the case where a material requires more than one label, then only the primary label may show the hazard class at the bottom of the label. Any secondary labels must not show a hazard class designation.

The label may be on a securely attached tag if:

1) the package is smaller than the required label;
2) the package surface is so irregular that a label cannot be affixed to it; or
3) the package is a compressed gas cylinder.

D. In the circumstance where a chemical may not be subject to limited quantity exceptions, such as nitric acid, specification packaging (non-bulk) is described in Table 3. Reference to the proper BBL packaging code for each hazardous material is found in Column Four of Table 2.

E. Placarding requirements do not apply to shipments of hazardous materials that are classified as either small quantities, or limited quantities when they are identified as such on the shipping papers.

With the exception of the following hazard classes:

Explosives 1.1
Explosives 1.2
Explosives 1.3
Poison Gas
Dangerous When Wet
Poison (packing Group 1, inhalation hazard only)
Radioactive

placarding is required only when 454 kilograms (1001 pounds) or more, aggregate gross weight is loaded in a vehicle, an unlikely circumstance with respect to the transportation of field chemicals. In the case of the above listed hazard classes, placarding is required for the transportation of any amount of the material.

## 6. SHIPPING PAPERS

A. Each person who offers a hazardous material for transportation must describe the hazardous material on the shipping paper (Attachment One) according to the following requirements:

1) When a hazardous material and a material not subject to the requirements of 49 CFR Part 172 are described on the same shipping paper, the hazardous material description entries must be entered:

a. first,
b. in a color that clearly contrasts with any description on the shipping paper of materials not regulated under Part 172, except that a description on a reproduction of a shipping paper may be highlighted, rather than printed, in a contrasting color, or

c. identified by the entry of an "X" placed before the proper shipping name in a column captioned "HM." The X may be replaced by "RQ," if appropriate.

2) The required shipping description on a shipping paper and all copies of the shipping paper must be legible and printed or typed in English.

3) **Proper shipping descriptions, as listed in Table 2, must be used, verbatim on the shipping paper.**

4) A shipping paper may consist of more than one page, if each page is consecutively numbered and the first page bears a notation specifying the total number of pages included in the shipping paper.

5) Shipping papers must contain an emergency response telephone number, and an appropriate USDOT Emergency Response Guide number (listed in Column 5 of Table 2).

## 7. CLASSIFICATION OF HAZARDOUS MATERIALS

A. Environmental samples that contain or are comprised of hazardous waste are classified as hazardous materials under DOT regulations. Shipping descriptions for hazardous waste environmental samples are presented in Table 4. **NOTE:** DOT does not exempt hazardous waste sample shipments from regulation.

B. Environmental samples (other than pure product or solutions) that exhibit a characteristic of one of the twenty-two hazard classes listed in the following table, are assigned an n.o.s. description for that hazard class. If the sample does not meet a hazard class description, and is not a hazardous waste or hazardous substance, then the materials is not regulated as a hazardous material. Well water samples, sediment samples, and soil samples with trace (ppm) solvent or metal contamination do not meet any of the hazard class definition, unless the materials has been classified as a hazardous waste.

C. Environmental samples that consist of pure product or solutions thereof are assigned shipping descriptions based on the characteristics of the product.

If the material does not fall under A or C, then contact your Regional Health and Safety Coordinator or the Corporate Safety Associate to determine whether the material is regulated.

| CLASS NUMBER | DIVISION NUMBER | NAME OF CLASS OR DIVISION | 49 CFR REFERENCE FOR DEFINITIONS |
|---|---|---|---|
| None | | Forbidden Materials | 173.21 |
| None | | Forbidden Explosives | 173.53 |
| 1 | 1.1 | Explosives (with a mass explosive hazard) | 173.50 |
| 1 | 1.2 | Explosives (with a projection hazard) | 173.50 |
| 1 | 1.3 | Explosives (with predominantly a fire hazard) | 173.50 |
| 1 | 1.4 | Explosives (with no significant blast hazard) | 173.50 |
| 1 | 1.5 | Very insensitive explosives; blasting agents | 173.50 |
| 1 | 1.6 | Extremely insensitive detonating substances | 173.50 |
| 2 | 2.1 | Flammable gas | 173.115 |
| 2 | 2.2 | Non-flammable compressed gas | 173.115 |
| 2 | 2.3 | Poisonous gas | 173.115 |
| 3 | | Flammable and combustible liquid | 173.120 |
| 4 | 4.1 | Flammable solid | 173.124 |
| 4 | 4.2 | Spontaneously combustible material | 173.124 |
| 4 | 4.3 | Dangerous when wet material | 173.124 |
| 5 | 5.1 | Oxidizer | 173.128 |
| 5 | 5.2 | Organic peroxide | 173.128 |
| 6 | 6.1 | Poisonous materials | 173.132 |
| 6 | 6.2 | Infectious substances (etiologic agent) | 173.134 |
| 7 | | Radioactive material | 173.403 |
| 8 | | Corrosive material | 173.136 |
| 9 | | Miscellaneous hazard material | 173.140 |
| None | | Other regulated material (ORM-D) | 173.144 |

## 8. HAZARDOUS MATERIALS TRAINING REQUIREMENTS

A. All BBL employees involved in packaging, labeling, shipping, and transporting hazardous materials from a BBL office to a project field site, and/or preparing those hazardous materials for transportation, must receive training in accordance with 49 CFR §172.704 (Subpart H), and §177.816 (Drivers).

B. Training to be provided includes General Awareness/Familiarization training, Safety training, Function-specific training, and Driver training. Each category is described below:

*General Awareness/Familiarization*: This training is designed to familiarize trainees with the general requirements of the HMR, and to enable them to recognize and identify hazardous materials.

*Safety*: This training includes a review of Subpart G of 49 CFR Part 172, in addition to a review of relevant BBL policies and procedures concerning hazardous chemical handling and storage. This training is accomplished annually in the form of Hazard Communication training either in the HAZWOPER Annual Refresher program, or separately for those employees who are not covered under HAZWOPER.

*Function-specific* This training includes a review of shipping papers, shipping descriptions, labeling and packaging requirements.

| | |
|---|---|
| *Driver Training* | This training includes a review of the appropriate sections of 49 CFR Part 390 through 397, and the procedures necessary for the safe operation of a motor vehicle. |

C. Training is to be provided every 24 months, and includes a summative examination upon which BBL employees must achieve a passing grade of at least 80%.

**- END OF PROCEDURE -**

**Executive Authorization:** _____

**Date:** 10/10/96

## TABLE 1 - LIMITED QUANTITY EXCEPTIONS

| Material | Limited Quantity Description |
|---|---|
| **CLASS 8**<br>Hydrochloric acid (PGII)<br>(includes Muriatic acid)<br>Potassium hydroxide (PGII)<br>Sodium hydroxide,<br>solid/liquid (PGII)<br>Sodium hypochlorite (PGIII)<br>Sulfuric acid (PGII) | Limited quantities of corrosive materials (Class 8) in Packing Groups II and III are excepted from labeling, unless offered or intended for transportation by aircraft, placarding, and specification packaging requirements when packaged as described below. The package must not exceed 66 pounds gross weight. The following packages are authorized:<br>1. PGII, inner packagings not over 1.0 litres (0.3 gallons) net capacity each for liquids; or not over 1.0 kilogram (2.2 pounds) net capacity each for solids; packed in strong outer packagings.<br>2. PGIII, inner packagings not over 4.0 litres, (1 gallon) net capacity each; or not over 5.0 kilograms (11 pounds) net capacity each for solids; packed in strong outer packagings. |
| Nitric acid (≤70%, >70%) | **No Limited Quantity exceptions.** |
| Table 4, Row 1 and 2 | Limited quantities of miscelaaneous hazardous materials (Class 9) are excepted from labeling, unless offered or intended for transportation by aircraft, placarding, and specification packaging requirements when packaged as described below. The package must not exceed 66 pounds gross weight. The following packages are authorized:<br>1. For liquids, inner packagings not over 4.0 L (1 gallon) net capacity each, packed in strong outer packagings.<br>2. For solids, inner packagings not over 5.0 kg (11 pounds) net capacity each, packed in strong outer packagings. |
| Alconox, Potassium<br>chloride, Zinc acetate | **Not hazardous materials.** |

## TABLE 1 - LIMITED QUANTITY EXCEPTIONS

| Material | Limited Quantity Description |
|---|---|
| **HAZARD CLASS 2 DIVISION 2,1, 2,2**<br>Air, compressed<br>Hydrogen, compressed,<br>Isobutane,<br>Isobutylene,<br>Methane, compressed | Limited quantities of compressed gases for which exceptions are permitted are excepted from labeling (except when offered for transportation by air), placarding and, unless required as a condition of exception, specification packaging requirements. The package must not exceed 66 pounds gross weight. The following packagings are authorized:<br><br>1. In containers of not more than four fluid ounces capacity (7.22 cubic inces or less), except cigarette lighters. |
| **HAZARD CLASS 2 DIVISION 2.2**<br><br>Fire extinguishers | Fire extinguishers charged with a limited quantity of compressed gas to not more than 1660 kPa (241 psig) at 21°C (70°F) are excepted from labeling (except when offered for transportation by air), placarding, and specification packaging requirements when shipped under the following conditions.<br><br>1. Each fire extinguisher must have conents which are nonflammable, nonpoisonous, and noncorrosive.<br>2. Each fire extinguisher must be shipped as an inner packaging. |
| **HAZARD CLASS 3**<br><br>Acetone (PGII)<br>Diesel Fuel (PGIII)<br>Gasoline (PGII),<br>Hexanes (PGII),<br>Isopropanol (PGII)*,<br>Methanol (PGII)*,<br>Pentane (PGI) | Limited quantities of flammable liquids (Class 3) are excepted from labeling requirements, unless offered or transported by aircraft, placarding, and specification packaging requirements when packaged as described below. The package must not exceed 66 pounds gross weight. The following combination packages are authorized:<br><br>1. PGI, inner packagings not over 0.5 litres (0.1 gallons) net capacity each, packaged in strong outer packagings;<br>2. PGII, inner packagings not over 1.0 litre (0.3 gallons) net capacity each, packaged in strong outer packagings;<br>3. PGIII, inner packagings not over 5.0 litres (1.3 gallons) net capacity each, packaged strong outer packaging.<br><br>A flammable liquid with a flash point at or above 38°C (100°F) that does not meet the definition of any other hazard class, may be reclassed as a combustible liquid. This provision does not apply to transportation by vessel or aircraft, except where other means of transportation is impracticable. The requirements of the HMR do not apply to a material classed as a combustible liquid in a non-bulk packaging unless the combustible liquid is a hazardous substance (RQ material), a hazardous waste, or a marine pollutant.<br><br>* An aqueous solution containing 24% or less alcohol by volume and no other hazardous material (1) may be reclassed as a combustible liquid; and (2) is not subject to the requirements of the HMR is it contains no less than 50% water. |

**TABLE 2 - SHIPPI[illegible]NFORMATION**

| Material | Proper Shipping Description | Labels | Packaging Code | ERG # |
|---|---|---|---|---|
| Acetone | Acetone, 3, UN1090, PGII | Flammable Liquid | 1 | 26 |
| Compressed air | Air, compressed, 2.2, UN1002 | Nonflammable Gas | 2 | 12 |
| Diesel fuel | Diesel fuel, 3, NA1993, PGIII | | 4 | 27 |
| Fire Extinguishers | Fire extinguishers, 2.2, UN1044 | Nonflammable Gas | 3 | 12 |
| Gasoline | Gasoline, 3, UN1203, PGII | Flammable Liquid | 1 | 27 |
| Hexane | Hexanes, 3, UN1208, PGII | Flammable Liquid | 1 | 27 |
| Hydrochloric acid (muriatic) | Hydrochloric acid, solution, 8, UN1789, PGII | Corrosive | 1 | 60 |
| Hydrogen | Hydrogen, compressed, 2.1, UN1049 | Flammable Gas | 2 | 22 |
| Isobutane | Isobutane, 2.1, UN1969 | Flammable Gas | 5 | 22 |
| Isobutylene | Isobutylene, 2.1, UN1055 | Flammable Gas | 5 | 22 |
| Isopropyl alcohol (Isopropanol) | Isopropanol, 3, UN1219, PGII | Flammable Liquid | 1 | 26 |
| Methane | Methane, compressed, 2.1, UN1971 | Flammable Gas | 2 | 17 |
| Methyl alcohol (Methanol) | Methanol, 3, UN1230, PGII | Flammable Liquid* | 1 | 28 |
| Nitric acid (> 70% $HNO_3$) | Nitric acid, 8, UN2031, PGI | Corrosive | 6 | 44 |
| Nitric acid (≤70% $HNO_3$) | Nitric acid, 8, UN2031, PGII | Corrosive | 6 | 44 |
| Pentane | n-Pentanes, 3, UN1265, PGI | Flammable Liquid | 7 | 27 |
| Potassium hydroixide (liquid) | Potassium hydroxide, solution, 8, UN1814, PGII | Corrosive | 1 | 60 |
| Sodium hydroxide (solid) | Sodium hydroxide, solid, 8, UN1823, PGII | Corrosive | 8 | 60 |
| Sodium hydroxide (liquid) | Sodium hydroxide, solution, 8, UN1824, PGII | Corrosive | 1 | 60 |
| Sodium hypochlorite (>5, ,16%) | Hypochlorite solutions, 8, UN1791, PGIII | Corrosive | 4 | 60 |
| Sulfuric acid | Sulfuric acid, 8, UN1830, PGII | Corrosive | 1 | 39 |

* For international shipments of methanol, must add poison label.

## TABLE 3 - SPECIFICATION PACKAGING

| Code | Packaging Requirements | | | |
|---|---|---|---|---|
| 1 | **Per §173.202 the following combination packagings are authorized:** | | | |
| | ***Outer packagings:*** | | | |
| | Steel drum 1A1 or 1A2 | Aluminum drum 1B1 or 1B2 | Metal drum other steel or aluminum 1N1 or 1N2 | Plywood drum 1D |
| | Fiber drum 1G | Plastic drum 1H1 or 1H2 | Wooden barrel 2C2 | Steel jerrican 3A1 or 3A2 |
| | Plastic jerrican 3H1 or 3H2 | Steel box 4A1 or 4A2 | Aluminum box 4B1 or 4B2 | Natural wood box 4C1 or 4C2 |
| | Plywood box 4D | Reconstituted wood box 4F | Fiberboard box 4G | Expanded plastic box 4H1 |
| | Solid plastic box 4H2 | | | |
| | ***Inner packagings:*** | | | |
| | Glasss or eathenware receptacles | Plastic receptacles | Metal receptacles | Glass ampoules |
| | **Except for transportation by aircraft, the following single packagings are authorized:** | | | |
| | Steel drum A1A, 1A2 | Aluminum drum 1B1 | Metal drum other steel or aluminum 1N1 or 1N2 | Plastic drum 1H1 or 1H2 |
| | Fiber drum 1G (with liner) | Wooden barrel 2C1 | Steel jerrican 3A1 or 3A2 | Plastic jerrican 3H1 or 3H2 |
| | Plastic receptacle in steel, aluminum, fiber or plastic drum 6HA1, 6HB1, 6HG1, 6HH | | Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2 | |
| | Glass, porcelain or stoneware in steel, aluminum or fiber drum 6PA1, 6PB1, 6PG1 | | Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG1 | |
| | Glass, porcelain or stoneware in solid or expanded plastic packaging 6PH1, 6PH2 | | Plastic receptacle in plywood drum 6HD1 | |
| | Glass, porcelain or stoneware in plywood drum or wickerwork hamper 6PD1, 6PD2 | | Cylinders, specification, as prescribed for any compressed gas, except for specifications 8 and 3HT. | |

# TABLE 3 - SPECIFICATION PACKAGING

| Code | Packaging Requirements |
|---|---|
| 2 | **Per 173.302, nonliquified compressed gases (except gas in solution) must be shipped in specification containers as follows:** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | 3A | 3AA | 3B | 3C | 3D | 3E | 4 |
| 4A | 4B | 4BA | 4BW | 4C | 25 | 26 | 33 |
| 38 | | | | | | | |

Specification 3AX, 3AAX, or 3T cylinders are authorized only for the following nonliquifed gases: air, argon, boron trifluoride, carbon monoxide, ethane, ethylene, helium, hydrogen, methane, neon, nitrogen, or oxygen, except that 3T is not authorized for hydrogen.

Specification 39 cylinder. For flammable gases, internal volume may not exceed 75 cubic inches.

Specification 3AL cylinders are authorized only for the following nonliquified gases: air, argon, carbon monoxide, diborane, ethylene, helium, mercury-free hydrogen, krypton, methane, nitrogen, neon, oxygen and xenon. Flammable gases shipped in 3AL cylinders are authorized only when transported by highway, rail, and cargo-only aircraft.

| | |
|---|---|
| 3 | **Per 173.309, the following fire extinguisher packagings are authorized:** |

Specification 2P or 2Q inner nonrefillable metal packagings are authorized for use as fire extinguishers, subject to the following conditions:

1. the liquid portion of the gas plus any additional liquid or solid may not completely fill the packaging at 55°C (130°F);
2. pressure in the packaging shall not exceed 1250 kPa (181 psig) at 55°C. If the pressure exceeds 141 psig but not 160 psig, a specification DOT 2P inner metal packaging must be used; if the pressure exceeds 160 psig, a specification 2Q inner metal packaging must be used.

Specification 3A, 3AA, 3AL, 4B, 4BA, 4B240ET or 4BW cylinders are authorized for use as fire extinguishers subject to the following conditions:

1. cylinders must be used exclusively for fire extinguishing agents such as ammonium phosphate, sodium bicarbonate, potassium bicarbonate, potassium imidodicarboxamide and bromochlorodifluoromethane or bromotrifluoromethane, which are commercially free from corroding components;
2. cylinders must be charged with a nonflammable, nonpoisonous, noncorrosive, dry gas, having a dew point at or below -46.7°C (-52°F) at 1 atmosphere, to not more than the service pressure of the cylinder;
3. cylinders must be protected externally by suitable corrosion-resistant coatings; and
4. the cylinders must be retested in accordance with §173,34(e)(18).

## TABLE 3 - SPECIFIC ON PACKAGING

| Code | Packaging Requirements | | | |
|---|---|---|---|---|
| 4 | **Per §173.203 the following combination packagings are authorized:** | | | |
| | ***Outer packagings:*** | | | |
| | Steel drum 1A1 or 1A2 | Aluminum drum 1B1 or 1B2 | Metal drum other steel or aluminum 1N1 or 1N2 | Plywood drum 1D |
| | Fiber drum 1G | Plastic drum 1H1 or 1H2 | Wooden barrel 2C2 | Steel jerrican 3A1 or 3A2 |
| | Plastic jerrican 3H1 or 3H2 | Steel box 4A1 or 4A2 | Aluminum box 4B1 or 4B2 | Natural wood box 4C1 or 4C2 |
| | Plywood box 4D | Reconstituted wood box 4F | Fiberboard box 4G | Expanded plastic box 4H1 |
| | Solid plastic box 4H2 | | | |
| | ***Inner packagings:*** | | | |
| | Glasss or eathenware receptacles | Plastic receptacles | Metal receptacles | Glass ampoules |
| | **The following single packagings are authorized:** | | | |
| | Steel drum A1A, 1A2 | Aluminum drum 1B1, 1B2 | Metal drum other steel or aluminum 1N1 | Plastic drum 1H1, 1H2 |
| | Fiber drum 1G (with liner) | Wooden barrel 2C1 | Steel jerrican 3A1 or 3A2 | Plastic jerrican 3H1 or 3H2 |
| | Plastic receptacle in steel, aluminum, fiber or plastic drum 6HA1, 6HB1, 6HG1, 6HH | | Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2 | |
| | Glass, porcelain or stoneware in steel, aluminum, wooden or fiber drum 6PA1, 6PB1, 6PG1 | | Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG2 | |
| | Glass, porcelain or stoneware in solid or expanded plastic packaging 6PH1, 6PH2 | | Plastic receptacle in plywood drum 6HD1 | |
| | Glass, porcelain or stoneware in plywood drum or wickerwork hamper 6PD1, 6PD2 | | Cylinders, specification, as prescribed for any compressed gas, except for specifications 8 and 3HT. | |

## TABLE 3 - SPECIFICATION PACKAGING

| Code | Packaging Requirements |
|---|---|
| 5 | Per §173.304, liquified compressed gas must be shipped in specification containers as follows: |

| 3 | 3A | 3AA | 3B | 3BN | 3D | 3E | 4 | 4A | 4B | 4BA |
|---|---|---|---|---|---|---|---|---|---|---|
| 4B240ET | 4BW | 4E | 9 | 25 | 26 | 38 | 39 | 40 | 41 | |

| Code | Packaging Requirements |
|---|---|
| 6 | Per §173.158 nitric acid must be shipped in specification containers as follows: |
| | NOTE: Nitric acid exceeding 40% concentration may not be packaged with any other material. |
| | Nitric acid in any concentration which does not contain sulfuric or hydrochloric acid as impurities may be packaged in 4H1 expanded plastic outer packagings with glass inner receptacles of not greater than 2.5 L (0.66 gallons) capacity each. No more than four 2.5 L inner receptacles may be packed in one outer packaging. |
| | Nitric acid of 90% or greater concentration, when offered for transportation or transported by highway, rail, or water may be packaged in 4C1, 4C2, 4D or 4F wooden boxes with inner packagings consisting of glass bottles further individually overpacked in tightly closed metal packagings.. |
| | Nitric acid of less than 90% concentration, when offered for transportation or transported by rail, highway or water may be packaged in 4G fiberboard boxes or 4C1, 4C2, 4D or 4F wooden boxes with inside glass packagings of not over 2.5 L capacity each. |
| | Nitric acid of 70% or less concentration, when offered for transportation or transported by rail, highway, or water, may be packaged as follows<br>1. In composite packagings 6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PH1, or 6PH2.<br>2. In 4H1 expanded plastic boxes with inner glass packagings of not more than 2.5 L each. |

| TABLE 3 - SPECIFICATION PACKAGING | | | | |
|---|---|---|---|---|
| **Code** | **Packaging Requirements** | | | |
| 7 | **Per 173.201 the following combination packagings are authorized:** | | | |
| | ***Outer Packagings*** | | | |
| | **Steel drum 1A1 or 1A2** | **Aluminum drum 1B1 or 1B2** | **Metal drum other than steel or aluminum 1N1 or 1N2** | **Plywood drum 1D** |
| | **Fiber drum 1G** | **Plastic drum 1H1 or 1H2** | **Steel jerrican 3A1 or 3A2** | **Plastic jerrican 3H1 or 3H2** |
| | **Steel box 4A1 or 4A2** | **Aluminum box 4B1 or 4B2** | **Natural wood box 4C1 or 4C2** | **Plywood box 4D** |
| | **Reconstituted wood box 4F** | **Fiberboard box 4G** | **Expanded plastic box 4H1** | **Solid plastic box 4H2** |
| | ***Inner Packagings*** | | | |
| | **Glass or earthenware receptacles** | **Plastic receptacles** | **Metal receptacles** | **Glass ampoules** |
| | **Except for transportation by passenger aircraft, the following single packagings are authorized:** | | | |
| | **Steel drum 1A1 or 1A2** | **Aluminum drum 1B1 or 1B2** | **Metal drum other than steel or aluminum 1N1 or 1N2** | **Plastic drum 1H1 or 1H2** |
| | **Steel jerrican 3A1 or 3A2** | **Plastic jerrican 3H1 or 3H2** | **Plastic receptacle in steel, aluminum, fiber or plastic drum 6HA1, 6HB1, 6HG1, 6HH** | |
| | **Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2.** | | **Glass, porcelain or stoneware in steel, aluminum or fiber drum 6PA1, 6PB1, 6PG1.** | |
| | **Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG2.** | | **Glass, porcelain or stoneware in solid or expanded plastic packagings 6PH1, 6PH2.** | |
| | **Cylinders, specification, as prescribed for any compressed gas, except for Specifications 8 and 3HT.** | | | |

## TABLE 3 - SPECIFICATION PACKAGING

| Code | Packaging Requirements | | | |
|---|---|---|---|---|
| 8 | **Per 173.212 the following combination packagings are authorized:** | | | |
| | ***Outer Packagings*** | | | |
| | Steel drum 1A1 or 1A2 | Aluminum drum 1B1 or 1B2 | Metal drum other than steel or aluminum 1N1 or 1N2 | Plywood drum 1D |
| | Fiber drum 1G | Plastic drum 1H1 or 1H2 | Wooden barrel 2C2 | Steel jerrican 3A1 or 3A2 |
| | Plastic jerrican 3H1 or 3H2 | Steel box 4A1 or 4A2 | Aluminum box 4B1 or 4B2 | Natural wood box 4C1 or 4C2 |
| | Plywood box 4D | Reconstituted wood box 4F | Fiberboard box 4G | Solid plastic box 4H2 |
| | ***Inner Packagings*** | | | |
| | Glass or earthenware receptacles | Plastic receptacles | Metal receptacles | Glass ampoules |
| | **Except for transportation by passenger aircraft, the following single packagings are authorized:** | | | |
| | Steel drum 1A1 or 1A2 | Aluminum drum 1B1 or 1B2 | Metal drum other than steel or aluminum 1N1 or 1N2 | Plastic drum 1H1 or 1H2 |
| | Plywood drum 1D | Wooden barrel 2C1 or 2C2 | Steel box 4A1 | Steel box with liner 4A2 |
| | Aluminum box 4B1 | Aluminum box with liner 4B2 | Natural wood box 4C1 | Natural wood box, sift proof 4C2 |
| | Plywood box 4D | Reconstituted wood box 4F | Fiberboard box 4G | Expanded plastic box 4H1 |
| | Solid plastic box 4H2 | Bag, woven plastic 5H1, 5H2, 5H3 | Bag, plastic film 5H4 | Bag, textile 5L1, 5L2, 5L3 |

| TABLE 3 - SPECIFICATION PACKAGING | | | | |
|---|---|---|---|---|
| | Bag, paper, multiwall, water resistant 5M2 | Steel jerrican 3A1 or 3A2 | Plastic jerrican 3H1 or 3H2 | |
| | Plastic receptacle in steel, aluminum, plywood fiber or plastic drum 6HA1, 6HB1, 6HD1, 6HG1, 6HH | | Plastic receptacle in steel, aluminum, wood, plywood or fiberboard box 6HA2, 6HB2, 6HC, 6HD2, 6HG2. | |
| | Glass, porcelain or stoneware in steel, aluminum, plywood or fiber drum 6PA1, 6PB1, 6PG1. | | Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC, 6PG2. | |
| | Glass, porcelain or stoneware in solid or expanded plastic packagings 6PH1, 6PH2. | | | |

| TABLE 3 - SPECIFICATION PACKAGING | | | |
|---|---|---|---|
| **Code** | **Packaging Requirements** | | |
| 9 | **Per 173.213 the following packagings are authorized:** | | |
| | *Outer Packagings:* | | |
| | Steel drum 1A1 or 1A2 | Aluminum drum 1B1 or 1B2 | Metal drum other than steel or aluminum 1N1 or 1N2 | Plywood drum 1D |
| | Fiber drum 1G | Plastic drum 1H1 or 1H2 | Wooden barrel 2C2 | Steel jerrican 3A1 or 3A2 |
| | Plastic jerrican 3H1 or 3H2 | Steel box 4A1 or 4A2 | Aluminum box 4B1 or 4B2 | Natural wood box 4C1 or 4C2 |
| | Plywood box 4D | Reconstituted wood box 4F | Fiberboard box 4G | Solid plastic box 4H2 |
| | *Inner Packagings:* | | | |
| | Glass or earthenware receptacles | Plastic receptacles | Metal receptacles | Glass ampoules |
| | **The following single packagings are authorized:** | | | |
| | Steel drum 1A1 or 1A2 | Aluminum drum 1B1 or 1B2 | Plywood drum 1D | Fiber drum 1G |
| | Plastic drum 1H1 or 1H2 | Metal drum other than steel or aluminum 1N1 or 1N2 | Wooden barrel 2C1 or 2C2 | Steel jerrican 3A1 or 3A2 |
| | Plastic jerrican 3H1 or 3H2 | Steel box with liner 4A2 | Steel box 4A1 | Aluminum box with liner 4B2 |
| | Natural wood box | Natural wood box, sift proof 4C2 | Plywood box 4D | Reconstituted wood box 4F |
| | Fiberboard box 4G | Expanded plastic box 4H1 | Solid plastic box 4H2 | Bag, woven plastic 5H1,5H2, 5H3 |
| | Bag, plastic film 5H4 | Bag, textile 5L1, 5L2 or 5L3 | Bag, paper, multiwall, water resistant 5M2 | Plastic receptacle in steel, aluminum, wooden, plywood, fiber or plastic drum 6HA1, 6HB1, 6HD1, 6HG1, 6HH |
| | Plastic receptacle in steel, aluminum, wooden, plywood or fiberboard box 6HA2,6HB2,6HC, 6HD2 or 6HG2 | Glass, pocelain or stoneware in steel, aluminum, plywood or fiber drum 6PA1, 6PB1, 6PD1, or 6PG1 | Glass, porcelain or stoneware in steel, aluminum, wooden or fiberboard box 6PA2, 6PB2, 6PC or 6PG2 | Glass, porcelain or stoneware **in expanded or solid plastic packaging 6PH1 or 6PH2** |

**NOTE: Alpha-numeric nomenclature refers to DOT Authorization codes. These codes can typically be found either stamped or stenciled on the package, usually the bottom.**

## TABLE 4 - HAZARD[illegible]S WASTE SAMPLES

| Material | Proper Shipping Description | Labels | Packaging Code | ERG # |
|---|---|---|---|---|
| Soil or sediment contaminated with, or consisting of, a RCRA Hazardous Waste | Environmentally hazardous substances, solid, n.o.s., 9, UN3077, III [Insert EPA Waste Code(s)] | Class 9 | 9 | 31 |
| Well or surface water contaminated with, or consisting of, a RCRA Hazardous Waste | Environmentally hazardous substances, liquid, n.o.s., 9, UN3082, III [Insert EPA Waste Code(s)] | **Class 9** | **4** | **31** |
| **For hazardous waste samples consisting of product, such as a solvent, (or in New York, PCBs), etc.** | **Contact Regional Health and Safety Coordinator or Corporate Safety Associate.** | | | |

## Appendix A: Hazardous Materials Shipping Examples

NOTE: As a shipper (one who offers hazardous materials for shipment), we have an obligation to never offer hazardous materials in packages that are not suitable for the material being shipped.

### Small Quantity Shipment Example

A BBL employee is required to transport sulfuric acid to a field site to be used as a sample preservative. From Table 1, the employee determines that sulfuric acid is a Class 8 (corrosive) material.

Referring to Section 4.A. of the PPM, the employee determines the following:

1. the maximum quantity per inner receptacle is limited to 30 mL;
2. the container is not liquid full at 131 °F;
3. the container is plastic (minimum 0.2 mm thick) or glass;
4. the container lid is held securely in place;
5. the completed package (inner receptacle and outer package) is capable of sustaining free drops on all sides and a corner from a height of 5.9 feet onto a solid, unyielding surface without breakage or leakage from any inner receptacle;
6. the gross weight of the package does not exceed 64 pounds;
7. the outside package is marked according to Section 4.A.8; and
8. The package is not opened or altered during transportation.

**Resolution:** The employee packages the sulfuric acid inside 30 mL vials (90% full), and secures the vial lids with tape. The vial(s) are then placed inside an outer packaging (cooler, cardboard box, etc.) and secured with packing material in such a way that the individual containers are not loose, do not touch each other, and are sufficiently protected to comply with the drop requirement listed in number 5, above. The outer package is then marked with the language required in Section 4.A.8. The employee may package as many of the vials as can reasonable fit, without sacrificing requirement number 5. The total package, when complete, must not exceed 64 pounds. Once in transport, the package must not be opened or altered.

With this done, the employee does not need labels, placards, shipping papers, or specification packaging.

## Limited Quantity Shipment Example

A BBL employee is required to transport isopropanol to a site to be used as a field preservative. Per Section 4.B of the PPM, the employee is directed to Table 1 - Limited Quantity Exceptions, where he/she determines that isopropanol is a Hazard Class 3, Packing Group II, material. The employee notes that an isopropanol solution of less than 24% isopropanol in water (aqueous) may be reclassed as a combustible liquid, and if it contains no less than 50% water would not be subject to shipping papers, labels, placarding, and specification containers. Assuming the solution contains more than or equal to 24% isopropanol, the employee proceeds as described below:

1. the inner container must not exceed 1.0 litres net capacity;
2. the inner container(s) must be packaged in a strong outer packaging;
3. the gross weight of the combined inner container(s) and the outer packaging must not exceed 66 pounds gross weight.

**Resolution:** If the container(s) that the isopropanol was received in are less than 1.0 liter capacity, then they should be used as the inner container. If not, 1 quart jars with a secured lid could be used. The inner containers should then be packed inside an outer packaging (cooler, cardboard, etc.) in such a manner that they are secured from movement during transport. *Although the entire package does not need to meet the drop criteria required for small quantities, we do have an obligation to ensure that the containers are packed securely in the best manner possible.*

Once packaged, a completed shipping paper must accompany the materials from the office to the field, and back. Refer to the sample shipping paper (attached).

## Environmental Samples

A BBL employee is required to transport environmental samples from a field location to an environmental laboratory for analysis. A variety of examples exist, however consider the case where the environmental samples consist of monitoring well water from a hazardous waste landfill where a variety of hazardous wastes have been disposed.

For our example, the well water is classified as F039 due to contamination by F039 leachate (RCRA contained-in rule). Per RCRA regulations, the well water samples are exempt from regulation so long as they are being shipped for laboratory analysis. DOT regulations harbor no such exemption. **All** hazardous wastes **are** DOT hazardous materials, and are thus subject to regulation during transport.

The employee refers to Table 4 - Hazardous Waste Samples. Because the material contains a variety of hazardous wastes and is not characteristic of a particular DOT hazard class (e.g., flammable, corrosive, poisonous, radioactive, etc.), the employee determines that the material fits the description provided in the second row, **Environmentally hazardous substances, liquid, n.o.s.** The employee then refers to Section 4.A. of the PPM to determine if Small Quantities are applicable. If not, then the employee refers to Table 1 to determine if Limited Quantities are applicable. If neither are applicable, then the employee must proceed to the fully-regulated example on the next page.

## Fully-regulated Hazardous Material

A BBL employee is required to transport a hazardous material that cannot be shipped either as a Small or Limited Quantity. One such example is provided on the previous page. Another example could involve the transportation of nitric acid as a sample preservative. If the nitric acid shipment does not meet the small quantity requirements, the employee discovers from Table 1 that nitric acid in any concentration is **not** subject to limited quantity exceptions.

The employee then refers to Table 2 and locates nitric acid. Note that there are two entries, differentiated by concentration. For our example, let's assume the nitric acid is less than 70%.

The employee notes the proper shipping description from Table 2, and records this on the shipping paper (sample attached). The employee also observes that the package must bear a "corrosive" warning label.

The fourth column in Table 2 directs the employee to packaging code 6 on Table 3. The third row in under packaging code 6 notes that nitric acid in any concentration which does not contain sulfuric or hydrochloric acid as impurities may be packaged in 4H1 expanded plastic outer packaging with glass inner receptacles of not greater than 2.5 litres capacity each. No more than four containers may be packaged in any one individual outer packaging. Because the nitric acid is less than 90% (row 5), the outer packaging can also be 4G fiberboard boxes, or 4C1, 4C2, 4D, or 4F wooden boxes.

In this case, the inner container should be the original container the material was received in. If this is not possible, the inner container must be made of glass and may not exceed 2.5 litres capacity. As for the outer packaging, again the original outer packaging should be used. If it is not available, then it is necessary to contact a packaging supplier and purchase either 4G fiberboard boxes, or one of the approved wooden boxes. Packaging suppliers will recognize the DOT specifications if you refer to them as DOT specification 4G. You should also specify an appropriate size to fit from one up to four inner containers.

**Note:** The inner containers need not be full. As with limited and small quantities, inner containers need to be secure within the outer packaging.

The completed package must be marked according Section 5.B. with the proper shipping name and the UN/NA identification number. In this case, the package would be marked:

**Nitric acid UN2031**

The package would also bear a "**Corrosive**" label on the same face that bore the mark listed above. As with all but small quantity shipments, a shipping paper (attached) must accompany the package during shipment.

# *Appendix G-2*
# *Safety Inspection Form*

O'BRIEN & GERE

# Safety Audit Checklist

Short Form

File Name: PAS Oswego Master Safety Audit Form_031312.docx

Revised: March 13, 2006

| | | | |
|---|---|---|---|
| | PAS Oswego | | Kevin Stone |
| | 55 E. Seneca St. Oswego, NY. | | |
| | Kevin Stone (OBG) Clay McClarnon (demaximis) | | |
| | | | |
| | OBG Corporate EH&S (Jeff Parsons) | | |

(place an X in one of the three categories for each item - specify deficiencies below)

| | | | |
|---|---|---|---|
| | | | First aid supplies available. |
| | | | Emergency contact numbers posted. |
| | | | Portable eye wash available |
| | | | OSHA and Department Of Labor Poster conspicuously posted. |
| | | | Corporate Health and Safety Manual Available. |
| | | | A project safety plan or JSA developed and reviewed with site workers. |
| | | | Subcontractors have current Safety Prequalification form on file. |
| | | | Toolbox safety meetings documented. |
| | | | Site security fence closed and locked during Site arrival and departure. |
| | | | Site security fence undamaged |
| | | | Wooden utility shed inspected for signs of damage |
| | | | Leachate hold tank free of damage |
| | | | Hot work/confined space entry permits documented and issued daily. |
| | | | O&M projects have equipment-specific Lockout/Tagout (LOTO) procedures |
| | | | Safety shoes, safety glasses with side shields, face shields, cut resistant gloves, apron, tyvek garment utilized based on level of site activity. |
| | | | Ear protection used where noise requires you to raise your voice to be heard <5 feet away. |
| | | | Fall protection used by employees working above 6 feet and in man lifts; (see JSA for exceptions) |
| | | | Ladder(s) used properly: stepladder fully open, extension ladder 3' past upper surface & tied off |
| | | | Leachate pump hose (from leachate tank to wooden shed drained and secured during non-use periods |
| | | | Chemical, oil and lubricant containers properly marked using HMIS labels |
| | | | Leachate spill pan used during time leachate is pumped offsite. Absorbents available. |
| | | | Leachate discharge equipment inspected prior to use, and properly shutoff and stowed when not in use. |
| | | | Site recover and monitoring well covers, power panel and leachate tank access doors or hatches locked when not in use. |
| | | | Wooden storage shed inspected for nesting bees or rodents |
| | | | Leachate transfer pump powered OFF when not in use |
| | | | GFIs used on all extension cords and temporary 110/120 volt wiring. |
| | | | Access road clear of snow or other debris |
| | | | Rescue services notified of any confined space entries. Specify Service: |
| | | | Retrieval equipment (harness, lifeline, and hoisting apparatus) setup during confined space entry |
| | | | Electrical panels locked and secured |
| | | | Lockout/Tagout is used - each employee has own lock – tag is attached to all locks |
| | | | Fire bottle serviceable – inspected monthly and tag annotated. |
| | | | Heat trace placed in the "ON" position during the period of Oct 1 – April 31 |
| | | | Good housekeeping maintained, trash removed from Site. |

***NOTES:*** **(Use reverse side as necessary.)**

# *Appendix G-3*
# *Material Safety Data Sheets*

# Material Safety Data Sheet

from Genium's Reference Collection
Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

No. 674

ISOBUTYLENE

Issued: November 1988

## SECTION 1. MATERIAL IDENTIFICATION

**Material Name:** ISOBUTYLENE

27

**Description (Origin/Uses):** Obtained from refinery steams by absorption on 65% sulfuric acid ($H_2SO_4$) at 59°F (15°C). Used primarily to produce diisobutylene, trimers, butyl rubber, and other polymers; also used to produce antioxidants for foods, plastics, and packaging food supplements.

**Other Designations:** Isobutene; 2-Methylpropene; *gamma*-Butylene; $CH_2=C(CH_3)_2$; CAS No. 0115-11-7

**Manufacturer:** Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.




NFPA

| HMIS | |
|---|---|
| H | 1 |
| F | 4 |
| R | 0 |
| PPG* | |
| *See sect. 8 | |

| | |
|---|---|
| R | 1 |
| I | 1 |
| S | 1 |
| K | 4 |

## SECTION 2. INGREDIENTS AND HAZARDS

| | % | EXPOSURE LIMITS |
|---|---|---|
| Isobutylene, CAS No. 0115-11-57 | Ca 100 | **OSHA PEL**<br>None Established<br>**ACGIH TLV, 1988-89**<br>None Established<br>**NIOSH REL**<br>None Established<br>**Toxicity Data***<br>Rat, Inhalation, $LC_{50}$: 620 g/m³ (4 Hrs)<br>Mouse, Inhalation, $LC_{50}$: 415 g/m³ (2 Hrs) |

*Monitor NIOSH, *RTECS* (UD0890000), for additional data.

## SECTION 3. PHYSICAL DATA

**Boiling Point:** -19.6°F (-6.9°C)
**Melting Point:** -220°F (-140°C)
**Vapor Density (Air = 1):** 1.9
**Specific Gravity ($H_2O$ = 1):** Ca 0.6

**Molecular Weight:** 56 Grams/Mole
**Solubility in Water (%):** Insoluble*
**% Volatile by Volume:** 100

**Appearance and Odor:** A colorless, extremely flammable gas; odor not listed.

*Isobutylene is very soluble in alcohol, ether, and sulfuric acid.

## SECTION 4. FIRE AND EXPLOSION DATA

| Flash Point* | Autoignition Temperature: 869°F (465°C) | LEL: 1.8% v/v | UEL: 9.6% v/v |
|---|---|---|---|

**Extinguishing Media:** Isobutylene gas is an extremely flammable gas that has a substantial explosive air-gas range. For isobutylene fires, the recommended fire-fighting technique is to stop the flow of gas instead of extinguishing the fire. If the flames are extinguished and the isobutylene gas continues to escape or leak, an explosive air-gas mixture can form quickly and ignite without warning. A resulting explosion could cause greater damage than that which would be caused by allowing the fire to burn itself out. If the fire must be extinguished to allow safe access to shutoff valves, recommended extinguishing agents include $CO_2$ and dry chemical. **Unusual Fire or Explosion Hazards:** In many cases, the preferred strategy is to allow the flames to continue to burn and to cool the surroundings with water spray to prevent ignition of nearby combustibles. Isobutylene gas is heavier than air and can collect in low-lying, confined spaces. Potentially explosive air-gas mixtures are especially likely to build up in such an area, so enter it with extreme caution whether or not it is presently involved in a fire. Possible sources of ignition must not be brought into any area suspected of containing substantial concentrations of isobutylene gas. **Special Fire-fighting Procedures:** Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

* Sax (Genium ref. 6) reports a flash point of -105°F (-76°C) for isobutylene.

## SECTION 5. REACTIVITY DATA

**Stability/Polymerization:** Isobutylene is stable in closed, pressurized containers during routine operations at room temperature. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Isobutylene can react dangerously with strong oxidizing materials. **Conditions to Avoid:** Prevent exposing isobutylene to any source of ignition such as an open flame, sparks, lighted tobacco products, or steam lines. **Hazardous Products of Decomposition:** Isobutylene fires can produce toxic gases such as carbon monoxide (CO) or lower-molecular-weight hydrocarbons. **Comments:** The extreme flammability of isobutylene means that any reactions involving this material, including nonhazardous ones, must be performed carefully in order to prevent fires and/or explosions.

## SECTION 6. HEALTH HAZARD INFORMATION

**Carcinogenicity:** Isobutylene is not listed as a carcinogen by the NTP, IARC, or OSHA.
**Summary of Risks:** Isobutylene is a simple asphyxiant. As such it will not cause significant physiological responses, but it can displace the minimum required atmospheric oxygen level. Significant displacement by isobutylene results in an oxygen-deficient atmosphere with no adequate warning properties. Asphyxiation fatalities can occur especially in confined, low-lying, poorly ventilated spaces because isobutyl

## SECTION 6. HEALTH HAZARD INFORMATION, cont.

ne gas is almost twice as dense as air itself (see sect. 3). **Medical Conditions Aggravated by Long-Term Exposure:** None reported. **Target Organs:** None reported. **Primary Entry:** Inhalation. **Acute Effects:** Initial symptoms of the effects of simple asphyxiant gases are rapid respiration and air hunger, diminished mental alertness, and impaired muscular coordination. Continuing lack of oxygen causes faulty judgment, depression of all sensations, rapid fatigue, and emotional instability. As the asphyxia continues, nausea; vomiting; prostration; loss of consciousness; and, finally, convulsions; deep coma; and death can occur. **Chronic Effects:** None reported. **FIRST AID: Inhalation.** Would-be rescuers need to be concerned about their own safety when entering confined, poorly ventilated, oxygen-deficient areas. Self-contained breathing equipment must be readily available for rescuers. Station standby workers outside the immediate area so that they can summon additional help if it is needed. Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have qualified medical personnel administer oxygen as required. **Comments:** The extreme flammability of isobutylene gas warrants special attention even during rescue operations. Rescue personnel must not smoke. All emergency lamps and floodlights that must be lowered into enclosed areas for rescue operations must be explosion proof. Obtain this equipment before any emergency occurs and make it accessible to emergency-response personnel. Get medical help (in plant, paramedic, community) for all exposures. Seek prompt medical assistance for further treatment, observation, and support after first aid.

## SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

**Spill/Leak:** *Treat any isobutylene gas leak as an emergency.* If the leaking gas has not yet ignited, use water spray to direct flammable gas-air mixtures away from sources of ignition. Extinguish all sources of ignition as quickly as possible; however, if the leaking gas is burning, do not attempt to extinguish the flames until the source of the isobutylene gas is located and sealed. Otherwise, flammable isobutylene gas-air mixtures can explode without warning and cause widespread damage that might not have occurred if the original fire had been allowed to burn itself out. If it is necessary to extinguish isobutylene flames in order to gain access to a shutoff valve, use dry chemical or carbon dioxide as extinguishing agents. **Waste Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

**OSHA Designations**

Air Contaminant (29 CFR 1910.1000 Subpart Z): Not Listed

**EPA Designations (40 CFR 302.4):** Not Listed

## SECTION 8. SPECIAL PROTECTION INFORMATION

**Respirator:** Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine operations (leaks or cleaning reactor vessels and storage tanks), wear an SCBA. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres, which lack warning properties; to work in them safely requires that an SCBA be worn. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of this material below the lower explosive limit cited in section 4. Local exhaust ventilation is preferred because it prevents dispersion of the contaminant into the general work area by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. **Safety Stations:** Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work areas. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants, and all lenses concentrate them. Do *not* wear contact lenses in any work area. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material and before eating, drinking, smoking, using the toilet, or applying cosmetics. Keep it off your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale isobutylene vapor.

## SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

**Storage/Segregation:** Store isobutylene in closed, pressurized containers in a cool, dry, well-ventilated area away from sources of ignition, combustible materials, and strong oxidizers. Protect containers from physical damage. **Engineering Controls:** Make sure all engineering systems (production, transportation) are of maximum explosion-proof design. Electrically ground and bond all containers, pipelines, etc., used in shipping, transferring, reacting, production, and sampling operations to prevent static sparks. **Comments:** Isobutylene is an extremely explosive and flammable gas. It must not be exposed to any possible source of ignition in work or storage areas.

**Transportation Data (49 CFR 172.101-2)**

**DOT Shipping Name:** Liquefied Petroleum Gas
**DOT Hazard Class:** Flammable Gas
**ID No.** UN1055
**DOT Label:** Flammable Gas
**DOT Packaging Requirements:** 49 CFR 173.304, .314, .315
**DOT Packaging Exceptions:** 49 CFR 173.306

**IMO Shipping Name:** Isobutylene
**IMO Hazard Class:** 2.1
**IMO Label:** Flammable Gas

**References:** 1, 6, 84-94, 116, 117, 120, 122.

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**Sheet No. 300**
**Acetone**

Issued: 11/77 Revision: F, 9/92

## Section 1. Material Identification

**Acetone ($CH_3COCH_3$) Description:** Derived by the dehydrogenation or oxidation of isopropyl alcohol with a metallic catalyst, the oxidation of cumene, the vapor phase oxidation of butane; and as a by-product of synthetic glycerol production. Used as a solvent for paint, varnish, lacquer, fat, oil, wax, resin, rubber, plastic, and rubber cement; to clean and dry parts of precision equipment; in the manufacture of chemicals (methyl isobutyl ketone, methyl isobutyl carbinol, methyl methacrylate, bisphenol-A, acetic acid (ketene process), mesityl oxide, diacetone alcohol, chloroform, iodoform, bromoform), explosives, aeroplane dopes, rayon, photographic films, isoprene; acetylene gas storage cylinders; in purifying paraffin; in nail polish remover; in the extraction of various principles from animal and plant substances; in hardening and dehydrating tissues; in cellulose acetate (especially as spinning solvent); as a solvent for potassium iodide and permanganate; as a delusterant for cellulose acetate fibers; in the specification testing of vulcanized rubber products.

R 1 NF
I 1
S 1*
K 3
* Slight skin absorption

HM
H
F
R
PPE
* Sec

**Other Designations:** CAS No. 67-64-1, AI3-01238, Chevron acetone, dimethylformaldehyde, dimethylketal, dimethyl ketone, β-ketopropane, methyl ketone, propanone, 2-propanone, pyroacetic acid, pyroacetic ether.

**Manufacturer:** Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*(73) for a suppliers list.

**Cautions:** Acetone vapor is a dangerous fire and explosion hazard. High vapor concentrations may produce narcosis (unconsciousness). Prolonged or repeated skin contact causes dryness, irritation, and mild dermatitis.

## Section 2. Ingredients and Occupational Exposure Limits

Acetone, 99.5% plus 0.5% water

**1991 OSHA PELs** *
8-hr TWA: 750 ppm (1800 mg/m³)
15-min STEL: 1000 ppm (2400 mg/m³)

**1990 IDLH Level**
20,000 ppm

**1990 NIOSH REL**
TWA: 250 ppm (590 mg/m³)

**1992-93 ACGIH TLVs**
TWA: 750 ppm (1780 mg/m³)
STEL: 1000 ppm (2380 mg/m³)

**1990 DFG (Germany) MAK**
1000 ppm (2400 mg/m³)
Category IV: Substances eliciting very weak effects (MAK >500 mL/m³)
Peak: 2000 ppm, 60 min, momentary value†, 3 peaks/shift

**1985-86 Toxicity Data** ‡
Human, eye: 500 ppm
Human, inhalation, $TC_{Lo}$: 500 ppm produced olfactic effects, conjunctival irritation, and other changes involving the lungs, thorax, or respiration.
Rat, oral, $LD_{50}$: 5800 mg/kg altered sleep time and produced tremors.
Mammal, inhalation, $TC_{Lo}$: 31500 µg/m³/24 hr administered to pregnant female from the 1st to 13th day of gestation produced effects on fertility (post-implantation mortality).

* In the cellulose acetate fiber industry, enforcement of the OSHA TWA for "doffers" was stayed on 9/5/89 until 9/1/90; the OSHA STEL *does not* apply to that industry.
† Momentary value is a level which the concentration should never exceed.
‡ See NIOSH, *RTECS* (AL3150000), for additional irritation, mutation, reproductive, and toxicity data.

## Section 3. Physical Data

**Boiling Point:** 133.2 °F (56.2 °C) at 760 mm Hg
**Freezing Point:** -139.6 °F (-95.35 °C)
**Vapor Pressure:** 180 mm Hg at 68 °F (20 °C), 400 mm Hg at 103.1 °F (39.5 °C)
**Saturated Vapor Density** (Air = 1.2 kg/m³, 0.075 lb/ft³): 1.48 kg/m³, .093 lb/ft³
**Refractive Index:** 1.3588 at 20 °C
**Appearance and Odor:** Colorless, highly volatile liquid; sweetish odor.
* Odor thresholds recorded as a range from the lowest to the highest concentration.

**Molecular Weight:** 58.08
**Specific Gravity:** 0.7899 at 20 °C/4 °C
**Water Solubility:** Soluble
**Other Solubilities:** Alcohol, benzene, dimethyl formamide, chloroform, ether, and most oils.
**Odor Threshold:** 47.5 mg/m³ (low), 1613.9 mg/m³ (high)*

## Section 4. Fire and Explosion Data

| Flash Point: 0 °F (-18 °C), CC | Autoignition Temperature: 869 °F (465 °C) | LEL: 2.6% v/v | UEL: 12.8% v/v |
|---|---|---|---|

**Extinguishing Media:** *Do not* extinguish fire unless flow can be stopped. For small fires, use dry chemical, carbon dioxide ($CO_2$), water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water in flooding quantities as fog because solid streams may be ineffective. **Unusual Fire or Explosion Hazards:** Acetone is a dangerous fire and explosion hazard; it is a Class IB flammable liquid. Vapors may travel to a source of ignition and flash back, fire-exposed containers may explode, and a vapor explosion hazard may exist indoors, outdoors, or in sewers. **Special Fire-fighting Procedures:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Structural firefighters' protective clothing provides limited protection. If feasible, remove all fire-exposed containers. Otherwise, apply cooling water to sides of containers until well after fire is extinguished. If the fire becomes uncontrollable or container is exposed to direct flame, consider evacuation of a one-third mile radius. In case of rising sound from venting safety device or any discoloration of tank during fire, withdraw immediately. For massive cargo fires, use unmanned hose holder or monitor nozzles. Do not release runoff from fire control methods to sewers or waterways.

## Section 5. Reactivity Data

**Stability/Polymerization:** Acetone is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Acetone may form explosive mixtures with hydrogen peroxide, acetic acid, nitric acid, nitric acid + sulfuric acid, chromic anhydride, chromyl chloride, nitrosyl chloride, hexachloromelamine, nitrosyl perchlorate, nitryl perchlorate, permonosulfuric acid, thiodiglycol + hydrogen peroxide. Acetone reacts vigorously with oxidizing materials and ignites on contact with activated carbon, chromium trioxide, dioxygen difluoride + carbon dioxide, and potassium-*tert*-butoxide. Other incompatibles include air, bromoform, bromine, chloroform + alkalies, trichloromelamine, and sulfur dichloride. **Conditions to Avoid:** Keep acetone away from plastic eyeglass frames, jewelry, pens, pencils, and rayon garments. **Hazardous Products of Decomposition:** Thermal oxidative decomposition of acetone can produce $CO_2$ and carbon monoxide (CO).

## Section 6. Health Hazard Data

**Carcinogenicity:** The IARC,(164) NTP,(169) and OSHA(164) do not list acetone as a carcinogen. **Summary of Risks:** Acetone has been placed among solvents of comparatively low acute and chronic toxicities. In industry, the most common effects reported are headache from prolonged vapor inhalation and skin irritation resulting from its defatting action. Exposures to less than 1000 ppm acetone vapor produces only slight eye, nose, and throat irritation. Acetone does not have sufficient warning properties to prevent repeated exposures. It is narcotic at high concentrations, i.e., above 2000 ppm. Concentrations above 12000 ppm cause loss of consciousness.

## tion 6. Health Hazard Data, *continued*

**ıical Conditions Aggravated by Long-Term Exposure:** None reported. **Target Organs:** Respiratory and central nervous systems, skin. **Primary Entry Routes:** Inhalation, skin and eye contact, ingestion. Liquid acetone is slowly absorbed through the skin. **Acute Effects:** Human systemic effects by inhalation include eye, nose and throat irritation; nausea and vomiting; changes in EEG (electroencephalogram) and carbohydrate metabolism; muscle weakness; drunken behavior; mental confusion and visual disturbance. In extreme cases, breathing high concentrations may produce coma. Human systemic effects by ingestion include gastrointestinal irritation, kidney damage (often indicated by albumin and red and white blood cells in the urine), liver damage (indicated by high levels of urobilin and early appearance of bilirubin), coma, metabolic changes, and systemic effects described for inhalation. Direct eye contact by liquid acetone may produce painful burning and stinging; watering of eyes; conjuctival inflammation; and corneal injury. Skin contact produces a cold feeling, dryness, and mild irritation.

**Chronic Effects:** Cases of chronic poisoning resulting from prolonged exposure to low concentrations of acetone are rare. Workers exposed to 1000 ppm, 3 hrs per day for 7-15 yrs, complained of dizziness, asthenia (lack or loss of strength), and chronic inflammation of the airways, stomach, and duodenum. Prolonged or repeated skin contact with liquid acetone may defat the skin and cause eczematoid dermatitis.

**FIRST AID**

**Eyes:** *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately. **Skin:** *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. For reddened or blistered skin, consult a physician. Carefully dispose of contaminated clothing because it may pose a fire hazard. **Inhalation:** Remove exposed person to fresh air, monitor for respiratory distress, and administer 100% humidified supplemental oxygen as needed. **Ingestion:** Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have that *conscious and alert* person drink 1 to 2 glasses of water, then induce vomiting. **After first aid, get appropriate in-plant, paramedic, or community medical support.**

**Note to Physicians:** In symptomatic patients, monitor serum and urine acetone, fluid intake, blood glucose, and arterial pH. Because of the prolonged elimination half-life of acetone, the symptomatic patient may need medical supervision for many hours (up to 30 hrs). Patients may develop hyperglycemia and ketosis mimicking acute diabetic coma. The hyperglycemia may persist for several days following acute exposure.

## Section 7. Spill, Leak, and Disposal Procedures

**Spill/Leak:** Notify safety personnel, evacuate all unnecessary personnel, remove all heat and ignition sources, and provide adequate ventilation. Cleanup personnel should protect against inhalation and skin or eye contact. If feasible and without risk, stop leak. Use water spray to reduce vapor, but it may not prevent ignition in closed spaces. For small spills, take up with sand or other noncombustible absorbent material and using nonsparking tools, place into containers for later disposal. For large spills, dike far ahead of liquid spill for later disposal. Do not release to sewers or waterways. Follow applicable OSHA regulations (29 CFR 1910.120). **Environmental Toxicity:** $LC_{50}$ *Salmo gairdneri* (rainbow trout): 5540 mg/L/96 hr at 54 °F (12 °C). $LC_{50}$ (oral) Ring-necked pheasant: >40,000 ppm. **Environmental Degradation:** Acetone biodegrades when released into the environment. The biological oxygen demand for 5 days (BOD5) is 46-55%. **Soil Absorption/Mobility:** Acetone volatilizes, leaches, and biodegrades if released on soil. **Disposal:** Acetone is a good candidate for fluidized bed, rotary kiln incineration, or catalytic oxidation. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**EPA Designations**

**ed as a RCRA Hazardous Waste (40 CFR 261.33):** Hazardous Waste No. U002 (Ignitability), (40 CFR 261.31): F003 (spent solvent)

**d as a CERCLA Hazardous Substance* (40 CFR 302.4):** Final Reportable Quantity (RQ), 5000 lb (2270 kg) [* per Clean Water Act, Sec. .(b)(4)]

**SARA Extremely Hazardous Substance (40 CFR 355):** Not listed

**Listed as a SARA Toxic Chemical (40 CFR 372.65)**

**OSHA Designations**

**Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)**

## Section 8. Special Protection Data

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy. **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For concentrations < 1000 ppm, wear any chemical cartridge respirator with organic vapor cartridge(s) and wear eye protection to avoid irritation or damage. For concentrations <6250 ppm, wear any supplied-air respirator operated in a continuous-flow mode. For concentrations < 12,500 ppm, wear any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister. For concentrations < 20,000 ppm, wear any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas. **Other:** Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Polyethylene/ethylene vinyl alcohol, Teflon, or butyl rubber with breakthrough times > 8 hr is recommended for PPE. **Ventilation:** Provide general and local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.[103] **Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment. **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

## Section 9. Special Precautions and Comments

**Storage Requirements:** Store in closed containers in a cool, dry well-ventilated area away from heat, sparks, flames, and other incompatibles. Keep large stocks away from inhabited buildings. Use non-sparking tools to open containers. Keep dry chemical or $CO_2$ extinguishers on hand in case of fire. **Engineering Controls:** To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to maintain concentrations at the lowest practical level. To prevent static sparks, electrically ground and bond all containers and equipment during fluid transfer. For bulk storage rooms, install electrical equipment, Class I, Group D. **Administrative Controls:** Consider replacement and periodic medical examinations with emphasis on the skin and respiratory tract. Also consider liver and kidney function tests and alysis.

**Transportation Data (49 CFR 172.101)**

**T Shipping Name:** Acetone
**OT Hazard Class:** 3
**) No.:** UN1090
**OT Packaging Group:** II
**DT Label:** Flammable Liquid
**ecial Provisions (172.102):** T8

**Packaging Authorizations**
a) **Exceptions:** 173.150
b) **Non-bulk Packaging:** 173.202
c) **Bulk Packaging:** 173.242

**Quantity Limitations**
a) **Passenger, Aircraft, or Railcar:** 5L
b) **Cargo Aircraft Only:** 60L

**Vessel Storage Requirements**
**Vessel Stowage:** B
**Other:** --

**'DS Collection References:** 26, 73, 100, 101, 103, 124, 126, 127, 132, 133, 136, 139, 140, 148, 149, 153, 159, 163, 164, 167, 168, 171, 174, 176, 180

**pared by:** MJ Wurth, BS; **Industrial Hygiene Review:** PA Roy, MPH, CIH; **Medical Review:** AC Darlington, MPH, MD

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*Material Safety Data Sheets Collection:*
Sheet No. 397
*n*-Hexane
Issued: 10/78 Revision: D, 9/92

## Section 1. Material Identification

*n*-Hexane ($CH_3(CH_2)_4CH_3$) **Description:** Derived by fractional distillation from petroleum (molecular sieve process). Used as a solvent for glues, cements, adhesives, fats, and oils; a lab reagent; liquid in low temperature thermometers (instead of mercury); thinner, cleaning agent; polymerization reaction medium; an alcohol denaturant; in retreading tires for determining the refraction index of minerals.

**Other Designations:** CAS No. 110-54-3, dipropyl, Gettysolve-B, hexyl hydride, NCI-C60571, Skellysolve-B.

**Manufacturer:** Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*(73) for a suppliers list.

NFPA: R 1, I 3, S 2*, K 3 (* Skin absorption) — 3 / 1 / 0 / –

HMIS: H 2†, F 3, R 0, PPE-Sec. 8 († Chronic effects)

**Cautions:** *n*-Hexane is highly flammable. It is irritating to the eyes, skin, and mucous membranes. Vapor inhalation produces central nervous system (CNS) depression, becoming anesthetic at high concentrations. Chronic exposure may result in polyneuropathy.

## Section 2. Ingredients and Occupational Exposure Limits

*n*-Hexane; commercial hexane is a mixture of *n*-hexane and isomers of methyl pentane and heptane. 1 to 6% benzene may also be present.

**1991 OSHA PEL**
8-hr TWA: 50 ppm (180 mg/m³)

**1990 IDLH Level**
5000 ppm

**1990 NIOSH REL**
TWA: 50 ppm (180 mg/m³)

**1992-93 ACGIH TLV**
TWA: 50 ppm (176 mg/m³)

**1990 DFG (Germany) MAK**
TWA: 50 ppm (180 mg/m³)
Category II: substances with systemic effects
Half-life: < 2 hr
Peak Exposure Limit: 100 ppm, 30 min average value, 4/shift

**1985-86 Toxicity Data***
Human, inhalation, $TC_{Lo}$: 5000 ppm/10 min caused hallucinations and distorted perceptions.
Rat, oral, $LD_{50}$: 28,710 mg/kg; no toxic effect noted
Rat, inhalation, $TC_{Lo}$: 1000 ppm/6 hr from the 8th to 16th day of pregnancy produced effects on newborn growth.
Rabbit, eye: 10 mg caused mild irritation.

* See NIOSH, *RTECS* (MN9275000), for additional irritation, mutation, reproductive, and toxicity data.

## Section 3. Physical Data

**Boiling Point:** 156 °F (69 °C)
**Freezing Point:** -139 °F (-95 °C)
**Vapor Pressure:** 150 mm Hg at 77 °F (25 °C)
**Refraction Index:** 1.37486 at 68 °F (20 °C)
**Critical Temperature:** 453.2 °F (234 °C)
**Critical Pressure:** 29.7 atm
**Liquid Surface Tension:** 18.4 dyne/cm
**Odor Threshold:** 65 ppm

**Molecular Weight:** 86.17
**Density:** 0.66 at 20/4 °C
**Saturated Vapor Density (Air = 0.075 lb/ft³ or 1.2 kg/m³):** 0.1049 lb/ft³ or 1.678 kg/m³
**Water Solubility:** Slightly, 0.014 mg/ml at 68 °F (20 °C)
**Other Solubilities:** Alcohol, acetone, chloroform, ether, and most non-polar solvents.
**Ionization Potential:** 10.18 eV
**Viscosity:** 0.334 cP at 35 °F (2 °C), 0.306 cP at 80 °F (27 °C), 0.276 cP at 145 °F (62.5 °C)
**Appearance and Odor:** A colorless, volatile liquid with a gasoline-like odor.

## Section 4. Fire and Explosion Data

| Flash Point: -7.6 °F (-22 °C) | Autoignition Temperature: 437 °F (225 °C) | LEL: 1.2% v/v | UEL: 7.5% v/v |
|---|---|---|---|

**Extinguishing Media:** *n*-Hexane is a Class 1B Flammable Liquid. For small fires, use dry chemical, carbon dioxide, water spray, or regular foam. For large fires, use water spray, fog, or regular foam. **Unusual Fire or Explosion Hazards:** Vapors may travel to an ignition source and flash back. Container may explode in heat of fire. *n*-Hexane poses a vapor explosion hazard indoors, outdoors, and in sewers. Burning rate = 7.3 mm/min. **Special Fire-fighting Procedures:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing appar-atus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Structural firefighters' protective clothing provides only limited protection. If possible without risk, move container from fire area. Apply cooling water to sides of container until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use monitor nozzles or unmanned hose holders; if impossible, withdraw from fire and let burn. Withdraw immediately if you hear a rising sound from venting safety device or notice any tank discoloration due to fire. Discoloration may indicate danger of BLEVE (boiling liquid expanding vapor explosion). Do not release runoff from fire control methods to sewers or waterways.

## Section 5. Reactivity Data

**Stability/Polymerization:** *n*-Hexane is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Incompatible with strong oxidizers and may explode at 82.4 °F (28 °C) when mixed with dinitrogen tetraoxide. **Conditions to Avoid:** Contact with heat and incompatibles.
**Hazardous Products of Decomposition:** Thermal oxidative decomposition of *n*-hexane can produce acrid smoke and irritating vapors.

## Section 6. Health Hazard Data

**Carcinogenicity:** The IARC,(164) NTP,(169) and OSHA(164) do not list *n*-hexane as a carcinogen. Although there is no data on human carcinogenicity specifically caused by n-hexane, there is an increase in association between Leukemia risk in the rubber industry and exposure to a variety of substances including hexane. **Summary of Risks:** Vapors are irritating to the skin, eyes, and respiratory tract. Inhalation produces varying degrees of CNS depression depending on concentration. High concentrations may lead to asphyxia (oxygen displacement). Chronic exposure (usually at least 60 to 240 ppm) results in neurotoxicity characterized by sensory loss, pain, and neurogenic atrophy of skeletal muscle. Peripheral neuropathy is mostly of the 'stocking & glove' type. *n*-Hexane is ultimately converted to 2,5-hexanedione during metabolism and is considered to be the metabolite responsible for toxicity. Evidence exists that *n*-hexane accumulates in fatty tissue which would explain its affinity for the blood, liver, and brain where lipids are prevalent. After exposure has ceased, the half-life is 64 hrs. Metabolism is inhibited by co-exposure to toluene, methylethyl ketone, or methyl *n*-butyl ketone. *n*-Hexane is absorbed through the skin in both liquid and vapor form. Therefore, dermal vapor absorption raises biological levels above those reached during inhalation of or below the TLV concentration. This is why it is imperative that protective clothing be used so that the TLV levels are sufficient to prevent over-exposure. **Medical Conditions Aggravated by Long-Term Exposure:** Skin, CNS, PNS, and respiratory diseases. **Target Organs:** Eyes, skin, respiratory system, central and peripheral nervous system. **Primary Entry Routes:** Inhalation, skin contact/absorption, eyes, ingestion. **Acute Effects:** Vapor inhalation produced marked vertigo and hallucinations at 5000 ppm/10 min; drowsiness, fatigue, appetite loss, and paresthesia in the distal extremities at 1000 to 2500/12 hrs; muscle weakness, cold pulsation in extremeties, blurred vision, head-

## Section 6. Health Hazard Data

Skin contact causes immediate irritation with redness, painful burning and possible blisters. Eye contact produces irritation, watering, and burning. Ingestion poses a serious aspiration hazard. If aspiration into the lungs occurs, asphyxiation from oxygen displacement may lead to brain damage and cardiac arrest. Cardiac sensitization to epinephrine (the body's adrenalin) may cause rhythm disturbances with potentially fatal consequences. **Chronic Effects:** Polyneuropathy occurs from repeated exposure to levels typically in the 400 to 600 ppm range; there is a case of polyneuropathy after exposure to 54 to 200 ppm/1 year. Initial symptoms include muscle weakness, motor loss, sensation disturbances (numbness and pain without stimulus), and distal symmetric leg pain after 2 to 6 months exposure. Clinical studies indicate muscle atrophy (wasting away), foot drop, decreased muscle tone and strength, and paresthesias of the arms and legs. Vision problems including changes in color vision, retinal pigmentation, and in perifoveal capillaries were found in workers exposed to 420 to 1280 ppm for > 5 years. Progression of neuropathy may continue for several months after exposure has ceased, followed by slow recovery taking on the average of 9 to 10 months and rarely, up to 2 years. Residual spinal cord damage was noted in most severely injured victims.

**FIRST AID** ***Emergency personnel should protect against exposure***

**Eyes:** *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately. **Skin:** *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Wash exposed area with soap and water. For reddened or blistered skin, consult a physician. **Inhalation:** Remove exposed person to fresh air and administer supplemental oxygen as needed. Intubation may be necessary in severe cases (aspiration of liquid). **Ingestion:** Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center and unless otherwise advised, have that *conscious and alert* person drink 1 to 2 glasses of water to dilute. *Do not* induce vomiting because of severe aspiration hazard. If spontaneous vomiting occurs, position head to avoid aspiration of vomitus.

**Note to Physicians:** BEI = 2,5-hexanedione in urine, sample at end of shift at workweeks end, 5 mg/g creatine. Also measure *n*-hexane in expired air. Analgesics may be necessary for pain management, there is no specific antidote. Monitor arterial blood gases in cases of severe aspiration.

## Section 7. Spill, Leak, and Disposal Procedures

**Spill/Leak:** Notify safety personnel, isolate and ventilate area, deny entry, and stay upwind. Shut off ignition sources. Cleanup personnel should protect against vapor inhalation and skin/eye contact. Take up small spills with earth, sand, vermiculite, or other absorbent, noncombustible material and place in suitable containers. Dike far ahead of large spill for later disposal or reclamation. For water spills, use oil skimming equipment to lift spill. Absorbent foams can be applied to slick. Follow applicable OSHA regulations (29 CFR 1910.120). **Environmental Degradation:** If released on soil, *n*-hexane will readily volatilize from moist surfaces although some may absorb to soil. In water, *n*-hexane will volatilize rapidly although some will absorb to sediment. The log bioconcentration factor (log BCF) estimated at 2.24 to 2.89 suggests bioconcentration is not an important factor in aquatic systems. The estimated Koc of 1250 to 4100 indicates that *n*-hexane absorbs to carbon/organic matter. Volatilization half-life from a model river is 2.7 hr at 77 °F (25 °C), 1 meter deep flowing at 1m/sec with a 3 m/sec wind speed. Volatilization from a model pond (which considers effect of absorption) is estimated at 6.8 days. In the atmosphere, it is expected to exist entirely in the vapor phase. It does not absorb UV light in the environmentally significant range (> 290 nm). It reacts with photochemically produced hydroxyl radicals. Estimated lifetime under photochemical smog conditions is 5.9 hr (SE England). **Disposal:** Spray into an incinerator (may burn quicker by addition of another flammable solvent). Evaporation in a suitable hood may be used for smaller amounts. Landfill is *not* recommended. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**EPA Designations**

SARA Extremely Hazardous Substance (40 CFR 355): Not listed
SARA Toxic Chemical (40 CFR 372.65): Not listed
Listed as a RCRA Hazardous Waste (40 CFR 261.21): D001, *Characteristic of ignitability*
Listed as 'Unlisted hazardous Waste, *Characteristic of ignitability*' a CERCLA Hazardous Substance* (40 CFR 302.4): Final Reportable Quantity (RQ), 100 lb (45.4 kg) [* per RCRA, Sec. 3001]

**OSHA Designations**

Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

## Section 8. Special Protection Data

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy. **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. For < 500 ppm, use a supplied-air respirator (SAR) or SCBA. For < 1250 ppm, use a SAR operated in continuous-flow mode or a SCBA with a full facepiece. For < 5000 ppm, use a SAR with a tight-fitting facepiece operated in continuous-flow mode or a SCBA with a full facepiece. For 2500 ppm, use a SAR operated pressure demand or other positive-pressure mode. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas. **Other:** Wear chemically protective gloves, boots, aprons, and gauntlets made of nitrile, Viton, polyvinyl chloride, or chlorinated polyethylene to prevent skin contact. **Ventilation:** Provide general and local exhaust ventilation systems to maintain airborne concentrations below the OSHA PEL (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.[103] **Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Separate contaminated work clothes from street clothes and launder before reuse. Remove this material from your shoes and clean PPE. **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

## Section 9. Special Precautions and Comments

**Storage Requirements:** Store in a cool, dry, well-ventilated area away from heat, ignition sources, and incompatibles (Sec. 5).

**Engineering Controls:** To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to maintain concentrations at the lowest practical level. Purge all vessels previously containing *n*-hexane with steam before entering for the purpose of repair (cutting, welding). Refer to OSHA's Confined Space Standard (29 CFR 1910.119). **Administrative Controls:** Consider preplacement and periodic medical exams of exposed workers that emphasize the central and peripheral nervous systems, skin, eyes, and respiratory system.

**Transportation Data (49 CFR 172.101)**

**DOT Shipping Name:** Hexanes
**DOT Hazard Class:** 3
**ID No.:** UN1208
**DOT Packing Group:** II
**DOT Label:** Flammable Liquid
**Special Provisions (172.102):** T8

**Packaging Authorizations**
a) **Exceptions:** 173.150
b) **Non-bulk Packaging:** 173.202
c) **Bulk Packaging:** 173.242

**Quantity Limitations**
a) **Passenger Aircraft or Railcar:** 5L
b) **Cargo Aircraft Only:** 60L

**Vessel Stowage Requirements**
a) **Vessel Stowage:** E
b) **Other:**

***MSDS Collection* References:** 26, 73, 100, 101, 103, 124, 126, 127, 132, 133, 139, 140, 148, 149, 153, 159, 162, 163, 164, 167, 168, 171, 174

**Prepared by:** M Gannon, BA; **Industrial Hygiene Review:** PA Roy, MPH, CIH; **Medical Review:** W Silverman, MD

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*Material Safety Data Sheets Collection:*

Sheet No. 9
Sulfuric Acid, Concentrated

Issued: 10/77 Revision: D, 9/92



## Section 1. Material Identification

**Sulfuric Acid Concentrated ($H_2SO_4$) Description:** Prepared by the "Cat-Ox" process; by the contact process (vanadium pentoxide catalyst) with sulfur, pyrite ($FeS_2$), hydrogen sulfide, or sulfur-containing smelter gases; and from gypsum (calcium sulfate). Sulfuric acid is by far the most widely used industrial chemical. Its uses include: in the manufacture of fertilizers, chemicals, nitrate explosives, parchment paper, glue, dyes and pigments; as an etchant, a lab reagent, an electrolyte in lead/acid batteries, a dehydrating agent in the manufacture of ethers and esters, and an alkylation catalyst; in the purification of petroleum, the refining of mineral and vegetable oils, the leather industry, the carbonization of wool fabrics, the recuperation of fatty acids from soapworks waste water, the production of rayon and film, the extraction of uranium from pitchblende, and pickling of metal; in electroplating baths, gas drying and nonferrous metallurgy; and to obtain glucose by the hydrolysis of cellulose.

R 1
I 3
S 4
K 0

NFPA
3 0 2 W

HMIS
H 3*
F 0
R 2
PPE†

* Chronic effects
† Sec. 8

**Other Designations:** CAS No. 7664-93-9, battery acid, BOV, Caswell No 815, dipping acid, electrolyte acid, hydrogen sulfate, matting acid, oil of vitriol, sulphuric acid, vitriol brown oil.

**Manufacturer:** Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*(73) for a suppliers list.

**Cautions:** Handle concentrated sulfuric acid with extreme caution because it is corrosive to all body tissues. Vapor inhalation can cause severe lung damage. Skin or eye contact can produce severe burns; blindness may result.

## Section 2. Ingredients and Occupational Exposure Limits

Sulfuric acid concentrated, 93-98% sulfuric acid; remainder is water. Impurities include nonvolatiles, 0.02-0.03 ppm; $SO_2$, 40-80 ppm; iron, 50-100 ppm; nitrate, 5-20 ppm.

**1991 OSHA PEL**
8-hr TWA: 1 mg/m³

**1990 IDLH Level**
80 mg/m³

**1990 NIOSH REL**
TWA: 1 mg/m³

**1992-93 ACGIH TLVs**
TWA: 1 mg/m³
STEL: 3 mg/m³

**1990 DFG (Germany) MAK**
TWA: 1 mg/m³
Category: Local irritants
Peak: 2 mg/m³, 5 min, momentary value †, 8 peaks per shift

**1985-86 Toxicity Data***
Human, inhalation, $TC_{Lo}$: 3 mg/m³ for 24 weeks; toxic effects not yet reviewed.
Man, unreported route, $LD_{Lo}$: 135 mg/kg; toxic effects not yet reviewed.
Rat, oral, $LD_{50}$: 2140 mg/kg; toxic effects not yet reviewed.
Rabbit, eye: 100 mg rinse produced severe irritation.

* See NIOSH, *RTECS* (WS5600000), for additional toxicity data.
† The momentary value is a level which the concentration should never exceed.

## Section 3. Physical Data

**Boiling Point:** 554 °F (290 °C); decomposes at 644 °F (340 °C) into sulfur trioxide and water.
**Melting Point (100%):** 50.65 °F (10.36 °C)
**Vapor Pressure:** <0.001 mm Hg at 20 °C
**Saturated Vapor Density (air = 1.2 kg/m³):** 1.2 kg/m³, 0.075 lbs/ft³
**pH:** 1 N sol = 0.3, 0.1 N sol = 1.2, 0.01 N sol = 2.1

**Molecular Weight:** 98.08
**Density/Specific Gravity (96-98%):** 1.841
**Water Solubility:** Soluble; reacts!*
**Other Solubilities:** Ethyl alcohol
**Odor Threshold:** 0.150 ppm

**Appearance and Odor:** Colorless (pure) to dark brown (impure), odorless, dense, oily liquid. Pure compound is a solid below 51 °F (11 °C).

* Sulfuric acid reacts violently with water with the evolution of heat. *Always add the acid to water or other diluent, not the water to acid!*

## Section 4. Fire and Explosion Data

| Flash Point: Not combustible | Autoignition Temperature: None reported | LEL: None reported | UEL: None reported |
|---|---|---|---|

**Extinguishing Media:** Use extinguishing media appropriate to surrounding fire. Only use water if absolutely necessary and use with great caution. Water applied directly to sulfuric acid results in violent heat liberation and splattering of the material. Use water spray only to keep fire-exposed containers cool. **Unusual Fire or Explosion Hazards:** Sulfuric acid, a strong dehydrating agent, reacts with organic materials and produces enough heat ignition, chars wood, and may cause ignition of finely divided materials on contact. Reaction with metals may produce highly flammable, hydrogen gas. **Special Fire-fighting Procedures:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Structural firefighter's protective clothing is *not* effective. Stay away from ends of tanks. Do not release runoff from fire control methods to sewers or waterways.

## Section 5. Reactivity Data

**Stability/Polymerization:** Sulfuric acid is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Include acetic acid; acetone cyanohydrin; (acetone + nitric acid); (acetone + potassium dichromate); acetonitrile; acrolein; acrylonitrile; acrylonitrile + water; (alcohol + hydrogen peroxide); allyl alcohol; allyl chloride; ammonium hydroxide; 2-amino ethanol; ammonium; triperchromate; aniline; (bromates + metals); bromine pentafluoride; *n*-butyraldehyde; carbides; cesium acetylene carbide; chlorates; (chlorates + metals); chlorine trifluoride; chlorosulfonic acid; cuprous nitride; diisobutylene; (dimethylbenzylcarbinol + hydrogen peroxide); epichlorohydrin; ethylene cyanohydrin; ethylene diamine; ethylene glycol; ethylene imine; fulminates; hydrochloric acid; hydrogen; iodine heptafluoride; (indene + nitric acid); iron; isoprene; lithium silicide; mercuric nitride; mesityl oxide; powdered metals; (nitric acid + glycerides); *p*-nitrotoluene; pentasilver trihydroxydiaminophosphate; perchlorates; perchloric acid; (permanganates + benzene); (1-phenyl-2-methylpropryl alcohol + hydrogen peroxide); phosphorus; phosphorus isocyanate; picrates; potassium *tert*-butoxide; potassium chlorate; (potassium permanganate + potassium chloride); (potassium permanganate + water); beta-propiolactone; propylene oxide; pyridine; rubidium acetylene carbide; silver permanganate; sodium; sodium carbonate; sodium chlorate; sodium hydroxide; steel; styrene monomer; (toluene + nitric acid); vinyl acetate; and water. **Conditions to Avoid:** Water, combustibles, heat, ignition sources, and other incompatibles. **Hazardous Products of Decomposition:** Thermal oxidative decomposition of sulfuric acid can produce sulfur oxides.

## Section 6. Health Hazard Data

**Carcinogenicity:** The IARC,(164) NTP,(169) and OSHA(164) do not list sulfuric acid as a carcinogen. However, a number of studies have associated exposures to sulfuric acid or to acid mists in general with laryngeal cancer. In 50 confirmed cases there was an approximately four-fold increased risk among highly exposed individuals relative to matched controls. It is not known if sulfuric acid can act as a direct carcinogen, as a promoter, or in combination with other substances.(167) **Summary of Risks:** Concentrated sulfuric acid is a severe respiratory tract, skin, and eye irritant.

*Continue on next page*

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## Section 6. Health Hazard Data, *continued*

posure can result in severe burns, tissue damage, scarring, functional inhibition, and blindness if splashed in the eye. Although ingestion is unlikely, it may cause severe injury and death. **Medical Conditions Aggravated by Long-Term Exposure:** Chronic respiratory, gastrointestinal, nervous, skin or eye diseases. **Target Organs:** Respiratory system, eyes, skin, and teeth. **Primary Entry Routes:** Inhalation, skin and eye contact. **Acute Effects:** Vapor or mist inhalation causes coughing, sneezing, nose irritation and nose bleeds, reflex bronchospasm, shortness of breath, pulmonary edema (fluid in lungs), emphysema, and permanent changes in pulmonary function. Ingestion causes corrosion of the mucous membranes of mouth, throat, and esophagus; and epigastric pain with nausea and vomiting of mucoid and "coffee ground" material. Skin contact produces severe burns; initially the zone of contact is bleached and turns brown prior to the formation of a clearly defined ulcer. These wounds are slow in healing and may cause extensive scarring that results in functional inhibition. If burns are extensive, the outcome may prove fatal. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death. Eye contact produces deep corneal ulceration, kerato-conjunctivitis, palpebral lesions, and possible blindness. **Chronic Effects:** Chronic effects may include dental erosion, conjunctivitis, tracheobronchitis, emphysema, stomatitis (inflammation of the mouth mucous membranes), gastritis (inflammation of stomach mucous membranes), and dermatitis. **FIRST AID Eyes:** *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult an ophthalmologist immediately. **Skin:** *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Use a 2% sodium bicarbonate solution to further neutralize any $H_2SO_4$ on the skin. Wash exposed area with soap and water. For reddened or blistered skin, consult a physician. **Inhalation:** Remove exposed person to fresh air and support breathing as needed. **Ingestion:** Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless otherwise advised, have that *conscious and alert* person drink 1 to 2 glasses of water or milk to dilute. *Do not* induce vomiting! Do not attempt to neutralize the acid with sodium bicarbonate. **Note to Physicians:** Monitor arterial blood gases, chest x-ray, and pulmonary function tests if respiratory tract irritation or respiratory depression is evident. Treat dermal irritation or burns with standard topical therapy.

## Section 7. Spill, Leak, and Disposal Procedures

**Spill/Leak:** Notify safety personnel of spill, evacuate all unnecessary personnel, remove all ignition sources, and provide adequate ventilation. Cleanup personnel should wear fully-encapsulating, vapor-protective clothing to protect against inhalation and skin or eye contact. Keep water and combustibles away from release. Stop or control leak if this can be done without undue risk. Neutralize small spills with sodium bicarbonate or a mixture of soda ash/slaked lime (50/50) and place into sealed containers for disposal. If a neutralizing agent is not available, absorb spilled sulfuric acid with vermiculite, dry sand, or earth. *Never* use organic material (e.g., sawdust) to absorb spill. For large spills, dike far ahead to contain for later disposal. Follow applicable OSHA regulations (29 CFR 1910.120). Report any release in excess of 1000 lbs. **Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Neutralize waste water pH between 5.5 and 8.5. Follow applicable Federal, state, and local regulations.

**Aquatic Toxicity:** $LC_{50}$ (saltwater, prawns): 42.5 ppm for 48 hrs; lethal (freshwater, bluegill): 24.5 ppm/24 hr.

**EPA Designations**
Listed as a RCRA Hazardous Waste (40 CFR 261.33): Characteristic of corrosivity
Listed as a CERCLA Hazardous Substance* (40 CFR 302.4): Final Reportable Quantity (RQ), 1000 lb (454 kg) [* per CWA, Sec. 311(b)(4)]
Listed as a SARA Extremely Hazardous Substance (40 CFR 355), TPQ: 1000 lbs.
Listed as a SARA Toxic Chemical (40 CFR 372.65)

**OSHA Designations**
Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

## Section 8. Special Protection Data

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy. **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. For concentrations < 25 $mg/m^3$ use any powered, air-purifying respirator with acid gas cartridge(s) in combination with a high-efficiency particulate filter. For concentrations < 50 $mg/m^3$, use any chemical cartridge respirator with a full facepiece and acid gas cartridge(s) in combination with a high-efficiency particulate filter. For concentrations < 80 $mg/m^3$, use any supplied air-respirator with a full facepiece and operated in pressure-demand or other positive-pressure mode. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. If respirators are used, OSHA requires a respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas. **Other:** Wear chemically protective gloves, boots, aprons, and gauntlets to prevent skin contact. $H_2SO_4$ has a minor to moderate effect on neoprene or rubber.[131] **Ventilation:** Provide general and local exhaust ventilation systems to maintain airborne concentrations below the OSHA PEL (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.[109] **Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Separate contaminated work clothes from street clothes and launder before reuse. Remove this material from your shoes and clean personal protective equipment. **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

## Section 9. Special Precautions and Comments

**Storage Requirements:** Store in clearly labelled, steel containers in a cool [below 50 °F (10 °C)], dry, well-ventilated location on an acid-resistant cement floor and away from direct sunlight, combustibles, and other reactive materials. Separate from carbides, chlorates, fulminates, nitrates, picrates, and powdered metals. Protect storage containers against damage and water. Use non-sparking tools near sulfuric acid carboys, drums, tank cars, or metal storage tanks because of the possible production of hydrogen during storage. Use hand pumps for the decanting and emptying of carboys. **Engineering Controls:** To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to maintain concentrations at the lowest practical level. Total enclosures of processes and the mechanization of handling procedures are the most effective measures to prevent contact with sulfuric acid. Protect electrical installations against the corrosive action of acid vapors. **Administrative Controls:** Consider preplacement and periodic physical examinations with emphasis on the respiratory tract (including pulmonary function tests), skin, eyes, and teeth.

**DOT Shipping Name:** Sulfuric acid
**DOT Hazard Class:** 8
**ID No.:** UN1830
**DOT Packaging Group:** II
**DOT Label:** Corrosive
**Special Provisions (172.102):** A3, A7, B2, B83, B84, N34, T9, T27

**Transportation Data (49 CFR 172.101)**
**Packaging Authorizations**
a) Exceptions: 173.154
b) Non-bulk Packaging: 173.202
c) Bulk Packaging: 173.242

**Quantity Limitations**
a) Passenger, Aircraft, or Railcar: 1L
b) Cargo Aircraft Only: 30L

**Vessel Stowage Requirements**
a) Vessel Stowage: C
b) Other: 14

**MSDS Collection References:** 26, 73, 89, 100, 101, 103, 124, 126, 127, 131, 132, 139, 140, 148, 149, 153, 159, 163, 164, 167, 171, 174, 180
**Prepared by:** MJ Wurth, BS; Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: AC Darlington, MPH

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*Material Safety Data Sheets Collection:*
Sheet No. 30A
Hydrochloric Acid
Issued: 10/77 Revision: C, 9/92 Erratum: 5/9

## Section 1. Material Identification

**Hydrochloric Acid (HCl) Description:** An aqueous solution of hydrogen chloride. Derived by dissolving hydrogen chloride gas in water at various concentrations. Hydrochloric acid is also formed as a byproduct from oxychlorination and/or oxyhydrochlorination of organic materials. Used in metal pickling and cleaning (boiler and heat exchange equipment scale removal), ore reduction, processing (corn syrup, hydrolyzing starch), dye and dye intermediate production, electroplating, leather tanning, in fertilizer, artificial silk, and paint pigment production, refining soaps and edible fats and oils, petroleum extraction, toilet bowl cleaners; as an alcohol denaturant, a chemical intermediate and solvent in organic synthesis, and in the photographic, textile, and rubber industries.

**Other Designations:** CAS No. 7647-01-0, Caswell No. 486, chlorohydric acid, Muriatic acid, spirits of salt.

**Manufacturer:** Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*(73) for a suppliers list.

**Cautions:** Hydrochloric acid is highly corrosive and causes serious skin and eye burns as well as acute and chronic respiratory problems.

R 1
I 4
S 4
K 0

NFPA
0
3 0
-

HMIS
H 2*
F 0
R 0
PPE†
* Chronic effects
† Sec. 8

41

## Section 2. Ingredients and Occupational Exposure Limits

Hydrochloric acid; ~38% (commercial), 20% ("azeotrope"). Trace impurities include ammonia, arsenic, iron, sulfate, free Cl-, and heavy metals.

**1991 OSHA PEL**
Ceiling: 5 ppm (7 mg/m³)

**1990 IDLH Level**
100 ppm

**1990 NIOSH REL**
Ceiling: 5 ppm (7 mg/m³)

**1992-93 ACGIH TLV**
Ceiling: 5 ppm (7.5 mg/m³)

**1990 DFG (Germany) MAK**
Ceiling: 5 ppm (7 mg/m³)
Category 1: local irritants
Peak Exposure Limit: 10 ppm, 5 min momentary value/8 per shift

**1985-86 Toxicity Data***
Human, inhalation, $LC_{Lo}$: 1300 ppm/30 min; toxic effects not yet reviewed
Rabbit, oral, $LD_{50}$: 900 mg/kg; toxic effects not yet reviewed
Rat, inhalation, $TC_{Lo}$: 450 mg/m³/1 hr (1 day prior to pregnancy) produced fetotoxicity (except death) & specific developmental abnormalities (homeostasis).
Rabbit, eye: 100 mg rinse caused mild irritation.

*See NIOSH, *RTECS* (MW4025000), for additional irritation, reproductive, and toxicity data.

## Section 3. Physical Data

**Boiling Point:** -120.64 °F (-84.8 °C)*
**Vapor Pressure:** 4 atm at 64 °F (17.8 °C)
**Vapor Density (Air = 1):** 1.257
**Surface Tension:** 23 at 244.68 (118.16 °C)
**Molecular Weight:** 36.46
**Odor Threshold:** 0.1 to 5 ppm
**Ionization Potential:** 12.74 eV

**Freezing Point:** 1.1 °F (-17.14 °C) for 10.81%, -51.16 °F (-46.2 °C) for 31.24%
**Density:** 1.194 at -14.8 °F (-26 °C)
**Water Solubility:** Soluble, 823 g/L at 32 °F (0 °C); 561 g/L at 140 °F (60 °C).
**Other Solubilities:** Soluble in alcohol, benzene, and ether; insoluble in hydrocarbons.
**pH:** 1N (0.1), 0.1N (1.1), 0.01N (2.02), 0.001N (3.02), 0.0001N (4.01)
**Refraction Index (1N solution):** 1.34168 at 64.4 °F (18 °C/D)

**Appearance and Odor:** Colorless liquid that fumes in air and has a strong pungent odor. Can be slightly yellow from traces of iron, chlorine, or organic matter. Forms a constant boiling azeotrope at 20 % HCl, 108.58 °C and 760 mm Hg.

* Decomposes at 3239.6 °F (1782 °C).

## Section 4. Fire and Explosion Data

| Flash Point: Noncombustible | Autoignition Temperature: None reported | LEL: None reported* | UEL: None reported* |
|---|---|---|---|

**Extinguishing Media:** Use extinguishing agents suitable for surrounding fire.
**Unusual Fire or Explosion Hazards:** *Extreme heat or contact with many metals liberates hydrogen gas which has explosion limits of 4 to 75%.
**Special Fire-fighting Procedures:** Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Structural firefighter's protective clothing is *ineffective* for fires involving hydrochloric acid. Stay away from ends of tanks. Cool tanks with water spray until well after fire is out. *Do not* release runoff from fire control methods to sewers or waterways.

## Section 5. Reactivity Data

**Stability/Polymerization:** Hydrochloric acid has high thermal stability (decomposes at 3239.6 °F/1782 °C). Hazardous polymerization does not occur unless exposed to aldehydes or epoxides.
**Chemical Incompatibilities:** Polymerizes on contact with aldehydes or epoxides; attacks most metals (except mercury, silver, gold, platinum, tantalum, and some alloys), some plastics, rubber, and coatings; reacts explosively with alcohols + hydrogen cyanide, potassium permanganate, tetraselenium tetranitride; ignites on contact with fluorine, hexalithium disilicide, metal acetylides or carbides (cesium acetylide, rubidium acetylide); and is incompatible with acetic anhydride, 2-amino ethanol, ammonium hydroxide, calcium phosphide, chlorosulfonic acid, 1,1-difluoroethylene, ethylene diamine, ethylene imine, oleum, perchloric acid, ß-propiolacetone, propylene oxide, sodium hydroxide, silver perchlorate + carbon tetrachloride, sulfuric acid, uranium phosphide, acetate, calcium carbide, magnesium bromide, mercuric sulfate, and chlorine + dinitroaniline.
**Conditions to Avoid:** Avoid contact with incompatibles.
**Hazardous Products of Decomposition:** Thermal oxidative decomposition of HCl produces toxic chloride fumes and explosive hydrogen gas.

## Section 6. Health Hazard Data

**Carcinogenicity:** The IARC,(164) NTP,(169) and OSHA(164) do not list HCl as a carcinogen.
**Summary of Risks:** HCl is a highly corrosive liquid and depending on concentration and duration of exposure, symptoms range from irritation to ulcerations and permanent injury. **Target Organs:** Eyes, skin, respiratory tract, and liver (in animals). **Primary Entry Routes:** Inhalation, skin and eye contact. **Medical Conditions Aggravated by Long-Term Exposure:** Respiratory disorders

## Section 6. Health Hazard Data *continued*

**Acute Effects:** Inhalation of vapors or mists is corrosive to the respiratory tract and can cause tracheal and bronchial epithelium necrosis (tissue death), cough, choking, ulceration. Liquid aspiration can cause pulmonary edema, lung collapse, emphysema and damage to the pulmonary blood vessels. Skin contact with HCl solutions causes burns and ulcerations. Permanent eye damage may result from splashes. Ingestion is unlikely but if it occurs, symptoms include gray tongue color, corrosion of mucous membranes, esophagus, and stomach, nausea, vomiting, intense thirst, diarrhea, difficulty swallowing, circulatory collapse and possible death. **Chronic Effects:** Repeated or prolonged exposure can cause dermatitis, conjunctivitis, gastritis, photosensitization, tooth erosion, and repeated exposure to mists from heated-metal pickling solutions can cause nose and gum bleeds, ulceration of oral or nasal mucosa, and "renders facial skin so tender that shaving is painful."[133]

**FIRST AID**

**Eyes:** *Do not* allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately. **Skin:** *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Treat skin with a 5% triethanolamine solution. For reddened or blistered skin, consult a physician. **Inhalation:** Remove exposed person to fresh air and support breathing as needed. **Ingestion:** Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have that *conscious and alert* person drink 1 to 2 glasses of water to dilute. *Do not* induce vomiting!

After first aid, get appropriate in-plant, paramedic, or community medical support.

**Note to Physicians:** Consider a chest x-ray in acute overexposure.

## Section 7. Spill, Leak, and Disposal Procedures

**Spill/Leak:** Notify safety personnel, isolate and ventilate area, deny entry, and stay upwind. Neutralize spills with crushed limestone, soda ash, lime, or sodium bicarbonate. After neutralizing, take up small spills with earth, sand, vermiculite, or other absorbent, noncombustible material and place in suitable containers for disposal; flush large spills to containment area and reclaim (if possible) or await disposal. Follow applicable OSHA regulations (29 CFR 1910.120). **Environmental Transport:** In soil, HCl will infiltrate moving faster in the presence of moisture. It may dissolve some soil matter, particularly those of a carbonate base will be neutralized to some degree and will be transported to groundwater. **Ecotoxicity Values:** Chronic plant toxicity = 100 ppm; injurious to irrigatable crops at 350 mg/L; trout, $LC_{100}$, 10 mg/L/24 hr shrimp, $LC_{50}$, 100 to 330 ppm/starfish, $LC_{50}$, 100 to 330 mg/L/48 hr; shore crab, $LC_{50}$, 240 mg/L/48 hr. **Disposal:** Neutralize to between 5.5 & 8.5 before disposal. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**EPA Designations**

Listed as a RCRA Hazardous Waste (40 CFR 261.23, *0.01N solution or higher*): No. D002, Characteristic of corrosivity

Listed as a CERCLA Hazardous Substance* (40 CFR 302.4): Final Reportable Quantity (RQ), 5000 lb (2270 kg) [* per CWA, Sec. 311 (b)(4)]

SARA Extremely Hazardous Substance (40 CFR 355), TPQ: Not listed

Listed as a SARA Toxic Chemical (40 CFR 372.65)

**OSHA Designations**

Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

## Section 8. Special Protection Data

**Goggles:** Wear chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Because contact lens use in industry is controversial, establish your own policy. **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. For < 50 ppm, use a cartridge respirator with acid gas cartridges, or any supplied-air respirator (SAR) or SCBA. For < 100 ppm, use any chemical cartridge respirator with a full facepiece and cartridge that protects against HCl inhalation, or any SAR or SCBA with a full facepiece. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas. **Other:** Wear chemically protective gloves, boots, aprons, and gauntlets to prevent skin contact. Polycarbonate, butyl rubber, polyvinyl chloride, and chlorinated polyethylene are recommended materials for PPE. Polyvinyl alcohol is not recommended. **Ventilation:** Provide general and local exhaust ventilation systems to maintain airborne concentrations below the OSHA PEL (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.[103] **Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Separate contaminated work clothes from street clothes. Launder contaminated work clothing before wearing. Remove this material from your shoes and clean personal protective equipment. **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

## Section 9. Special Precautions and Comments

**Storage Requirements:** Prevent physical damage to containers. Store in a cool, dry, well-ventilated area on a cement floor away from direct sunlight and heat sources. Use decanting pumps or pouring frames to minimize spillage during loading and unloading operations.

**Engineering Controls:** To reduce potential health hazards, use sufficient dilution or local exhaust ventilation to control airborne contaminants and to maintain concentrations at the lowest practical level. HCl should be manufactured in closed systems. Pay close attention to leak detection. Aqueous scrubbers are used to control hydrogen chloride emissions from vent stacks and other sources. Workers shouldn't enter tanks previously containing HCl until they have been cleaned.

**Administrative Controls:** Consider preplacement and periodic medical exams of exposed workers with emphasis on the eyes, skin, and respiratory tract. Pulmonary function tests (FEV, FVC) are useful in determining lung disorders. Conduct difficult operations in fume hoods.

**Transportation Data (49 CFR 172.101)**

**DOT Shipping Name:** Hydrochloric acid, solution
**DOT Hazard Class:** 8
**ID No.:** UN1789
**DOT Label:** Corrosive
**DOT Packing Group:** II
**Special provisions (172.102):** A3, A6, B2, B15, N41, T9, T27

**Packaging Authorizations**
a) **Exceptions:** 173.154
b) **Non-bulk Packaging:** 173.202
c) **Bulk Packaging:** 173.242

**Quantity limitations**
a) **Passenger, Aircraft, or Railcar:** 1 L
b) **Cargo Aircraft Only:** 30 L

**Vessel Stowage Requirements**
a) **Vessel Stowage:** C
b) **Other:** 8

*MSDS Collection* **References:** 26, 73, 89, 100, 101, 103, 124, 126, 127, 132, 133, 136, 139, 148, 149, 153, 159, 163, 164, 167, 168, 171, 174, 180
**Prepared by:** M Gannon, BA; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** AC Darlington, MPH, MD

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# *Appendix G-4*
# *Daily Air Monitoring Log*

O'BRIEN & GERE

# Air Monitoring Log

File Name: AIR_MONITORING_LOG.doc
Revised: July 30, 2003

[redacted]

| | Background or Upwind Level | | | | | |
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-- Keep 1 copy of Air Monitoring Result on site for the project duration --

O'BRIEN & GERE

# Air Sampling Data Form

File Name: AIR_SAMPLING.doc
Revised: March 31, 2010

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|---|---|---|---|---|---|---|---|---|---|
| Client Name: | | | | | | | | Project No: | |
| Project Name: | | | | | | | | Sample Date: | |
| Project Location: | | | | | | | | | |
| Sample ID | Person Name or Location | Start Time | Stop Time | Start Time | Stop Time | Sample Duration | Shift Duration | COMMENTS: Include description activities that may affect results | |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| Pump Type: | | | | Pump Manufacturer: | | | | | Pump Model: | | |
| Pump ID | Pre-Cal (L/min) | Post-Cal (L/min) | Average (L/min) | Sample Duration (min) | Sample Volume (L) | Collection Media | Laboratory Analysis Results: | | | | |
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Sampled by (print): | | Title | | | |
| (sign): | | Date | | Time | |

Please forward analytical results to:
Manager of Corporate Health & Safety
O'Brien & Gere
5000 Brittonfield Parkway
Phone: (315) 437-6100
Fax: 315-437-7554

**COMMENTS / REMARKS:** (include information on calibration device – make, model, serial #, etc.)

- ☐ Standard Service (10 days)
- ☐ Rush Service – Date: _____
- ☐ Fax Results to _____
  Fax # (  ) _____ - _____
- ☐ Phone Results to _____
  Phone #(  ) _____ - _____

# *Appendix G-5*
# *Prime Contractor Daily Safety Meeting Log*

O'BRIEN & GERE

# Pre-Work Briefing

File Name: PREWORK_BRIEFING_Oct 2010.docx
Revised: January 29, 2002

| | | | |
|---|---|---|---|
| Client: | Demaximis Inc. | | |
| Project Name: | Former Pollution Abatement Services (PAS) Oswego, NY | Project No. | Refer to current project listing |
| Project Location: | 55 East Seneca St. Oswego, NY. | | |
| PM: | Kevin Stone or Martin Koennecke when assinged | | |
| Applicable Safety Requirements: | ☐ O'Brien & Gere Safety Requirements<br>☐ Site-Specific Safety Plan or JSA<br>☐ Site Owner Safety Requirements<br>☐ Subcontractor safety<br>☐ General Site safety requirements<br>☐ Leachate Removal<br>☐ Well sampling & monitoring<br>☐ Lawn mowing activities<br>☐ Winter Operation<br>☐ Key contact information | Other: | |

The purpose of the Pre-Work Briefing is to provide **site-specific safety orientation** to employees and subcontractors. This certifies that undersigned individuals have read, understand, and agree to comply with applicable **site-specific safety requirements** that can be obtained from site safety plans, site Job Safety Analyses (JSAs), site owner requirements, and/or other site safety documents furnished to me by O'Brien & Gere. I understand that these safety requirements are not "all-inclusive" and that I will be expected to follow any additional safe work practices applicable to my specific scope of work.

| Print Name | Signature | Company | Date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**-- Have EACH employee sign this form before they begin work on site --**

# *Appendix G-6*
# *Incident Investigation Report*

O'BRIEN & GERE

# Incident Investigation Form

File Location: I:\Ogina\Admin\H&S\forms\INCIDENT_INVESTIGATION.doc
Revised: January 15, 2008

☐ Restricted Workday (___ days)
☐ Lost Workday (___ days)
☐ Fatality

☐ Near Miss
☐ Property Damage >$1,000
☐ Other

## PROJECT INFORMATION

Zip:

## INCIDENT INFORMATION

☐ NA

## INJURED PERSON INFORMATION

(Or Witness Information if Injured Party is ...)

Employment Status:
☐ Craft, Temporary, Contract ☐ *Other
☐ Regular Status Employee ☐ *Subcontractor
* Name of Company:

O'Brien & Gere: ☐ Eng ☐ OGINA ☐ OPS ☐ Limited
Business Unit: ☐ ENV ☐ CFS ☐ TWS ☐ OPS ☐ Corp

provide confidentially upon request

☐ M / ☐ F DOB:

Experience w/ OBG: years months
Total Experience: years months

☐ No ☐ Yes – specify:

☐ Alone ☐ With Crew or Fellow Worker (get witness names)

## WITNESS INFORMATION

(Or Injured Employee if not Part A)

Witness #1 Name: Contact Phone #
Witness #2 Name: Contact Phone #
Witness #3 Name: Contact Phone #

**FULLY COMPLETE THIS FORM AND SEND TO THE MANAGER OF CORPORATE H&S (Jeff Parsons x2871) AND THE LEGAL/INSURANCE DEPARTMENT (Meg Hermann x2624) WITHIN 24 HOURS**
**Phone: (315) 437-6100 / Fax: (315) 463-7554**
**Attach All Applicable Medical Reports**

cc:

## DESCRIBE HOW THE INCIDENT OCCURRED

Describe in **detail**, and in chronological order, the events that lead to the accident, how the incident occurred, and any other facts you feel may be relevant to the investigation. Please avoid opinions or hearsay.

## CAUSAL FACTORS

Check all that apply and identify corrective actions for each factor. Beginning with the most apparent or most direct cause of the incident, ask **"WHY" five times** to identify the sequence of events or conditions that contributed to the incident.

**PROCEDURES**
- ☐ Not available
- ☐ Difficult to use / understand
- ☐ Use of procedure was not required but should be
- ☐ Followed incorrectly
- ☐ Not followed
- ☐ Inadequate details
- ☐ Situation not covered
- ☐

**WORK ENVIRONMENT**
- ☐ Housekeeping poor
- ☐ Hot / Cold
- ☐ Poor lighting
- ☐ High Noise
- ☐ High Radiation/Contamination
- ☐ Cramped quarters
- ☐

**ENGINEERING/DESIGN**
- ☐ Inadequate technical design
- ☐ Inadequate specifications
- ☐ Inadequate change mgmt

**COMMUNICATION**
- ☐ Misunderstood verbal directions
- ☐ No communication or untimely
- ☐ Standard terminology or signals not used or are misunderstood
- ☐ Interference from noisy environment
- ☐ Notifications late or not provided
- ☐ Job/task safety analysis not reviewed with personnel
- ☐

**EQUIPMENT & TOOLS**
- ☐ Wrong equipment/tool for the task
- ☐ Defective equipment/tools
- ☐ PM not done or inadequate
- ☐ Inadequate / removed guards
- ☐ Inadequate isolation (LOTO)
- ☐ No inspection of tools / equipment
- ☐
- ☐
- ☐
- ☐

**MANAGEMENT/ORGANIZATION**
- ☐ Inadequate work planning
- ☐ Unclear reporting relationship
- ☐ Unclear assignment of responsibility or authority
- ☐ Improper delegation
- ☐ Inadequate audits/inspections
- ☐ Inadequate incident reporting
- ☐ Inadequate incident investigation
- ☐ Corrective actions not complete
- ☐ Corrective actions inadequate
- ☐ Inadequate purchasing
- ☐ Wrong person assigned to job
- ☐ Lack of supervisor knowledge
- ☐ Inadequate/lack of safety mtgs
- ☐ Inadequate control of change
- ☐ Mgmt resources inadequate
- ☐ Excessive work hours (fatigue)
- ☐ No or inadequate enforcement
- ☐ No pre-task safety analysis
- ☐
- ☐

**HUMAN FACTORS**
- ☐ Lack of experience or skill
- ☐ Infrequent performance
- ☐ Operating equipment without authority
- ☐ Operating equipment unsafely
- ☐ Taking unsafe position/posture
- ☐ Poor judgement or inappropriate risk taking
- ☐ Physical impairment (explain)
- ☐ Drugs/alcohol (explain)
- ☐
- ☐

**TRAINING**
- ☐ Training not provided
- ☐ Training inadequate
- ☐ Did not attend training
- ☐ Training not appropriate for the job or task
- ☐
- ☐
- ☐

## CORRECTIVE ACTIONS

List the corrective actions taken to minimize the possibility of a similar incident from occurring in the future. Assign specific individuals and completion dates for each corrective action. The "Safety Audit Closeout" form can be used to help track completion of corrective actions or use the table below.

| # | Description | Responsible Person | Target Completion | Actual Completion |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Prepared by: (print)** | | **Sign:** | | **Date:** | |
| **CHS Review: (print)** | | **Sign:** | | **Date:** | |

## O'BRIEN & GERE EMPLOYEE INFORMATION RELEASE

To be completed by O'Brien & Gere Employees requiring Hospital/Clinic Treatment or ANY Back Injury

| | |
|---|---|
| Employee Name: | |
| Date of Injury: | |

I hereby authorize O'Brien & Gere or any of its representatives to be furnished any information and facts regarding this injury, including reports and records, results and diagnosis, treatment and prognosis, estimates of disability, and recommendations for further treatment. This information is to be used for the purpose of evaluating and handling my claim for injury as a result of an incident occurring on or about the above-noted date of injury and for no other purpose, now or in the future.

O'Brien & Gere
Employee Signature: _____ Date: _____

## EMPLOYEE & SUBCONTRACTOR INJURED PERSON STATEMENT

To be completed by O'Brien & Gere Employees and Subcontractors for ALL Accident Reports

Please describe what happened with respect to the incident that occurred on _____ (date) at the following location, _____.

Injured Person Signature: _____ Date: _____

Injured Person Name (print): _____

## WITNESS STATEMENT

Please describe what happened with respect to the incident that occurred on _____(date) at the following location, _____.

Company Name: _____ Phone #: _____

Witness Signature: _____ Date: _____

Witness Name (print): _____

# *Appendix H*
# *Significant Industrial User Wastewater Discharge Permit (Oswego)*

**CITY OF OSWEGO**
**ENVIRONMENTAL CONSERVATION**
**WASTEWATER DISCHARGE PERMIT FOR SIGNIFICANT INDUSTRIAL USERS**

| | |
|---|---|
| COMPANY NAME: | **POLLUTION ABATEMENT SERVICES SITE (PAS)** |
| LOCATION: | **EAST SENECA STREET**<br>**OSWEGO, NEW YORK 13126** |
| MAILING ADDRESS: | **de maximis, inc.**<br>**2975 Bee Ridge Road**<br>**Suite C**<br>**Sarasota, FL 34239** |
| CONTACT PERSON(S): | **Clay McClarnon – (865) 691-5052; cell: (865) 607-8249**<br>**Mark Valentine – (941) 926-7929** |

The above Industrial User is authorized to discharge industrial wastewater to the City of Oswego East Side Wastewater Treatment Plant in compliance with the City's Sewer Use Ordinance, Pre-Treatment Regulations and any applicable provisions of Federal or State Law, or regulations and in accordance with discharge point, effluent limitations, monitoring requirements and other conditions set forth herein.

This Permit is granted in accordance with information submitted by the Industrial User Application and in conformity with operating data at the Wastewater Treatment Plant. This Permit is not transferable. ***(Part IV, sec. 10)***

**Effective Date:** **July 20, 2010**

**Expiration Date:** **December 31, 2013**

**Amended on February 8, 2012**

## WASTEWATER DISCHARGE PERMIT FOR SIGNIFICANT INDUSTRIAL USERS

**PART I. - WASTEWATER DISCHARGE LIMITATION AND MONITORING REQUIREMENTS:**

A. During the period June 1, 2010 to December 31, 2013, the Permittee, Pollution Abatement Services Site (PAS) of Oswego, NY (Site) is authorized to discharge its leachate to the City of Oswego Sewer System.

B. During this same period it is understood that based on historical data, PAS will typically discharge between 15,000–20,000 gallons of leachate each month. PAS will provide an annual schedule of anticipated discharge dates to the City at the beginning of each year and notify the City of any changes in a timely fashion. It is anticipated that PAS leachate will typically be discharged in the first week of each month. In addition, the discharge from the site shall not exceed the following limitations:

**Industry Discharge Limitation**

| | Parameter | Daily Maximum Loading |
|---|---|---|
| 1. | Flow | .03 MGD* |
| 2. | Temperature | (See Section D. 3) |
| 3. | pH | No less than 5.0 Instantaneous / No more than 10.5 Instantaneous |
| 4. | TSS | 100 lbs/da |
| 5. | BOD | 50 lbs/da |
| 6. | Antinomy | 0.003 mg/l |
| 7. | Arsenic | 0.007 mg/l |
| 8. | Beryllium | 0.005 mg/l |
| 9. | Cadmium | 0.11 lbs/da |
| 10. | Chromium (Total) | 2.49 lbs/da |
| 11. | Copper | 0.11 lbs/da |
| 12. | Cyanide | 0.17 lbs/da |
| 13. | Lead | 0.05 lbs/da |
| 14. | Mercury** | 0.0002 mg/l / 0.00004 lbs/da |
| 15. | Nickel | 0.25 lbs/da |
| 16. | Selenium | 0.001 mg/l |
| 17. | Silver | 0.25 lbs/da |
| 18. | Thallium | 0.003 mg/l |
| 19. | Zinc | 0.50 lbs/da |
| 20. | Total Phenols | 0.34 lbs/da |

* Multiple daily discharge events may be performed during any month.
** Concentration based on flow discharge of .03 mgd.

**PART I. - WASTEWATER DISCHARGE LIMITATION AND MONITORING REQUIREMENTS: (Cont.)**

C. During the period of June 1, 2010 to December 31, 2013, the discharge from the site shall consist of collected leachate, only, and shall comply with Article IX, Sections 199-59 through 199-68 of the City of Oswego Sewer Use Ordinance.

D. The Permittee shall not discharge wastewater containing any of the following substances to the wastewater facility:

1. Fats, wax, grease or oils of petroleum origin, whether or not, in excess of one hundred (100) mg/1 or containing substance which may solidify or become viscous at temperature between 32 degrees F (0 Degrees C) and 140 degrees F (60 degrees (C);

2. Any gasoline, benzene, naphtha, fuel oil or other flammable or explosive liquids, solids or gases exceeding 5% of the lower explosive limit (LEL);

3. Discharges are limited to a temperature no higher than 113 degrees F. (45 degrees C).

4. Any ashes, hair, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch, manure, or any other solids grater than 1/2" in any dimension, solid or viscous substances capable of causing obstructions or other interference with proper operation of the sewer system;

5. Any pollutant, including oxygen demanding pollutants (B.O.D. etc.) at flow rate and/or concentration which will cause the pollutant to pass through to the receiving waters or interfere with City of Oswego East Side Wastewater Treatment Facility. For the purpose of this section, the terms "pass through" and "interference" have the same definition as appear in the City of Oswego Sewer Use Ordinance.

E. All discharges shall comply with all other applicable laws, regulations, standards and in the City of Oswego Sewer Use Ordinance and any applicable State and Federal Pretreatment Laws, regulations, standards and requirements including any such laws, regulations, standards or requirements that may become effective during the term of this Permit.

**PART II. (a) MONITORING REQUIREMENTS:**

A. From the period beginning on the effective date of this Permit, until December 31, 2013, the Permittee shall monitor its discharge for the following parameters at the indicated frequency:

| | Sample Parameter | Measurement Location | Frequency | Sample Type |
|---|---|---|---|---|
| 1. | Flow | (See Note 1) | When Discharging | Meter |
| 2. | pH | " | When Discharging | Grab |
| 3. | Temperature | " | When Discharging | Grab |
| 4. | TSS, BOD, Sb, As, Be, Cd, Cr, Cu, Cn, Pb, Hg, Ni, Se, Ag, Tl, Zn & Total Phenols * | (See Note 1) | 2/yr | Composite |
| 5. | Priority Pollutants | (See Note 2) | Every three years | Composite |

* The City of Oswego will split one of the two annual composite samples and have it analyzed at their contract laboratory.

Notes:

1. The measurement will be made using standard field instrumentation at the location and/or collection point noted on the attached flow diagram. (Page 2 of 17)

2. To insure compliance with discharge prohibition, a Priority Pollutant scan or equivalent and monitoring of the parameters listed above is required once every three years.

B. All handling and preservation of collected samples and laboratory analysis shall be performed in accordance with 40CFR Part 136 and amendments thereto, unless specified otherwise in the monitoring conditions of this Permit.

**PART II. (b) SPECIAL CONDITIONS/COMPLIANCE SECTION:**

**A. MONITORING and VIOLATION REQUIREMENTS**

1. Permittee shall provide flow, temperature and pH data for all discharges. Temperature and pH readings are to be taken once during each discharge.

2. If the results of the Permittee's wastewater analysis indicate that a violation of this Permit has occurred, the Permittee must:

**PART II. (b) SPECIAL CONDITIONS/COMPLIANCE SECTION contd.**

a. Inform the City of Oswego of the violation within 48 hours of receipt of the parameter analysis result; and

b. Repeat the sampling and analysis for the parameter identified as in violation within 30 days of the notification and submit, in writing, the results of this second analysis within 5 days of the receipt of the second parameter analysis results.

## B. BYPASS OF TREATMENT FACILITIES:

1. Definitions:

   a. **Bypass** means the intentional diversion of wastestreams from any portion of an Industrial User's treatment facility.

   b. **Severe Property Damage** means substantial physical damage to property and treatment facilities which cause them to become inoperable, or the likelihood that substantial and permanent loss of natural resources can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

2. Bypass is prohibited and may result in an enforcement action by the City of Oswego, unless bypass is unavoidable to prevent loss of life, personal injury, severe property damage or no feasible alternatives exist. (The condition of no feasible alternatives is not satisfied, if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass, which occurred during normal periods of equipment downtime or preventative maintenance.)

3. In order to provide for essential maintenance of the equipment that will ensure effective treatment of the wastewater stream, the industrial user may allow bypass to occur. However, the bypass must not violate any Pretreatment Standards or Requirements. This type of bypass is not subject to the provisions contained in paragraphs 2 and 4 of this section.

4. Notification and Reporting Requirements:
   a. If an Industrial User knows in advance of the need for a bypass, it shall submit prior notice to the City of Oswego, if possible, at least ten days before the date of the bypass.

b. However, if an unanticipated bypass occurs, that exceeds any Pretreatment Standards, the industrial user must submit an oral notice within 24 hours from the time the user becomes aware of the bypass. A written submission shall be provided within 5 days of the time that the user becomes aware of the bypass. The written submission shall contain a description of the bypass and its cause; the duration of the bypass, including exact dates and times, and, if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass. On a case by case basis, the City of Oswego may waive the written report, if the oral report has been received within 24 hours.

5. The City of Oswego may approve an anticipated bypass, after considering its adverse effects, if it is determined that it will meet the conditions listed in paragraphs 2 & 4 of this section.

**PART III. - SLUG LOADING NOTIFICATION AND REPORTING REQUIREMENTS:**

1. Permittee shall notify the City immediately upon any accidental spill, or slug discharge to the Wastewater Treatment Plant, as outlined in the Accidental Spill Section and the General Discharge Prohibitions, Article VI., Section 2(a) 1-12. (See Appendix #2), of the City of Oswego Sewer Use Ordinance. Formal written notification discussing circumstances and remedies shall be submitted to the City Engineer and Wastewater Treatment Plant Superintendent within five (5) days of the occurrence.

2. Permittee shall notify the City prior to the introduction of new wastewater or pollutant, of any substantial change in the volume or characteristics of the wastewater being introduced into the Wastewater Treatment Plant from the Site. Formal written notification shall be submitted fourteen (14) days prior to such introduction.

3. Any upset or violation experienced by Permittee of its processes that place it in a temporary state of non-compliance with Wastewater Discharge Limitations contained in the Permit, or other limitations specified in the City's Sewer Use Ordinance shall be reported to the City within twenty-four (24) hours of first awareness of commencement of the upset or violation. A detailed report shall be filed within five (5) days with the City Engineer and Wastewater Treatment Plant Superintendent.

4. (a) Permittee is required to submit to the City, quarterly reports including the flow and volume of discharges made during the quarter and the results of sampling performed during the quarter for any of the parameters specified in Part I. of the Permit.

   (b) Pursuant to the Code of Federal Regulations, 40 CFR 403.12 (1), all quarterly report submissions must contain the following certification statement:

***I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of the imprisonment for knowing violations.***

5. Quarterly reporting periods shall be **April 1; July 1; October 1**and **January 1.** Quarterly reports shall be submitted no later than thirty (30) days after the end of each reporting period to the following addresses:

   Mr. Anthony A. Leotta, P.E.
   City Engineer
   City Hall
   Oswego, New York 13126

   Mr. Gary T. Hallinan
   Wastewater Treatment Plant Superintendent
   2 First Avenue
   Oswego, New York 13126

## PART IV. STANDARD CONDITIONS:

1. GENERAL:

   (A) The Permittee shall comply with the City of Oswego Pretreatment Program, dated August 1983, as amended September 1, 1983; July 18, 1984; and, November 26, 1984, as approved by the E.P.A. on January 31, 1985, as well as the General Pretreatment Regulations. (40 CFR 403).

2. RIGHT OF ENTRY:

(A) The Permittee, after notification by the City of Oswego, will allow the City, or its representatives exhibiting proper credentials and identification, to enter upon premises of the Site, at all reasonable hours, for the purpose of inspection, sampling, or records inspection. Reasonable hours in the context of inspection and sampling include anytime the Site leachate removal system is operating resulting in wastewater discharge to the City's Wastewater Treatment Plant.

3. RECORDS RETENTION:

(A) The Permittee shall retain and preserve for no less than three (3) years, any records, books, documents, memoranda, reports, correspondence and any and all summaries thereof, relating to monitoring, sampling and chemical analysis made by or in behalf of the User in connection with its discharge.

(B) All records that pertain to matters that are the subject of special orders or any other enforcement or litigation activities brought by the City shall be retained and preserved by the Permittee until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

4. CONFIDENTIAL INFORMATION:

(A) Except for data determined to be confidential under Article VII. Section 10 of the City's Sewer Use Ordinance, all reports required by this Permit shall be available for public inspection at the Office of the City Engineer.

5. RECORDING OF RESULTS:

(A) For each measurement or sample taken pursuant to the requirements of this Permit, the Permittee shall record the following information:

1. The exact place, date and time of sampling;
2. The dates the analyses were performed;
3. The person(s) who performed the analyses;
4. The analytical techniques or methods used; and,
5. The results of all required analyses.

**PART IV. - STANDARD CONDITIONS: (Cont.)**

6. DILUTION AND RETENTION:

(A) The Permittee will not be allowed to increase the use of potable or process water, or in any way, attempt to dilute a discharge as a partial or complete substitute to achieve compliance with the limitations contained in this Permit.

(B) The Permittee will not be allowed to store and retain wastewater in chests and the entry sewer line in order to maintain flow limitations.

7. RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) REQUIREMENTS:

(A) The disposal of sludges and spent chemicals not allowed in the wastewater flow shall be accomplished in accordance with Section 405 of the Clean Water Act and Subtitles C and D of the Resource Conservation and Recovery Act as appropriate.

(B) Certification of Discharge of Hazardous Wastes:

Industrial users discharging more than 15 kilograms per month of hazardous wastes or any amount of acutely hazardous wastes under CFR Part 261 are required to provide a one time written notification of such discharge to the City of Oswego, State and EPA. This written notification must contain the EPA hazardous waste number and the type of discharge (i.e., batch, continuous). If the industrial user discharges more than 100 kilograms per month of the hazardous waste, the written notifications must also include:

1. An identification of the hazardous constituents in the industrial user's discharge;
2. An estimate of the mass and concentration of the constituents in the industrial user's discharge in a calendar month; and,
3. An estimate of the mass and concentration of the constituents in the industrial user's discharge in a year.

Industrial users are exempt from reporting pursuant to the above provision if they have already reported such data pursuant to 40 CFR 403.12(b), (d), and (e). Industrial users must also provide a certification accompanying this notification that a waste reduction program is in place to reduce the volume and toxicity of hazardous wastes to the greater degree economically practical.

## PART IV- STANDARD CONDTIONS: (Cont.)

8. ENFORCEMENT REQUIREMENTS: All violations will be processed as follows per City of Oswego Sewer Use Ordinance Article XI, Sections 199-97 through 199-100.

**§ 199-97. Enforcement response plan.**

A. The City Engineer has prepared an enforcement response plan. The enforcement response plan, in a step-by-step fashion, outlines the procedures to be followed to identify, document and respond to violations by users of the POTW. All violations by users of the POTW shall be met with some type of enforcement response. The response shall be comprehensive and effective.

B. The enforcement response plan:

(1) Describes how the City Engineer will investigate instances of noncompliance.

(2) Describes the types of escalated enforcement actions that the City Engineer will take in response to all anticipated types of user violations and the time periods within which to initiate and follow-up these actions

(3) Reflects the City Common Council's responsibility to enforce all applicable standards and requirements.

C. The enforcement response plan contains:

(1) Criteria for scheduling periodic inspection and/or sampling visits to POTW users.

(2) Forms and guidelines for documenting compliance data in a manner which will enable the information to be used as evidence.

(3) Systems to track due dates, compliance schedule milestones and pending enforcement actions.

(4) Criteria, responsible personnel and procedures to select and initiate an enforcement action.

D. The range of appropriate enforcement actions shall be based on the nature and severity of the violation and other relevant factors, such as:

(1) Magnitude of the violation;
(2) Duration of the violation;
(3) Effect of the violation on the receiving water;
(4) Effect of the violation of the POTW;
(5) Effect of the violation of the health and safety of the POTW employees;
(6) Compliance history of the user;
(7) Good faith of the user; as shall promote consistent and timely use of enforcement remedies.

E. The City Common Council has adopted the enforcement response plan. The enforcement response plan, which is incorporated by reference herein, shall be and is hereby deemed to be a part of this Part 2. A copy of the adopted enforcement response plan may be obtained from the City Engineer. The enforcement response plan shall be reviewed about every five years.

## PART IV- STANDARD CONDTIONS: (8) Cont.

**§ 199-98. Administrative remedies.**

A. Notification of violation. When the City Engineer finds that a user has violated or continues to violate any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, the City Engineer may serve upon that user a written notice of violation. Within 10 days of the receipt of this notice, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted by the user to the City Engineer. Submission of this plan in no way relieves the user of liability for any violations occurring before or after receipt of the notice of violation. Nothing in this section shall limit the authority of the City Engineer to take any action, including emergency actions or any other enforcement action, without first issuing a notice of violation.

B. Consent orders. The City Engineer may enter into consent orders, assurances of voluntary compliance or other similar documents establishing an agreement with any user responsible for noncompliance. Such documents will include specific action to be taken by the user to correct the noncompliance within a time period specified by the document. Such documents shall have the same force and effect as the administrative orders issued pursuant to Subsections D and E of this section and shall be judicially enforceable.

C. Show-cause hearing. The City Engineer may order a user which has violated, or continues to violate, any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement to appear before the City Engineer and show cause why the proposed enforcement action should not be taken. Notice shall be served on the user specifying the time and place for the meeting, the proposed enforcement action, the reasons for such action and a request that the user show cause why the proposed enforcement action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least 10 days prior to the hearing. Such notice may be served on any authorized representative of the user. A show-cause hearing shall not be a bar against, or prerequisite for, taking any other action against the user.

D. Compliance orders. When the City Engineer finds that a user has violated or continues to violate any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, the City Engineer may issue
an order to the user responsible for the discharge directing that the user come into compliance within a specified time. If the user does not come into compliance within the time provided, sewer service may be discontinued unless adequate treatment facilities, devices or other related appurtenances are installed and properly operated. Compliance orders also may contain other requirements to address the noncompliance, including additional self-monitoring and management practices designed to minimize the amount of pollutants discharged to the sewer. A compliance order may not extend the deadline for compliance established for a pretreatment standard or requirement nor does a compliance order relieve the user of liability for any violation, including any continuing violation. Issuance of a compliance order shall not be a bar against, or a prerequisite for, taking any other action against the user.

E. Cease and desist orders.

(1) When the City Engineer finds that a user has violated or continues to violate any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement or that the user's past violations are likely to recur, the City Engineer may issue an order to the user directing it to cease and desist all such violations and directing the user to:

(a) Immediately comply with all requirements; and

(b) Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation, including halting operations and/or terminating the discharge.

## PART IV- STANDARD CONDTIONS: (8) Cont.

(2) Issuance of a cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the user.

F. Administrative fines.

(1) When the City Engineer finds that a user has violated or continues to violate any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, the City Engineer may fine such user in an amount not to exceed $1,000. Such fines shall be assessed on a per-violation, per-day basis. In the case of monthly or other long-term average discharge limits, fines shall be assessed for each day during the period of violation.

(2) Unpaid charges, fines and penalties shall, after 30 calendar days, be assessed an additional penalty of 10% of the unpaid balance, and interest shall accrue thereafter at a rate of 1.5% per month. A lien against the user's property will be sought for unpaid charges, fines and penalties.

(3) Users desiring to dispute such fines must file a written request for the City Engineer to reconsider the fine along with full payment of the fine amount within 15 days of being notified of the fine. Where a request has merit, the City Engineer may convene a hearing on the matter. In the event that the user's appeal is successful, the payment, together with any interest accruing thereto, shall be returned to the user. The City Engineer may add the costs of preparing administrative enforcement actions such as notices and orders to the fine.

(4) Issuance of an administrative fine shall not be a bar against, or a prerequisite for, taking any other action against the user.

G. Emergency suspensions. The City Engineer may immediately suspend a user's discharge, after informal notice to the user, whenever such suspension is necessary to stop an actual or threatened discharge which reasonably appears to present or cause an imminent or substantial endangerment to the health or welfare of persons. The City Engineer may also immediately suspend a user's discharge, after notice and opportunity to respond, that threatens to interfere with the operation of the POTW or which presents, or may present, an endangerment to the environment.

(1) Any user notified of a suspension of its discharge shall immediately stop or eliminate its contribution. In the event of a user's failure to immediately comply voluntarily with the suspension order, the City Engineer may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the POTW, its receiving stream or endangerment to any individuals. The City Engineer may allow the user to recommence its discharge when the user has demonstrated to the satisfaction of the City Engineer that the period of endangerment has passed, unless the termination proceedings in Subsection (H) of this section are initiated against the user.

(2) A user that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement describing the causes of the harmful contribution and the measures taken to prevent any future occurrence to the City Engineer prior to the date of any show cause or termination hearing under Subsections C and D of this section.

(3) Nothing in this section shall be interpreted as requiring a hearing prior to any emergency suspension under this section.

H. Termination of discharge.

(1) In addition to the provisions in § 199-80, of this Part 2, any user who violates the following conditions is subject to discharge termination:

(a) Violation of wastewater discharge permit conditions;
(b) Failure to accurately report the wastewater constituents and characteristics of its discharge;
(c) Failure to report significant changes in operations or wastewater volume, constituents and characteristics prior to discharge;

## PART IV- STANDARD CONDTIONS: (8) Cont.

(d) Refusal of reasonable access to the user's premises for the purpose of inspection, monitoring, or sampling; or

(e) Violation of the pretreatment standards in Article IX of this Part 2.

(2) Such user will be notified of the proposed termination of its discharge and be offered an opportunity to show cause under Subsection C of this section why the proposed action should not be taken. Exercise of this option by the City Engineer shall not be a bar to, or a prerequisite for, taking any other action against the user.

**§ 199-99. Judicial remedies.**

A. Injunctive relief. When the City Engineer finds that a user has violated or continues to violate any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, the City Engineer may petition the Court of the City of Oswego through the City Attorney for the issuance of a temporary or permanent injunction, as appropriate, which restrains or compels the specific performance of the wastewater discharge permit, order or other requirement imposed by this Part 2 on activities of the user. The City Engineer may also seek such other action as is appropriate for legal and/or equitable relief, including a requirement for the user to conduct environmental remediation. A petition for injunctive relief shall not be a bar against, or a prerequisite for, taking any other action against a user.

B. Civil penalties.

(1) A user who has violated or continues to violate any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement shall be liable to the city for a maximum civil penalty of $1,000 per violation, per day. In the case of a monthly or other long-term average discharge limit, penalties shall accrue for each day during the period of the violation.

(2) The city may recover reasonable attorneys' fees, court costs and other expenses associated with enforcement activities, including sampling and monitoring expenses, and the cost of any actual damages incurred by the city.

(3) In determining the amount of civil liability, the court shall take into account all relevant circumstances, including but not limited to the extent of harm caused by the violation, the magnitude and duration of the violation, any economic benefit gained through the user's violation, corrective actions by the user, the compliance history of the user and any other factor as justice requires.

(4) Filing a suit for civil penalties shall not be a bar against, or a prerequisite for, taking any other action against a user.

C. Criminal prosecution.

(1) A user who willfully or negligently violates any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement shall, upon conviction, be guilty of a Class A misdemeanor, punishable by a fine of not less than $500 nor more than $1,000 per violation, per day, or imprisonment for not more than one year, or both.

(2) A user who willfully or negligently introduces any substances into the POTW which causes personal injury or property damage shall, upon conviction, be guilty of a Class A misdemeanor and be subject to a penalty of not more than $1,000 or be subject to imprisonment for not more than one year, or both. This penalty shall be in addition to any other cause of action for personal injury or property damage available under state law.

(3) A user who knowingly makes any false statements, representations or certifications in any application, record, report, plan or other documentation filed or required to be maintained pursuant to this Part 2, wastewater discharge permit or order issued hereunder or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required under this Part 2 shall, upon conviction, be punished by a fine of not more than $1,000 per violation, per day, or imprisonment for not more than one year, or both.

## PART IV- STANDARD CONDTIONS: (8) Cont.

D. Remedies nonexclusive. The remedies provided for in this Part 2 are not exclusive. The City Engineer may take any, all or any combination of these actions against a noncompliant user. Enforcement of pretreatment violations will generally be in accordance with the city's enforcement response plan. However, the City Engineer may take other action against any user when the circumstances warrant. Further, the City Engineer is empowered to take more than one enforcement action against any noncompliant user.

**§ 199-100. Supplemental enforcement action.**

A. Performance bonds. The City Engineer may decline to issue or reissue a wastewater discharge permit to any user who has failed to comply with any provision of this Part 2, a previous wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, unless such user first files a satisfactory bond payable to the city in a sum not to exceed a value determined by the City Engineer to be necessary to achieve consistent compliance.

B. Liability insurance. The City Engineer may decline to issue or reissue a wastewater discharge permit to any user who has failed to comply with any provision of this Part 2, a previous wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement unless the user first submits proof that it has obtained financial assurances sufficient to restore or repair damage to the POTW caused by its discharge.

C. Water supply severance. Whenever a user has violated and continues to violate any provision of this Part 2, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, water service to the user may be severed. Service will only recommence, at the user's expense, after it has satisfactorily demonstrated its ability to comply.

9. REVOCATION OF PERMIT:

(A) This Permit issued to the Pollution Abatement Services Site. by the City of Oswego may be revoked when, after inspection, monitoring or analysis, it is determined that the discharge of wastewater to the Treatment Plant is in violation of Federal, State, or Local Laws, Ordinances, or Regulations. Additionally, falsification or intentional misrepresentation of data or statements pertaining to the Permit reports, or any other required reporting form, shall be cause for Permit revocation.

(B) However, the Permit revocation shall be held in abeyance if, within 10 days of receipt of a written notice from the City of Oswego that (a) the parties have been unable to resolve, amicably, differences concerning the Permit conditions and compliance therewith by User; (b) the User has been deemed in violation of the Permit; and, (c) such violation(s) are deemed by the City of Oswego to adversely and substantially affect the operation of the Treatment Plant, the User provides a written request for a decision by and under the rules of the American Arbitration Association. The Permit revocation shall be held in abeyance pending decision by the arbitration proceeding, but will become effective if the final decision by the arbitration tribunal supports the revocation.

**PART IV- STANDARD CONDTIONS: (9) Cont.**

(C) Provided further that the Permit shall not be violated by User's activities in compliance with any special contracts that User may have with the City.

10. LIMITATION OF PERMIT TRANSFER:

This Wastewater Discharge Permit is issued specifically to the Pollution Abatement Services Site for the time specified and is not assignable to another user or transferable to any other location without prior written approval by the City of Oswego. Sale of Pollution Abatement Services Site, or transfer of operating responsibility shall obligate the purchaser to seek prior written approval of the City for continued discharge to the Wastewater Treatment Plant.

11. FALSIFYING INFORMATION OR TAMPERING WITH MONITORING EQUIPMENT:

(A) Knowingly making any false statements on any report or other document required by this Permit, or knowingly rendering any monitoring device or method inaccurately, may result in legal action by the City of Oswego.

12. MODIFICATION OR REVISION OF THE REPORT:

(A) The terms and conditions of this Permit may be subject to modification or revision by the City at any time as limitations or requirements identified by the Sewer Use Ordinance and for Wastewater Treatment Plant Operations, are modified or other just cause exists. Such modification or revision shall take place upon sixty (60) days written notice to Permittee by the City.

(B) This Permit may also be modified to incorporate special conditions resulting from the issuance of a special order to the City of Oswego by the New York State Department of Environmental Conservation or the United States Environmental Protection Agency.

(C) The terms and conditions of this Permit may also be modified as a result of the United States Environmental Protection Agency promulgating a new federal pretreatment standard.

(D) Any Permit modifications which result in new conditions in the Permit shall include a reasonable time schedule for compliance.

**PART IV. STANDARD CONDITIONS: (Cont.)**

13. DUTY TO REAPPLY:

(A) The City shall notify the Permittee thirty (30) days prior to the expiration of the User's Permit. Within ten (10) days of the notification, Permittee shall request, in writing, for re-issuance of the Permit.

14. SIGNATORY REQUIREMENTS:

(A) All reports required by this Permit shall be signed by an authorized principal officer, designated project coordinator or designee for the Pollution Abatement Services Site.

15. SEVERABILITY:

(A) The provisions of this Permit are severable and if any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

16. PROPERTY RIGHTS:

(A) The issuance of this Permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any invasion of personal or corporate rights, nor any infringement of Federal, State or Local Requirements.

A. A. Leotta

Anthony A. Leotta, P.E.
City Engineer
City of Oswego

# *Appendix I*
# *Oswego Discharge Compliance Table*

# TABLE 1 - PAS OSWEGO SITE QUARTERLY REPORT FOR CITY OF OSWEGO (2013)
# LEACHATE DISCHARGE TO OSWEGO EASTSIDE WASTEWATER TREATMENT FACILITY
# (Oswego SIU Wastwater Discharge Permit No.6-2010-13)

| Discharge Quarter | 3Q 2012 | | 4Q 2012 | | 1Q 2013 | | 2Q 2013 | |
|---|---|---|---|---|---|---|---|---|
| | Date Discharged (temp/pH) | Gallons Discharged | Date Discharged (temp/pH) | Gallons Discharged | Date Discharged (temp/pH) | Gallons Discharged | Date Discharged (temp/pH) | Gallons Discharged |
| | 7/5/12 | 20,000 | 10/2/12 | 20,005 | 1/9/13 | 10,000 | 4/3/13 | 10,000 |
| | 56/6.8 | | 53/6.66 | | 46/6.8 | | 44/6.5 | |
| | 8/1/12 | 20,000 | 11/7/12 | 20,005 | 2/6/13 | 10,000 | 5/8/13 | 20,000 |
| | 56/6.7 | | 50/6.65 | | 48/6.7 | | 49/6.6 | |
| | 9/5/12 | 20,000 | 12/5/12 | 10,010 | 3/6/13 | 10,000 | 6/5/13 | 20,000 |
| | 55/6.8 | | 48/6.58 | | 44/6.8 | | 48/6.8 | |
| **Total Discharged** | | 60,000 | | 50,020 | | 30,000 | | 50,000 |
| | | | | | | | | |
| **Date Sampled*** | **Permit Limit** | 8/8/2012 | | 11/7/2012 | | Not sampled | | 5/9/2012 |
| **Analytes**** | **mg/L ***** | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L ******** |
| **Antinomy** | *0.003* | | | ND | | | | ND <0.0005 |
| **Arsenic** | *0.007* | **0.013** | | **0.0304** | | | | **0.0173** |
| **Beryllium** | *0.005* | | | ND | | | | ND <0.002 |
| Cadmium | *0.11 lb/day* | | | ND | | | | ND <0.0025 |
| Chromium (total) | *2.49 lb/day* | | | 0.011 | | | | 0.0093 |
| Copper | *0.11 lb/day* | | | 0.0106 | | | | 0.0206 |
| Cyanide | *0.17 lb/day* | | | ND | | | | ND <0.0005 |
| Lead | *0.05 lb/day* | | | 0.0075 | | | | ND <0.0075 |
| Mercury | *0.00004 lb/day* | | | ND | | | | ND <0.0002 |
| Nickel | *0.25 lb/day* | | | 0.512 | | | | 0.357 |
| **Selenium** | *0.001* | **ND <0.010** | | **0.0126** | | | | **0.00639** |
| Silver | *0.25 lb/day* | | | ND | | | | ND <0.005 |
| **Thallium** | *0.003* | | | ND | | | | ND <0.0005 |
| Zinc | *0.5 lb/day* | | | ND | | | | 0.0106 |
| | | | | | | | | |
| BOD 5 | *50 lb/day* | | | 19 | | | | 13 |
| TSS | *100 lb/day* | | | 76 | | | | 56 |
| Phenolics | *0.34lb/day* | | | 0.103 | | | | 0.093 |
| pH | *5> and <10.5* | | | 6.65 | | | | 6.6 |

** Semi-annual sampling of PAS leachate discharge conducted in accordance with SIU Wastewater Discharge Permit No.6-2010-13.*

*** Analytes in bold incorporated February 8,2012 and are being evaluated for potential compliance changes by City of Oswego.*

**** lb/day factor 0.16632@20k gal*

***** Analytes in bold exceed limit*

*Prpared by de maximis, inc. 7/16/2013*

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# *Oswego Discharge Compliance Table*

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**** lb/day factor 0.16632@20k gal*

***** Analytes in bold exceed limit*

*Prpared by de maximis, inc. 7/16/2013*

# *Appendix J*
# *Wastewater Discharge Permit*
# *(Auburn)*

3/31/10

Permit No. 2008- 01

**CITY OF AUBURN**
**DEPARTMENT OF MUNICIPAL UTILITIES**
**WASTEWATER DISCHARGE PERMIT**

| | |
|---|---|
| **DATE OF ISSUANCE:** | **February 29, 2008** |
| **EFFECTIVE DATE:** | **March 3, 2008** |
| **EXPIRATION DATE:** | **March 3, 2011** |
| **COMPANY NAME:** | **Pollution Abatement Services**<br>**Leachate – Oswego, New York** |
| **MAILING ADDRESS:** | **Pollution Abatement Services Site**<br>**c/o Mark Valentine,**<br>**de maximis, Inc.**<br>**2975 Bee Ridge Road**<br>**Suite C**<br>**Sarasota, Florida 34239** |
| **FACILITY ADDRESS:** | **East Seneca Street**<br>**Oswego, New York 13126** |

The above Industrial User is authorized to discharge industrial wastewater to the City of Auburn sewer system according to the City's Sanitary Sewer Ordinance, any applicable provisions of Federal or State law or regulation, effluent limitations, monitoring requirements, and other conditions set forth herein.

Compliance with the City of Auburn Sanitary Sewer Ordinance will be assessed via wastewater discharge monitoring. The City of Auburn will monitor each Significant Industrial User (SIU) during the first quarter of each year. The Industrial User will conduct self-monitoring as specified in this permit during the three remaining quarters.

Mr. Mark R. Palesh - City Manager

Mr. Mark Valentine – Project Coordinator

CITY OF AUBURN

*Focused on being*
*The Best Small City in New York State*

Department of Engineering Services
Bruce H. Ross
Assistant Civil Engineer

February 29, 2008

**CERTIFIED/RETURN RECEIPT REQUESTED**

RECEIVED
MAR 10 2008
de maximis, inc.

Mr. Mark Valentine
Project Coordinator
de maximis, Inc.
2975 Bee Ridge Road
Suite C
Sarasota, Florida 34239

**Re: Industrial Pretreatment Program**
**PAS Leachate Wastewater Discharge Permit #2008-01**

Dear Mr. Valentine:

Enclosed is a copy of the final Wastewater Discharge Permit #2008-01 for the PAS facility in Oswego. This permit establishes conditions that must be met to allow the discharge of wastewater to the City's wastewater treatment plant. The permit is effective from March 3, 2008 through midnight March 3, 2011.

Specific quarterly report requirements are delineated within the permit. Included are specific parameters for monitoring listed under the Monitoring Report Schedule and Requirements (page 7 of 14) and Table A (page 14 of 14). Please have page 1 of 14 signed, and return the original to this office. A copy will be signed and returned to you for your records.

As we discussed, following final approval by the USEPA, the permit fee of $835.00 shall be made to the "City of Auburn". You may contact the Auburn Wastewater Treatment Plant at 315-255-4180 to begin discharging immediately following execution of the permit.

Sincerely,

Bruce H. Ross
Assistant Civil Engineer

enc.
BR/br
cc: Mr. Anthony DeCaro, Chief Water Treatment Plant Operator
Mr. William H. Lupien, Jr., P.E., Supt. of Engineering Services
Mr. Frank DeOrio, Technical Associate, O'Brien & Gere, Inc. North America
File

H:\Industrial Pretreatment\PAS Landfill Leachate\PAS Leachate WWDP Letter, February 29, 2008.doc

**Permit No. 2008- 01**

**CITY OF AUBURN**
**DEPARTMENT OF MUNICIPAL UTILITIES**
**WASTEWATER DISCHARGE PERMIT**

| | |
|---|---|
| **DATE OF ISSUANCE:** | **February 29, 2008** |
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Mr. Mark R. Palesh - City Manager

Mr. Mark Valentine – Project Coordinator

## PART I
## WASTEWATER DISCHARGE LIMITATIONS

The industrial user shall comply with the effluent limitations and prohibited discharges pursuant to the City of Auburn Sanitary Sewer Ordinance and the Federal Pretreatment Regulations contained in 40 Code of Federal Regulations Part 403.

**Section 46.59 Effluent Limitations and Concentrations**

The concentration in wastewater discharged into the City sanitary sewer system of any of the following pollutants shall not exceed the values specified below. These limitations shall apply to each individual industrial sewer lateral at a point immediately prior to discharge to the City sanitary sewer system.

| Pollutant | Allowable Effluent Concentration (milligrams/liter) 24-Hour Composite |
|---|---|
| Antimony | 2.0 |
| Arsenic | 2.0 |
| Barium | 5.0 |
| Cadmium | 2.0 |
| Chromium, hex | 2.0 |
| Chromium, total | 2.0 |
| Copper | 1.5 |
| Iron | 10.0 |
| Lead | 2.0 |
| Mercury | 0.5 |
| Nickel | 5.0 |
| Selenium | 3.0 |
| Silver | 5.0 |
| Zinc | 5.0 |
| Cyanide | 1.0 |
| Methylene Chloride | 3.0 |
| Phenol | 10.0 |
| Trichloroethylene | 3.0 |
| Tetrachloroethylene | 3.0 |
| 1,1,1-Trichloroethane | 3.0 |
| Toluene | 5.3 |

**Section 242-45 Special Conditions**

No person shall discharge or permit the discharge or infiltration into the City sewer system of the following wastes unless prior written approval is granted by the City:

1. Wastes containing more than three hundred (300) mg/l of $BOD_5$.

2. Wastes containing more than three hundred fifty (350) mg/l of total suspended solids (TSS).

3. Wastes containing more than ten (10) mg/l of total phosphorus.

4. Wastes containing more than forth (40) mg/l of total Kjeldahl nitrogen.

5. Wastes containing more than one hundred (100) mg/l of oil and grease.

**Based on the current available capacity of the City of Auburn wastewater plant for treatment of $BOD_5$, TSS and TKN, the PAS Leachate shall be permitted to discharge leachate containing concentrations of these pollutants in excess of the above limits. The City reserves the right to enforce the above limits as conditions dictate (See Part IV Standard Conditions, Item 12).**

**Section 242-44 Prohibited Discharges**

A. No person shall discharge wastes directly or indirectly into the City sewer system, or into any private sewer drain emptying into the City sewer system, which cause, threaten to cause, or are capable of causing either alone or by interaction with other substances:

1. Pollutants which create a fire or explosive hazard in the POTW, including, but not limited to, waste streams with a closed-cup flashpoint of less than 140°F (60°C) using the test methods specified in 40 CFR 261.21 or any liquids, solids, or gases which, by reason of their nature or quantity, are or may be sufficient, either alone or by interaction with other substances, to cause fire or explosion or be injurious in any other way to the treatment works or to the operation of the treatment works. At no time shall two (2) successive readings on an explosion hazard meter, at the point of discharge into the system (or at any point in the system), be more than five (5) percent nor any single reading over ten (10) percent of the lower explosive limit (LEL) of the meter. Prohibited materials include, but are not limited to: Gasoline, kerosene, naptha, benzene, toluene, xylene, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, carbides, hydrides, and sulfides, and any other substances which the City, the DEC or EPA has notified the user is a fire hazard or hazard to the system.

2. Solids or viscous substances which may cause obstruction to the flow in a sewer or other interference with the operation of the wastewater treatment facilities such as, but not limited to: petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through; grease, garbage with particles greater than one-half inch in any dimension, animal guts or tissues, paunch manure, bones, hair, hides or fleshings, entrails, whole blood, feathers, ashes, cinders, sand, spent lime, stone or marble dust, metal, glass, straw, shavings, grass clippings, rags, spent grains, spent hops, whey, refining or processing of fuel or lubricating oil, mud or glass grinding or polishing wastes.

3. Any wastewater having a pH less than 5.5 nor higher than 9.5 or wastewater

having any other corrosive property capable of causing damage or hazard to structures, equipment, and/or personnel of the treatment works.

4. Any substance or any wastewater containing toxic pollutants in sufficient quantity, either singly or by interaction with other pollutants, to injure or interfere with any wastewater treatment process, constitute a hazard to humans or animals, create toxic effect in the receiving waters of the treatment works, or to exceed the limitation set forth in a categorical pretreatment standard. A toxic pollutant shall include, but not be limited to, any pollutant identified pursuant to Section 307(a) of the Federal Act.

5. Any noxious or malodorous liquids, gases or solids which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or hazard to life or are sufficient to prevent entry into the sewers for their maintenance and repair.

6. Any substance that alone or in conjunction with other discharges may cause the treatment works' effluent or any other product of the treatment works, such as residues, sludges or scums, to be unsuitable for reclamation and reuse or to interfere with the reclamation process where the treatment works is pursuing a reuse and reclamation program. In no case shall such substance discharged to the treatment works cause the treatment works to be in noncompliance with sludge use or disposal criteria, guidelines or regulations developed under Section 405 of the Federal Act, and criteria, guidelines or regulations affecting sludge use or disposal developed pursuant to the Solid Waste Disposal Act, the Clean Air Act, the Toxic Substances Control Act, or DEC criteria applicable to the sludge management method being used presently or planned to be used in the future.

7. Any substance that alone or in conjunction with other discharges will cause the treatment works to violate its national pollutant discharge elimination system (NPDES) permit and/or state pollutant discharge elimination system (SPDES) permit or the receiving water quality standards.

8. Any wastewater with objectionable color not removed in the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions.

9. Any wastewater having a temperature which will inhibit biological activity in the treatment works treatment plant resulting in interference, but in no case wastewater with a temperature at the introduction into the sewer system which exceeds one hundred fifty (150) degrees Fahrenheit (sixty-five and five tenths (65.5) degrees centigrade), unless the treatment works treatment plant is designed to accommodate such temperature or in such quantities that the temperature at the treatment works influent exceeds on hundred four (104) degrees Fahrenheit (forty (40) degrees centigrade).

10. Any pollutants, including oxygen-demanding pollutants (BOD, etc.), released at a flow and/or pollutant concentration which a user knows or had reason to know will cause interference to the treatment works.

11. Any wastewater which causes a hazard to human life or creates a public nuisance.

12. Trucked or hauled pollutants, except at discharge points designated by the City in accordance with Section 242-43 of the City ordinance.

B. When the City determines that a user (s) is contributing to the treatment works any of the above-enumerated substances in such amounts as to interfere with the operation of the treatment works, the City shall:

1. Advise the user(s) of the impact of the contribution on the treatment works; and
2. Develop effluent limitation(s) for such user to correct the interference with the treatment works; and/or
3. Take appropriate action pursuant to §242-74.

C. Affirmative Defense. A User shall have an affirmative defense in any action brought against it alleging a violation of the general prohibitions established in §242-24 and §242-39 of this ordinance where the User can demonstrate that:

1. It did not know or have reason to know that its Discharge, alone or in conjunction with a discharge or discharges from other sources, would cause Pass Through or Interference; and

2. A local limit designed to prevent Pass Through and/or Interference, as the case may be, was developed for each pollutant in the User's Discharge that caused Pass Through or Interference, and the User was in compliance with each such local limit directly prior to and during the Pass Through or Interference; or if a local limit designed to prevent Pass Through and/or Interference, as the case may be, has not been developed for the pollutant(s) that caused the Pass Through or Interference, the User's Discharge directly prior to and during the Pass Through or Interference did not change substantially in nature or constituents from the User's prior discharge activity when the city was regularly in compliance with the City of Auburn SPDES permit requirements and, in the case of Interference, applicable requirements for sewage sludge use or disposal.

**Section 242-46 Federal Effluent Limitations**

A. Effluent limitations promulgated by the Federal Act shall apply in any instance where they are more stringent than limitations in these rules and regulations. Under Section 307 of the Federal Act, pretreatment standards are designed to achieve these purposes:

1. To protect the operation of the publicly owned treatment works;
2. To prevent discharge of pollutants which pass through such works inadequately treated; and,
3. To prevent treatment plant sludges from becoming contaminated with toxic materials which would limit a publicly owned treatment works' sludge disposal alternatives.

Users in industrial categories subject to effluent guidelines issued under Section 304 of the Federal Act and discharging pollutants to publicly owned treatment works are required to achieve the level of treatment established by federal regulations.

B. Nothing in these rules and regulations shall be construed to relieve any industrial user from its obligation to comply with the pretreatment standards established pursuant to Section 307 of the Federal Act. Limitations on wastewater strength in sections 242-44 and 242-45 of these rules and regulations may be supplemented with more stringent limitations when, in the opinion of the City:

1. The limitations in sections 242-44 and 242-45 of these rules and regulations may not be sufficient to protect the operation of the Department's treatment works; or

2. The limitations in sections 242-44 and 242-45 of these rules and regulations may not be sufficient to enable the Department's treatment works to comply with the water quality standards or effluent limitations specified in the Department's national pollutant discharge elimination system (NPDES) permit or the state pollutant discharge elimination system (SPDES) permit.

C. The categorical pretreatment standards found at 40 CFR Chapter I, Subchapter N, Parts 405-471 are hereby incorporated.

1. Where a categorical pretreatment standard is expressed only in terms of either the mass or the concentration of a pollutant in wastewater, the City may impose equivalent concentration or mass limits in accordance with 40 CFR 403.6(c).

2. When wastewater subject to a categorical pretreatment standard is mixed with wastewater not regulated by the same standard, the City shall impose an alternate limit using the combined waste stream formula in 40 CFR 403.6(e).

3. A user may obtain a variance from a categorical pretreatment standard if the user can prove, pursuant to the procedural and substantive provisions in 40 CFR 403.13, that factors relating to its discharge are fundamentally different from the factors considered by EPA when developing the categorical pretreatment standard.

4. A user may obtain a net gross adjustment to a categorical standard in accordance with 40 CFR 403.15.Users in industrial categories subject to effluent guidelines issued under section 304 of the Federal Water Pollution Control Act and discharging pollutants to publicly owned treatment works are required to achieve the level of treatment established by federal regulations. <u>This facility is not engaged in operations subject to the federal pretreatment standards.</u>

**Monitoring Report Schedule and Requirements**

**The PAS Leachate** shall conduct monitoring and submit reports as specified below:

| Quarter | Report Due Date | Sampling Location | Monitoring Requirements | Parameters for Analysis |
|---|---|---|---|---|
| First | March 1 | Truck/Tank | (1) | (3) |
| Second | June 1 | Truck/Tank | (2) | Table A |
| Third | September 1 | Truck/Tank | (2) | Table A |
| Fourth | December 1 | Truck/Tank | (2) | Table A |

(1) The City of Auburn will collect a minimum of two (2) grab samples in the first quarter from either 1) The discharge from the PAS Leachate Collection Tank (Figure 1) to a tanker truck intended for discharge at the Auburn Wastewater Treatment Plant or, 2) A discharge made from a tanker truck discharging leachate delivered from the PAS Leachate Collection Tank to the City of Auburn Wastewater Treatment Plant.

(2) Two (2) grab samples shall be collected during the discharge from PAS Leachate Collection Tank (Figure 1) to a tanker truck on a day when delivery is made to the City of Auburn Wastewater Treatment Plant. The PAS leachate shall submit a statement with each self-monitoring report certifying that the samples taken of the discharge to the tanker truck are representative of the PAS leachate.

(3) The City of Auburn shall conduct first quarter monitoring.

## PART II
## REPORTING REQUIREMENTS

1. The Industrial User shall notify the City immediately upon any accidental or slug discharge to the sanitary sewer as outlined in Section 242-60 (Accidental Discharge) of the City Code: Formal written notification discussing circumstances and remedies shall be submitted to the City within five (5) days of the occurrence (see City Code Section 242-60).

2. The Industrial User shall notify the City prior to the introduction of new wastewater or pollutants or any substantial change in the volume or characteristics of the wastewater being introduced into the POTW from the User's industrial processes. Formal written notification shall follow within 30 days of such introduction.

3. Any upset experienced by the Industrial User of its treatment facilities or production process that places it in a temporary state of noncompliance versus wastewater discharge limitations contained in this permit or other limitations specified in the City's Ordinance shall be reported to the City within 24 hours of first awareness of the commencement of the upset. A detailed report shall be filed within five days.
4. The Industrial User shall repeat sampling and analysis and submit the results to City of Auburn within 30 days after becoming aware of a permit violation.

5. The Industrial User is required to submit to the City quarterly reports (second, third and fourth quarter) on the results of its sampling of the pollutants specified in the Monitoring Report Schedule and Requirements table.

6. All reports shall be submitted to:

Mr. Bruce H. Ross
Assistant Civil Engineer
Department of Municipal Utilities
Memorial City Hall
24 South Street
Auburn, New York 13021

## PART III
## STANDARD CONDITIONS

1. The Industrial User shall comply with all the discharge standards in Section 242-44 of the City Ordinance.

2. **Right of Entry** - The Industrial User shall, after reasonable notification by the City, allow the City or its representatives, exhibiting proper credentials and identification, to enter upon the premise of the User, at all reasonable hours, for the purposes of inspection, sampling, or records inspection. Reasonable hours in the context of inspection and sampling includes any time the Industrial User is operating any process that results in a process wastewater discharge to the City's sewerage system.

3. **Records Retention** - The Industrial User shall retain and preserve for no less than three (3) years, any records, books, documents, memoranda, reports, correspondence and any summaries thereof, relating to monitoring, sampling and chemical analyses made by or for the User concerning its discharge.

   All records that pertain to matters that are the subject of special orders or any other enforcement or litigation activities brought by the City shall be retained and preserved by the Industrial User until all enforcement proceedings have concluded and all periods of limitations with respect to any appeals have expired.

4. **Confidential Information** - Except data determined to be confidential under Section 242-61 of the City's Ordinance, all reports required by this permit shall be available for public inspection at the Office of the Industrial Pretreatment Coordinator.

5. **Recording of Results** - For each measurement or sample taken pursuant to the requirements of this permit, the user shall record the following information:

   a. The exact place, date, and time of sampling;

   b. The dates the analyses were performed;

   c. The person(s) who performed the analyses;

   d. The analytical techniques or methods used; and

   e. The results of all required analyses.

6. **Dilution** - No Industrial User shall increase the use of potable or process water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit.

7. **Proper Disposal of Pretreatment Sludges and Spent Chemicals** - The disposal of sludges and spent chemicals generated shall be done according to Section 405 of the Clean Water Act and Subtitles C and D of the Resource Conservation and Recovery Act.

8. **Signatory Requirements** - All reports required by this department shall be signed by a principal executive officer or designee of the User.

9. **Revocation of Permit** - The permit issued to the Industrial User by the City may be revoked when, after inspection, monitoring or analysis it is determined that the discharge of wastewater to the sanitary sewer is in violation of federal, state, or local laws, ordinances, or regulations. Additionally, falsification or intentional misrepresentation of data or statements pertaining to the permit application or any other required reporting form, shall be cause for permit revocation.

10. **Limitation on Permit Transfer** - Wastewater discharge permits are issued to a specific User for a specific operation and are not assignable to another User or transferable to any other location without the prior written approval of the City. Sale of a User shall obligate the purchaser to seek prior written approval of the City for continued discharge to the Publicly Owned Treatment Works (POTW).

11. **Falsifying Information or Tampering with Monitoring Equipment** - Knowingly making any false statement on any report or other document required by this permit or knowingly rendering any monitoring device or method inaccurate, may result in punishment under the criminal laws of the City, as well as being subjected to civil penalties and relief.

12. **Modification or Revision of the Permit** -
    a. The terms and conditions of this permit may be subject to modification by the City at any time as limitations or requirements identified by the City's Ordinance are modified or other just cause exists.

    b. This permit may also be modified to incorporate special conditions resulting from the issuance of a special order.

    c. The terms and conditions may be modified as a result of EPA promulgating a new federal pretreatment standard.

    d. Any permit modifications that result in new conditions in the permit shall include a reasonable time schedule for compliance if necessary.

13. **Duty to Reapply** - The City shall notify a user one hundred and eighty (180) days before the expiration of the User's Permit. Within ninety (90) days of the notification, the User shall reapply for reissuance of the permit on a form provided by the City. If

the permittee is not notified thirty (30) days before the expiration date of the permit, the permit shall be extended one additional year.

14. **Severability** - The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

15. **Property Rights** - The issuance of this permit does not convey any property rights in either real or personal property, or any exclusion privileges, nor does it authorize any invasion of personal rights, nor any infringement of federal, state or local regulations.

16. **Administrative Sanctions**

A. Any person who violates any of the provisions of or who fails to perform any duty imposed by these rules and regulations, or any order of determination of the City promulgated under these rules and regulations, or the terms of any permit issued thereunder, shall be liable to the City for a civil penalty not to exceed One Thousand Dollars ($1,000.00) for each such violation, to be assessed after a hearing held in conformance with the procedures set forth in these rules and regulations. Each violation shall be a separate and distinct violation and, in the case of a continuing violation, each day's continuance thereof shall be deemed a separate and distinct violation. Such penalties may be recovered in an action brought by the Corporation Counsel at the request of the City in the name of the City in any court of competent jurisdiction. Such civil penalties may be released or compromised by the City before the matter has been referred to the Corporation counsel. Where such matter has been referred to the Corporation Counsel, any such penalty may be released or compromised. Any action commenced to recover the same may be settled and stopped by the Corporation Counsel with the consent of the City.

B. In addition to the power to assess penalties as set forth in Subd. A above, the City shall have the power, following a hearing held in conformance with the procedure set forth in these rules and regulations to issue an order suspending, revoking or modifying the violator's permit, or enjoining the violator from continuing the violation. Any such order of the City shall be enforceable in an action brought by the Corporation Counsel at the request of the City in the name of the Department in any court of competent jurisdiction.

C. Any civil penalty or order issued by the City pursuant to this Section shall be reviewable in a proceeding pursuant to Article 78 of the Civil Practice Law and Rules. Application for such review must be made within sixty (60) days after service, in person or by mail, or a copy of the determination or order

upon the attorney of record of the applicant and of each person who has filed a notice of appearance, or the applicant in person, if not directly represented by an attorney.

17. **Criminal sanctions**

A. Any person who willfully violates any provision of these rules and regulations or any final determination or order of the City made according to these rules and regulations shall be punished by a fine of not less than Five Hundred Dollars ($500.00) nor more than One Thousand Dollars ($1,000.00) or face appropriate civil/criminal prosecution. Each offense shall be a separate and distinct offense, and, in the case of a continuing offense, each day's continuance thereof shall be deemed a separate and distinct offense.

B. No prosecution under this Section shall be instituted until after final disposition of an appeal or review, if any, provided by Section 242-74(C).

18. **Civil liability** - Any person violating any of the provisions of these rules and regulations shall, in addition, be civilly liable to the City for any expense, loss, or damage occasioned to the City by reason of such violation.

19. **Enforcement response** - The City will investigate and respond to instances of industrial user noncompliance using the procedures of the Enforcement Response Plan attached as Exhibit A.

20. **Significant Noncompliance** - Any violation that meets the criteria of "significant noncompliance" shall be published at least annually in the largest daily newspaper in the City of Auburn. Significant noncompliance is defined by 40 CFR 403.8(f)(2)(vii) of the Federal Regulations as a violation that "meets one or more of the following criteria:

(A) Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent or more of all of the measurements taken during a six-month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter;

(B) Technical Review Criteria (TRC) violations defined here as those in which thirty-three percent or more of all of the measurements for each pollutant parameter taken during a six-month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable TRC (TRC=1.4) for BOD, TSS, fats, oil, and grease, and 1.2 for all other pollutants except pH.
(C) Any other violation of a pretreatment effluent limit (daily maximum or longer-term average) that the Control Authority determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of POTW personnel or the general public):

(D) Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the POTW's exercise of is emergency authority under paragraph (f)(1)(vi)(B) of this section to halt or prevent such a discharge;

(E) Failure to meet, within 90 days after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order for starting construction, completing construction, or attaining final compliance;

(F) Failure to provide, within 30 days after the due date, required reports such as baseline monitoring reports, 90-day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules;

(G) Failure to accurately report noncompliance;

(H) Any other violation or group of violations that the Control Authority determines will adversely affect the operation or implementation of the local pretreatment program.

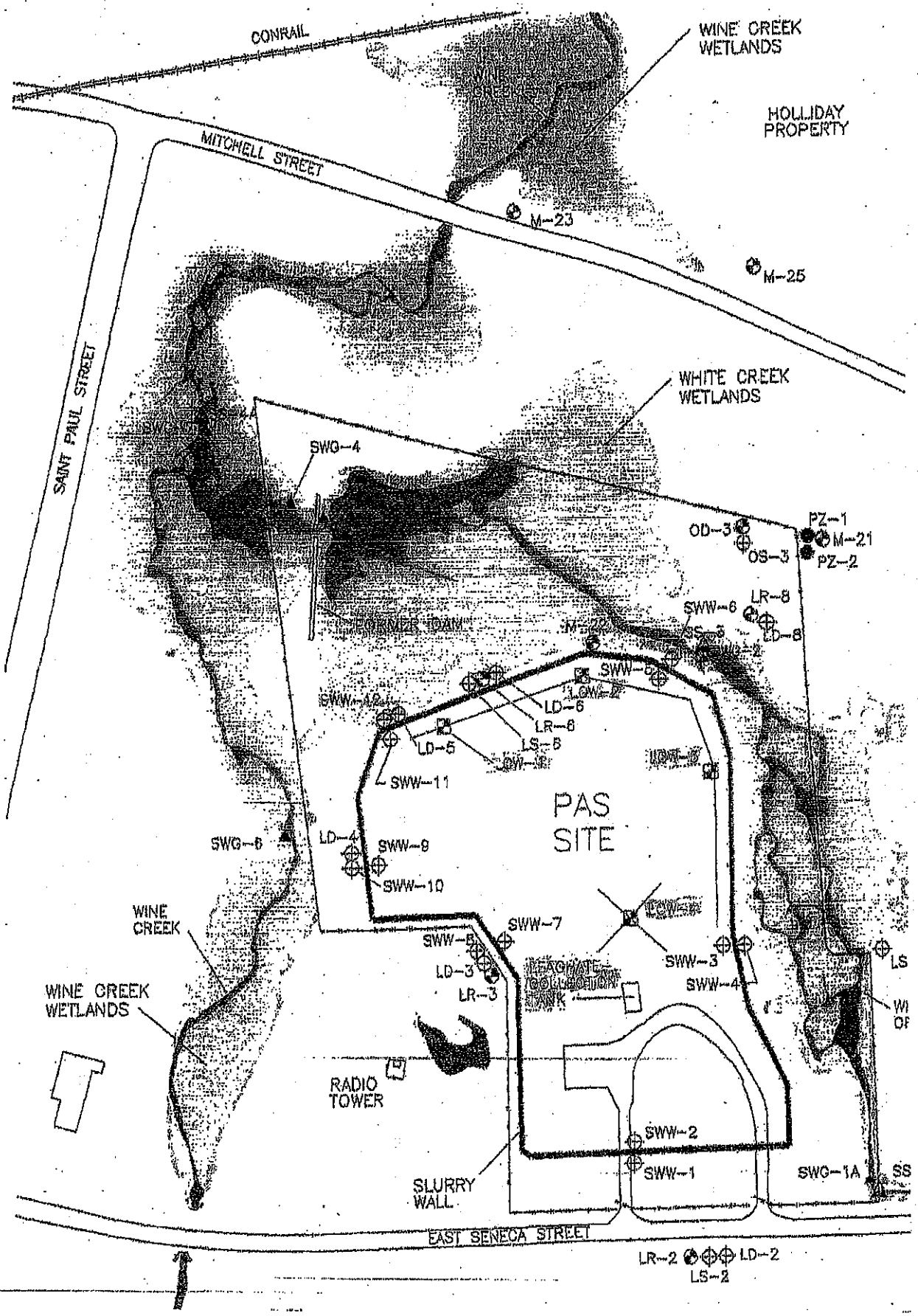
## TABLE A

### PARAMETERS REQUIRED FOR QUARTERLY SIU SELF-MONITORING

| PARAMETER | LIMIT (mg/L) |
|---|---|
| $BOD_5$ | 300 |
| Total Suspended Solids | 350 |
| pH | 5.5 – 9.9 su |
| Total Kjeldahl Nitrogen | 40 |
| Phenols, Total | 10.0 |
| Phosphorus, Total | 10.0 |
| Arsenic, Total | 2.0 |
| Barium, Total | 5.0 |
| Chromium, Total | 2.0 |
| Copper, Total | 1.5 |
| Iron, Total | 10.0 |
| Lead, Total | 2.0 |
| Nickel, Total | 5.0 |
| Zinc, Total | 5.0 |
| Trichloroethylene | 3.0 |
| 1,2 dichloroethylene | 3.0 |
| Methylene Chloride | 3.0 |
| Toluene | 5.0 |
| Benzene | * |
| Vinyl Chloride | * |

* No limit. Sample for informational purposes only

# FIGURE 1


CONRAIL
WINE CREEK WETLANDS
HOLLIDAY PROPERTY
MITCHELL STREET
M-23
M-25
SAINT PAUL STREET
WHITE CREEK WETLANDS
SWG-4
PZ-1
M-21
PZ-2
OD-3
OS-3
LR-8
SWW-6
LD-8
FORMER TOWN
SWW-5
LD-6
LR-6
LS-6
LD-5
SWW-11
SWW-12
PAS SITE
SWG-6
LD-4
SWW-9
SWW-10
WINE CREEK
SWW-7
SWW-8
LD-3
LR-3
LEACHATE COLLECTION TANK
SWW-3
SWW-4
WINE CREEK WETLANDS
RADIO TOWER
SWW-2
SWW-1
SWG-1A
SLURRY WALL
EAST SENECA STREET
LR-2
LD-2
LS-2

# *Appendix K*
# *Truck Unloading Verification Form*

O'BRIEN & GERE

# PAS Oswego Site Truck Unloading Verification Form

Date -

Unloading Facility

Auburn POTW, Auburn, New York

- Manifest #_____Estimated Gallons:_____
  - Truck # or Plate; #_____Tank Trailer # _____
  - Driver;_____

Stick Measurement:

- Loading:_____
- Unloading (Auburn POTW); _____

POTW Disposal

- Waste Disposal Approved By (Auburn POTW); _____
- Transported Waste Verified For Disposal Through The POTW
- Verified By ;_____

O'Brien & Gere, Inc. of North America, an O'Brien & Gere company
5000 Brittonfield Parkway, P.O. Box 4873, Syracuse, New York 13221-4873
(315) 437-6100 / FAX (315) 463-7554 • http://www.obg.com

...and offices in major U.S. cities

# *Appendix L*
# *Non-Hazardous Waste Manifest*

| NON-HAZARDOUS WASTE MANIFEST | 1. Generator's US EPA ID No. | Manifest Doc No. | 2. Page 1 of 1 | |
|---|---|---|---|---|

**GENERATOR**

| 3. Generator's Name and Mailing Address<br><br>4. Generator's Phone (including area code) | | |
|---|---|---|
| 5. Transporter 1 Company Name | 6. US EPA ID Number | A. Transporter's Phone |
| 7. Transporter 2 Company Name | 8. US EPA ID Number | B. Transporter's Phone |
| 9. Designated Facility Name and Site Address | 10. US EPA ID Number | C. Facility's Phone |

| 11. Waste Shipping Name and Description | 12. Containers | | 13. Total Quantity | 14. Unit Wt/Vol |
|---|---|---|---|---|
| | No. | Type | | |
| a. | | | | |
| b. | | | | |
| c. | | | | |
| d. | | | | |

| D. Additional Descriptions for Materials Listed Above | E. Handling Codes for Wastes Listed Above |
|---|---|
| | |

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

| Printed/Typed Name | Signature | Month | Day | Year |
|---|---|---|---|---|
| | | | | |

**TRANSPORTER**

17. Transporter 1 Acknowledgement of Receipt of Materials

| Printed/Typed Name | Signature | Month | Day | Year |
|---|---|---|---|---|
| | | | | |

18. Transporter 2 Acknowledgement of Receipt of Materials

| Printed/Typed Name | Signature | Month | Day | Year |
|---|---|---|---|---|
| | | | | |

**FACILITY**

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

| Printed/Typed Name | Signature | Month | Day | Year |
|---|---|---|---|---|
| | | | | |

**ORIGINAL - RETURN TO GENERATOR**

# *Appendix M*
# *Well Logs*

MONITOR WELL CONSTRUCTION REPORT

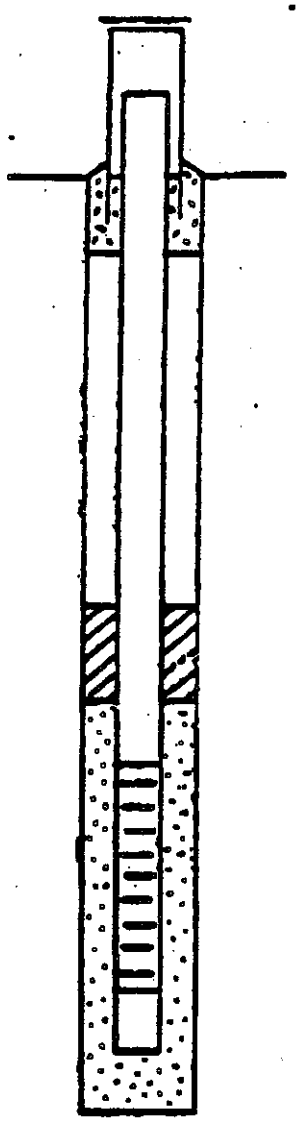
Site PAS Well No. LR-6

Total Depth 57'2" Surface Elev. 270.9' Top Riser Elev. 274.39'

Water Levels (Depth, Date, Time) _____ Date Installed 11-1-88

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Riser: | Dia. 2" | Material 304 s.s. | Length 50' | Slot Size 0.010" |
| Screen: | Dia. 2" | Material 304 s.s. | Length 10' | |
| Prot. Csg: | Dia. 6" | Material steel | Length 7' | |

SCHEMATIC



39" Prot. Csg stickup

36" Riser stickup

Ground Surface

5' Bottom Surface Seal

Grout Type cement/bentonite

Surface Seal Type concrete

Seal Type bentonite slurry

40' Top Seal

46' Top Sand Pack

47' Top Screen

Sand Pack Type/Size #4 QROK

57' Bottom Screen

57'2" Bottom Sump/Wellpoint

57'2" Total Depth of Boring

Comments _____

Driller M. Hawkins

Geologist _____

DEC Inspector R. Edwards

# TEST BORING LOG

BORING NO. LR-6

PROJECT Pollution Abatement Services Site Oswego, NY

SHEET 1 OF 2

DRILLING CONTRACTOR Atlantic Testing Canton, NY

PURPOSE Long-term monitoring program

ELEVATION 270.9 (g.s.)

DATUM

| GROUNDWATER | | | | | CASING | SAMPLE | XXXXXX |
|---|---|---|---|---|---|---|---|
| DATE | TIME | DEPTH | CASING | TYPE | HSA | s.s. | tricone |
| | | | | DIAMETER | 4½" | 2" | 5½" |
| | | | | WEIGHT | | 140# | |
| | | | | FALL | | 30" | |

DATE STARTED 10/31/88

DATE FINISHED 11/1/88

DRILLER M. Hawkins

INSPECTOR R. Edwards

| DEPTH FT. | SAMPLE NUMBER | BLOWS ON SAMPLE SPOON PER 6" | UNIFIED CLASSIFICATION | GRAPHIC LOG | IDENTIFICATION | REMARKS |
|---|---|---|---|---|---|---|
| 2 | | 2-5<br>4-4 | | | 4": Topsoil, Dk Br SANd & Silt moist<br>8": RdBr coarse-med SAND, tr Silt & fine Gravel.<br>4": RdTan fine-med-coarse SAND, tr fine Gravel | 16" recovery<br>HDPE liner @ 14' |
| 4 | | 8-8<br>10-13 | | | 2": Rd Tan f-m-c SAND; tr fine Gravel<br>6": Br f-med SAND & Silt, tr f-m Gravel orange staining, occ blk staining MOIST<br>8": RdTan fine-med SAND DRY | 16" recovery |
| 6 | | 41-26<br>16-11 | | | 3": BkBr org f-mSAND & Silt, w/roots<br>3": Br f-med SANd & Silt, tr Clay & fine gravel, rock frags, red staining<br>11": Br f-m SAND & Silt, tr Clay, 1 f-m Gravel | 17" recovery<br>gravel sub-rounded oxidized ti |
| 8 | | 9-10<br>6-11 | | | No recovery | |
| 10 | | 12-20<br>25-30 | | | 6": Lt Br fine SAND & Silt, little Clay and fine-med Gravel WET<br>14": GyBr fine SAND & Silt, with fine-med Gravel tr Clay Moist-Dry (TILL) | 20" recovery<br>contains thin black streaks |
| 12 | | 77-45<br>36-46 | | | 5": Br f-m SAND & Silt, tr f-m Gravel<br>13": TanGy f-m SAND & Silt w/f-m-c Gravel-sub-rounded rust around some gravel. Moist-Dry dense | 18" recovery |
| 14 | | 35-33<br>43-47 | | | TanBr f-m SAND & Silt w f-m-c Gravel few coarse sand lenses WET<br>Rust & orange streaks. moist-dry at base DENSE | 18" recovery |
| 16 | | 17-20<br>28-28 | | | 7": Br f-m SAND & Silt, little f-med Gravel, tr Clay WET-moist<br>13": BrRed f-m SAND & Silt w f-m-c Gravel rust streaks moist-dry dense | 20" recovery |
| 18 | | 28-48<br>59-76 | | | 6": BrRed f SAND & Silt, tr f-m Gravel, tr Clay WET-moist<br>15": Gy-RedGy f SAND & Silt w f-m Gravel dry-moist v. dense 1" Br seam | 21" recovery |
| | | 85-68 | | | 3" Br f-m Sandy SILT, tr f-m Gravel & Clay moist | 16" recovery |

TEST BORING LOG | BORING NO. LR-6

PROJECT Pollution Abatement Services Site Oswego, NY | SHEET 2 OF 2

| DEPTH FT. | SAMPLE NO. | BLOWS ON SAMPLE SPOON, PER 6" | UNIFIED CLASSIFICATION | GRAPHIC LOG | IDENTIFICATION | REMARKS |
|---|---|---|---|---|---|---|
| | | 78-100/3" | | | Rock fragments. 2" BrGy fine Sandy SILT with fine Gravel DRY | 8" recovery |
| 22 | | --- | | | | |
| | | 57-100/3" | | | Red-Grey fine SAND & Silt, some fine-medium Gravel & rock Frags. DRY | 6" recovery rock frags in tip of spoon |
| 24 | | --- | | | | |
| | | 75-100/4" | | | Red Grey fine SAND & Silt, trace fine to medium Gravel DRY | 10" recovery |
| 26 | | --- | | | | |
| | | 30-100/3" | | | Red Grey fine-med SAND & Silt, with fine-med-coarse Gravel, rock frags DRY - Moist | 8" recovery rock frags in tip of spoon |
| 28 | | --- | | | | |
| | | 118-- | | | Red Grey fine Sandy SILT with fine-medium Gravel, rock fragments | 5" recovery rock frags in tip |
| 30 | | --- | | | | |
| | | 100/on rock (boulder | | | Rock frags. Wash out hole & roller bit through rock | Spoon did not advance |
| 32 | | | | | | 10 |
| | | 44-100/4" | | | RdGy fine SAND & Silt w med-fine Gravel, tr Clay WET-MOIST dense 2"till/2"loose med Gvl,wet/5"till | 9" recovery most G sub-rdd gvl in seam sub-angular 11 |
| 34 | | --- | | | | |
| | | 76-100/5" | | | Red Grey fine SAND & Silt, some fine to med Gravel Moist-dry v dense | 9" recovery |
| 36 | | --- | | | | |
| | | 12-24 | | | 2" RdGy fine SAND & Silt with fine Gravel moist dense | 13" recovery |
| | | 100/5" | | | 11" Gy Clayey SILT, some fine Sand moist-dry v dense Contains v. thin fine Sand lenses | |
| 38 | | 20-19 | | | | |
| | | 30-97 | | | 3" Gy f SAND & Silt w Clay & f Grvl 4" Gy Clayey Silt, some f Sand, f-m Gravel MOIST dense | 7" recovery (Red staining around Red SS pebble, wthrd) |
| 40 | | 15-10 | | | | |
| | | 18-82 | | | RdGy fine SAND & Silt with Clay dense, moist Rock frags in bottom 4" Refusal--bedrock | 11" recovery less clay than above |
| | | | | | Auger refusal at 41'8". Advance hole with roller bit 15' into rock | |

MONITOR WELL CONSTRUCTION REPORT

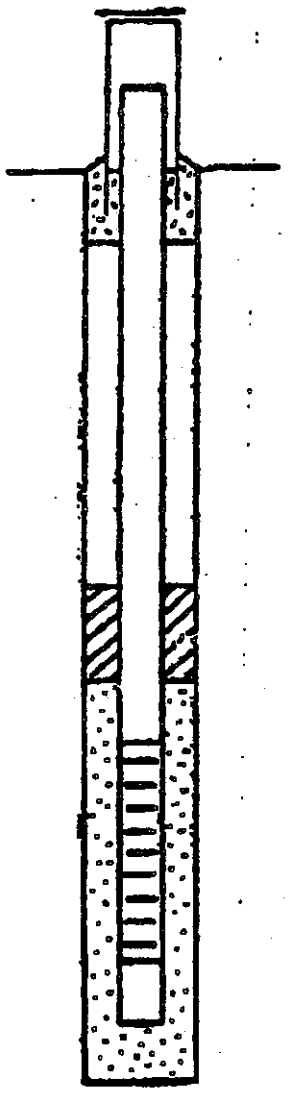
Site PAS — Well No. LR-8

Total Depth 40.5' — Surface Elev. 270.0' — Top Riser Elev. _____

Water Levels (Depth, Date, Time) _____ — Date Installed 11-11-88

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Riser: | Dia. 2" | Material 304 s.s. | Length 33' | | | | |
| Screen: | Dia. 2" | Material 304 s.s. | Length 10' | Slot Size 0.010" | | | |
| Prot. Csg: | Dia. 6" | Material steel | Length 7' | | | | |

SCHEMATIC



45" Prot. Csg stickup

42" Riser stickup

Ground Surface

3' Bottom Surface Seal

Surface Seal Type concrete

Grout Type cement/bentonite

Seal Type bentonite slurry

22' Top Seal

28'5" Top Sand Pack

29'6" Top Screen

Sand Pack Type/Size #4 QROK

39'6" Bottom Screen

39'8" Bottom Sump/Wellpoint

40'6" Total Depth of Boring

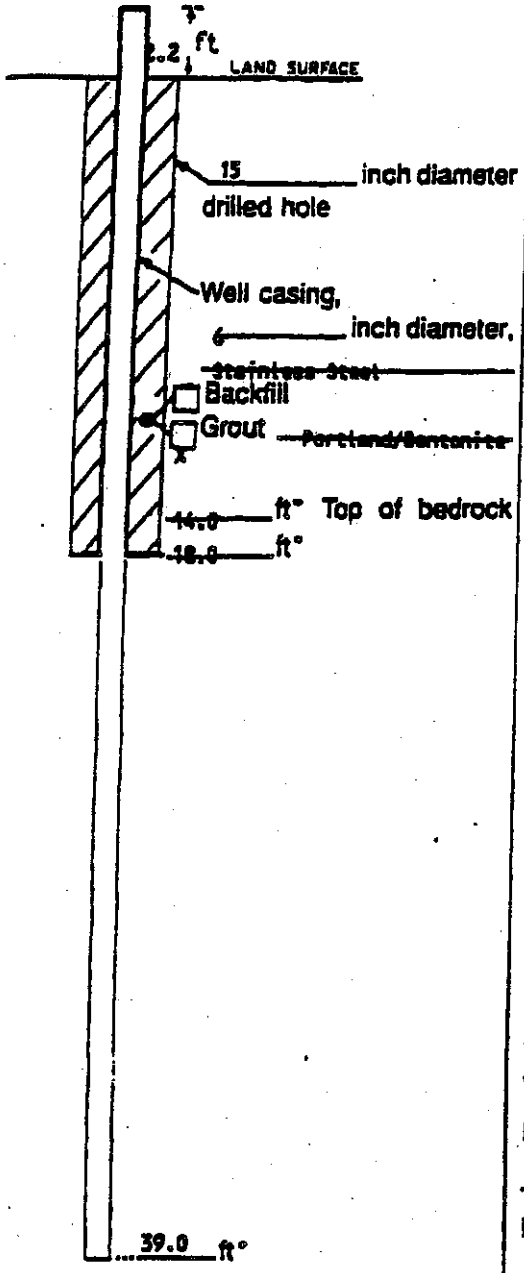
Comments _____

Driller T. Burnham — DEC Inspector R. McNamee

Geologist _____

GERAGHTY & MILLER, INC.
Environmental Services

# WELL CONSTRUCTION LOG
(BEDROCK)




Measuring Point is Top of Well Casing Unless Otherwise Noted.

°Depth Below Land Surface

Project PAS - NY50402 Well M-21

Town/City Oswego

County Oswego State New York

Permit No.

Land-Surface Elevation and Datum 270.28 feet mean sea- level ☒ Surveyed ☐ Estimated

Installation Date(s) 9/9/91 - 9/17/91

Drilling Method 6 1/4", 8 1/4", NX, P

Drilling Contractor Barnes Wells, Inc.

Drilling Fluid Water

Development Technique(s) and Date(s)

Submersible Pump for 2.0 hours on 9/17/91

Centrifugal Pump (Rig) for 1.0 hours on 9/18/91

Fluid Loss During Drilling 30 - 40 gallons

Water Removed During Development Approximately 1,400 gallons

Static Depth to Water 11.21 feet below M.P.

Pumping Depth to Water 36 feet below M.P.

Pumping Duration 3.0 hours

Yield 10.8 - 11.5 gpm Date 9/17, 9/18/91

Specific Capacity gpm/ft

Well Purpose Bedrock Ground Water Monitoring

Fracture Zones Horizontal/Angular: 18.6, 19.8, 20.0-22.0, 22.3, 24.6, 25.8, 33.0-34.0, 34.8, 38.1

Remarks

Vertical Fracture Zones: 15.2-16.8, 22.3-24.3, 38.1-38.8

Strong odor to water

Prepared by S. Beames

GERAGHTY & MILLER, INC.
Environmental Services

# SAMPLE/CORE LOG

Boring/Well M-21 Project/No. PAS - NY50402 Page 1 of 2

Site Location Oswego, New York Drilling Started 9/9/91 Drilling Completed 9/17/91

Total Depth Drilled 39.0 feet Hole Diameter 15 inches Type of Sample/ Coring Device Split Spoon

Length and Diameter of Coring Device 2' x 2" Sampling Interval 2 feet

Land-Surface Elev. _____ feet ☐ Surveyed ☐ Estimated Datum _____

Drilling Fluid Used None 0 - 14.0'; Water 14.0 - 39.0' Drilling Method 4 1/4", 8 1/4", NX, P

Drilling Contractor Parratt Wolff, Inc. Driller Rice Helper Lansing/Eaves

Prepared By S. Beames Hammer Weight 140# Hammer Drop 30 inches

| Sample/Core Depth (feet below land surface) From | To | Core Recovery (feet) | Time/Hydraulic Pressure or Blows per 6 Inches | SAMPLE ID | Sample/Core Description |
|---|---|---|---|---|---|
| 0 | 2 | 1.5 | 3-4-6-8 | No Lab | SAND (80%) brown, coarse to medium, trace fine; Top Soil (10%) |
| | | | | samples | organics, silt; Silt (5%) brown; Gravel (5%) fine, subround, |
| | | | | taken | trace medium to coarse; poorly sorted, damp. |
| 2 | 4 | 1.5 | 8-7-7-10 | | SAND (70%) brown, medium to fine, trace coarse; Silt (30%) |
| | | | | | brown; trace fine gravel, trace organics, moist. |
| 4 | 6 | 0.0 | 50/0.1 | | Cobbles/Boulders 4.1 - 6.0' |
| 6 | 8 | 1.4 | 17-27- | | SAND (60%) brown, coarse to medium, trace fine; Gravel (40%) |
| | | | 50/0.4 | | coarse to fine, subangular (fragmented) to subround; poorly |
| | | | | | sorted, cobbles present, moderately compacted, moist. |
| 7.5 | 9.1 | | | | Boulder/Cobbles |
| 10 | 12 | 0.8 | 32-50/0.3 | | Same as above (moist - wet). |
| 12 | 14 | 1.0 | 49-61 | | Same as above (wet). |
| 14 | | 0.0 | 50/0.0 | | Rock. |
| 14.3 | 19.3 | 5.08 | (100%) | | Bedrock - SANDSTONE, green, fine, medium hard to hard, |
| NX-1 | RQD | 4.8/5 | (96%) | | competant, trace green siltstone gravel/fragments throughout |
| | | | | | (dropstones?), very little weathering, horizontal bedding, trace |
| | | | | | crossbedding (18.0'), trace fine gravel (18.4'), wet. |
| | | | | | Horizontal fractures: well developed, 18.6'; |
| | | | | | Vertical: 15.2 - 16.8', healed 18.6 - 19.3'. |

GERAGHTY & MILLER, INC.
Environmental Services

# SAMPLE/CORE LOG (Cont.d)

Boring/Well M-21



Prepared By S. Beames

| Sample/Core Depth (feet below land surface) From | To | Core Recovery (feet) | Time/Hydraulic Pressure or Blows per 6 Inches | SAMPLE ID | Sample/Core Description |
|---|---|---|---|---|---|
| 19.3 | 24.3 | 4.9/5 | (98%) | | SANDSTONE - same as above. Varying amounts of silt |
| MX-2 | RQD | 4.0/4.9 | (81%) | | (fe silty fine sandstone at 21.3', 22.3 - 22.6'). Horizontal |
| | | | | | fractures: 19.8', 22.3'. Fractured at angles: 20.1', 20.6', |
| | | | | | 20.7', 20.8', 20.9', 21.9'. Vertical fractures: 22.3 - 24.3' |
| 24.0 | 29.0 | 4.5 | (89%) | | SANDSTONE - same as above. |
| P-1 | RQD | 2.92/4.5 | (65%) | | Well developed horizontal fractures 24.25', 24.6', 25.8'. |
| 29.0 | 34.0 | 4.7 | (94%) | | SANDSTONE - same as above. |
| P-2 | RQD | 3.0/4.7 | (64%) | | Trace coarse sand, siltstones 29.0 - 29.2', black |
| | | | | | staining 30.25'. |
| 34.0 | 39.0 | 4.8 | (96%) | | SANDSTONE - same as above. |
| P-3 | RQD | 3.94/4.8 | (82%) | | Upper 3" fractured. At 34.8' fracture and gravel zone |
| | | | | | approximately 0.04' thick. Healed vertical fracture/crack |
| | | | | | 38.1 - 38.8'. Horizontal fracture 38.1'. |
| 39.0 | | | | | End of coring. |
| | | | | | Water at 11.21' |

ROUX

| | |
|---|---|
| Project: Supplemental Pre-Remedial Design Study<br>PAS Site, Oswego, New York | Log of Well No. M-25 |
| Northing: | Land Surface Elevation: 264.56 ft. above mean sea level |
| Easting: | Measuring Point Elevation: 265.87 ft. above mean sea level |
| Date Started: 7/13/94 | Sounded Depth of Well: 35.23 ft. below measuring point |
| Date Completed: 7/21/94 | Casing Diameter and Type: 6-inch stainless steel |
| Logged By: J. Makowski | Casing Depth: 15.5 ft. below land surface |
| Drilling Company: Parratt-Wolff | Bottom of Well: 33.9 ft. below land surface |
| Drilling Method: hollow-stem auger/water rotary | Open Hole Diameter: 5.4 inches |
| | Static Depth to Water: 8.9 ft. below land surface |

| Depth (feet) | Sampler Blows per 6" | Rec. % | PID (ppm) | SAMPLE DESCRIPTION | Inferred USCS Class | Monitoring Well Construction | REMARKS |
|---|---|---|---|---|---|---|---|
| | 4<br>5<br>5<br>11 | 60 | 0.0 | Light and dark brown SILT, little fine Gravel, trace fine Sand; roots throughout; angular gravel; slight plasticity; dry | ML | | Casing stick-up is approximately 1.3 above land surface.<br>Static depth to water measured on August 4, 1994 |
| | | | | | SW | | Hard drilling from 4 to 5 feet below land surface |
| 5 | 8<br>26<br>50/4" | 38 | 0.0 | Light brown fine SAND, little fine Gravel, trace Silt; angular gravel; slight plasticity; moist | | | Hard drilling from 7 to 8 feet below land surface; notably easier drilling from 9 to 10 feet below land surface |
| | | | | Notable change to gray color in cuttings<br>Cuttings wet | ML | | |
| 10 | 12<br>50/3" | 40<br>96 | 0.0<br>0.0 | Light gray SILT, little fine Gravel; angular gravel; wet | | | Hard drilling at 10 feet below land surface<br>Auger refusal; confirmed by split-spoon refusal |
| | | | | Gray SANDSTONE | | | First core run from 10.5 to 15.5 feet below land surface (RQD=69%); vertical fracturing from approximately 10.8 to 11.7-foot interval; coring difficult |
| 15 | | 84 | 0.0 | Gray SANDSTONE | | | Second core run from 15.5 to 18 feet below land surface (RQD=30%); coring difficult. |
| | | 92 | 0.0 | Gray SANDSTONE, minor green Shale | | | Third core run from 18 to 21 feet below land surface (RQD=29%); coring difficult; hole collapsing |
| 20 | | 100 | 0.0 | Gray SANDSTONE, minor green Shale | | | Fourth core run from 21 to 21.8 feet below land surface (RQD=47%); much broken rock in core barrel |
| | | 100 | 0.0 | Gray SANDSTONE | | | Fifth core run from 21.8 to 23 feet below land surface (RQD=86%) iron-staining noted at approximately 22.6-foot interval |
| | | 100 | 0.0 | Gray SANDSTONE | | | Sixth core run from 23 to 28 feet below land surface (RQD=98%) |
| 25 | | | | | | | |

*Continued Next Page*

ROUX

Project: Supplemental Pre-Remedial Design Study
PAS Site, Oswego, New York

Log of Well No. M-25

| Depth (feet) | Sampler | Blows per 6" | Rec. % | PID (ppm) | SAMPLE DESCRIPTION | Inferred USCS Class | Monitoring Well Construction | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 30 | | | 100 | 0.0 | Gray SANDSTONE | | | Seventh core run from 28 to 33 feet below land surface (RQD=82%) vertical fracturing observed at approximately 28.4 to 30-foot interval |
| 35 | | | | | | | | |
| 40 | | | | | | | | |
| 45 | | | | | | | | |
| 50 | | | | | | | | |
| 55 | | | | | | | | |

ROUX

| | |
|---|---|
| Project: Supplemental Pre-Remedial Design Study PAS Site, Oswego, New York | Log of Well No. M-26 |
| Northing: | Land Surface Elevation: 271.85 ft. above mean sea level |
| Easting: | Measuring Point Elevation: 273.38 ft. above mean sea level |
| Date Started: 7/14/94 | Sounded Depth of Well: 44.65 ft. below measuring point |
| Date Completed: 7/26/94 | Casing Diameter and Type: 6-inch stainless steel |
| Logged By: J. Makowski | Casing Depth: 6.5 ft. below land surface |
| Drilling Company: Parratt-Wolff | Bottom of Well: 43.1 ft. below land surface |
| Drilling Method: hollow-stem auger/water rotary | Open Hole Diameter: 5.4 inches |
| | Static Depth to Water: 12.9 ft. below land surface |

| Depth (feet) | Sampler Blows per 6" | Rec. % | PID (ppm) | SAMPLE DESCRIPTION | Inferred USCS Class | Monitoring Well Construction | REMARKS |
|---|---|---|---|---|---|---|---|
| 0 | 4<br>9<br>25/3" | 80 | 0.0 | Light brown SILT, little fine Gravel, trace fine Sand; roots throughout; slight plasticity; dry | ML | | Casing stick-up is approximately 1.5 feet above land surface. |
| | | 100 | 0.0 | Gray SANDSTONE (upper 0.6 feet contains weathered sandstone rubble) | | | Hard drilling at 1.5 feet below land surface; refusal at less than 2 feet below land surface<br>First core run from 1.7 to 6.7 feet below land surface (RQD=35%) |
| 5 | | 100 | 0.0 | Gray SANDSTONE | | | Second core run from 6.7 feet to 8.7 feet below land surface (RQD=34%) |
| | | 100 | 0.0 | Gray SANDSTONE | | | Third core run from 8.7 to 13.7 feet below land surface (RQD=75%); iron-staining noted approximately 13.25' bls. |
| 10 | | | | | | | Static depth to water measured on August 4, 1994 |
| | | 96 | 0.0 | Gray SANDSTONE, minor Shale | | | Fourth core run from 13.7 to 18.7 feet below land surface (RQD=69%) |
| 15 | | | | | | | |
| | | 98 | 0.0 | Gray SANDSTONE, minor Shale | | | Fifth core run from 18.7 to 23.7 feet below land surface (RQD=72%); water loss noted |
| 20 | | | | | | | |
| | | 97 | 0.0 | Gray SANDSTONE | | | Sixth core run from 23.7 to 28.7 feet below land surface (RQD=68%); |
| 25 | | | | | | | |

*Continued Next Page*

ROUX

Project: Supplemental Pre-Remedial Design Study
PAS Site, Oswego, New York

Log of Well No. M-26

| Depth (feet) | Samples | Blows per 6" | Rec. % | PID (ppm) | SAMPLE DESCRIPTION | Inferred USCS Class | Monitoring Well Construction | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | vertical fracture noted at approximately 24.9 feet |
| 30 | | | 96 | 0.0 | Gray SANDSTONE | | | Seventh core run from 28.7 to 33.7 feet below land surface (RQD=94%); coring difficult at approximately 31.7 feet. |
| 35 | | | 100 | 0.0 | Gray SANDSTONE, minor blue-green Shale | | | Eighth core run from 33.7 to 38.7 feet below land surface (RQD=87%) |
| 40 | | | 100 | 0.0 | Gray SANDSTONE, minor blue-green Shale | | | Ninth core run from 38.7 to 43.7 feet below land surface (RQD=85%); coring difficult from approximately 42 to 43 feet |
| 45 | | | | | | | | |
| 50 | | | | | | | | |
| 55 | | | | | | | | |

*de maximis, inc.*

301 Gallaher View Road
Suite 227
Knoxville, TN 37919
(615) 691-5052
Fax (615) 691-6485

August 4, 1995

Mr. Bruce Clark
County Attorney
Oswego County
46 Bridge Street
Oswego, NY 13126

Dear Mr.Clark:

As part of the continued environmental actions at the Pollution Abatement Services (PAS) site, the United States Environmental Protection Agency (USEPA) is requiring a groundwater and environmental study in areas around the PAS site in Oswego. This environmental study, known as the Supplemental Pre-Remedial Design Study (SPRDS), is specified in the December 1993 Record of Decision (ROD) as revised through public comment. The SPRDS activities will include soil, sediment and surface water sampling in the vicinity of Wine & White Creek adjacent to the county property. The parties to the SPRDS, are required to obtain written permission for access to the county property located at 700 E Seneca Street to conduct tasks specified by the USEPA in conjunction with this environmental study.

The tasks required by this environmental study will be conducted by an independent contractor, Roux Associates, Inc. under the direction of *de maximis, inc.*, who is acting as Project Coordinator. Representatives of the USEPA, or their contractors, will provide regulatory oversight of all project activities, which include those performed by Roux Associates. You should be aware that the USEPA, in their oversight role, will not be liable for the work performed by independent contractors.

The work tasks required for this environmental study include site reconnaissance and collection of soil or sediment samples in accordance with the SPRDS Phase II Workplan. A copy of this SPRDS Phase II Workplan will be provided to the county upon request. These required work tasks will be performed with your prior approval and in a professional manner to minimize any disruption or inconvenience.

Please review the Landowner Consent Form that has been enclosed. The form requests your signature for written permission for the tasks previously described. The form specifies that access will be provided for representatives, agents, or contractors of Roux Associates, Inc., *de maximis*, the USEPA, and the New York Department of Environmental Conservation. We request that you sign the form and mail the completed form to me using the self-addressed return envelope enclosed. A copy of this form has also been enclosed for your records.

If you have any questions, please call me collect at 615-691-5052.

Sincerely,

Clay McClarnon

Clay McClarnon

CSM/mt

cc: Geri Edens
Mark Valentine

F:\PROJECTS\3085\ACCESS2.LH

LANDOWNER CONSENT FORM

I have read the attached letter dated August 4, 1995 and, based on the representations set forth in the letter, I hereby consent to the entry upon the county property on E Seneca Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including site reconnaissance and collection of soil or sediment samples.

_____
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 128.28.01.2

_____
Print Name

_____
Date

LANDOWNER CONSENT FORM

I have read the attached letter dated August 4, 1995 and, based on the representations set forth in the letter, I hereby consent to the entry upon the county property on E Seneca Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including site reconnaissance and collection of soil or sediment samples.

COUNTY OF OSWEGO
By: Frank R Church
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 128.28.01.2

Hon. Frank R. Church, Chairman, Oswego County Legislature
Print Name

August 18, 1995
Date

OSWEGO COUNTY SEAL STATE OF NEW YORK

CONTRACT APPROVED
AS TO FORM
County of Oswego
AUG 18 1995
Office of the County Attorney
Bruce M. Clark, Esq.
Oswego County Attorney

PAPER

# *Appendix N*
# *Access Agreement*

3085-14
3045-14

Cadwalader, Wickersham & Taft

1333 New Hampshire Ave., N.W.

Washington, D.C. 20036

Telephone: (202) 862-2200

FAX: (202) 862-2400
TWX: 710-822-1934

100 MAIDEN LANE
NEW YORK, N.Y. 10038
TEL: (212) 504-6000
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660 SOUTH FIGUEROA STREET
LOS ANGELES, CA 90017
TEL: (213) 955-4600
FAX: (213) 955-4666

440 ROYAL PALM WAY
PALM BEACH, FLA 33480
TEL: (407) 655-9500
FAX: (407) 655-9508

James W. Moorman
(202) 862-2300

September 30, 1994

By Federal Express

Mr. Michael J. O'Toole, Jr.
Director, Division of Hazardous
Waste Remediation
New York State Department
of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7010

Re: Temporary Access Agreement
Pollution Abatement Services Site
Site Code: 7-38-001
Interim Groundwater Removal Activities

Dear Mr. O'Toole:

On behalf of the parties to the PAS Oswego Site Participation Agreement, we request that the New York State Department of Environmental Conservation amend the June 29, 1994 Temporary Access Agreement for the Supplemental Pre-Remedial Design Study (SPRDS) to include the activities required by the 1994 U.S. EPA administrative Order on Consent for interim groundwater removal activities at the Pollution Abatement Services site in Oswego, New York. Two copies of an amendment to the Temporary Access Agreement for the SPRDS are provided for your consideration. Because of the shortness of time, I have put the amendment in final and signed the copies. Please return one copy signed by yourself to me.

If you have any questions, please call me.

Sincerely,

James W. Moorman
Chairman, PAS Oswego Site Steering
Committee

cc: Mark Valentine
Steering Committee

**AMENDMENT TO JUNE 29, 1994 NYSDEC TEMPORARY ACCESS AGREEMENT**

Whereas, on October 25, 1991 the New York State Department of Environmental Conservation (NYSDEC) granted the PAS Oswego Site Interim Groundwater Removal Trust (IGR Trust), its employees, agents or contractors (including *de maximis, inc.*) temporary access to the Pollution Abatement Services site (the "Site") for the purposes of ingress, egress, regress, and activities in relation to interim groundwater removal, as well as any other related activities as may be required by the United States Environmental Protection Agency (U.S. EPA) Administrative Order on Consent (the 1991 IGR Order) subject to the specific conditions provided in the October 25, 1991 temporary access agreement (the 1991 IGR Access Agreement); and

Whereas, on June 29, 1994 NYSDEC granted the companies and entities that are parties to the PAS Oswego Site Participation Agreement dated May 1, 1994 (the Group), its employees, agents or contractors, (including *de maximis, inc.* and Roux Associates, Inc.), and the U.S. EPA, its contractors and oversight officials, temporary access to the Site for the purposes of ingress, egress, regress, and construction in relation to conducting a Supplemental Pre-Remedial Design Study (SPRDS), as well as any other related activities as may be required by the U.S. EPA Administrative Order on Consent for the SPRDS (the SPRDS Order) according to the conditions provided in the June 29, 1994 temporary access agreement (the SPRDS Access Agreement); and

Whereas, the U.S. EPA elected to enter into a new administrative order by consent in order to extend interim groundwater activities at the Site; and

Whereas, the U.S. EPA and the Group expect to sign the Administrative Order on Consent No. 94-215 on or about September 30, 1994 (the 1994 IGR Order). The 1994 IGR Order will contain a U.S. EPA-approved Work Plan which describes the work to be performed under the order; and

Whereas, the 1991 IGR Order will terminate upon the effective date of the 1994 IGR Order; and

Whereas, the IGR Trust will also terminate upon satisfaction of the 1991 IGR Order, and

Whereas, the Group requires access to the Site in order to perform the work under the 1994 IGR Order.

Now therefore, NYSDEC and the Group acting through the PAS Oswego Site Steering Committee under said Participation Agreement, agree to amend the SPRDS Access Agreement as follows:

1. The SPRDS Access Agreement is hereby amended to also provide ingress, egress, regress, and activities of contractors, (including *de maximis, inc.* and OBG Technical Services, and the U.S. EPA, its contractors and oversight officials for purposes of performing interim groundwater removal activities required by the 1994 IGR Order, which includes a U.S. EPA-approved Work Plan.

2. Exhibit 1 to the SPRDS Access Agreement is hereby amended to include those Companies and entities that are parties to the PAS Oswego Site Participation Agreement as amended on September 30, 1994 and as listed on Exhibit 1A attached.

3. The Group agrees to furnish to the NYSDEC a Certificate of Insurance which describes the liability coverage for the Group's contractor, who is responsible for performance of the work described in the 1994 IGR Order and conforms with the conditions described in Paragraph 6 of the SPRDS Access Agreement.

4. All of the provisions of the SPRDS Access Agreement will remain in full effect as amended herein.

This amendment to the Temporary Access Agreement will take effect upon receipt of the signed acceptance copy and proof of insurance, and will expire upon receipt of notification from the U.S. EPA of satisfactory completion of all the requirements of the SPRDS Order and the 1994 IGR Order. The Commissioner may, after notice and an opportunity to be heard is given to the Group, modify, suspend, or revoke this amended agreement if he determines that any condition of the agreement has been, is being, or is about to be violated.

Michael J. O'Toole, Jr.
Director
Division of Hazardous Waste
Remediation
New York State Department of
Environmental Conservation

Date

ACCEPTED BY:

James W. Moorman

James W. Moorman, On behalf of
the Parties to the PAS Oswego
Site Participation Agreement

Sept. 30, 1994
Date

Nabisco, Inc., sucessor by merger to Planters LifeSavers, Inc.)
Nashua Corporation
Native Textiles
Nepco Energy Corporation
New Coleman Holdings, Inc. f/k/a Coleman Company, Inc.
Newcut, Inc.
Niagara Mohawk Power Corporation
Noco Energy Corporation
Oneida Ltd.
Onset Corporation successor to Momentum Technologies, Inc.
Oxy U.S.A. Inc. on behalf of Cities Service
Pfizer Inc.
Phillips Petroleum Company
Praxair, Inc. f/k/a Union Carbide Industrial Gases Inc. f/k/a Linde Division of Union Carbide Corporation
Purolator Products Company
Rochester Gas and Electric Corporation
Roehlen Engraving Division of Standex International Corporation
Rotron, Inc.
Safety-Kleen Envirosystems
Schenectady International, Inc.
Sealright Co., Inc.
Shell Oil Company
Smith Corona Corporation
Champion International Corporation as successor by merger to St. Regis Corp.
State University of New York
Sun Co. Inc. (R&M) formerly Sun Refining and Marketing
Syracuse University
Tenneco
Texaco and Getty Oil
United Gilsonite Laboratories
United Refining of Pa.
University of Rochester
Unisys Corporation
Wilson Sporting Goods Co.
Sterling Winthrop Labs
W.R. Grace
Xerox



** TOTAL PAGE.006 **

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New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

Langdon Marsh
Acting Commissioner

JUN 29 1994

Mr. Mark Valentine
Project Coordinator
de maximis, inc.
9041 Executive Park Drive
Suite 401
Knoxville, TN 37923

Dear Mr. Valentine:

RE: Temporary Access Agreement
Pollution Abatement Services Site
Site Code: 7-38-001
Supplemental Pre-Remedial Design Study

The Companies and entities that are parties to the PAS Oswego Site Participation Agreement dated as of May 1, 1994, (the "Group"), acting through the PAS Oswego Site Steering Committee under said Participation Agreement its employees, agents or contractors, (including de maximis, inc. and Roux Associates, Inc.), and the United States Environmental Protection Agency, its contractors and oversight officials are hereby granted temporary access to Pollution Abatement Services site (the site), as shown on the attached map, for the purposes of ingress, egress, regress, and construction in relation to conducting a Supplemental Pre-Remedial Design Study (SPRDS), as well as any other related activities as may be required by the U.S. EPA Administrative Order on Consent for the SPRDS (the Order), subject to the following conditions:

1. The "Department" shall mean the New York State Department of Environmental Conservation (NYSDEC).

2. The "Group" shall mean the Companies and entities that are parties to the PAS Oswego Site Participation Agreement dated as of May 1, 1994 and acting through the PAS Oswego Site Steering Committee under said Participation Agreement. A list of such companies and entities is attached hereto as Exhibit 1.

3. This agreement shall not be assigned or transferred without the prior written consent of the Department.

4. The Group and the United States Environmental Protection Agency, its contractors and oversight officials, shall have access to the site at all reasonable times, or as otherwise required by NYSDEC. The Department shall have the right to have its representatives present to observe the Group's activities. However, the unavailability of such Department representatives shall not be cause to deny or restrict access to the site.

5. The Group will be liable for all damages to persons (including death) and property resulting from the Group's negligent or willful acts and omissions and those of its employees, contractors, subcontractors, agents, guests, and any other persons working under or for the Group in connection with the project for which this agreement is granted, while conducting activities at the site. Further, the Group agrees to indemnify and save harmless the Department of Environmental Conservation and its Commissioner and employees and the People of the State of New York, their officers and employees from judgments, claims, suits, and actions arising out of the negligent or willful acts or omissions of the Group, or its authorized representatives, in connection with the field activities as described in the approved Work Plan, for which this agreement is granted.

6. The Group agrees to furnish to the Department a Certificate of Insurance which describes the liability coverage for the Group's contractor, who is responsible for performance of the work described in the approved Work Plan. The Certificate of Insurance shall demonstrate that the limits of liability in such policy shall not be less than $1,000,000 for all damages arising out of bodily injury, including death at any time resulting therefrom, sustained by one person in any one accident and, subject to that limit for one person, not less than $2,000,000 for all damages arising out of bodily injury, including death at any time resulting therefrom, sustained by two or more persons in any one accident, and not less than $1,000,000 for all damages arising out of injury to or destruction of property in any one accident, and subject to that limit per accident. Such Certificate shall state that it will not be changed or cancelled until thirty days' written notice has been given to said Department.

7. The enumeration in this agreement of the kind and amount of insurance shall not abridge, diminish or affect the Group's legal responsibilities for the consequences of accidents arising out of or resulting from the acts and omissions of the Group under this agreement. Nor shall it relieve the Group's contractor from maintaining other forms of insurance as required by other laws and regulations including, without limitation, workers compensation, disability, vehicle and liability, all of which the Respondents Contractor represents that it has in force and will maintain in force.

8. The Group agrees that any damages to existing remediated areas (the cover, slurry wall, leachate/groundwater collection system), or existing structures (buildings, wells, roads, fences) that are caused by the acts and omissions of the Group will be restored to their condition which existed prior to the initiation of the field activities required by the approved Work Plan.

9. The Group will provide to said Department a Work Plan and Field Operations Plan (FOP) as required by the Order, which shall fully describe the field activities at the site. The Group will provide the Department with any modifications to the Work Plan and FOP.

10. Work associated with the granting of this agreement shall be progressed in such a manner as to avoid interference with the operation and maintenance of the Pollution Abatement Services site in accordance with the Long-term Monitoring Program. The Group and NYSDEC will coordinate any field activities required by the approved Work Plan with the NYSDEC's operation and maintenance program.

11. The Group agrees that no vehicular traffic of any kind shall be allowed on the cover of the remediated portion of the main site, except that portion of the project which is directly involved with the required work, and as approved by the Department's field representative.

12. The Group agrees that precautions shall be taken to avoid accidental or intentional spillage or disposal of waste materials or construction debris directly or indirectly into White Creek or Wine Creek or in areas where such material would eventually be carried into the streams by storm runoff, or disposal of any materials on any portion of the remediated site.

13. The Group agrees to restore any vegetated areas disturbed during the required work to their original condition.

14. The Group agrees that upon completion of the required work, all materials and debris (including construction debris, personal protective clothing and equipment, soil and rock cuttings, and miscellaneous trash) created by the required work activities as described in the approved Work Plan and FOP will be removed from the site and disposed of in accordance with applicable regulations.

15. The Group agrees to notify the Department at least seven calendar days prior to entering upon the site to conduct the activities described in the approved Work Plan.

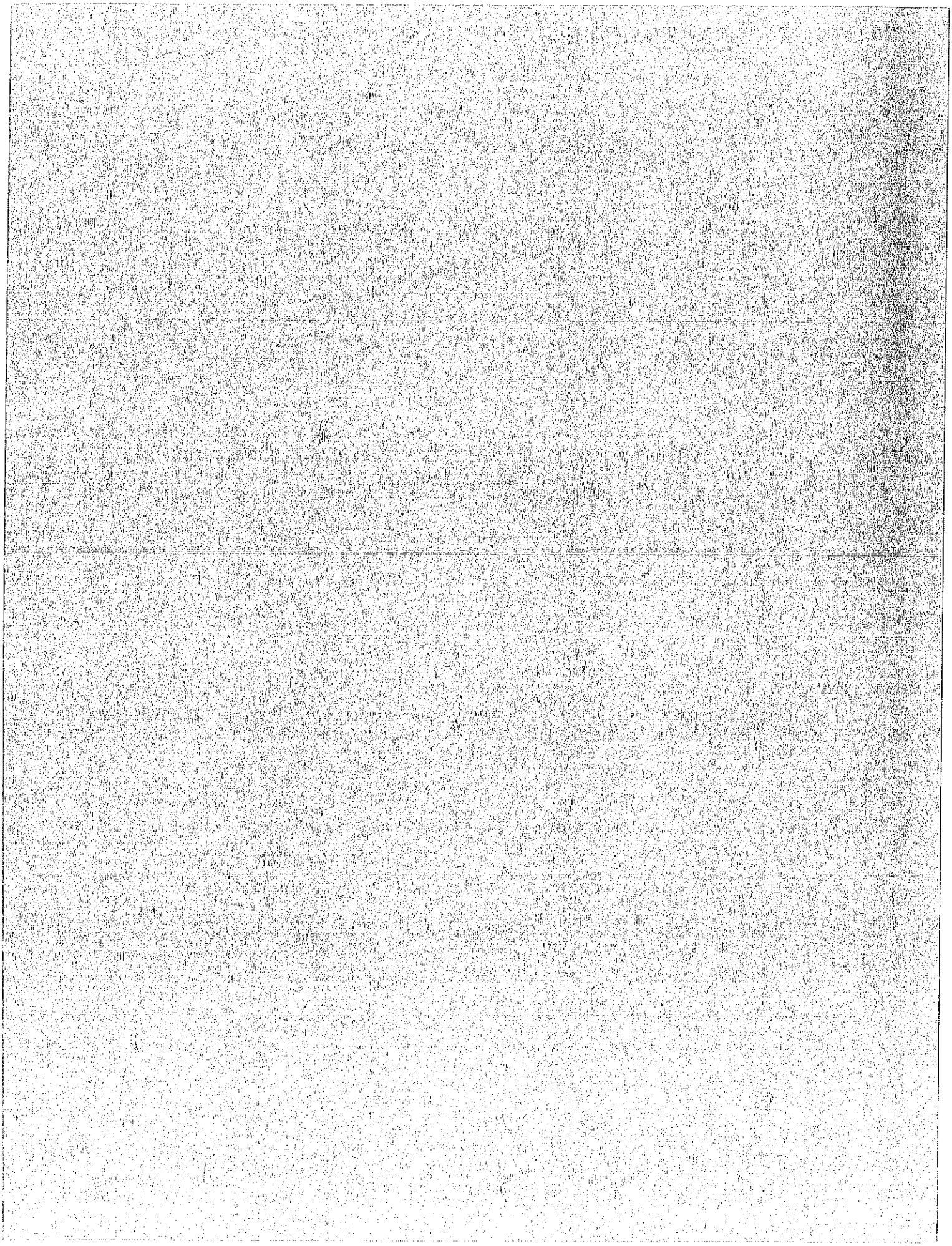
16. The Group agrees to obtain all other local permits for this work, as required to comply with the Order, to accomplish the activities described in the approved Work Plan and FOP.

If these conditions are acceptable, please have the enclosed copy of this letter signed and return it to me. The Temporary Access Agreement will take effect upon my receipt of the signed copy and proof of insurance, and will expire upon receipt of notification from the U.S. EPA of satisfactory completion of all the requirements of the Order. The Commissioner may, after notice and an opportunity to be heard is given to the Group, modify, suspend, or revoke this agreement if he determines that any condition of the agreement has been, is being, or is about to be violated.

If you have any questions concerning this matter, please contact Mr. Robert Edwards at (518) 457-5677.

Sincerely,

Michael J. O'Toole, Jr.
Director
Div. of Hazardous Waste Remediation



3131-74

**ENVIRONMENTAL PROTECTION EASEMENT AND DECLARATION OF RESTRICTIVE COVENANTS**

This Environmental Protection Easement and Declaration of Restrictive Covenants is made this 22nd day of February, 2006, by and between Industrial Precision Products, Inc. ("Grantor"), having an address of 350 Mitchell Street, Oswego, New York 13126, and, de maximis, inc., as Trustee of The PAS Oswego Site Trust ("Grantee"), having an address of c/o de maximis, inc., Trustee, 405 Montbrook Lane, Knoxville, Tennessee, 37919.

**WITNESSETH:**

WHEREAS, Grantor is the owner of a parcel of land located in the county of the state of New York, more particularly described on **Exhibit A**, attached hereto and made a part hereof together with any buildings and improvements thereon and appurtenances thereto (the "Property"); and

WHEREAS, the Property is part of the Pollution Abatement Services ("PAS") Superfund Site ("Site"), which the U.S. Environmental Protection Agency ("EPA"), pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9605, placed on the National Priorities List, as set forth in Appendix B of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300, by publication in the Federal Register on September 8, 1983; and

WHEREAS, in Records of Decision dated June 6, 1984 and December 29, 1993 (the "1984 ROD" and the "1993 ROD"), the Regional Administrator of EPA, Region II, selected, and the New York State Department of Environmental Conservation ("NYSDEC") concurred with, "response actions" for the Site, which provide, in part, for the following actions:

(a) limited excavation and off-site disposal of contaminated materials, installation of a perimeter slurry wall, site grading and capping, installation of a leachate and groundwater collection and treatment system, and groundwater monitoring;

(b) enhancing the present source control system by optimizing the leachate and groundwater extraction rate and other operating parameters in order to achieve, to the degree practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system;

(c) bedrock groundwater extraction and treatment;

(d) connecting downgradient residents in the Smith's Beach area, who were using residential wells, to the public water supply to ensure that potential future exposure to contaminants in the bedrock groundwater does not occur; and

(e) institutional controls on groundwater usage through deed restrictions at the PAS Site and downgradient from the Site (a map depicting the approximate location of the



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ENSE

groundwater plume and the area hydrogeologically downgradient is depicted in Exhibit B); and

WHEREAS, on September 30, 1996, EPA issued an Explanation of Significant Differences ("ESD") which modified the 1993 ROD and concluded that bedrock groundwater extraction and treatment would not be an effective means of addressing the contamination in the bedrock aquifer because it would adversely impact the existing containment system or the nearby creeks and wetlands. The ESD addresses the contamination in the bedrock by calling for the enhancement of the present source control system alone; and

WHEREAS, pursuant to the terms of a Consent Decree entered by the United States District Court for the Northern District of New York on August 10, 1998, *United States of America v. Agway et al.* Civil Action No. 98-CV-0112 (the "1998 Consent Decree"), the Grantees have agreed to finance and perform certain remedial work in accordance with the 1998 Consent Decree, the 1984 ROD and the 1993 ROD (as modified by the ESD); and

WHEREAS, the parties hereto have agreed that Grantor shall grant a permanent easement and covenant: a) to provide a right of access over the Property to the Grantee for purposes of implementing, facilitating and monitoring the response action; and b) to impose on the Property use restrictions that will run with the land for the purpose of protecting human health and the environment; and

WHEREAS, Grantor wishes to cooperate fully with the Grantee in the implementation of all response actions at the Site;

NOW, THEREFORE:

1. Grant: Grantor on behalf of itself, its successors and assigns, in consideration of the terms of the 1998 Consent Decree and other good and valuable consideration, does hereby give, grant, covenant and declare in favor of the Grantee that the Property shall be subject to the restrictions on use and rights of access set forth below, and does give, grant and convey to the Grantee with general warranties of title the perpetual right to enforce said restrictions and rights, which shall be of the nature and character, and for the purposes hereinafter set forth, with respect to the Property.

2. Purpose: It is the purpose of this instrument to convey to the Grantee real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to contaminants.

3. Restrictions on use: The following restrictions on use apply to the use of the Property, run with the land and are binding on the Grantor:

   The Property shall not be used in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial measures (including all monitoring wells) that have been



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implemented pursuant to the 1998 Consent Decree. Such restrictions include, but are not limited to:

a. the installation or use of any groundwater wells on the Property except as approved by EPA for the implementation of the work required to be performed under the Consent Decree; and

b. any groundwater use of the Property which would adversely affect the integrity of the containment system installed at the Site pursuant to the 1984 ROD.

4. Modification of termination of restrictions: The restrictions on use in the preceding paragraph of this instrument shall terminate when EPA certifies completion of the Work pursuant to paragraph 50(b) of the Consent Decree. Within 30 days of that certificate the Grantee will file an acknowledgement of same in the County Clerk's office. Prior to that time, these restrictions may only be modified, or terminated in whole or in part, in writing, by the Grantee, with the prior written consent of EPA, provided, however, that any modification or termination of said restrictions shall not adversely affect the remedy selected by EPA for the Site. If requested by the Grantor, such writing will be executed by Grantee in recordable form.

5. Right of access: A right of access by the Grantees or their authorized representatives to the Property at all reasonable times for the following purposes shall run with the land and be binding on Grantor:

a) Implementing the work pursuant to the 1998 Consent Degree, including but not limited to the Operation and Maintenance activities;

b) Verifying any data or information relating to the Site;

c) Verifying that no action is being taken on the Property in violation of the terms of this instrument or of any federal or state environmental laws or regulations;

d) Conducting investigations under CERCLA relating to contamination on or near the Site, including, without limitation, sampling of air, water, sediments, soils; and

e) Implementing additional or new response actions under CERCLA.

6. Reserved rights of Grantor: Grantor hereby reserves unto itself, its successors, and assigns, all rights and privileges in and to the use of the Property which are not incompatible with the restrictions, rights, covenants and easements granted herein.

7. Federal authority: Nothing in this document shall limit or otherwise affect EPA's rights of entry and access or EPA's authority to take response actions under CERCLA, the NCP, or other federal law.

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BASE

8. No public access and use: No right of access or use by the general public to any portion of the Property is conveyed by this instrument.

9. Public notice: Grantor agrees to include in each instrument conveying any interest in any portion of the Property, including but not limited to deeds, leases and mortgages, a notice which is in substantially the following form:

> **NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL PROTECTION EASEMENT AND DECLARATION OF RESTRICTIVE COVENANTS, DATED _____, 20___, RECORDED IN THE OFFICE OF THE CLERK OF OSWEGO COUNTY ON _____, 20___, IN BOOK _____, PAGE ___.**

Within thirty (30) days of the date and such instrument of conveyance is executed, Grantor agrees to provide Grantee and EPA with a certified true copy of said instrument (by certified mail with return receipt) and, if it has been recorded in the public land records, its recording reference.

10. Enforcement: The Grantee shall be entitled to enforce the terms of this instrument by resort to specific performance. All remedies available hereunder shall be in addition to any and all other remedies at law or in equity, including CERCLA. Any forbearance, delay or omission to exercise Grantee's rights under this instrument in the event of a breach of any term of this instrument shall not be deemed to be a waiver by the Grantee of such term or of any of the rights of the Grantee under this instrument.

11. Damages: Grantee shall also be entitled to recover damages for breach of any covenant or violation of the terms of this instrument including any impairment to the remedial action that increases the cost of the selected response action for the Site as a result of such breach or violation.

12. Waiver of certain defenses: Grantor hereby waives any defense of laches, estoppel, or prescription.

13. Covenants: Grantor hereby covenants to and with the Grantee and its assigns, that the Grantor is lawfully seized in fee simple of the Property, that the Grantor has a good and lawful right and power to sell and convey it or any interest therein, that the Property is free and clear of encumbrances and that the Grantor will forever warrant and defend the title thereto and the quiet possession thereof.

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14. Notices: Any notice, demand, request, consent, approval, or communication under this instrument that either party desires or is required to give to the other shall be in writing and shall either be served personally or sent by first class mail, postage prepaid, addressed as follows:

| To Grantor: | To Grantee: |
|---|---|
| Mr. William Gallagher<br>President<br>Industrial Precision Products, Inc.<br>350 Mitchell Street<br>Oswego, New York 13126 | Thomas Dorsey<br>de maximis, inc.<br>Trustee<br>PAS Oswego Site Trust<br>450 Montbrook Lane<br>Knoxville, Tennessee, 37919 |

A copy of each such communication shall also be sent to the following:

| To EPA: | To NYSDEC: |
|---|---|
| Patricia Pierre<br>Project Manager<br>U.S. Environmental Protection Agency<br>Region II<br>Central New York Remediation Section<br>290 Broadway<br>New York, NY 10007-1866 | Mr. Payson Long<br>Environmental Engineer I<br>Remedial Bureau D<br>Division of Environmental Remediation<br>New York State Department of<br>Environmental Conservation<br>625 Broadway<br>Albany, NY 12233-7013 |

15. General Provisions:

Controlling law: The interpretation and performance of this instrument shall be governed by the laws of the United States or, if there are no applicable federal laws, by the law of New York State.

Liberal construction: Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the grant to effect the purpose of this instrument and the policy and purpose of CERCLA. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

Severability: If any provision of this instrument, or the application of it to any person or circumstance, is found to be invalid, the remainder of the provisions of this instrument, or the application of such provisions to persons or circumstances other than those to which it is found to be invalid, as the case may be, shall not be affected thereby.

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Entire agreement: This instrument sets forth the entire agreement of the parties with respect to rights and restrictions created hereby, and supersedes all prior discussions, negotiations, understandings, or agreements relating thereto, all of which are merged herein; provided that nothing in this instrument shall be deemed to alter or modify the Consent Decree.

No forfeiture: Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.

Joint obligation: If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

Assignment: The rights and obligations of the Grantor and Grantee created under this agreement may be assigned only with the prior written consent of EPA. Notice of any such assignments shall be made pursuant to Paragraph 14 of this agreement.

Successors: The covenants, easements, terms, conditions, and restrictions of this instrument shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and permitted assigns and shall continue as a servitude running in perpetuity with the Property. The term "Grantor," wherever used herein, and any pronouns used in place thereof, shall include the persons and/or entities named at the beginning of this document, identified as "Grantor" and their personal representatives, heirs, successors, and permitted assigns. The term "Grantee," wherever used herein, and any pronouns used in place thereof, shall include the persons and/or entities named at the beginning of this document, identified as "Grantee" and their personal representatives, heirs, successors, and permitted assigns.

Captions: The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.

Third-Party Beneficiary: Grantor and Grantee hereby agree that EPA and NYSDEC shall be, on behalf of the public, third-party beneficiaries of the benefits, rights and obligations conveyed to Grantee in this instrument; provided that nothing in this instrument shall be construed to create any obligations on the part of EPA or NYSDEC.

TO HAVE AND TO HOLD unto the Grantee and its assigns forever.

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IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Executed this 1st day of March, 2006.

William Gallagher
President
Industrial Precision Products, Inc.

STATE OF NEW YORK )
) ss.:
COUNTY OF OSWEGO )

On the 1st day of March in the year 2006 before me, the undersigned, personally appeared William Gallagher personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual or the person upon behalf of which the individual acted, executed this instrument.

Notary Public

EDWARD A. MERWINE
NOTARY PUBLIC, STATE OF NEW YORK
QUALIFIED IN OSWEGO CO NO 4966093
My Commission Expires On April 30, 20[illegible]

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This instrument is accepted this 22nd day of February, 2006.

Thomas Dorsey
de maximis, inc.
Trustee
PAS Oswego Site Trust

STATE OF TENNESSEE )
COUNTY OF KNOX )

On the 22nd day of February in the year 2006 before me personally came R. Thomas Dorsey to me known, who, being duly sworn, did depose and say that he/she/they reside(s) in Knoxville, Tennessee (If the place of residence is in a city, including the street and street number, if any, thereof); that he is Trustee of the PAS Oswego Site Trust, the Trust described in and which executed the above instrument; [illegible] Witness my hand and official seal hereto affixed the day and year written above.

Notary Public in and for the
State of Tennessee

LORI R. GILLINGER
NOTARY PUBLIC
AT LARGE
KNOX COUNTY, TN

My Commission Expires: 12/22/07

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Attachments

Exhibit A Legal description of the Property

Exhibit B Approximate location of groundwater plume

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*EXHIBIT A*



Issued By:
TICOR TITLE INSURANCE COMPANY

Schedule A (cont'd)

No: 5403-25282

The land referred to in this Commitment is described as follows:

AN EASEMENT OVER PREMISES DESCRIBED AS:

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Oswego and State of New York, being part of Lot 37 of the 18th Township of Scriba's Patent, bounded and described as follows: Beginning at the southwesterly corner of the property conveyed by Operation Oswego, Inc., the party of the first part herein, to Stephen L. Gallagher, the party of the second part herein, by Deed dated February 20, 1983 and recorded in Oswego County Clerk's Office Book 662 at page 757; thence South 62 deg. 32' 40 seconds West a distance of 200 feet; thence North 27 deg. 27' 20 seconds West to the center line of Mitchell Street; running thence Easterly along the centerline of Mitchell Street to a point in the northwesterly corner of the property conveyed by Operation Oswego, Inc., the party of the first part herein, to Stephen L. Gallagher, the party of the second part herein, by deed dated February 20, 1983 and recorded in the Oswego County Clerk's Office Book of Deeds 662 at page 707; thence South 27 deg. 27' 20 seconds East to the place o beginning, together with the appurtenances and all the estate and rights of the party of the first part in and to said premises.

Being the same premises conveyed to Stephen L. Gallagher and Amelia B. Gallager from Stepohn L. Gallagher by deed recorded in the Oswego County Clerk's Office in Book 513 at page 294.

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Oswego, County of Oswego and State of New York, being a part of Lots 38 and 37, of the Eighteenth Township of Scriba's Patent, bounded and described as follows: BEGINNING at the southwesterly corner of the property conveyed by Operation Oswego County, Inc., to Stephen L. Gallagher by deed dated the 2nd day of December, 1964, which deed is shown in Book 677 at page 661; thence North 62 deg. 32' 40" East 400 feet to a point; thence South 27 deg. 27' 20" East 100 feet to a point; thence South 62 deg. 32' 40" West 680 feet to an iron bar; thence North 27 deg. 27' 20" West, 573.25 feet to a point in the center line of Mitchell Street; formerly known as the Baldwin Road; thence North 80 deg. 23' 40" East along the center line of Mitchell Street 166.67 feet to the northwest corner of said premises described in said deed shown at Book 677 at page 661; thence South 27 deg. 27' 20" East 607.80 feet to the place of beginning. Being a portion of premises delineated on a map entitled "Survey of Part of Lot 37, Eighteenth Township, Scriba's Patent", dated August 21, 1970, prepared by Donald S. Severance, L.S. #35913, which has been heretofore filed in the Oswego County Clerk's Office.

Being the same premises conveyed to Stephen L. Gallagher and Amelia B. Gallagher from Operation Oswego County by deed recorded in the Oswego County Clerk's Office in Book 741 at page 587.



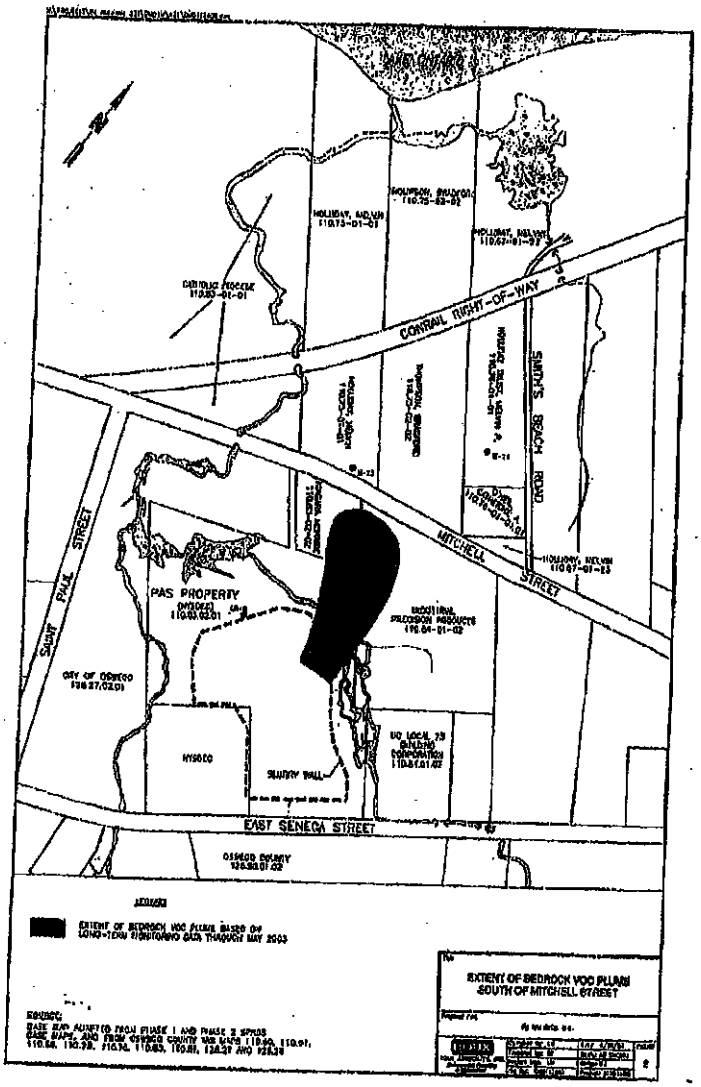

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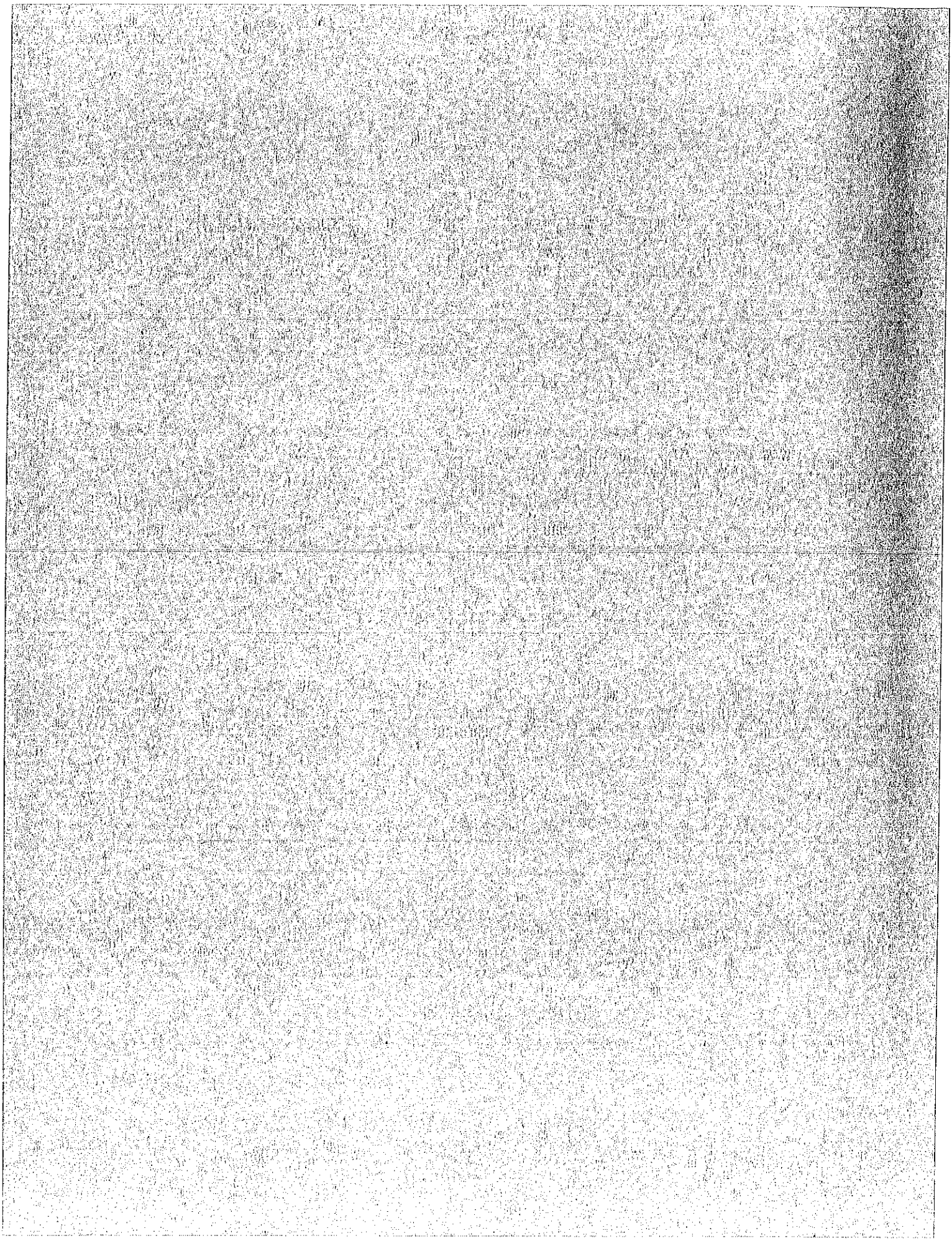
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# *EXHIBIT B*


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George J. Williams, County Clerk




George J. Williams, County Clerk



*de maximis, inc.*

301 Gallaher View Road
Suite 227
Knoxville, TN 37919
(615) 691-5052
Fax (615) 691-6485

July 18, 1995

The Honorable Terrence Hammill
Mayor of Oswego
City Hall
Oswego, NY 13216

Dear Mr. Mayor:

As part of the continued environmental actions at the Pollution Abatement Services (PAS) site, the United States Environmental Protection Agency (USEPA) is requiring a groundwater and environmental study in areas around the PAS site in Oswego. This environmental study, known as the Supplemental Pre-Remedial Design Study (SPRDS), is specified in the December 1993 Record of Decision (ROD) as revised through public comment. The SPRDS activities will include soil, sediment and surface water sampling in the vicinity of Wine Creek adjacent to the city property. The parties to the SPRDS, are required to obtain written permission for access to the city property located at 621 E Seneca Street to conduct tasks specified by the USEPA in conjunction with this environmental study.

The tasks required by this environmental study will be conducted by an independent contractor, Roux Associates, Inc. under the direction of *de maximis, inc.*, who is acting as Project Coordinator. Representatives of the USEPA, or their contractors, will provide regulatory oversight of all project activities, which include those performed by Roux Associates. You should be aware that the USEPA, in their oversight role, will not be liable for the work performed by independent contractors.

The work tasks required for this environmental study include site reconnaissance and collection of soil or sediment samples in accordance with the SPRDS Phase II Workplan. A copy of this SPRDS Phase II Workplan will be provided to the city upon request. These required work tasks will be performed with your prior approval and in a professional manner to minimize any disruption or inconvenience.

Please review the Landowner Consent Form that has been enclosed. The form requests your signature for written permission for the tasks previously described. The form specifies that access will be provided for representatives, agents, or contractors of Roux Associates, Inc., *de maximis*, the USEPA, and the New York Department of Environmental Conservation. We request that you sign the form and mail the completed form to me using the self-addressed return envelope enclosed. A copy of this form has also been enclosed for your records.

If you have any questions, please call me collect at 615-691-5052.

Sincerely,

Clay McClarnon

CSM/mt

cc: Geri Edens
Mark Valentine

LANDOWNER CONSENT FORM

I have read the attached letter dated July 18, 1995 and, based on the representations set forth in the letter, I hereby consent to the entry upon the city property on E Seneca Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including site reconnaissance and collection of soil or sediment samples.

_____
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 128.27.02.1

_____
Print Name

_____
Date

| st-it" Fax Note 7671 | Date 8/17 | # of pages ▶ 1 |
|---|---|---|
| To C. McCLARNON | From MAYOR'S Office | |
| Co./Dept. de maximis, INC. | Co. CITY OF OSWEGO | |
| Phone # | Phone # | |
| Fax # 615-691-6485 | Fax # 315-342-8238 | |

de maximis



LANDOWNER CONSENT FORM

I have read the attached letter dated July 18, 1995 and, based on the representations set forth in the letter, I hereby consent to the entry upon the city property on E Seneca Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including site reconnaissance and collection of soil or sediment samples.

CITY OF OSWEGO, NEW YORK

X By: Terrence M. Hammill

LANDOWNER SIGNATURE (NAME)

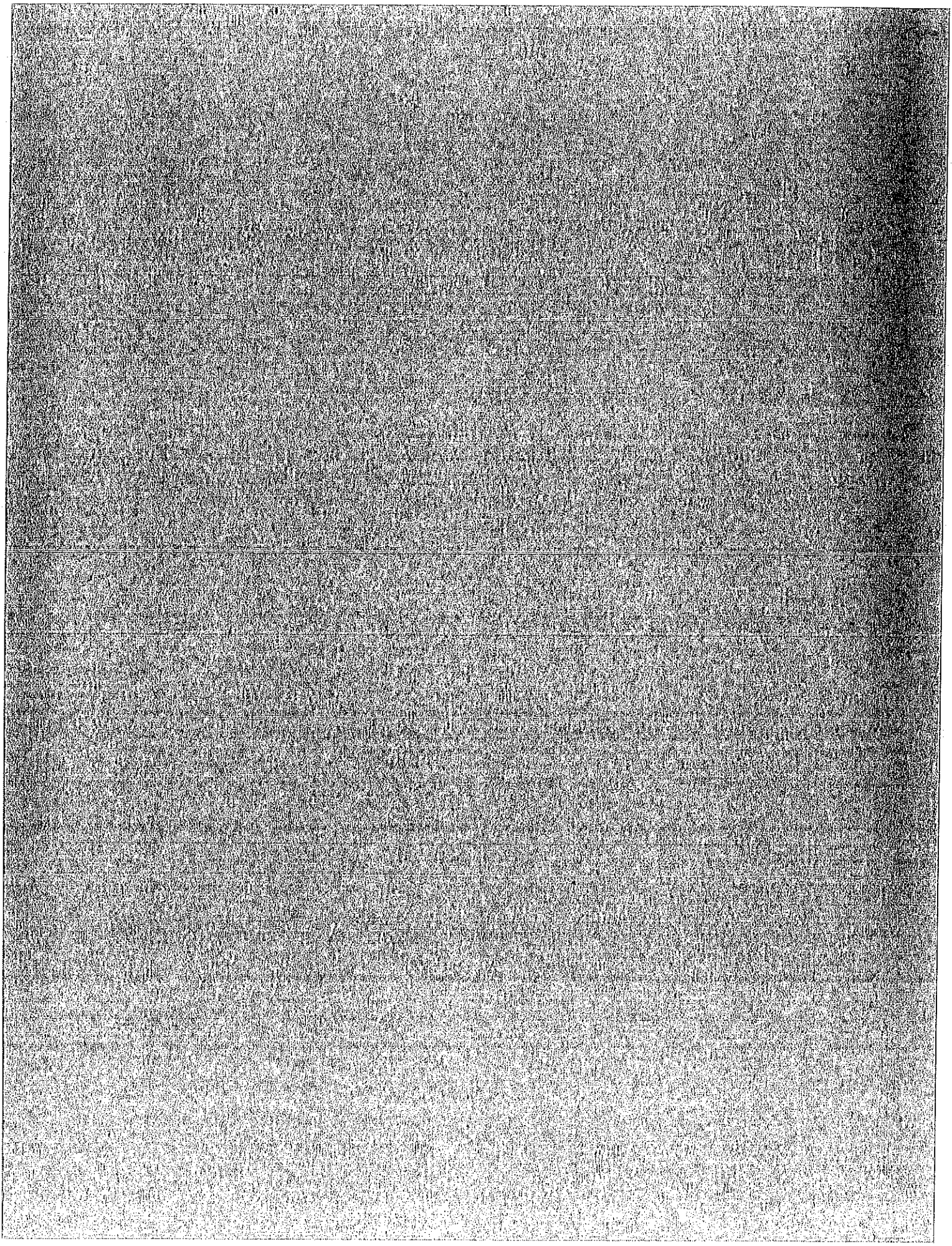
Parcel Nos. 128.27.02.1

Terrence M. Hammill, Mayor

Print Name

August 16, 1995

Date



600
17

## GRANT OF EASEMENT

I, Melvin Holliday, of RD #1 Mitchell Street, City of Oswego, County of Oswego, State of New York, record owner of the real properties described below, for and in consideration of the sum of ten dollars ($10.00), duly paid, the receipt of which is hereby acknowledged, and in the further consideration of the performance of the covenants and agreements by the grantee, as set out and expressed below, do hereby grant, remise, and relinquish to the signatory companies who are members of PAS Oswego Site Group, organized under the terms of the PAS Oswego Site Participation Agreement dated as of May 1, 1994 and operating through the PAS Oswego Site Steering Committee, their successors and assigns, "Grantee" herein, the right, privilege, and easement for ingress and egress to use and occupy temporarily the properties described as:

Parcel No. 110.75.01.01 located at 171 Mitchell Street in Oswego, New York; and

Parcel No. 110.75.02.02 located at 185 Mitchell Street in Oswego, New York,

Parcel No. 110.76.01.1 located at 205 Mitchell Street in Oswego, New York,

RECEIVED
$ 10.00
REAL ESTATE
JUL 29 1994
TRANSFER TAX
OSWEGO
COUNTY

for the purposes of performing any and all tasks related to the Supplemental Pre-Remedial Design Study and the Final Consent Decree at the PAS Oswego Site, or any other tasks conducted in connection with the investigation or remediation of the PAS Oswego Site, including but not limited to installation and periodic testing of groundwater monitoring wells, environmental measurement devices and other related activities.

As a further consideration of this grant, grantee herein agrees as follows:

Indemnification

006874

Grantee agrees to indemnify and hold harmless the grantor, grantor's successors, heirs or assigns for any liability directly resulting from the activities of the Grantee (including its agents, representatives and contractors) conducted upon the above-described properties.

Copies of Reports and Surveys

Grantee shall deliver to grantor, grantor's successors, heirs or assigns copies of all surveys and title reports relating to the above-described properties upon completion of said surveys and title reports.

## Condition of Property

Upon termination of the right, privilege, and easement granted by this instrument for temporary use of the above-described properties, grantee will cause to be removed from the above-described properties, all debris, surplus material, and equipment and leave such property in a condition equivalent to its condition upon the date of execution of this instrument.

## Termination

The right, privilege, and easement granted by this instrument for temporary use of the above-described properties shall cease and terminate immediately following certification by the United States Environmental Protection Agency that the tasks required under this Supplemental Pre-Remedial Design Study and the Final Consent Decree are complete and the access to and use of the above-described properties is no longer necessary for investigation and/or remediation of the PAS Oswego Site.

## Binding Effect

This instrument, and the covenants and agreements contained in this instrument shall inure to the benefit of and be binding and obligatory upon the heirs, executor's administrators, successors, and assigns of the respective parties, and shall run with the land for the aforesaid period and no longer; and shall lease and terminate immediately upon the filling or receiving of the aforesaid certificate form U.S.E.P.A.

In witness whereof, each party to this instrument has caused it to executed on the date indicated below.

Melvin Holliday, Grantor

James Moorman
Chairman, PAS Oswego Site Steering Committee on behalf of the signatory companies who are members of the PAS Oswego Site Participation Agreement dated May 1, 1994

File:Easement.ltr 3085

STATE OF NEW YORK
COUNTY OF OSWEGO SS..
CITY OF OSWEGO

On this 24th day of June, 1994, before me, the subscriber, personally came MELVIN HOLLIDAY, to me known to be the person described in and who executed the within instrument and he acknowledged to me that he executed the same.

Nancy A. Greene

COMMISSIONER OF DEEDS
Exp. 1/11/96

DISTRICT OF COLUMBIA SS

~~STATE OF TENNESSEE~~
~~COUNTY OF~~ SS..
~~CITY OF KNOXVILLE~~

On this 6th day of ~~June~~ July, 1994, before me, the subscriber, personally came JAMES MOORMAN, Chairman of PAS Oswego Site Steering Committee, to me known to be the person described in and who executed the within instrument and he acknowledged to me that he executed the same.

Paula R. Martin

NOTARY PUBLIC Paula R. Martin

Commission Expires March 14, 1995

RETURN TO:
Stephen C. Greene, Esq.
85 West Bridge Street
Oswego, New York 13126

RECEIVED
'94 JUL 29 PM 12 45
OSWEGO COUNTY
CLERK

Rec'd. BK 1256 PG 219

Ph # 315 - 343-6459

*de maximis, inc.*

9041 Executive Park Drive
Suite 401
Knoxville, TN 37923
(615) 691-5052
Fax (615) 691-6485

March 30, 1994

Linda Losurdo
RR9, Box 20, Mitchell St.
Oswego, NY 13126

Dear Ms. Losurdo:

As part of the continued environmental actions at the Pollution Abatement Services (PAS) site, the United States Environmental Protection Agency (USEPA) is requiring a groundwater and environmental study in areas around the PAS site in Oswego. This environmental study, known as the Supplemental Pre-Remedial Design Study (SPRDS), is specified in the December 1993 Record of Decision (ROD) as revised through public comment. The parties to the SPRDS, are required to obtain written permission for access to your property located at 235 Mitchell Street to conduct tasks specified by the USEPA in conjunction with this environmental study.

The tasks required by this environmental study will be conducted by an independent contractor, Roux Associates, Inc. under the direction of *de maximis, inc.*, who is acting as Project Coordinator. Representatives of the USEPA, or their contractors, will provide regulatory oversight of all project activities, which include those performed by Roux Associates. You should be aware that the USEPA, in their oversight role, will not be liable for the work performed by independent contractors.

The work tasks required for this environmental study include installation and periodic testing of groundwater monitoring wells, other environmental measurement devices and related activities. Any clearing of vegetation required in performance of the necessary tasks will be performed with your prior approval and in a professional manner to minimize any disruption or inconvenience.

Please review the Landowner Consent Form that has been enclosed. The form requests your signature for written permission for the tasks previously described. The form specifies that access will be provided for representatives, agents, or contractors of Roux Associates, Inc., *de maximis*, the USEPA, and the New York Department of Environmental Conservation. We request that you sign the form and mail the completed form to me using the self-addressed return envelope enclosed. A copy of this form has also been enclosed for your records.

If you have any questions, please call me collect at 615-691-5052.

Sincerely,

Clay McClarnon

Clay McClarnon

CSM/mt

cc: Geri Edens
Mark Valentine

PAPER

LANDOWNER CONSENT FORM

I have read the attached letter dated March 30, 1994 and, based on the representations set forth in the letter, I hereby consent to the entry upon my property on 235 Mitchell Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including installation and periodic testing of groundwater monitoring wells, environmental measurement devices and other related activities. I understand that any monitoring well will be left in the ground until the USEPA agrees that the environmental study is completed and the well can be removed.

_____
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 110.76.01.2

_____
Print Name

_____
Date

File:\CLAY\3085\ACCESS2.LL

PAPER

3085-14

RECEIVED 4-25-94

*de maximis*



LANDOWNER CONSENT FORM

I have read the attached letter dated March 30, 1994 and, based on the representations set forth in the letter, I hereby consent to the entry upon my property on 235 Mitchell Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including installation and periodic testing of groundwater monitoring wells, environmental measurement devices and other related activities. I understand that any monitoring well will be left in the ground until the USEPA agrees that the environmental study is completed and the well can be removed.

Linda J. Losurdo
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 110.76.01.2

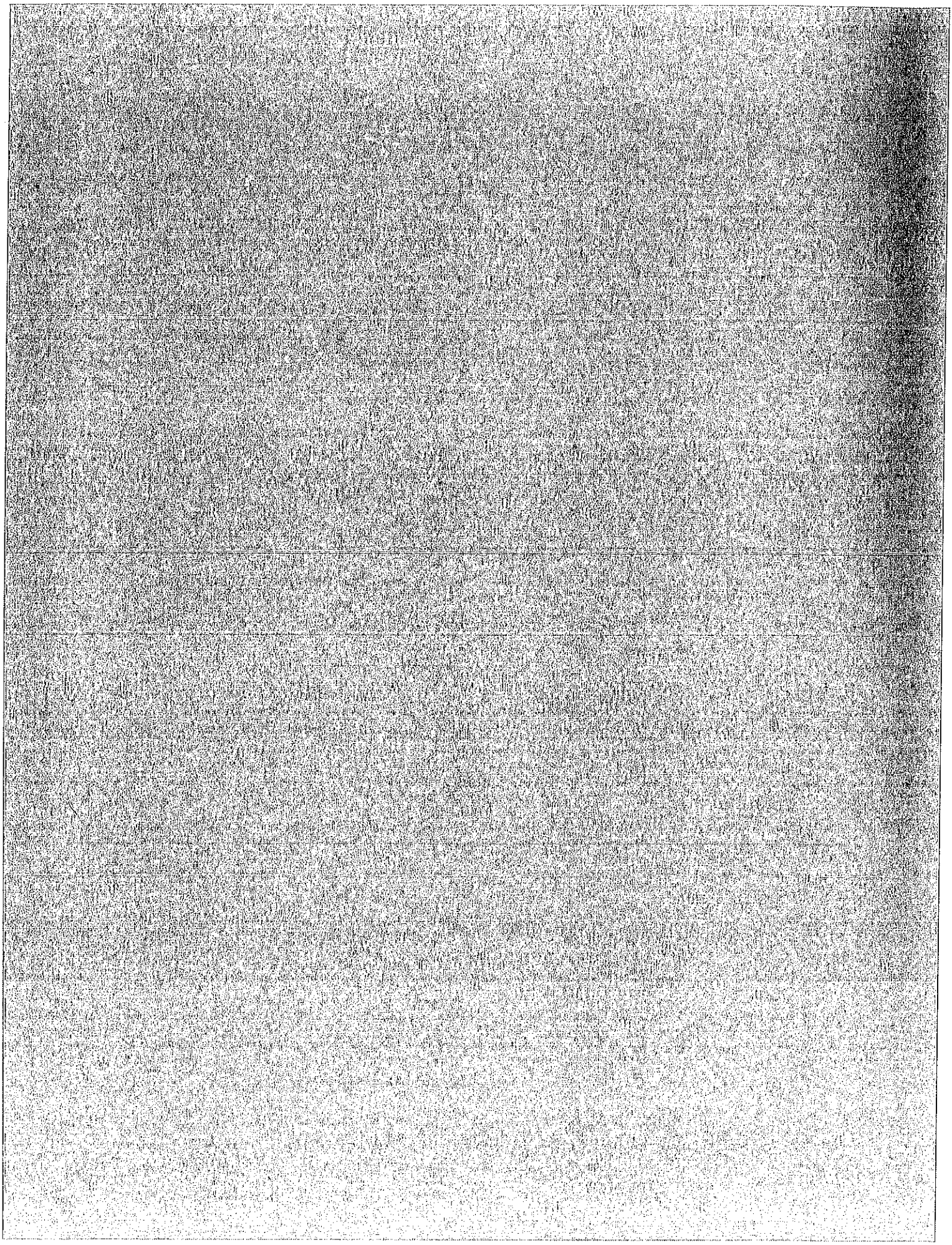
Linda J. Losurdo
Print Name

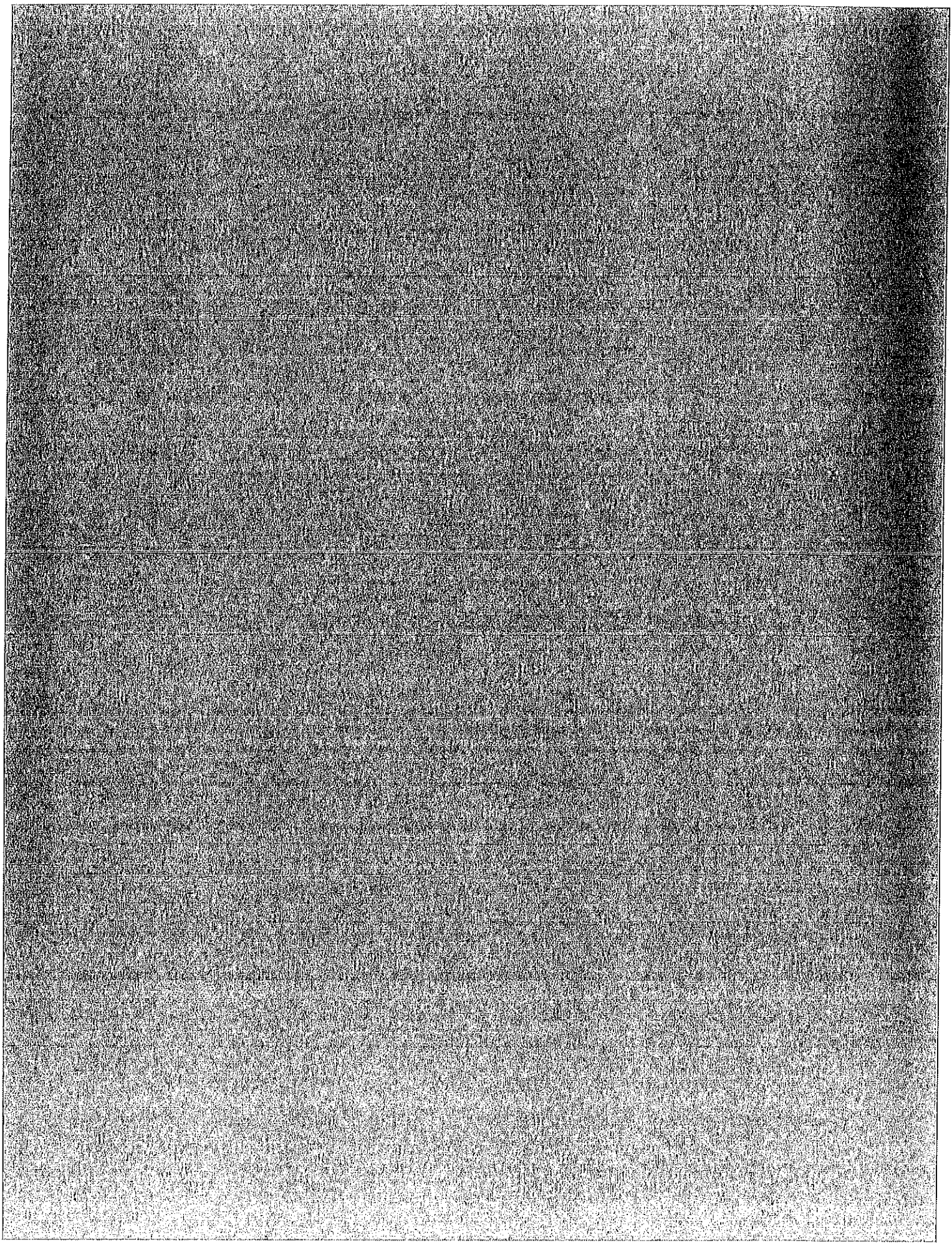
4/20/94
Date

I am signing this with the understanding (as per my phone call from Ms. McClarnon 4-19-94) that one well approx. 4" in diameter will be dug on my property. This well will be placed in a location that I ~~has~~ have been notified of and have agreed upon. LL

File:\CLAY\3085\ACCESS2.LL

PAPER





*de maximis, inc.*

301 Gallaher View Road
Suite 227
Knoxville, TN 37919
(615) 691-5052
Fax (615) 691-6485

July 17, 1995

Mr. John Fitzgibbons
117 E. Steward St.
Oswego, NY 13126

Dear Mr. Fitzgibbons:

As part of the continued environmental actions at the Pollution Abatement Services (PAS) site, the United States Environmental Protection Agency (USEPA) is requiring a groundwater and environmental study in areas around the PAS site in Oswego. This environmental study, known as the Supplemental Pre-Remedial Design Study (SPRDS), is specified in the December 1993 Record of Decision (ROD) as revised through public comment. The SPRDS activities will include soil, sediment and surface water sampling in the vicinity of Wine Creek adjacent to your property. The parties to the SPRDS, are required to obtain written permission for access to your property located at 11-99 George Street to conduct tasks specified by the USEPA in conjunction with this environmental study.

The tasks required by this environmental study will be conducted by an independent contractor, Roux Associates, Inc. under the direction of *de maximis, inc.*, who is acting as Project Coordinator. Representatives of the USEPA, or their contractors, will provide regulatory oversight of all project activities, which include those performed by Roux Associates. You should be aware that the USEPA, in their oversight role, will not be liable for the work performed by independent contractors.

The work tasks required for this environmental study include site reconnaissance and collection of soil or sediment samples. These tasks will be performed with your prior approval and in a professional manner to minimize any disruption or inconvenience.

Please review the Landowner Consent Form that has been enclosed. The form requests your signature for written permission for the tasks previously described. The form specifies that access will be provided for representatives, agents, or contractors of Roux Associates, Inc., *de maximis*, the USEPA, and the New York Department of Environmental Conservation. We request that you sign the form and mail the completed form to me using the self-addressed return envelope enclosed. A copy of this form has also been enclosed for your records.

If you have any questions, please call me collect at 615-691-5052.

Sincerely,

Clay McClarnon

Clay McClarnon

CSM/mt

cc: Geri Edens
Mark Valentine

PAPER

LANDOWNER CONSENT FORM

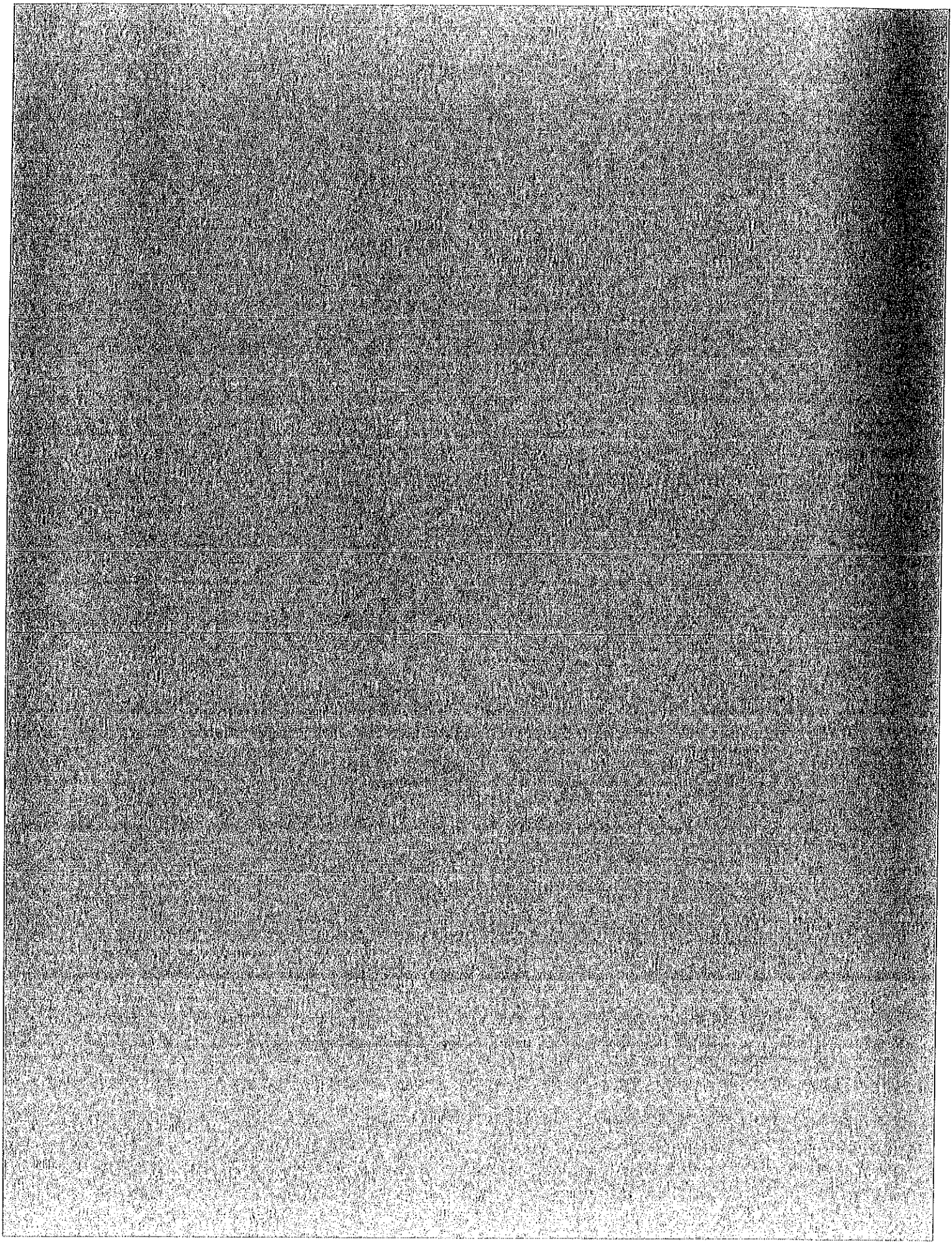
I have read the attached letter dated July 17, 1995 and, based on the representations set forth in the letter, I hereby consent to the entry upon my property on George Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including site reconnaissance and collection of soil or sediment samples.

John E. Fitzgibbons
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 128.27.02.3

JOHN E. FITZGIBBONS
Print Name

AUGUST 28, 1995
Date



3085 - 14

*de maximis, inc.*

301 Gallaher View Road
Suite 227
Knoxville, TN 37919
(615) 691-5052
Fax (615) 691-6485

June 21, 1995

Mr. Doug Buske
Business Manager
Plumbers and Steamfitters
UA Local 73 Bldg. Corp.
RR1, Box 911
Oswego, NY 13126

Dear Mr. Buske:

As part of the continued environmental actions at the Pollution Abatement Services (PAS) site, the United States Environmental Protection Agency (USEPA) is requiring a groundwater and environmental study in areas around the PAS site in Oswego. This environmental study, known as the Supplemental Pre-Remedial Design Study (SPRDS), is specified in the December 1993 Record of Decision (ROD) as revised through public comment. The SPRDS activities will include soil, sediment and surface water sampling in the vicinity of White Creek adjacent to the UA Local property. The parties to the SPRDS, are required to obtain written permission for access to your property located at 705 East Seneca Street to conduct tasks specified by the USEPA in conjunction with this environmental study.

The tasks required by this environmental study will be conducted by an independent contractor, Roux Associates, Inc. under the direction of *de maximis, inc.*, who is acting as Project Coordinator. Representatives of the USEPA, or their contractors, will provide regulatory oversight of all project activities, which include those performed by Roux Associates. You should be aware that the USEPA, in their oversight role, will not be liable for the work performed by independent contractors.

The work tasks required for this environmental study include site reconnaissance and collection of soil or sediment samples. These tasks will be performed with your prior approval and in a professional manner to minimize any disruption or inconvenience.

Please review the Landowner Consent Form that has been enclosed. The form requests your signature for written permission for the tasks previously described. The form specifies that access will be provided for representatives, agents, or contractors of Roux Associates, Inc., *de maximis*, the USEPA, and the New York Department of Environmental Conservation. We request that you sign the form and mail the completed form to me using the self-addressed return envelope enclosed. A copy of this form has also been enclosed for your records.

If you have any questions, please call me collect at 615-691-5052.

Sincerely,

Clay McClarnon

Clay McClarnon

CSM/mt

cc: Geri Edens
Mark Valentine

F:\PROJECTS\3085\ACCESS2.DB

PAPER

LANDOWNER CONSENT FORM

I have read the attached letter dated June 21, 1995 and, based on the representations set forth in the letter, I hereby consent to the entry upon my property on 705 East Seneca Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including site reconnaissance and collection of soil or sediment samples.

_____
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 110.84.01.07

_____
Print Name

_____
Date



PAPER

3085 - 19

*de maximis*



LANDOWNER CONSENT FORM

I have read the attached letter dated June 21, 1995 and, based on the representations set forth in the letter, I hereby consent to the entry upon my property on 705 East Seneca Street in Oswego, New York by representatives, agents, or contractors of parties to the Pollution Abatement Services Supplemental Pre-Remedial Design Study, including Roux Associates, Inc., *de maximis, inc.*, the United States Environmental Protection Agency (USEPA), and the New York State Department of Environmental Conservation to perform work tasks required for the SPRDS including site reconnaissance and collection of soil or sediment samples.

Doug Buske
LANDOWNER SIGNATURE (NAME)

Parcel Nos. 110.84.01.07

DOUG BUSKE
Print Name

6-28-95
Date

# *Appendix O*
# *Annual Report Format*

*Appendix O*
*BBL Environmental Services, Inc.*
*PAS Site*
*Oswego, New York*

***Operation and Maintenance and Long-Term Monitoring Plan***
***Annual Progress Report Format***

Written quarterly progress reports will be prepared in accordance with the Consent Decree and submitted to the USEPA and NYSDEC by the tenth day of every third month. As described in Section X, Paragraph 30 of the Consent Decree, quarterly progress reports will include, at a minimum, the following information in regard to the previous three months of operation and maintenance and long-term monitoring at the Site.

- A description of the actions taken toward achieving compliance with the Consent Decree for the suite;
- A summary of all results of sampling and tests and all other data received or generated during the performance of operation and maintenance and long-term monitoring activities;
- Identification of all plans and other deliverables required by the Consent Decree for the site that were completed and submitted to the USEPA;
- A description of all actions, including, but not limited to, data collection, that are scheduled for the upcoming three months;
- Information describing unresolved delays encountered or anticipated that may affect future scheduled site work, and a description of the efforts made to mitigate the delays or anticipated delays;
- Modifications to either the Operation and Maintenance and Long-Term Monitoring Plan, or activity schedules that have been submitted to or approved by the USEPA.
- A description of activities undertaken in support of the Community Relations Plan, and associated activities anticipated for the upcoming year.

# *Appendix P*
# *Institutional Controls*
# *Annual Certification*

***PAS OSWEGO SUPERFUND SITE***

**Institutional Controls Implementation Plan**
**Annual Certification**
**December 4, 2012**

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REQUIREMENT: The Institutional Control Implementation Plan (ICIP) for the PAS Oswego Superfund Site (Site) as approved by USEPA includes requirements for the period following the execution and recording of the Easement, which were documented in the approved Remedial Action Completion Report. It states that following implementation of institutional controls on the Industrial Precision Products Property, the Site will be inspected on an annual basis to determine whether any intrusive activities have occurred. In addition, building and property records will be reviewed to ascertain whether or not any filings have been made for such activities. The ICIP provides for an annual report summarizing the findings of the inspection and record review to be prepared, along with a certification confirming that operation and maintenance activities continue, and that this annual report would be included with the OM&M progress report to be submitted to EPA in July of each year.

---

CERTIFICATION: The PAS Oswego annual Site and records inspection was performed by de *maximis, inc.* on December 5, 2012. During this visit an inspection was made of the PAS Oswego Site during a monthly operation leachate removal event. This Site inspection was scheduled to allow a visit with a representative of Industrial Precision Products to determine if any intrusive activities may have occurred on their property since the Remedial Action Completion Report was approved in August 2006. *de maximis* also contacted representatives of the City and County to confirm that no potential filings were made to install wells on the Industrial Precision Property. Based on results of the Site and records inspection, a determination has been made that no intrusive activities have occurred or are planned on the Industrial Precision Control Property and that the operation and maintenance activities at the PAS Oswego Site are continuing in accordance with the requirements of Consent Decree.