# REMEDIAL INVESTIGATION/

# INTERIM REMEDIAL MEASURE WORK PLAN

# FOR
# 1001 MAIN STREET
# (FORMER MOBIL SERVICE STATION 99-MST SITE # C915260)
# CITY OF BUFFALO, ERIE COUNTY, NEW YORK

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## EXECUTIVE SUMMARY

This document presents the Remedial Investigations summary and Interim Remedial Measures work plan for the Brownfield Cleanup Program site located at 979-1001 Main Street, Buffalo, NY. The project details are summarized below:

*Contaminant Source and Constituents*

The contamination is sourced from a petroleum release from underground storage tanks associated with a former retail gasoline station. The station operated from approximately 1950 to 1982. The site is currently used for surface parking. Constituents requiring remediation are volatile organic compounds associated with gasoline; in particular benzene, toluene, ethyl-benzene and xylenes.

*Extent of Contamination*

Soil and groundwater have been impacted by the release of gasoline. Soil contamination generally extends from 10 feet below grade to 40 feet below grade, increasing in depth, and decreasing in thickness with distance from the release area. The contamination extends across approximately ½ of the site.

The shallowest site-wide formation for groundwater is generally found within a coarse sand and gravel layer that ranges from ½ to 5-feet thick and is found from 32 to 35 feet below grade. This zone is the main transport layer for contamination beneath the site and is semi-confined by a fine – medium sand and silt above and silt and clay below. Light non-aqueous phase liquid (i.e. residual gasoline product) is also present in this formation in the central area of the site.

*Interim Remedy*

Numerous studies and remedial activities have occurred on the site over the past ten years. Soil vapor extraction and total fluids removal (high vacuum extraction) have had limited effect. To facilitate the development of the site for a large scale office building, **the project has set a goal of meeting Commercial Use Soil Cleanup Objectives** for the site. To achieve this, the project developers will complete the following interim remedial measures:

1. Installation of both permanent and temporary lag and pile steel sheeting shoring to achieve and excavation depth of up to 42 feet.

2. Removal of approximately 16,000 cu.yds. of contaminated soil for off-site disposal or treatment and a regulated facility. Removal of approximately 11,000 cu.yds. of uncontaminated urban fill/soil for offsite reuse.

3. Dewatering of the excavation area; removal of product for off-site disposal; and on-site treatment of contaminated groundwater for discharge into the sanitary sewer system (under permit from the Buffalo Sewer Authority).

4. Confirmatory soil sampling of the excavation walls (where exposed) and bottom to show compliance with the Commercial Use Soil Cleanup Objective.

# 1 INTRODUCTION

This Remedial Investigation/ Interim Remedial Measures ("IRM") Work Plan provides a summary of nature and extent of contamination and a description of the procedures that will be implemented for the remediation of contaminated soil and groundwater under the assigned New York State Department of Environmental Conservation ("NYSDEC") Site #C915260. This IRM has been prepared in accordance with Division of Environmental Remediation ("DER")-10 "Technical Guidance for Site Investigation and Remediation." The remedial activities described in the IRM are in accordance with accepted remedies outlined in DER-15 "Presumptive/Proven Remedial Technologies" that will protect both the environment and the health of the local community. To effectively describe the environmental conditions and remedial activities this IRM will cover the following:

- Description of the current and historic site conditions;
- Summary of contaminants of concern and the extent of the contamination;
- Description and sequence of the remedial activities;
- Quality controls and protocols for analytical sampling;
- Description of the health and safety procedures to protect site workers and the local community and
- Description of community participation activities.

C&S Engineers, Inc ("C&S") has prepared this IRM on behalf of the co-applicants of the BCP Kaleida Health, Kaleida Properties and F.L.C 50 High Street Properties. This IRM presents the remedial activities on petroleum-impacted soil, light non-aqueous phase liquids ("LNAPL"), and groundwater covered under the NYS DEC Site #C915260.

This spill is located on four parcels and a portion of a fifth parcel. The BCP applicants have submitted a subdivision application to the City of Buffalo to combine the block bounded by Main, High, Goodrich and Ellicott Streets into two parcels (1001 Main Street and 818 Ellicott Street). The western parcel (addressed as 1001 Main Street) is planned to be re-developed by F.L.C 50 High Street Properties as a medical office building ("MOB") and totals 1.4 acres.

The Brownfield Cleanup Agreement signed by the co-applicants on June 15, 2012 outlines the extent of the remedial activities to be covered under the BCP. In order to effectively remediate the spill, the area covered under the BCP, the BCP Project Area ("Site") includes the entire western parcel (1001 Main Street) and extends approximately 40 feet east onto the adjacent eastern parcel (818 Ellicott Street). Total acreage of the BCP Project Area "Site" is 1.7-acres. The intent of this IRM is to remediate the subsurface soils to meet Commercial Use Soil Cleanup Objectives ("SCO") standards as defined in NYCRR Part 375-6 and petroleum-impacted groundwater greater than 10,000 micrograms per liter ("ug/L") through excavation of soils and dewatering.

## 1.1 Site Description

The Site is located at 979- 1001 Main Street in the City of Buffalo, New York. The Site is primarily used as a parking lot for Buffalo General Medical Center ("BGMC"). The Site boundary is bordered by the following streets:

| | |
|---|---|
| *North-* | Goodrich Street |
| *East-* | Approximately 315 ft from Ellicott Street (adjoining parking lot) |
| *South-* | High Street |
| *West-* | Main Street |

The BCP boundary runs concurrently with the Site boundary to the north, south and west and totals 1.7 acres. The eastern border of the BCP boundary has been extended approximately 40 ft to the east. Figure 1-1 shows the boundaries of both the parcels and the Site.

## 1.2 Site History

Sanborn Maps of the area from 1889 to 1986 were reviewed for this project. From 1889 to 1986 the property has been used for numerous residential and commercial properties including:

- The University at Buffalo Medical and Dental School on the eastern portion of the property;
- A restaurant and hotel on the eastern portion of the property after the medical school left; and
- From 1950 to 1982 an Exxon-Mobil gas station was located at the southwestern corner of the property.

Petroleum releases from underground storage tanks associated with the former retail gasoline station were discovered on site in 1981. Significant site investigation, groundwater monitoring and remedial activities related to the gasoline release have been ongoing since 1996. Site remedial activities that have been implemented in the last 10 years include soil vapor extraction and total fluids removal (high vacuum extraction). These remedies have had limited effect in the overall reduction of contamination across the site.

The site is currently used for surface parking. Constituents that requiring remediation are volatile organic compounds associated with gasoline, in particular benzene, toluene, ethyl-benzene and xylenes.

# 2 SUMMARY OF ENVIRONMENTAL CONDITIONS

## 2.1 Nature and Extent of Contamination

Site fill, subsurface soil and groundwater have been impacted by petroleum hydrocarbons from the former Exxon-Mobil Service Station at the corner Main and High Streets. The nature and extent of these contaminants have been clearly defined as a result of more than 30 years of investigative and remedial activities at the Site. The majority of the data collected in the site investigations was provided in the BCP Application. Additional data collected to support the IRM approach since the submission of the IRM is summarized and provided as an attachment to this document.

### 2.1.1 Groundwater

Groundwater sampling has occurred quarterly or semi-annually since 1997, although a majority of the wells were installed in 2008. The sampling has shown that the dissolved BTEX contaminant plume has generally remained on-site, with the exception of VOCs present along the Goodrich Street right of way in the area of MW-02. However, sampling has also shown that since the cessation of remedial actions in 2008, the LNAPL plume has moved from the eastern side of the Site, to the central and western side of the Site (Figure 2-1).

To confirm that S ite contaminants are limited to petroleum hydrocarbons, a groundwater sampling event was completed in the fall of 2011. Groundwater samples were collected from selected monitoring wells across the Site as well as off-site along Goodrich Street. The samples were subsequently analyzed for full target compound list and target analytic list set of parameters to evaluate the potential presence for COCs other than petroleum hydrocarbons at the Site. Analytical results indicated that the Site COCs are limited to petroleum hydrocarbons.

Appendix A provides a summary of the analytical results from the fall 2011 sampling event.

The shallowest site-wide formation for groundwater is generally found within a coarse sand and gravel layer that ranges from ½ to 5-feet thick and is found from 32 to 35 feet below grade. This zone is the main transport layer for contamination beneath the site and is semi-confined by fine – medium sand and silt above and silt and clay below. LNAPL (i.e. residual gasoline product) is also present in this formation in the central area of the site.

In January – February of 2012, hydrology studies were completed for the Site to establish potential subsurface flow conditions that may affect dewatering to the site during remediation. These studies identified several conditions with the site hydrology:

1. While previous studies had established areas of saturated soil and had identified the contaminant transport zone to be in the coarse sand and gravel layer between 32 and 35 feet, deeper borings and wells established the this zone is semi confined, and that deeper zones of groundwater are present below 50 feet of depth and within the bedrock fracture system (approximately 100 feet depth). Wells screened within these discrete zones showed independent groundwater levels, indicating communication of groundwater between these zones is minimal.

2. Pumping rates within the formations both within the groundwater transport zone and below were very low. Maximum removal rates were approximately 1 quart per minute.

This indicates that while the dense sand and silt soils have porosity, its conductivity (ability to transmit water) is restricted.

Data from the 2012 hydrology studies is presented in Appendix B.

### 2.1.2 Soils

The extent of soil contamination has been studied over the last ten years in support of design for on-site remediation systems. The most significant data was collected during Exxon-Mobil's 2008 Supplemental Subsurface Investigation. The investigation consisted of the installation of 24 borings, 19 of which were converted to monitoring wells. This investigation provided significant data to delineate the vertical and horizontal limits of the contamination. This data was supplemented by PID screening data collected during the 2010 geotechnical investigation conducted in support of the current proposed Site development and a supplemental Commercial Cleanup Evaluation Investigation in April of 2012 (Appendix C). The data from these three investigations, along with previous studies, has resulted in the following determination of Site conditions:

1. The Site surface contains urban fill of variable thickness (two to 11 feet), which is in turn underlain by sand and a sand silt formation in the top 25 to 35 feet BGS. Below the sand and silt layers is a laterally discontinuous coarse sand and gravel lens one to five feet in thickness, which can act as a preferential pathway for groundwater flow. Beneath this coarse sand and gravel lens(s) are silt and inter-bedded sand beds to a depth of approximately 42 feet BGS.

2. An area of free product (LNAPL) is in the area of groundwater monitoring wells MW-11, MW-22, MW-26, MW-23 and MW-24.

3. The main zone of contaminated soil is in the middle of the Site. The shallowest depth of contamination is approximately 10 feet BGS, although in general the depth ranges from approximately 20 feet BGS (top of contaminated zone) to approximately 40 feet BGS (bottom of contaminated zone).

4. A thin zone of contamination extends northward across the northern property boundary, within the discontinuous coarse sand/gravel lens. This contaminant zone appears to be associated with preferential groundwater flow in that zone. The coarse sand/gravel lens ranges from ½ to five feet in thickness and ranges in depth between 32 to 35 feet BGS.

Based on the assumed remediation goal of Commercial Use, Figures 2-2 and 2-3 respectively show the horizontal limits of soil contamination, the depth of the top of excavation of contaminated soils and the depth of the bottom of excavation.

Based on the nature and extent of the soil and groundwater contamination, the following sections present the estimated volumes of contaminated soil, groundwater and free product that are likely present on-site.

### 2.1.3 Area and Volume of Contaminated Soil

Contaminated soil is expected to exist on-site from a depth of approximately 10 feet (15 feet above groundwater) to a depth of approximately 40 feet BGS. In the area of the Site where free product is present, contaminated soils may be present to a depth to 42 feet BGS.

Potential volume of contaminated soils that exceed Commercial Use SCOs is approximately 430,000 cubic feet; or approximately 16,000 cubic yards. The calculation is presented in the table below:

*Table 2-1: Estimate of Contaminated Soil to be Removed*

| | | | | **TOTAL VOLUME** | |
|---|---|---|---|---|---|
| **CONT. THICKNESS** | **MEDIAN RANGE** | **CONTAMINATED AREA (sq ft)** | **MEDIAN TOTAL DEPTH** | **VOLUME (cu ft)** | **VOLUME (cu yds)** |
| 5-10 | 0 | 0 | | - | - |
| 10-15 | 0 | 0 | | - | - |
| 15-20 | 0 | 0 | | - | - |
| 20-25 | 22.5 | 12,542 | 40 | 282,195 | 10,452 |
| 25-30 | 27.5 | 5,534 | 42 | 152,198 | 5,637 |
| | | | | 434,393 | 16,089 |

2.1.4 Area and Volume of LNAPL

Data collected during the February 2012 groundwater sampling event indicates that there is an area of LNAPL free product located in the central portion of the Site. The area of the free product is approximately 0.15 acres. Assuming an overall average thickness of ½ -inch of free product within the 0.15 acres and an average soil porosity of 30% [1], approximately 586 gallons of free product is estimated to be on the Site (See Figure 2-1). The calculation is presented in the table below:

*Table 2-2: Estimate of LNAPL to be Removed*

| | | | | **TOTAL VOLUME** | |
|---|---|---|---|---|---|
| **LNAPL THICKNESS (ft)[1]** | **AREA (ft)[2]** | **VOLUME (cu ft)** | **AVG POROSITY[3]** | **VOLUME (cu ft)** | **VOLUME (gal)[4]** |
| 0.04 | 6,534 | 261 | 30% | 78 | 586 |

1: 1-inch = 0.08 feet

2: 0.15 acres = 6,534 sq ft

3: Based on average for a medium sand matrix

4: 1 cu ft LNAPL = 7.48 gal

### 2.1.5 Area and Volume of Contaminated Groundwater

Calculation of the volume of contaminated groundwater on-site is represented by the area on-site where BTEX contamination in groundwater exceeds 10.0 ug/L, as represented on Figure 2-1. This occurs in a total area of approximately 1.02 acres.

While the potentiometric top of the water table (25 feet BGS), the groundwater bearing zoning is generally confined in from a depth of 32-35 feet BGS, with a maximum thickness of 5 feet. Assuming a saturated zone of 5 feet, this is a volumetric area of approximately 85,000cubic feet. Using an average interstitial total porosity of 39% (for coarse sands[1]) and 7.48 gallons of water per cubic foot, approximately 635,000 gallons of contaminated groundwater exceeding 10 ug/L can be expected to be in place in this area of the Site. Using an effective porosity of 30%, approximately 147,000 gallons will remain entrained in the soil if full dewatering of the soil layer were to occur. The calculation is presented in the table below:

*Table 2-3: Estimate of Contaminated Groundwater Volume*

| | | | | **TOTAL VOLUMES** | |
|---|---|---|---|---|---|
| **Water bearing Zone Thickness (ft)[1]** | **AREA (ft)[2]** | **VOLUME (cu ft)** | **AVG POROSITY[3]** | **VOLUME (cu ft)** | **VOLUME (gal)[4]** |
| 5.0 | 43,560 | 217,800 | 39% | 84,942 | 635,366 |
| 5.0 | 43,560 | 217,800 | 30% | 65,340 | 488,743 |
| | | | | **Gallons Entrained** | **146,623** |

1: Based on coarse sand and gravel layer max. thickness

2: Area Rounded to 1 acre

3: Based on average porosity for a coarse sand matrix (39%) and effective porosity (30%)

4: 1 cu ft water = 7.48 gal

Of the remaining groundwater entrained in the soil, an area of approximately 18,076 sq. ft will be removed and disposed during remediation. With an assumed saturate thickness of 5 feet, a total of approximately 61,000 gallons of entrained contaminated water will be removed through excavation. The calculation is presented in the table below:

[1] Argonne National Laboratories (http://web.ead.anl.gov/resrad/datacoll/porosity.htm)

*Table 2-4: Estimate of Contaminated Groundwater Volume in Excavated Soils*

| | | | | TOTAL VOLUME | |
|---|---|---|---|---|---|
| **Water bearing Zone Thickness (ft)[1]** | **AREA (ft)[2]** | **VOLUME (cu ft)** | **AVG POROSITY[3]** | **VOLUME (cu ft)** | **VOLUME (gal)[4]** |
| 5.0 | 18,076 | 90,380 | 9% | 8,134 | 60,844 |
| | | | Less total gal. of contaminated water entrained | | 146,623 |
| | | | | **Entrained Gallons Remaining** | **85,779** |

1: Based on coarse sand and gravel layer max. thickness

2: Area Rounded to 1 acre

3: Based on 9% difference between porosity (39%) and effective porosity (30%) of onsite soils

4: 1 cu ft water = 7.48 gal

Of the estimated 635,000 gallons of contaminated water beneath the Site, approximately 86,000 gallons will remain after the IRM dewatering and excavation is completed.

# 3 IRM WORK PLAN

The remedial action will be comprised of three main tasks:

- The construction of the shoring system;
- Soil excavation and removal and
- Groundwater collection and treatment.

This remedial action has been determined to be appropriate for the cleanup of contaminated soil to achieve specific soil cleanup standards outlined in NYCRR Part 375-6.

## 3.1 IRM Cleanup Objectives

The remedial work planned for the Site is intended to remediate soil contamination to meet Commercial Use Soil Cleanup Objectives ("SCO") as specified in NYCRR Part 375-6. Soil contamination is variable throughout the Site. The highest concentration of contamination is located in the surrounding soils of the release source. The remedial action will target removing these soils, and associated groundwater and LNAPL, for attaining compliance with the Commercial Use SCO.

## 3.2 Phasing of Remedial Activities

To ensure efficient use of the resources required for the remediation of the Site, it is essential that the sequence of Site activities be well defined. The IRM work at the Site will be conducted in the following sequence:

- Waste Characterization
- Site Preparation
- Installation of shoring system
- Placement of groundwater collection and treatment system
- Excavation of petroleum contaminated soils
- Sampling and analysis of soil to confirm Commercial SCO has been completed
- Construction of sub-grade facilities

Work is proposed to begin in September of 2012. It is estimated that remedial activities will last approximately 4 months. All sampling activities will be conducted in accordance with NYSDEC quality assurance protocols outlined in **Section 5: Quality Assurance and Quality Control Protocols.** The Citizen Participation Plan ("CPP") that informs the public on the proposed remediation is included in Appendix D. The public health of the local community will be monitored during construction activities as outlined in the Community Air Monitoring Plan ("CAMP") provided in Appendix E. C&S will provide oversight, air monitoring, soil screening, GPS data and photographic and other documentation during the IRM activities. The following sections define the work required to complete each of the tasks comprising the remedial activities of the IRM.

### 3.2.1 Waste Characterization

Waste characterization of the soils was conducted in October, 2010. Waste characterization activities took place before construction; composite samples were collected at ten boring locations throughout the Site. Composite samples were sent to a laboratory and were analyzed for the following contaminates:

- TCLP VOCs
- TCLP SVOCs
- TCLP Metals
- PCBs
- Pesticides
- Ignitability

- Flash Point

The results of the sampling determined the soil was not a hazardous waste. A letter summarizing the results was transmitted to the NYSDEC in December 2010.

### 3.2.2 Site Preparation

*Public Exclusion Areas*

A public exclusion area will be clearly marked out around the Site by the temporary construction fencing.

To the north, fencing will be extended across Goodrich Street, and extended eastward to provide Site security and to complete the "exclusion zone". Fencing will also be installed north-south along the eastern Site boundary, except where entry in and out of the excavation will take place. Additionally, to allow for dedicated pedestrian access through this area during construction, jersey barriers will be placed along Main Street, between High and Goodrich Streets. Figure 3-1 shows the general construction layout of the site.

### 3.2.3 Shoring System

*Site Shoring*

The perimeter of the Site will be permanently shored with lag and pile sheet metal wall system. This system creates a water tight seal using overlapping, interconnected steel plates. Shoring will be installed to a depth of 45 feet BGS, in certain areas along Main Street, where excavation may be deeper to reach contamination; shoring will be installed to a depth of 50 feet.

Shoring along the perimeter will utilize tie-backs into the surrounding soil to maintain structural integrity during excavation. Where excavation does not extend all the way to the Site perimeter, excavation walls will use a combination of temporary shoring and soil benching to maintain wall integrity. Figure 3-2 shows the plan view of the shoring system, Figure 3-3 shows a typical section design of the shoring system.

### 3.2.4 Groundwater Collection and Treatment System

An industrial discharge permit will be secured from the Buffalo Sewer Authority ("BSA") to discharge groundwater into the sanitary sewer system. The BSA permit allows treated water to be discharged into the BSA sanitary sewer system. The discharge is limited only to periods where no rain or snow melt are occurring.

Groundwater collected as part of Site de-watering activities will be pumped into on-site settling tanks. From the tanks, it will subsequently pass through an activated carbon treatment vessel for treatment of VOCs prior to discharge to the BSA sewer system. In addition to carbon treatment, the system will also contain an oil-water separation chamber to collect LNAPL that may enter the dewatering system. Figure 3-4 shows a schematic of the treatment system.

Once excavation begins, several sumps may be utilized to maintain the water level in the excavation. In addition, in several areas where free-phase petroleum is known to exist, sumps may be used to temporarily collect product. The product will be removed by periodically vacuuming the LNAPL.

Pre- and post-treatment samples of collected water will be periodically sampled per permit requirements to verify treatment system performance. Samples will be analyzed on a 48 hour turnaround time. The flow of water through the treatment system will be monitored with a flow meter to record total volume treated and discharged to the BSA.

Treatment system operational records including daily volumes, product recovered, influent and effluent analytical results, times of operation and permit discharge monitoring reports will be kept on-site and will also be included in the final engineering report.

### 3.2.5 Excavation

Soils within the shoring wall area will be excavated at various depths across the Site, Figures 2-2 and 2-3 show the estimated depths of excavation. Contaminated soil within the release source ranges from 10 ft BGS to 42 ft BGS; excavation will remove contaminated soils to the level required to met Commercial SCO. The following lists the type of equipment to be used during excavation (Note that this list is subject to change as needed by the contractor as excavation conditions and needs change.):

- Caterpillar 312BL Backhoe
- Komatsu PC200LC Backhoe
- John Deere 240 D LC Backhoe
- Komatsu D68 Dozer
- Komatsu WA180 Front Loader
- Dump Trucks

*Soil/Fill Management*

Excavation will remove both contaminated and non-contaminated soils. Excavated soils will be inspected for staining or discoloration and screened for the presence of VOCs on-site into "clean soil" and "contaminated soil" using a photo-ionization detector ("PID"). Contaminated soils removed from areas of known petroleum impacts, based on previous records of soil analytical results and PID readings, will be segregated for disposal at a NYSDEC approved facility. Petroleum impacted soils excavated from the Site will be sent for offsite disposal at a licensed disposal facility, or will be sent to a licensed soil treatment facility. In both instances, the soils will be direct loaded into trucks and shipped to a licensed disposal or treatment facility with no overnight stockpiling.

Excavated soils will be continuously screened with PID during remediation activities; soils that exceed 10 ppm or contain a petroleum odor will be segregated for additional testing. Sampling parameters of excavated soils will be generally based on guidance provided DER-10 Table 5.4(e)10; or in coordination with the NYSDEC field representative. Results of the excavated soil testing will be reported to the NYSDEC. Excavated soils that are below residential criteria in Appendix 5 will be sent for offsite reuse.

If temporary stockpiling is required, odors will be controlled by covering the soils with polyethylene plastic.

Once the excavation nears the target depths and horizontal limits, soil samples will be collected to assess whether the Commercial Use SCO has been met.

*Soil Tracking Prevention*

Trucks and equipment leaving the Site will be broom-cleaned to remove clumped soil and prevent soil tracking off-site. Standard construction protocols will be utilized, including stone aprons and periodic sweeping of the construction exit areas. Adjacent roads in the designated truck route will be inspected daily to ensure the prevention of soils migration. Roads that have any soils accumulation will be mechanically scraped rather than mechanically broom swept to reduce fugitive dust emissions. Excavation on-site will occur in a manner which minimizes the tracking of on-road haul trucks from moving through contaminated soils. On-site stone haul roads may be constructed as necessary to reduce the amount of soils tracked onto the stone apron areas. The use of water to clean truck tires will be avoided to prevent the generation of potentially impacted water.

### 3.2.6 Closure Sampling Plan

Soil sampling will be performed to assess whether cleanup standards have been achieved. As outlined in **Section 3.1: IRM Cleanup Objectives;** remediation will be deemed complete when soil analytical results from the excavation limits demonstrate that VOC concentration are below the Commercial Use. Samples will be taken after horizontal and vertical excavation limits have been completed. Since BTEX and related petroleum compounds have been verified as the only Site COCs, closure soil sample analysis will be limited to VOCs using EPA Method 8260B.

Approximately 10% of the closure samples (bottom and side walls) will be analyzed for all parameters on TCL organics and TAL metals list**.**

Prior to excavation, the Site will be divided into excavation sectors. These sectors will be used to systematically excavate the hole and provide sufficient entrance and egress. Once field monitoring indicates that remediation objectives have likely been met (based on estimated excavation limits, soil vapor readings, odor and visual concurrence), closure samples of the bottom and sidewalls of the excavation will be collected for VOC analysis on a 24-hour turnaround basis. If sampling indicates that targeted remedial goals have not been met, excavation in that area will resume and the process will be repeated. If analytical results indicate that the remedial goals have been met, the results will be transmitted to the NYSDEC and excavation will cease in that sector.

One sidewall sample will be collected for each 30 linear feet by 20 vertical feet of excavated sidewall and one sample will be collected from the bottom of each 225 square feet (15 by 15 feet) of excavated bottom. Category B deliverable package will be requested to validate analytical results by a third-party expert.

All sampling locations will be given a discrete identifying number, its depth will be recorded (based on construction surveying crew data) and its horizontal location will be recorded using a survey quality hand held GPS, with an approximate accuracy of 2 foot. Post excavation soil samples will be collected in concurrence with the NYSDEC field representative.

3.2.7 Sub-grade facilities

Once the sampling and analysis has confirmed the soil remedial objectives have been met, construction of the MOB will begin. The MOB will have two floors of sub-grade parking. The shoring system will be left in place and will become the walls for the sub-grade parking. Once the parking decks are in place, construction of the above-grade portion of the MOB will commence.

# 4 REMEDIAL INVESTIGATION

This section describes the activities to determine if the IRM was successful in achieving Commercial Cleanup standards.

## 4.1 Environmental Conditions

Site fill, subsurface soil and groundwater have been impacted by petroleum products that were released from USTs from the former Exxon-Mobil Service Station. Over thirty years of investigations on the Site has concluded that the COCs are primarily BTEX compounds. The following summarizes what is known about the extent of contamination across the Site:

1. The main contaminated zone exists in the middle of the Site where the former USTs were located. Soils within the main contaminated zone is impacted from 10 ft BGS to 40 ft BGS.

2. An area of free product (LNAPL) is in the area of groundwater monitoring wells MW-11, MW-22, MW-26, MW-23 and MW-24. These wells are within the estimated extent of the release area.

3. Groundwater exists as a semi-confined aquifer, with a coarse sand/gravel lens between 32 and 35 feet BGS and ranges between ½ to five feet in thickness. This coarse sand/gravel zone acts serves as the method contaminant transport to the north across the Site.

4. Contaminated soil has expanded from the release area northward across the northern property boundary, with preferential groundwater flow in the discontinuous coarse sand/gravel lens.

Further detail can be found in **Section 2.1 Nature and Extent of Contamination**.

## 4.2 Remedial Investigation Rationale

The IRM as described in the previous section (**3.0 IRM Work Plan**) allows for a comprehensive view of subsurface conditions. Implementing the IRM will enhance the understanding of fate and transport of contamination. The remedial investigation will follow the source removal and Site dewatering that was accomplished in the IRM. This investigation will assess the remaining conditions after the IRM has been employed.

### 4.2.1 Soils

Soil sampling will assess whether Commercial Cleanup SCOs have been achieved. Soil sampling will be preformed after horizontal and vertical limits have been completed. One sidewall sample will be collected for each 30 linear feet by 20 vertical feet of excavated sidewall and one sample will be collected from the bottom of each 225 square feet (15 by 15 feet) of excavated bottom. Based on these guidelines, approximately 80 bottom samples and 36 sidewall samples will be collected.

All sampling locations will be given a discrete identifying number, its depth will be recorded (based on construction surveying crew data) and its horizontal location will be recorded using a survey quality hand held GPS, with an approximate accuracy of 2 foot. Post excavation soil samples will be collected in concurrence with the NYSDEC field representative.

Based on the estimated limits and depths of excavation approximately 80 confirmatory bottom and 36 sidewall samples will be collected for closure sampling. Closure samples will be tested for VOCs and SVOCs. Twelve samples (10% of total number of closure samples) will be tested for TCL organics (VOCs, SVOCs, PCBs and Pesticides) and TAL Metals. Closure sampling is further discussed in **Section 3.2.6 Closure Sampling Plan**.

Samples will be collected as grab samples from both the excavation floor and side walls. Samples will be collected as outlined in DER-10 for grab samples and discussed in **Section 5.1.1 Sampling Methods** in this RI/IRM Work Plan.

### 4.2.2 Groundwater

Post-remediation groundwater monitoring wells will be installed after the Site has been backfilled. The number and final location of the monitoring wells will be determined in concordance with the NYSDEC field representative, however it is anticipated that at least four wells will be placed on Site.

Monitoring wells will be advanced to approximately 35 ft BGS (as determined from curb elevation). Wells will be constructed using a 2-inch inside diameter flush-joint Schedule 40 PVC pipe and 10 to 15 feet (length of screen will be dependent on field conditions) 0.010-inch slotted well screen. Subsequent to installation of the pipe and well screen, a sand pack will be constructed from the base of the well to one foot above the top of the well screen. A bentonite clay seal will then be installed on top of the sand pack. Riser piping will be 5 feet above the bentonite seal. Installation will be completed after the wells have been grouted to ground surface or to the top of the lowest parking garage floor. In areas that were excavated to depths at or below 35 feet, the well screen will extend 5 feet below the maximum depth of excavation. Well screens will also extend to a minimum of 2 feet above groundwater level.

After installation, two to three rounds of sampling over six months will be conducted. Prior to sample collection, water levels will be measured and recorded from all monitoring wells. Following water level measurements, all monitoring wells will be purged using a polyethylene bailer. Samples will be taken subsequent to purging and after fresh groundwater has re-filled the wells; samples will be collected using polyethylene bailer and collected in the appropriate sample bottles provided by the analytical laboratory. Groundwater samples will be analyzed for VOCs in accordance with EPA SW-846/Method 8260 methodology. Category B deliverable package will be requested to validate analytical results by a third-party expert.

### 4.3 Reporting

Based on the results of the remedial investigation a Remedial Investigation / Alternative Analysis Report ("RI/AAR") will be submitted to the NYSDEC. The RI/AAR will assess the effectiveness of the IRM in comparison with other remedial options in achieving site cleanup levels.

## 5 QUALITY ASSURANCE AND QUALITY CONTROL PROTOCOLS

To ensure that suitable and verifiable data results are obtained from the information collected at the Site, quality assurance procedures are detailed in this section.

### 5.1 Sampling Methods, Analytical Procedures and Documentation

5.1.1 Sampling Methods

Sampling procedures will be conducted in accordance with the NYSDEC *Sampling Guidelines and Protocols Manual*. Collecting of representative samples will include the following procedures:

- Ensuring that the sample taken is representative of the material being sampled;
- Using proper sampling, handling and preservation techniques;
- Properly identifying the collected samples and documenting their collection in field records;
- Maintaining chain-of-custody; and
- Properly preserving samples after collection.

*Soil Sampling*

Soil sampling will be performed using two methods: (1) field screening using a PID and (2) grab samples.

Several discrete samples will be taken from each soil pile and placed into individual zip-lock bags. Soil samples will be allowed to sit in sealed zip-lock bag for a short period of time (minimum of five minutes). Head space measurements will then be taken from each zip-lock bag. To prevent cross contamination zip-lock bags will not be reused and will be properly disposed. Calibration of all electronic field screening equipment will be completed daily and will be done to manufacture's specifications.

Contaminates of concern during excavation are BTEX and petroleum related compounds; only analysis of VOCs will be sampled using the grab method. As detailed in the *Sampling Guidelines and Protocols Manual*, grab samples will be placed in 8oz wide mouth glass jars. Sample jars will immediately be placed on ice in a cooler.

Soil sample frequency will be based on the guidance with DER-10. Confirmatory bottom soil samples will be collected on a 15 by 15 foot square grid (225 sq ft). Based on the estimated excavation area of 18,000 sq. ft., approximately 80 confirmatory bottom samples will be collected. Confirmatory side wall samples will also be collected, because of the estimated depth of the excavation, sidewall samples will be collected on a 30 by 20 foot grid. Based on the estimated limits and depths of excavation (560 linear feet of wall to a maximum depth of 40 feet), approximately 36 side-wall samples will be collected. Note that this area does not include side-wall samples from the western property boundary that will consist of a permanent shoring face. Final number of samples will be verified once field excavation limits are achieved. Sampling frequency will be established in concurrence with the NYSDEC field representative.

An estimated total of 120 confirmatory samples will be collected from both the walls and bottom. As stated in DER-10, if conditions warrant (discrete layers of staining, etc.), additional samples may also be collected. Table 4-1 presents a summary of the number of samples scheduled for collection.

Confirmatory samples will be collected in a timely manner, based on the following DER guidance:

- Within 24 hours of excavation, samples should be collected from the zero to six-inch depth interval;
- After 24 hours, samples should be collected at six to twelve inches depth interval at the excavation floor; and
- No water should be present in the excavation bottom where bottom samples are collected.

*Water Sampling*

Water sampling will be conducted on the de-watering treatment system to demonstrate compliance with the BSA temporary Industrial Discharge permit. Effluent samples will be collected as required to show that discharge limits are being met, as well as to track the effectiveness of the carbon filtration media and estimate the timing for carbon replacement. Additionally, influent samples will be collected in order to track the general VOC concentrations that are entering the treatment system, and to correlate the concentration of VOCs in groundwater remaining in the ground. It is estimated that 20 influent samples will be collected during site activities.

Samples will be collected in 40 ml glass jars and immediately placed on ice. The water will be analyzed for VOCs on a 24-hour turnaround time.

*QA/QC Sampling*

Duplicate samples will be collected from a minimum of 10% of the locations, selected randomly. Based on an estimate of 120 confirmatory soil samples and 20 water influent samples, 12 duplicate soil and 2 water samples will be collected .

Matrix Spike /Matrix Spike Duplicates ("MS/MSD") will also be collected on a 10% allocation. Therefore an additional 12 soil and 2 water samples will be collected for MS/MSD analysis.

*Table 4-1*: Summary of Estimated Sampling

| Sample Type | Matrix | Est. # | Purpose |
|---|---|---|---|
| Excavation Bottom | Soil | 80 | Confirmatory |
| Excavation Wall | Soil | 40 | Confirmatory |
| Groundwater Influent | Water | 20 | Confirmatory |
| Duplicate Soil | Soil | 12 | QA/QC |
| Duplicate Influent | Water | 2 | QA/QC |
| MS/MSD –So. | Soil | 12 | QA/QC |
| MS/MSD –Aq. | Water | 2 | QA/QC |
| **Total** | | **168** | |

5.1.2 Analytical Procedures

*Laboratory Analysis*

Laboratory analysis will be conducted by a third-party laboratory that is accredited by the NYSDOH Environmental Laboratory Accreditation Program ("ELAP"). Laboratory analytical methods will include the most current NYSDEC Analytical Services Protocol ("ASP").

Remedial investigations have concluded that the Site is impacted by petroleum compounds which are primarily BTEX. Soil samples sent to a certified laboratory will be tested for Total Compound List VOCs using the U.S. EPA Method 8260B. To fill in data gaps from previous investigations approximately 10% of post excavation soil samples, in addition to VOC, will be analyzed for the following contaminates:

- Target Analyte List for Metals and Cyanide (EPA Method 6010C);
- Target Compound List for Semi-volatile Compounds (EPA Method 8270);
- Target Compound List for Pesticides/Aroclors (EPA Method 8081A); and
- Polychlorinated biphenyls (EPA Method 8082)

Category B deliverable will be requested to be used in a third-party data validation.

*Data Usability*

Data Usability Summary Report ("DUSR") will be performed by a third-party data consultant using the most recent methods and criteria from the U.S. EPA. The DUSR will assess all sample analytical data, blanks, duplicates and laboratory control samples and evaluate the completeness of the data package.

### 5.1.3 Documentation

*Custody Procedures*

As outlined in NYSDEC *Sampling Guidelines and Protocols*, a sample is under the following conditions:

- It is in your actual possession;
- It is in your view after being in your physical possession;
- It was in your possession and then you locked or sealed it up to prevent tampering; or
- It is in a secure area

The environmental professional will maintain all chain-of-custody documents that will be completed for all samples that will leave the Site to be tested in the laboratory.

*Soil Manifests*

All soil being removed from the Site will be tracked by bills-of-lading forms.

Truckloads of contaminated soil will be tracked using bills-of-lading provided by the respective disposal or recycling facility.

Records of truck loads will be kept on-site during construction and recording sheets and copies of the bills of lading documenting the final total trucked tonnage will be provided in the Final Engineering Report.

*Water Sampling Results*

Treatment influent and effluent analytical results will be included in the Final Engineering Report. The final influent sampling results from each dewatering sump will provide documentation of the remaining groundwater conditions.

*Air Monitoring Records*

Air monitoring will be conducted for both community air protection and for in-hole construction activities. Air monitoring will be conducted continuously during active excavation periods. The monitoring will include particulate and VOC screening. All records will be kept on-site during construction and will be made available for regulatory inspection. A daily air monitoring log, including discrete and time-weighted average meter readings, will be maintained through the end of remedial field activities. The specifics of the air monitoring procedures and criteria are detailed in the CAMP (community perimeter monitoring) and HASP (in-hole activities).

# 6 HEALTH AND SAFETY

To assure the safety of the workers and the local community, monitoring practices of the work environment will be in place during all phases of IRM activities. A Health and Safety Plan ("HASP") was prepared that details procedures for maintaining safe working conditions and minimizing the potential for exposure to hazardous material. The HASP is provided in Appendix F.

Air monitoring during active construction will be conducted using PID and a aerosol particle meter. Details on air monitoring are provided in the Community Air Monitoring Plan ("CAMP"). The CAMP is provided in Appendix E.

# 7 REPORTING

An environmental professional from C&S will be on-site on a full-time basis to document IRM activities. Documentation will include the following parts:

- Daily reports of remedial activities;
- CAMP results; and
- Photographs and fieldwork maps.

## 7.1 Construction Monitoring

Reporting procedures will include a daily report. Information that may be included on the daily report includes:

- Processes and location of construction under way;
- Equipment and personnel working in the area;
- Number and type of truckloads of soil/fill removed from the Site;
- A description of off-site materials received;
- Approximate verification sampling locations and sample designations; and
- Problem identification and corrective measures.

The NYSDEC will be notified of problems requiring modifications to this IRM prior to proceeding. Photographic documentation of the IRM activities will be prepared by C&S throughout the duration of the remediation as necessary.

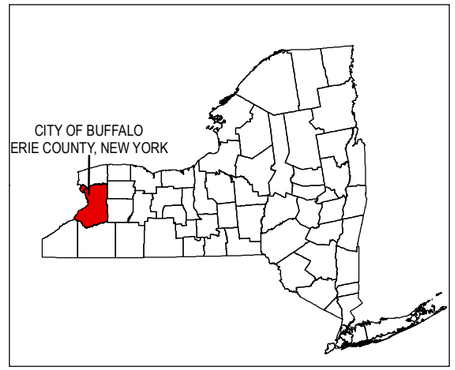
A summary of the IRM activities will be submitted to the NYSDEC as monthly progress reports and will be included in the Final Engineering Report. All data submitted to the NYSDEC will be in approved electronic data deliverable ("EDD") format.

# 8 SCHEDULE

Site preparation is planned to begin in December of 2012. An approved IRM by mid-November would start remedial activities by mid-January, 2013. IRM activities are anticipated to last 3 months.

# FIGURES


## Location Map




## Legend

- Proposed Medical Office Building Site
- Proposed BCA Boundary

## Notes

1) Digital Orthophoto from NYS GIS Clearinghouse. Buffalo 2011 1 ft resolution.

2) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

0 100 200 Feet

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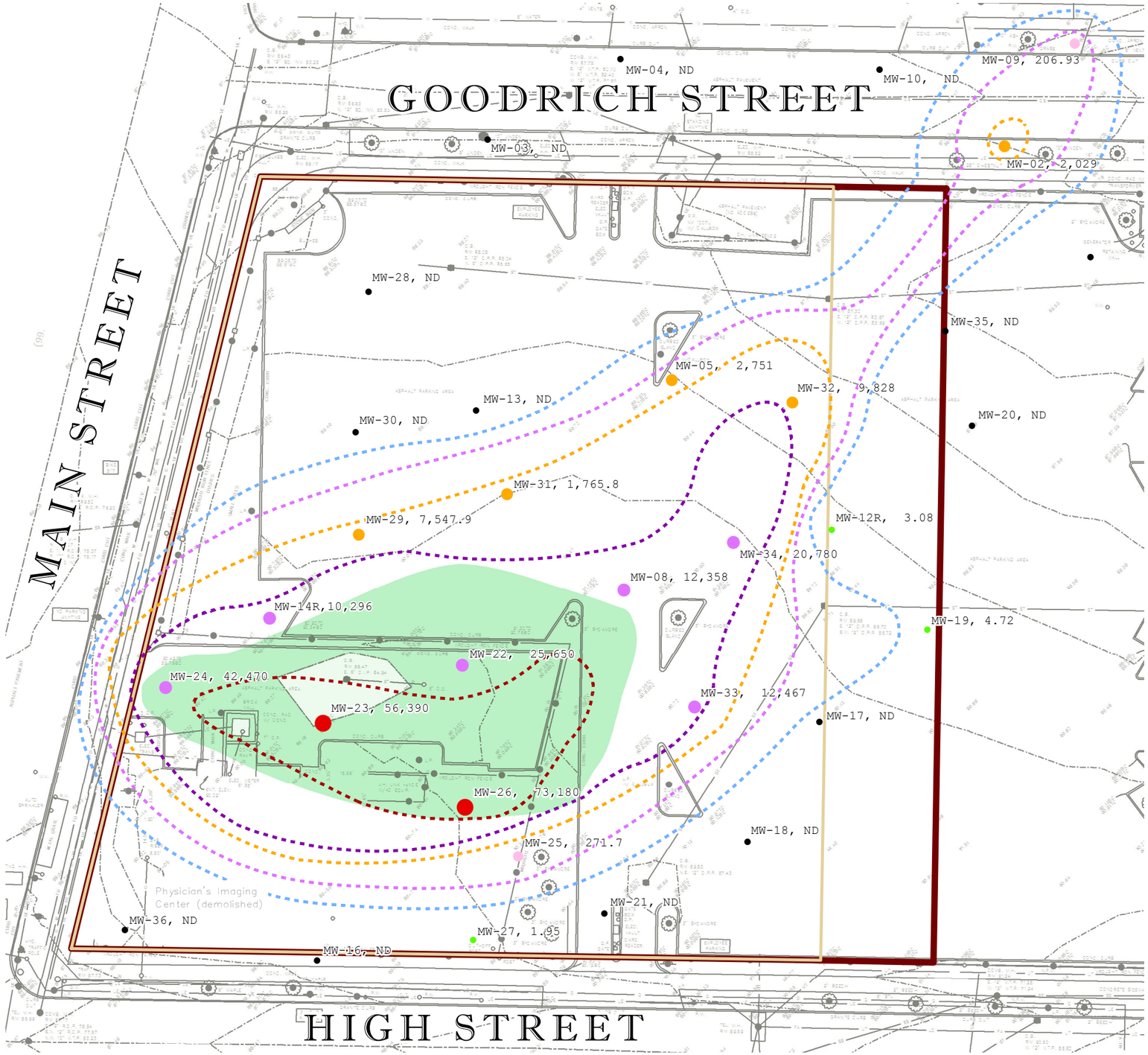
SITE PLAN

FIGURE 1-1

Path: F:\Project\K11-Kaleida Health\K11.002.001 - MOB Brownfield Cleanup Program\Environmental-study\CADD-GIS\GIS\Projects\IRM_FIGURE_1-1_SITE_LOCATION.mxd




## Legend

- Proposed Medical Office Building Site
- Proposed BCA Boundary
- Separate Phase Hydrocarbon Plume ("Free Product Zone") February 2012

**Total BTEX Concentration (ug/L) February 2012**

- Not Detected
- <10
- 10 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 50,000
- >50,000

Location Identifier — Concentration ug/L
MW-24, 42,470
ND = Not Detected

**Total BTEX Isoconcentration Contours (ug/L) February 2012**

- <10
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 50,000
- >50, 000

## Notes

1) Survey data from McIntosh & McIntosh P.C. "Topographical Map of Part of Lot-29, TWP.-11, R.-8, Holland Purchase" Job No. 7669-B(2) September 24, 2008.

2) The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities, either in service or abandoned. The surveyor has not physically located the underground utilities.

3) Groundwater sampling results from February 16, 2012 GES Monitoring Report.

4) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
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GROUNDWATER CONTAMINANT PLUME

FIGURE 2-1

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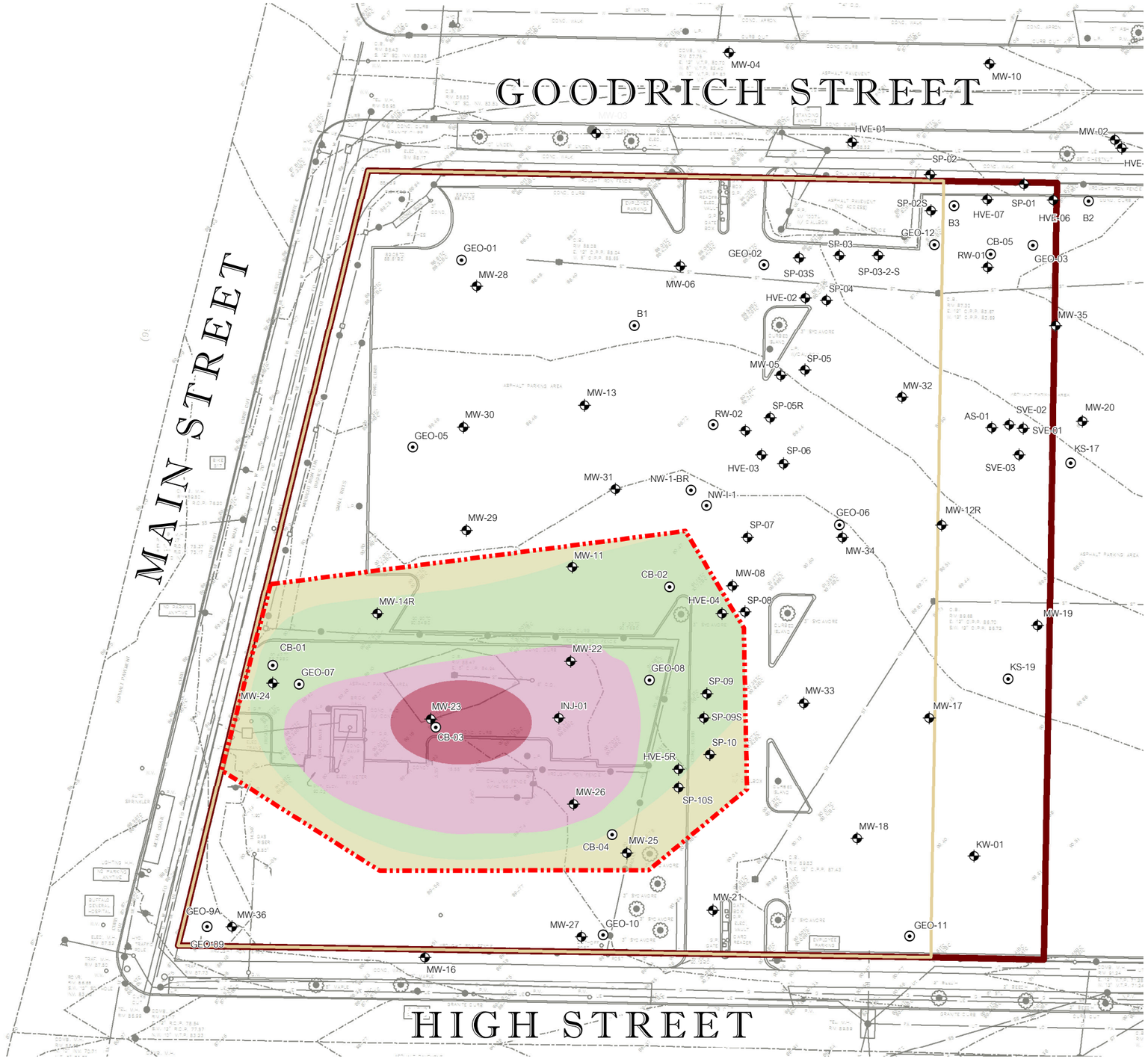


## Legend

- Monitoring Well
- Soil Boring
- Proposed Medical Office Building Site
- Proposed BCA Boundary
- Proposed Limits of Excavation

**Top of Contaminated Soil - Feet Below Ground Surface ("ftbgs")**

- 10 ftbgs
- 15 ftbgs
- 20 ftbgs
- 30 ftbgs

## Notes

1) Survey data from McIntosh & McIntosh P.C. "Topographical Map of Part of Lot-29, TWP.-11, R.-8, Holland Purchase" Job No. 7669-B(2) September 24, 2008.

2) The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities, either in service or abandoned. The surveyor has not physically located the underground utilities.

3) Groundwater sampling results from March 23, 2012 GES Monitoring Report.

4) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
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SOIL EXCAVATION LIMTS
TOP OF CONTAMINATION

FIGURE 2-2

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## Legend

- Monitoring Well
- Soil Boring
- Proposed Medical Office Building Site
- Proposed BCA Boundary
- Proposed Limits of Excavation

**Bottom of Contaminated Soil - Feet Below Ground Surface ("ftbgs")**

- 35 ftbgs
- 40 ftbgs

## Notes

1) Survey data from McIntosh & McIntosh P.C. "Topographical Map of Part of Lot-29, TWP.-11, R.-8, Holland Purchase" Job No. 7669-B(2) September 24, 2008.

2) The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities, either in service or abandoned. The surveyor has not physically located the underground utilities.

3) Groundwater sampling results from March 23, 2012 GES Monitoring Report.

4) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
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SOIL EXCAVATION LIMTS
BOTTOM OF CONTAMINATION

FIGURE 2-3

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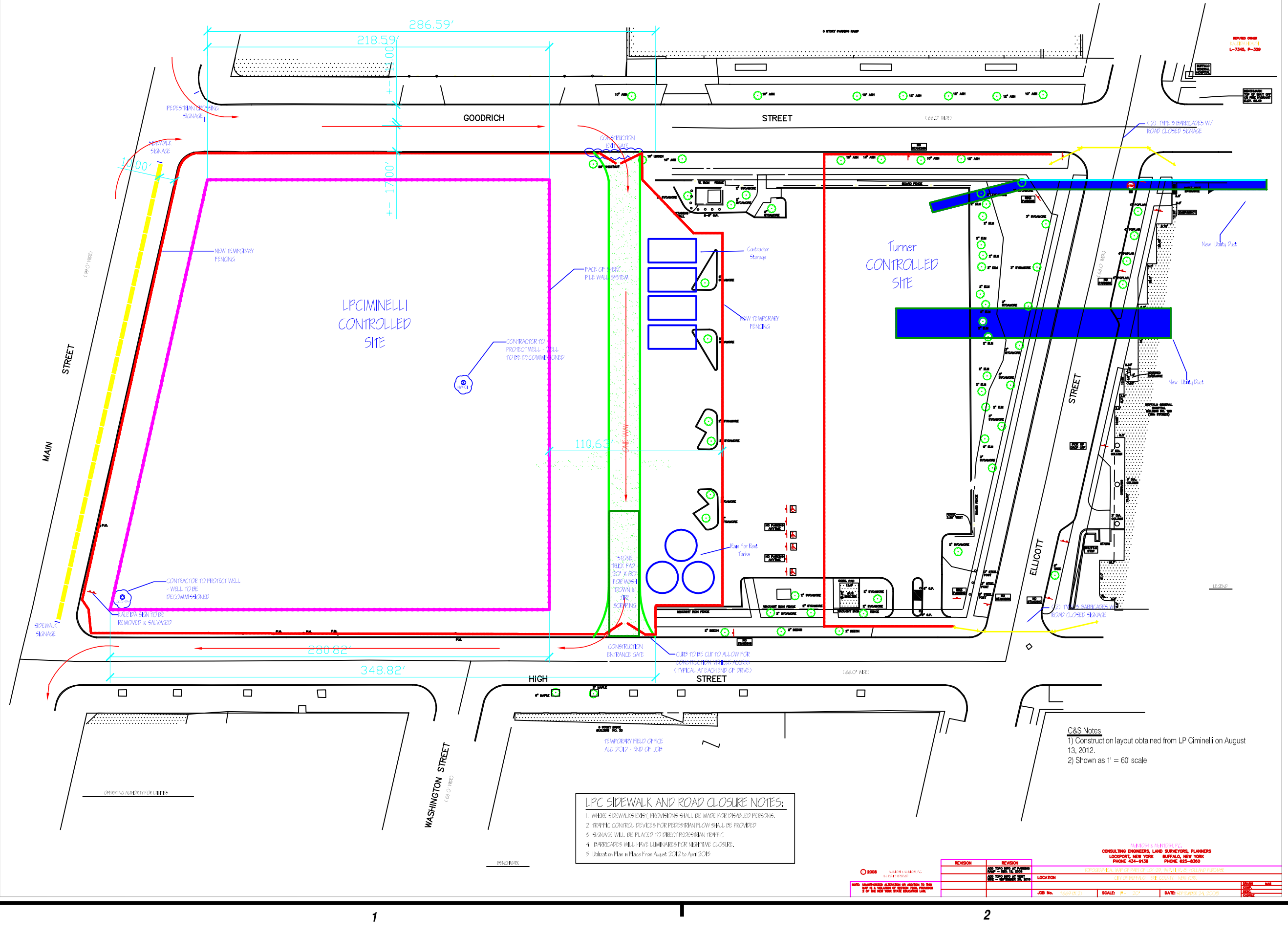


LPC SIDEWALK AND ROAD CLOSURE NOTES:

1. WHERE SIDEWALKS EXIST, PROVISIONS SHALL BE MADE FOR DISABLED PERSONS.
2. TRAFFIC CONTROL DEVICES FOR PEDESTRIAN FLOW SHALL BE PROVIDED
3. SIGNAGE WILL BE PLACED TO DIRECT PEDESTRIAN TRAFFIC
4. BARRICADES WILL HAVE LUMINARIES FOR NIGHTTIME CLOSURE.
5. Utilization Plan in Place From August 2012 to April 2015

C&S Notes

1) Construction layout obtained from LP Ciminelli on August 13, 2012.
2) Shown as 1" = 60' scale.

REMOVED


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GENERAL CONSTRUCTION LAYOUT

FIGURE 3-1




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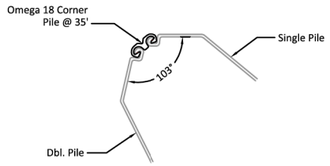
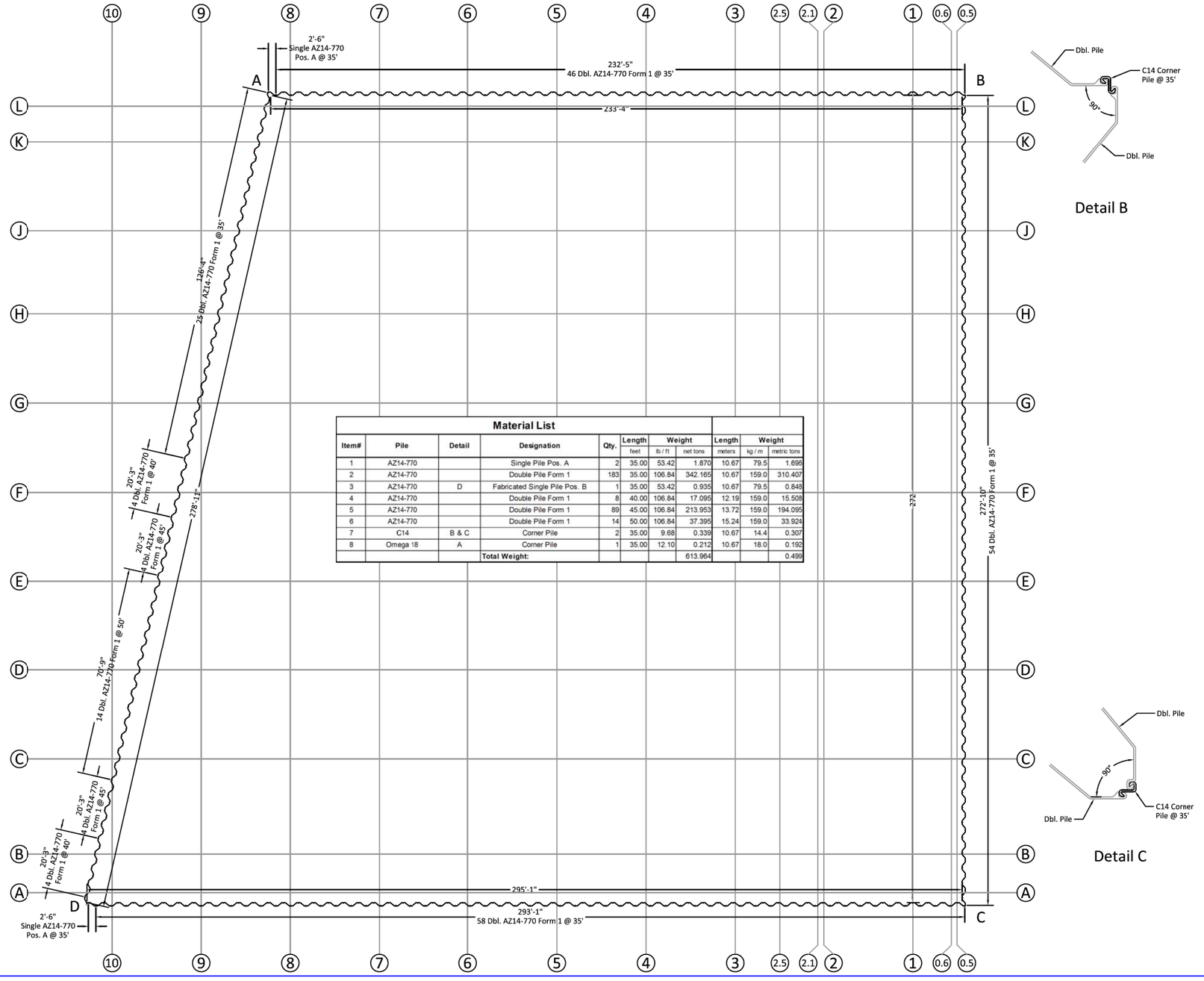
BUFFALO, NEW YORK PHONE 625-8360


Aug. 14, 2012 – 10:39am
F:\Project\K11-Kaleida Health\K11.002.001 – MOB Brownfield Cleanup Program\Environmental-study\CADD-GIS\CAD\Figure 3-1 General Construction Layout.dwg

Preliminary

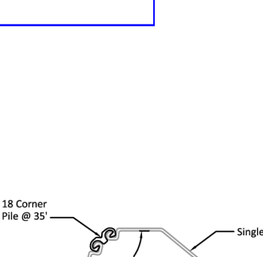



Detail A




**Material List**

| Item# | Pile | Detail | Designation | Qty. | Length feet | Weight lb / ft | Weight net tons | Length meters | Weight kg / m | Weight metric tons |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | AZ14-770 | | Single Pile Pos. A | 2 | 35.00 | 53.42 | 1.870 | 10.67 | 79.5 | 1.695 |
| 2 | AZ14-770 | | Double Pile Form 1 | 183 | 35.00 | 106.84 | 342.165 | 10.67 | 159.0 | 310.407 |
| 3 | AZ14-770 | D | Fabricated Single Pile Pos. B | 1 | 35.00 | 53.42 | 0.935 | 10.67 | 79.5 | 0.848 |
| 4 | AZ14-770 | | Double Pile Form 1 | 8 | 40.00 | 106.84 | 17.095 | 12.19 | 159.0 | 15.508 |
| 5 | AZ14-770 | | Double Pile Form 1 | 89 | 45.00 | 106.84 | 213.953 | 13.72 | 159.0 | 194.095 |
| 6 | AZ14-770 | | Double Pile Form 1 | 14 | 50.00 | 106.84 | 37.395 | 15.24 | 159.0 | 33.924 |
| 7 | C14 | B & C | Corner Pile | 2 | 35.00 | 9.68 | 0.339 | 10.67 | 14.4 | 0.307 |
| 8 | Omega 18 | A | Corner Pile | 1 | 35.00 | 12.10 | 0.212 | 10.67 | 18.0 | 0.192 |
| | | | **Total Weight:** | | | | 613.964 | | | 0.499 |




Detail D




Detail B




Detail C

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|---|---|---|---|
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| 0 | Released For Approval | 06-15-12 | JA |

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MOB Garage
Buffalo New York
CONTRACTOR
H. F. Darling

| | |
|---|---|
| DATE: | 06-15-12 |
| SCALE: | N.T.S. |
| DRAWN BY: | J. Austro |
| PROJECT NO. | 041-3132 |
| SHEET: | L—1 |
| REV. | 1 |

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PLAN LAYOUT SHORING DESIGN

FIGURE 3-2

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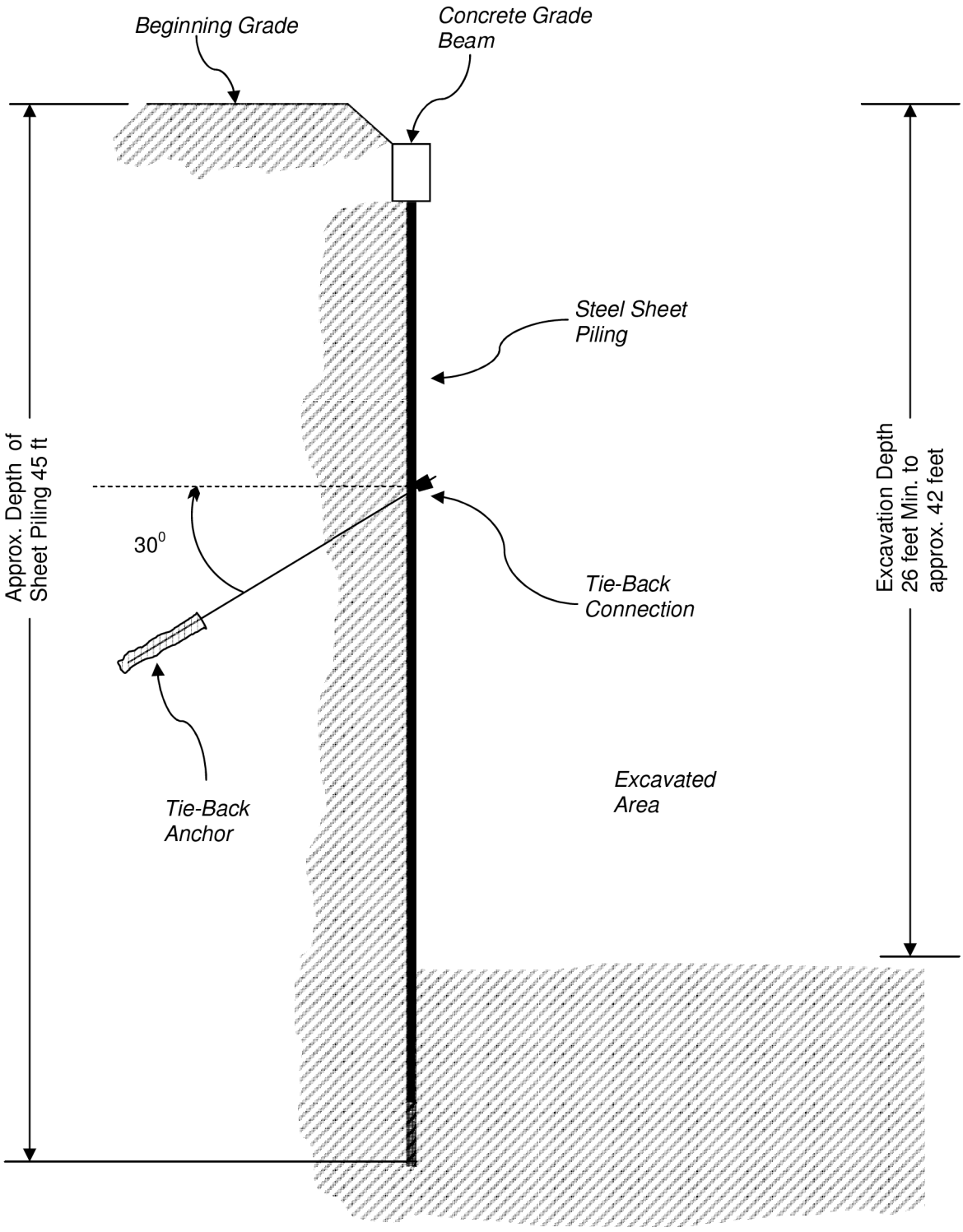


TITLE:

# TYPICAL SHORING DESIGN SECTION

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| | |
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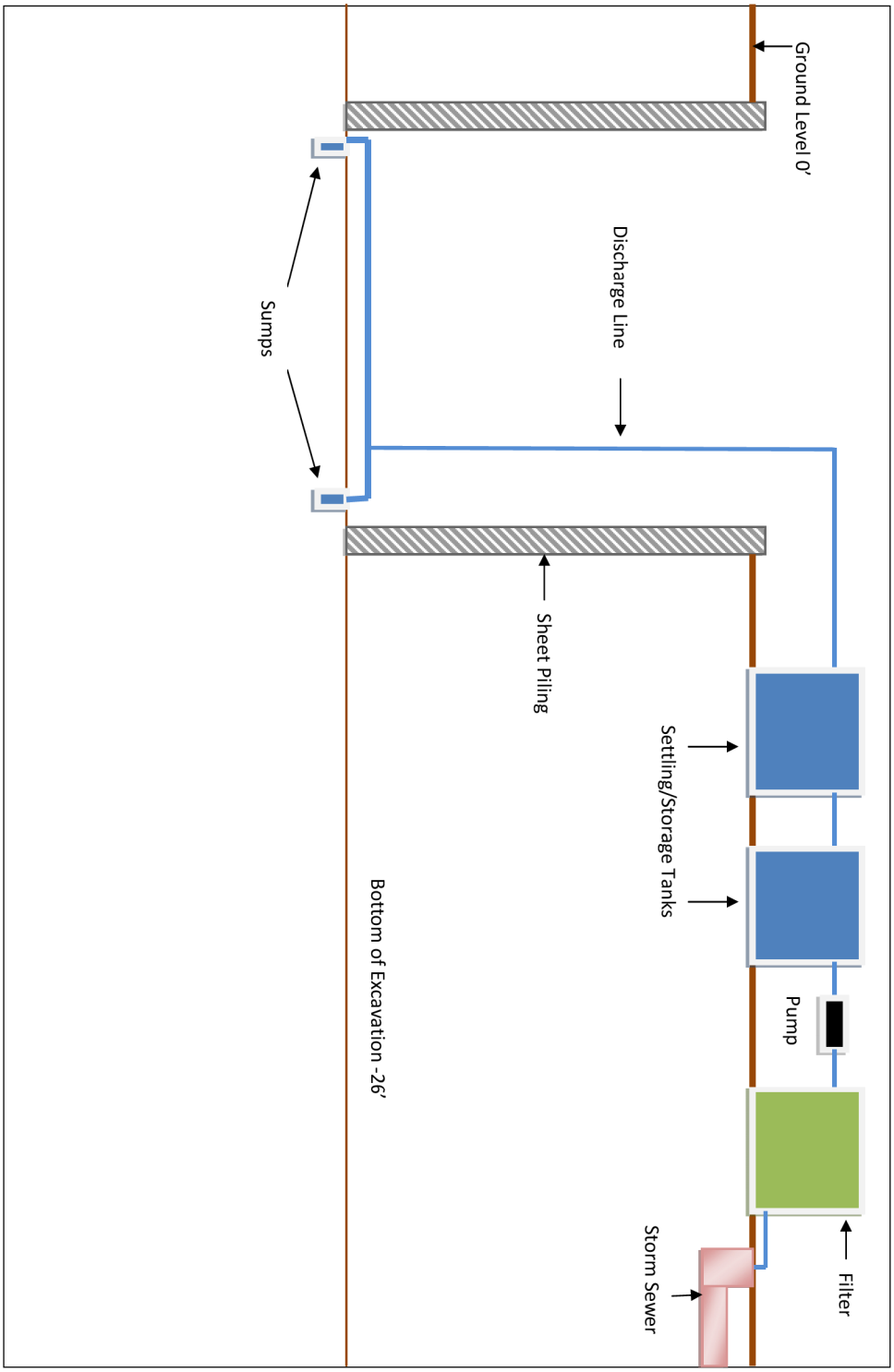
FIGURE 3-3




TITLE:

# DEWATERING SCHEMATIC

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| | |
|---|---|
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FIGURE 3-4

# APPENDICIES

# APPENDIX A
## SUMMARY OF FALL 2011 GROUNDWATER SAMPLING EVENT

APPENDIX A
Summary of Fall 2011 Groundwater Sampling Event

Sample Location Map

N

Goodrich St

Main St

Ellicott St

High St

MW-04
MW-10
MW-09
MW-03
HVE-01
MW-02
HVE-08
MW-A
SP-02
SP-01
HVE-06
SP-02S
HVE-07
GEO-4
MW-07
GEO-1
SP-03S
SP-03
GEO-3
MW-06
GEO-2
SP-03-2-S
RW-01
MW-28
HVE-02
SP-04
MW-35
MW-05
SP-05
MW-32
MW-13
SP-05R
SVE-02
MW-20
MW-30
GEO-5
AS-01
SVE-01
HVE-03
SP-06
SVE-03
MW-31
GEO-6
MW-29
MW-12R
SP-07
MW-34
MW-11
MW-08
MW-14R
SP-08
MW-19
HVE-04
MW-22
GEO-8
GEO-7
SP-09
MW-33
MW-24
MW-23
INJ-01
SP-09S
MW-17
HVE-5R
SP-10
SP-10S
MW-26
MW-18
MW-25
GEO-9
MW-36
MW-27
GEO-10
MW-21
MW-16

Notes:
1) Survey data is from McIntosh & McIntosh, P.C. (Job No. 7669-C) Sept. 30, 2010 survey, and was provided by Kalieda Health.

**Legend**

- Proposed Groundwater Sampling
- Subject Property
- Monitoring Well
- Sparge Well
- Extraction Well
- Recovery Well
- Soil Vapor Extraction Well
- Geotechnical Boring
- Concrete Walk
- Electric
- Storm Sewer

0 25 50 100 Feet

Path: F:\PROJECT\511NY059 Children's Phase II\GIS\ArcMap\Groundwater Sample_Locations2.mxd

PROPOSED GROUNDWATER SAMPLING WELLS

American Consulting Professionals of New York, PLLC

MEDICAL OFFICE BUILDING

FIGURE X

APPENDIX A
Summary of Fall 2011 Groundwater Sampling Event

Tabulated Analytical Results

# TABLE 1
# SUMMARY OF DETECTED GROUNDWATER ANALYTICAL RESULTS
# OCTOBER 2011

| Location Identifier | | | MW-02 | MW-03 | MW-08 | MW-12R | MW-18 |
|---|---|---|---|---|---|---|---|
| Field Sample Identifier | | | MW-02 | MW-03 | MW-08 | MW-12R | MW-18 |
| Sample Matrix | | | Groundwater | Groundwater | Groundwater | Groundwater | Groundwater |
| Depth Interval (ft) | | | - | - | - | - | - |
| Sample Date | | | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 |
| **Parameter** | **Units** | **Criteria*** | | | | | |
| **Volatile Organic Compounds** | | | | | | | |
| Acetone | UG/L | 50 | 293 B | 10.0 U | 876 JB | 10.0 U | 10.0 U |
| Benzene | UG/L | 1 | 7.00 U | 0.700 U | 1,290 | 55.5 | 0.700 U |
| Ethylbenzene | UG/L | 5 | 178 | 2.00 U | 2,020 | 5.20 | 2.00 U |
| Methyl ethyl ketone (2-Butanone) | UG/L | 50 | 98.5 J | 10.0 U | 1,000 U | 10.0 U | 10.0 U |
| Toluene | UG/L | 5 | 20.0 U | 2.00 U | 2,340 | 2.00 U | 2.00 U |
| Xylene (total) | UG/L | 5 | 1,802 | 2.00 U | 21,200 | 2.00 U | 2.00 U |
| **Semivolatile Organic Compounds** | | | | | | | |
| 2,4-Dimethylphenol | UG/L | 50 | 50.0 U | 10.0 U | 65.7 J | 10.0 U | 10.0 U |
| 2-Methylnaphthalene | UG/L | - | 403 | 10.0 U | 618 | 10.0 U | 10.0 U |
| Naphthalene | UG/L | 10 | 283 | 10.0 U | 954 | 10.0 U | 10.0 U |
| **Pesticide Organic Compounds** | | | | | | | |
| alpha-BHC | UG/L | - | 0.0911 JC | 0.100 U | 0.177 C | 0.100 U | 0.100 U |
| delta-BHC | UG/L | - | 0.101 | 0.443 C | 0.128 C | 0.100 U | 0.0942 J |
| **Metals** | | | | | | | |
| Aluminum | UG/L | - | 174 J | 296 | 1,110 | 2,050 | 1,310 |
| Arsenic | UG/L | 25 | 10 U | 10 U | 10 | 10 U | 10 U |
| Barium | UG/L | 1000 | 328 | 321 | 354 | 97 J | 176 |
| Calcium | UG/L | - | 205,000 | 174,000 | 166,000 | 419,000 | 307,000 |
| Chromium | UG/L | 50 | 10 U | 10 U | 10 U | 5 J | 6 J |

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. April 2000, Class GA.

The flags shown were assigned during chemistry validation.

Concentration Exceeds Criteria

U - Not detected above the reported quantitation limit.

J - The reported concentration is an estimated value.

B - The reported concentration is above the method detection limit but below the quantitation limit.

***Only detected analytical results are reported.***

***NOTE: Detection limits shown are MDL.***

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[MATRIX] = 'WG' AND [LOGDATE] = #10/20/2011#

# TABLE 1
# SUMMARY OF DETECTED GROUNDWATER ANALYTICAL RESULTS
# OCTOBER 2011

| Location Identifier | | | MW-02 | MW-03 | MW-08 | MW-12R | MW-18 |
|---|---|---|---|---|---|---|---|
| Field Sample Identifier | | | MW-02 | MW-03 | MW-08 | MW-12R | MW-18 |
| Sample Matrix | | | Groundwater | Groundwater | Groundwater | Groundwater | Groundwater |
| Depth Interval (ft) | | | - | - | - | - | - |
| Sample Date | | | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 |
| **Parameter** | **Units** | **Criteria*** | | | | | |
| **Metals** | | | | | | | |
| Copper | *UG/L* | 200 | 25 U | 25 U | 14 J | 25 U | 25 U |
| Iron | *UG/L* | 300 | 1,960 | 400 | 14,300 | 13,700 | 2,630 |
| Lead | *UG/L* | 25 | 73 | 10 U | 58 | 5 J | 6 J |
| Magnesium | *UG/L* | 35000 | 38,400 | 50,400 | 43,400 | 197,000 | 56,700 |
| Manganese | *UG/L* | 300 | 649 | 12 J | 198 | 783 | 63 |
| Potassium | *UG/L* | - | 54,700 | 10,200 | 7,660 | 23,300 | 50,300 |
| Sodium | *UG/L* | 20000 | 1,810,000 | 1,720,000 | 481,000 | 1,290,000 | 2,040,000 |
| Vanadium | *UG/L* | - | 25 U | 25 U | 25 U | 25 U | 25 U |
| Zinc | *UG/L* | 2000 | 60 U | 60 U | 34 J | 50 J | 76 |
| **Miscellaneous Parameters** | | | | | | | |
| Cyanide | *MG/L* | - | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.02 |

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. April 2000, Class GA.

The flags shown were assigned during chemistry validation.

Concentration Exceeds Criteria

U - Not detected above the reported quantitation limit.

J - The reported concentration is an estimated value.

B - The reported concentration is above the method detection limit but below the quantitation limit.

***Only detected analytical results are reported.***

***NOTE: Detection limits shown are MDL.***

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[MATRIX] = 'WG' AND [LOGDATE] = #10/20/2011#

# TABLE 1
# SUMMARY OF DETECTED GROUNDWATER ANALYTICAL RESULTS
# OCTOBER 2011

| Location Identifier | | | MW-27 | MW-28 | MW-29 | MW-35 | MW-36 |
|---|---|---|---|---|---|---|---|
| Field Sample Identifier | | | MW-27 | MW-28 | MW-29 | MW-35 | DUP10-20-11-1 |
| Sample Matrix | | | Groundwater | Groundwater | Groundwater | Groundwater | Groundwater |
| Depth Interval (ft) | | | - | - | - | - | - |
| Sample Date | | | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 |
| **Parameter** | **Units** | **Criteria*** | | | | | Field Duplicate |
| **Volatile Organic Compounds** | | | | | | | |
| Acetone | UG/L | 50 | 10.0 U | 10.0 U | 10.0 U | 5.73 JB | 10.0 U |
| Benzene | UG/L | 1 | 3.00 | 0.700 U | 0.700 U | 0.700 U | 0.700 U |
| Ethylbenzene | UG/L | 5 | 2.00 U | 2.00 U | 2.00 U | 2.00 U | 2.00 U |
| Methyl ethyl ketone (2-Butanone) | UG/L | 50 | 10.0 U | 10.0 U | 10.0 U | 10.0 U | 10.0 U |
| Toluene | UG/L | 5 | 1.15 J | 2.00 U | 1.09 J | 2.00 U | 2.00 U |
| Xylene (total) | UG/L | 5 | 2.32 | 2.00 U | 8.73 | 2.00 U | 2.00 U |
| **Semivolatile Organic Compounds** | | | | | | | |
| 2,4-Dimethylphenol | UG/L | 50 | 10.0 U | 10.0 U | 10.0 U | 10.0 U | 10.0 U |
| 2-Methylnaphthalene | UG/L | - | 10.0 U | 10.0 U | 10.0 U | 10.0 U | 10.0 U |
| Naphthalene | UG/L | 10 | 10.0 U | 10.0 U | 10.0 U | 10.0 U | 10.0 U |
| **Pesticide Organic Compounds** | | | | | | | |
| alpha-BHC | UG/L | - | 0.100 U | 0.100 U | 0.100 U | 0.100 U | 0.100 U |
| delta-BHC | UG/L | - | 0.111 C | 0.159 C | 0.533 C | 0.138 C | 0.0967 J |
| **Metals** | | | | | | | |
| Aluminum | UG/L | - | 5,220 | 208 | 1,190 | 174 J | 5,820 |
| Arsenic | UG/L | 25 | 10 U | 10 U | 10 U | 10 U | 10 U |
| Barium | UG/L | 1000 | 150 | 252 | 100 U | 100 U | 155 |
| Calcium | UG/L | - | 268,000 | 168,000 | 14,700 | 60,000 | 162,000 |
| Chromium | UG/L | 50 | 8 J | 6 J | 8 J | 10 U | 5 J |

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. April 2000, Class GA.

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Concentration Exceeds Criteria

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B - The reported concentration is above the method detection limit but below the quantitation limit.

***Only detected analytical results are reported.***

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# TABLE 1
# SUMMARY OF DETECTED GROUNDWATER ANALYTICAL RESULTS
# OCTOBER 2011

| Location Identifier | | | MW-27 | MW-28 | MW-29 | MW-35 | MW-36 |
|---|---|---|---|---|---|---|---|
| Field Sample Identifier | | | MW-27 | MW-28 | MW-29 | MW-35 | DUP10-20-11-1 |
| Sample Matrix | | | Groundwater | Groundwater | Groundwater | Groundwater | Groundwater |
| Depth Interval (ft) | | | - | - | - | - | - |
| Sample Date | | | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 | 10/20/11 |
| **Parameter** | **Units** | **Criteria*** | | | | | Field Duplicate |
| **Metals** | | | | | | | |
| Copper | *UG/L* | 200 | 25 U | 25 U | 25 U | 25 U | 25 U |
| Iron | *UG/L* | 300 | 8,720 | 544 | 1,600 | 280 | 6,880 |
| Lead | *UG/L* | 25 | 13 | 10 U | 10 U | 10 U | 7 J |
| Magnesium | *UG/L* | 35000 | 85,400 | 37,300 | 2,520 | 22,100 | 51,000 |
| Manganese | *UG/L* | 300 | 633 | 33 | 35 | 26 | 518 |
| Potassium | *UG/L* | - | 10,000 | 6,720 | 1,590 J | 3,170 | 11,200 |
| Sodium | *UG/L* | 20000 | 442,000 | 757,000 | 1,380 J | 91,500 | 1,050,000 |
| Vanadium | *UG/L* | - | 13 J | 25 U | 25 U | 25 U | 25 U |
| Zinc | *UG/L* | 2000 | 81 | 73 | 56 J | 141 | 62 |
| **Miscellaneous Parameters** | | | | | | | |
| Cyanide | *MG/L* | - | 0.01 U | 0.01 | 0.01 U | 0.01 U | 0.01 U |

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. April 2000, Class GA.

The flags shown were assigned during chemistry validation.

Concentration Exceeds Criteria

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J - The reported concentration is an estimated value.

B - The reported concentration is above the method detection limit but below the quantitation limit.

***Only detected analytical results are reported.***

***NOTE: Detection limits shown are MDL.***

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# TABLE 1
# SUMMARY OF DETECTED GROUNDWATER ANALYTICAL RESULTS
# OCTOBER 2011

| Location Identifier | | | MW-36 |
|---|---|---|---|
| Field Sample Identifier | | | MW-36 |
| Sample Matrix | | | Groundwater |
| Depth Interval (ft) | | | - |
| Sample Date | | | 10/20/11 |
| **Parameter** | **Units** | **Criteria*** | |
| **Volatile Organic Compounds** | | | |
| Acetone | UG/L | 50 | 6.68 JB |
| Benzene | UG/L | 1 | 0.370 J |
| Ethylbenzene | UG/L | 5 | 2.00 U |
| Methyl ethyl ketone (2-Butanone) | UG/L | 50 | 10.0 U |
| Toluene | UG/L | 5 | 2.00 U |
| Xylene (total) | UG/L | 5 | 2.00 U |
| **Semivolatile Organic Compounds** | | | |
| 2,4-Dimethylphenol | UG/L | 50 | 10.0 U |
| 2-Methylnaphthalene | UG/L | - | 10.0 U |
| Naphthalene | UG/L | 10 | 10.0 U |
| **Pesticide Organic Compounds** | | | |
| alpha-BHC | UG/L | - | 0.100 U |
| delta-BHC | UG/L | - | 0.132 |
| **Metals** | | | |
| Aluminum | UG/L | - | 15,900 |
| Arsenic | UG/L | 25 | 6 J |
| Barium | UG/L | 1000 | 305 |
| Calcium | UG/L | - | 198,000 |
| Chromium | UG/L | 50 | 16 |

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. April 2000, Class GA.

The flags shown were assigned during chemistry validation.

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B - The reported concentration is above the method detection limit but below the quantitation limit.

***Only detected analytical results are reported.***

***NOTE: Detection limits shown are MDL.***

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[MATRIX] = 'WG' AND [LOGDATE] = #10/20/2011#

# TABLE 1
# SUMMARY OF DETECTED GROUNDWATER ANALYTICAL RESULTS
# OCTOBER 2011

| Location Identifier | | | MW-36 |
|---|---|---|---|
| Field Sample Identifier | | | MW-36 |
| Sample Matrix | | | Groundwater |
| Depth Interval (ft) | | | - |
| Sample Date | | | 10/20/11 |
| **Parameter** | **Units** | **Criteria*** | |
| **Metals** | | | |
| Copper | *UG/L* | 200 | 27 |
| Iron | *UG/L* | 300 | 18,400 |
| Lead | *UG/L* | 25 | 26 |
| Magnesium | *UG/L* | 35000 | 66,900 |
| Manganese | *UG/L* | 300 | 743 |
| Potassium | *UG/L* | - | 15,300 |
| Sodium | *UG/L* | 20000 | 1,100,000 |
| Vanadium | *UG/L* | - | 25 U |
| Zinc | *UG/L* | 2000 | 170 |
| **Miscellaneous Parameters** | | | |
| Cyanide | *MG/L* | - | 0.01 U |

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. April 2000, Class GA.

The flags shown were assigned during chemistry validation.

Concentration Exceeds Criteria

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J - The reported concentration is an estimated value.

B - The reported concentration is above the method detection limit but below the quantitation limit.

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[MATRIX] = 'WG' AND [LOGDATE] = #10/20/2011#

# APPENDIX A
# Summary of Fall 2011 Groundwater Sampling Event

## Data Usability Summary Report

Vali-Data of WNY, LLC
1514 Davis Rd.
West Falls, NY 14170

November 18, 2011
Mr. Norm Wohlabaugh
American Consulting Professionals of NY
403 Main St.
Suite 320
Buffalo, NY 14203

Dear Mr. Wohlabaugh,

I would like to thank you for using Vali-Data of WNY, LLC for your data validation needs.

Enclosed is the DUSR for MOB project Buffalo General Hospital; SDG# 15395, and the corresponding invoice. If you have any questions, please feel free to contact me at (716) 655-6530. I look forward to working together in the future.

Sincerely,

Jodi Zimmerman
Vali-Data of WNY, LLC

O/C NICW 11/24/11

Bill to SIINY061
Took 2 out to Paige

# INVOICE

**Vali-data of WNY, LLC**
*Providing cost-effective Data Validation Services to Western New York*

1514 Davis Rd
West Falls, NY 14170
Phone (716)655-6530

INVOICE #11182011
DATE: NOVEMBER 18, 2011

**TO:**
Mr. Norm Wohlabaugh
American Consulting Professionals of NY
403 Main St.
Suite 320
Buffalo, NY 14203

**FOR:**
MOB Project, Buffalo General Hospital
SDG#15395
Project # 11-4536A

| DESCRIPTION | No. of Samples | RATE | AMOUNT |
|---|---|---|---|
| Validation of samples per DUSR Requirements | | | |
| 3 or more analytical suites | 11 | $49.50 | $544.50 |
| 2 analytical suites | 0 | $38.50 | $0 |
| 1 analytical suite | 0 | $27.50 | $0 |
| MS/MSD | | | |
| 3 or more analytical suites | 2 | $49.50 | $99.00 |
| 2 analytical suites | 0 | $38.50 | $0 |
| 1 analytical suite | 0 | $27.50 | $0 |
| Blank | | | |
| 3 or more analytical suites | 0 | $19.00 | $0 |
| 2 analytical suites | 0 | $14.25 | $0 |
| 1 analytical suite | 0 | $ 9.50 | $0 |
| Duplicate | | | |
| 3 or more analytical suites | 0 | $49.50 | $0 |
| 2 analytical suites | 0 | $38.50 | $0 |
| 1 analytical suite | 0 | $27.50 | $0 |
| Total | | | $643.50 |

Make all checks payable to Vali-Data of WNY, LLC

**Thank you for your business!**

# Data Usability Summary Report

Vali-Data of WNY, LLC
1514 Davis Rd.
West Falls, NY 14170

MOB project; Buffalo General Hospital
Paradigm Environmental Services Inc. SDG#15395
November 16, 2011
Sampling date: 10/20/2011

Prepared by:
Jodi Zimmerman
Vali-Data of WNY, LLC
1514 Davis Rd.
West Falls, NY 14170

**DELIVERABLES**

This Data Usability Summary Report (DUSR) was prepared by evaluating the analytical data package for LaBella Associates, project located at 395 Buell Rd. Project #209153, SDG#2686, Paradigm # 11-0667A, -0667AR submitted to Vali-Data of WNY, LLC on May 17,2011. This DUSR has been prepared in general compliance with NYSDEC Analytical Services Protocol and USEPA National Functional Guidelines. The laboratory performed the analyses using USEPA method 8260 (Volatile Organics), 8270 (Semi Volatile Organics), 8081 (Pesticides), 8082 (PCB), Inorganics (6010), Mercury (7470) and Cyanide (EPA 335.4).

**VOLATILE ORGANIC COMPOUNDS**

The following items/criteria were reviewed for this analytical suite:

-Data Completeness
-Narrative and Data Reporting Forms
-Chain of Custody and Traffic Reports
-Holding Times
-Internal Standard (IS) Area Performance
-Surrogate Spike Recoveries
-Method Blank
-Field Duplicate Sample Precision
-Laboratory Control Samples
-MS/MSD
-Compound Quantitation
-Initial Calibration
-Continuing Calibration
-GC/MS Performance Check

The items listed above were technically in compliance with the method and SOP criteria with the exceptions discussed in the text below. The data have been reviewed according to the procedures outlined above and qualified accordingly.

**OVERALL EVALUATION OF DATA AND POTENTIAL USABILITY ISSUES**

The data are acceptable for use but are qualified below in Method Blank, Compound Quantitation and Continuing Calibration.

Paradigm Environmental only records target analytes detected at a level ½ MRL or greater. Some target analytes may have been detected above the MDL, below ½ MRL and should be qualified as estimated.

**DATA COMPLETENESS**

All criteria were met.

**NARRATIVE AND DATA REPORTING FORMS**
All criteria were met.

**CHAIN OF CUSTODY AND TRAFFIC REPORTS**
All criteria were met.

**HOLDING TIMES**
All holding times were met.

**INTERNAL STANDARD (IS)**
All criteria were met.

**SURROGATE SPIKE RECOVERIES**
All criteria were met per ASP QC limits. Several surrogate spike recoveries were outside laboratory QC limits.

**METHOD BLANK**
All criteria were met Acetone was detected above the MDL, below the reporting limit and is qualified as estimated. Methylene Chloride and 4-Butanone were detected in the blank above the MDL, below the MRL and should be qualified as estimated. Paradigm has reviewed the data and does not believe these target analytes to be present or they are detected outside the laboratories range for qualification (see Overall evaluation above). No supporting data has been included in the package.

**FIELD DUPLICATE SAMPLE PRECISION**
All criteria were met.

**LABORATORY CONTROL SAMPLES**
All criteria were met.

**MS/MSD**
All criteria were met.

**COMPOUND QUANTITATION**
All criteria were met except several target analytes were detected in the samples above the MDL, below the RL and should be qualified as estimated. Paradigm has reviewed the data and does not believe these target analytes to be present or they are detected outside the laboratories range for qualification (see Overall evaluation above). No supporting data has been included in the package.

**INITIAL CALIBRATION**
All criteria were met except the %RSD of Acetone and Methylene Chloride were outside ASP outer QC limits in the initial calibration performed on 10/12/11. Alternate forms of regression

were performed with acceptable results on these target analytes, so no further action is required.
The %RSD of Bromomethane was outside ASP QC limits in the initial calibration performed on 10/12/11. The RRF for Trichloroethene was outside QC limits in the initial calibration performed on 10/12/11. ASP allows for up to two target analytes to be outside QC limits without further action.
The %RSD of several target analytes was within ASP QC limits but was >15%, so Paradigm used alternate forms of regression on these target analytes.

**CONTINUING CALIBRATION**
All criteria were met except the %D of Methylene Chloride was outside the ASP QC outer limits in the continuing calibrations performed on 10/26/11. Alternate forms of regression were performed with acceptable results on this target analyte, so no further action is required.
The %D of 2-Chloroethyl vinyl Ether was outside the ASP QC outer limits in the continuing calibration performed on 10/26/11. This target analyte should be qualified as estimated in the blank, spikes and samples.

**GC/MS PERFORMANCE CHECK**
All criteria were met.

## SEMIVOLATILE ORGANIC COMPOUNDS

The following items/criteria were reviewed for this analytical suite:

- Data Completeness
-Narrative and Data Reporting Forms
-Chain of Custody and Traffic Reports
-Holding Times
-Internal Standard (IS) Area Performance
-Surrogate Spike Recoveries
-Method Blank
-Field Duplicate Sample Precision
-Laboratory Control Samples
-MS/MSD
-Compound Quantitation
-Initial Calibration
-Continuing Calibration
-GC/MS Performance Check

The items listed above were technically in compliance with the method and SOP criteria with the exceptions discussed in the text below. The data have been reviewed according to the procedures outlined above and qualified accordingly.

**OVERALL EVALUATION OF DATA AND POTENTIAL USABILITY ISSUES**
The data are acceptable for use.

Paradigm Environmental only records target analytes detected at a level ½ MRL or greater.

**DATA COMPLETENESS**
All criteria were met.

**NARRATIVE AND DATA REPORTING FORMS**
All criteria were met.

**CHAIN OF CUSTODY AND TRAFFIC REPORTS**
All criteria were met.

**HOLDING TIMES**
All holding times were met.

**INTERNAL STANDARD (IS)**
All criteria were met.

**SURROGATE SPIKE RECOVERIES**
All criteria were met except the %Rec in sample MW-8 were diluted out. The %Rec of 2-Fluorophenol was outside QC limits, low, in Water PB 10/25. ASP allows for one surrogate per group to be outside QC limits without further action.

**METHOD BLANK**
All criteria were met.

**FIELD DUPLICATE SAMPLE PRECISION**
All criteria were met.

**LABORATORY CONTROL SAMPLES**
All criteria were met.

**MS/MSD**
All criteria were met.

**COMPOUND QUANTITATION**
All criteria were met.

**INITIAL CALIBRATION**
All criteria were met the %RSD of Indeno(1,2,3-cd)pyrene was outside ASP QC limits. ASP allows for up to four target analytes to be outside QC limits without further action. The %RSD

of several target analytes was within ASP QC limits but was >15%, so Paradigm used alternate forms of regression on these target analytes.

**CONTINUING CALIBRATION**
All criteria were met except the %RSD of Indeno(1,2,3-cd)pyrene was outside ASP QC limits. ASP allows for up to four target analytes to be outside QC limits without further action.

**GC/MS PERFORMANCE CHECK**
All criteria were met.

## PESTICIDES

The following items/criteria were reviewed for this analytical suite:

- -Data Completeness
- -Narrative and Data Reporting Forms
- -Chain of Custody and Traffic Reports
- -Holding Times
- -Surrogate Spike Recoveries
- -Method Blank
- -Field Duplicate Sample Precision
- -Laboratory Control Samples
- -MS/MSD
- -Compound Quantitation
- -Initial Calibration
- -Continuing Calibration

The items listed above were technically in compliance with the method and SOP criteria with the exceptions discussed in the text below. The data have been reviewed according to the procedures outlined above and qualified accordingly.

**OVERALL EVALUATION OF DATA AND POTENTIAL USABILITY ISSUES**
The data are acceptable for use but are qualified below in Method Blank and Compound Quantitation.

Paradigm Environmental only records target analytes detected at a level ½ MRL or greater. Some target analytes may have been detected above the MDL, below ½ MRL and should be qualified as estimated.

**DATA COMPLETENESS**
All criteria were met.

**NARRATIVE AND DATA REPORTING FORMS**
All criteria were met except the internal standard in sample MW-8 was outside QC limits but

was not qualified on the 'Pesticide Internal Standard Area and RT Summary' form. An updated page is attached. Detected target analytes in MW-8 should be qualified as estimated.
The MDL failed for Methoxychlor off the secondary column. Results from the primary column should be used.

**CHAIN OF CUSTODY AND TRAFFIC REPORTS**
All criteria were met.

**HOLDING TIMES**
All holding times were met.

**SURROGATE SPIKE RECOVERIES**
All criteria were met except the %Rec of TCMX was outside ASP QC limits, low, in MW-36 and MW-18MS. ASP allows for one surrogate to fail per column without further action.

**METHOD BLANK**
All the criteria were met except Endrin Aldehyde was detected above the MDL, below the reporting limit and should be qualified as estimated. Paradigm has reviewed the data and does not believe these target analytes to be present or they are detected outside the laboratories range for qualification (see Overall evaluation above). No supporting data has been included in the package.

**FIELD DUPLICATE SAMPLE PRECISION**
All criteria were met.

**LABORATORY CONTROL SAMPLES**
All criteria were met.

**MS/MSD**
All criteria were met except the %Rec of Aldrin was outside ASP QC limits, low, in MW-18MS. The %RPD of Aldrin and Heptachlor were outside ASP QC limits.

**COMPOUND QUANTITATION**
All criteria were met except several target analytes were detected in the samples above the MDL, below the RL and should be recorded as estimated. Paradigm has reviewed the data and does not believe these target analytes to be present or they are detected outside the laboratories range for qualification (see Overall evaluation above). No supporting data has been included in the package.

The %D between the columns was outside QC limits for alpha-BHC in samples; MW-8 and MW-2.
The %D between the columns was outside QC limits for delta-BHC in samples; MW-8, Dup 10-20-11-1, MW-27, MW-3, MW-35, MW-28, MW-29 and MW-36.
The concentrations from the primary column were recorded.

**INITIAL CALIBRATION**
All criteria were met except linear regression was used for all target analytes and surrogates off both columns.

**CONTINUING CALIBRATION**
All criteria were met except linear regression was used for all target analytes and surrogates off both columns.

**POLYCHLORINATED BIPHENYLS**

The following items/criteria were reviewed for this analytical suite:

- -Data Completeness
- -Narrative and Data Reporting Forms
- -Chain of Custody and Traffic Reports
- -Holding Times
- -Surrogate Spike Recoveries
- -Method Blank
- -Field Duplicate Sample Precision
- -Laboratory Control Samples
- -MS/MSD
- -Compound Quantitation
- -Initial Calibration
- -Continuing Calibration

The items listed above were technically in compliance with the method and SOP criteria with the exceptions discussed in the text below. The data have been reviewed according to the procedures outlined above and qualified accordingly.

**OVERALL EVALUATION OF DATA AND POTENTIAL USABILITY ISSUES**
The data are acceptable for use except where stated below in Laboratory Control Samples and MS/MSD.

Paradigm Environmental only records target analytes detected at a level ½ MRL or greater. Some target analytes may have been detected above the MDL, below ½ MRL and should be qualified as estimated

**DATA COMPLETENESS**
All criteria were met.

**NARRATIVE AND DATA REPORTING FORMS**
All criteria were met.

**CHAIN OF CUSTODY AND TRAFFIC REPORTS**
All criteria were met.

**HOLDING TIMES**
All holding times were met.

**SURROGATE SPIKE RECOVERIES**
All criteria were met except the %Rec of TCMX was outside ASP QC limits in sample MW-18MS.

**METHOD BLANK**
All the criteria were met.

**FIELD DUPLICATE SAMPLE PRECISION**
All criteria were met.

**LABORATORY CONTROL SAMPLES**
All criteria were met except a five point calibration was not performed for Aroclor 1221. ASP and National Functional Guidelines requires a 5 point calibration be performed on all detected PCB's within 72 hours of analysis. Since one was not performed, the concentrations of Aroclor 1221 in the laboratory control samples cannot be used.

**MS/MSD**
All criteria were met except a five point calibration was not performed for Aroclor 1221. ASP and National Functional Guidelines requires a 5 point calibration be performed on all detected PCB's within 72 hours of analysis. Since one was not performed, the concentrations of Aroclor 1221 in the laboratory control samples cannot be used.

**COMPOUND QUANTITATION**
All criteria were met.

**INITIAL CALIBRATION**
All criteria were met except linear regression was used for all target analytes and surrogates off both columns.

**CONTINUING CALIBRATION**
All criteria were met except linear regression was used for all target analytes and surrogates off both columns.

## METALS

The following items/criteria were reviewed for this analytical suite:

-Data Completeness
-Narrative and Data Reporting Forms
-Chain of Custody and Traffic Reports
-Holding Times
-Method Blank
-Laboratory Control Sample
-MS
-Duplicate
-Field Duplicate
-Serial Dilution
-Compound Quantitation
-Calibration

The items listed above were technically in compliance with the method and SOP criteria with the exceptions discussed in the text below. The data have been reviewed according to the procedures outlined above.

**OVERALL EVALUATION OF DATA AND POTENTIAL USABILITY ISSUES**
The data are acceptable for use but are qualified below in Method Blank, MS, Duplicate and Compound Quantitation.

Paradigm Environmental only records target analytes detected at a level ½ MRL or greater. Some target analytes may have been detected above the MDL, below ½ MRL and should be qualified as estimated.

**DATA COMPLETENESS**
All criteria were met.

**NARATIVE AND DATA REPORTING FORMS**
All criteria were met.

**CHAIN OF CUSTODY AND TRAFFIC REPORTS**
All criteria were met.

**HOLDING TIMES**
All holding times were met.

**METHOD BLANK**
All criteria were met except Cr, Cu, K and Na were detected above MDL, below RL in the prep blank and should be qualified with a 'B' in all samples with detects. Paradigm has reviewed the

data and does not believe these target analytes to be present or they are detected outside the laboratories range for qualification (see Overall evaluation above).

**LABORATORY CONTROL SAMPLE**
All criteria were met.

**MS**
All criteria were met except the %Rec of K, Ca and Na were outside ASP QC limits in MW-18MS. The sample concentration of Ca and Na was greater than 4 times the spike level so no further action is required. K should be qualified as estimated high, 'J+', in sample MW-18.
The %Rec of several target analytes was outside laboratory QC limits in MW-18MS. These target analytes fell within ASP QC limits, so no further action is required.

**DUPLICATE**
All criteria were met except the %D of Pb was outside ASP QC limits in MW-18Dup. The results for this target analyte in the sample and duplicate are <5X CRQL and the difference is < $^{+}/_{-}$ CRQL, so no further action is required.
Be, Co and Ni were detected in sample MW-18 but not in MW-18Dup. Paradigm has reviewed the data and does not believe these target analytes to be present or they are detected outside the laboratories range for qualification (see Overall evaluation above).

**FIELD DUPLICATE**
All criteria were met.

**SERIAL DILUTION**
No serial dilution was performed.

**COMPOUND QUANITATION**
All criteria were met except several target analytes were detected above the MDL, below the reporting limit and should be qualified as estimated, 'J'. Paradigm has reviewed the data and does not believe these target analytes to be present or they are detected outside the laboratories range for qualification (see Overall evaluation above).

**CALIBRATION**
All criteria were met.

## CYANIDE

The following items/criteria were reviewed for this analytical suite:

- -Data Completeness
- -Narrative and Data Reporting Forms

-Chain of Custody and Traffic Reports
-Holding Times
-Method Blank
-Laboratory Control Samples
-MS
-Duplicate
-Field Duplicate
-Compound Quantitation
-Calibration

The items listed above were technically in compliance with the method and SOP criteria with any exceptions discussed in the text below. The data have been reviewed according to the procedures outlined above.

**OVERALL EVALUATION OF DATA AND POTENTIAL USABILITY ISSUES**
The data are acceptable for use except where qualified below in Compound Quantitation.

**DATA COMPLETENESS**
All criteria were met.

**NARRATIVE AND DATA REPORTING FORMS**
All criteria were met except no MDL were included in the original package. That page is attached.

**CHAIN OF CUSTODY**
All criteria were met.

**HOLDING TIMES**
All holding times were met.

**METHOD BLANK**
All criteria were met.

**LABORATORY CONTROL SAMPLES**
All criteria were met.

**MS**
All criteria were met.

**DUPLICATE**
All criteria were met.

**FIELD DUPLICATE**
All criteria were met.

**COMPOUND QUANTITATION**
All criteria were met except Cn was detected above the MDL, below the reporting limit and should be qualified as estimated in sample; MW-3.

**CALIBRATION**
All criteria were met.

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# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15395 |
| **Field Location:** | MW-18 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | < 2.00 |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 0.700 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | ~~< 2.00~~ .47 J |
| m,p-Xylene | ~~< 2.00~~ .50 J |
| o-Xylene | < 2.00 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | ~~< 10.0~~ 4.76 JB |
| 2-Butanone | < 10.0 |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92783.D

Comments: ug / L = microgram per Liter
Matrix Spike outliers indicate probable matrix interference

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15396 |
| **Field Location:** | MW-8 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 200 |
| Bromomethane | < 200 |
| Bromoform | < 500 |
| Carbon Tetrachloride | < 200 |
| Chloroethane | < 200 |
| Chloromethane | < 200 |
| 2-Chloroethyl vinyl Ether | < 1,000 UJ |
| Chloroform | < 200 |
| Dibromochloromethane | < 200 |
| 1,1-Dichloroethane | < 200 |
| 1,2-Dichloroethane | ~~< 200~~ 38.17 J |
| 1,1-Dichloroethene | < 200 |
| cis-1,2-Dichloroethene | < 200 |
| trans-1,2-Dichloroethene | < 200 |
| 1,2-Dichloropropane | < 200 |
| cis-1,3-Dichloropropene | < 200 |
| trans-1,3-Dichloropropene | ~~< 200~~ 50.5 J |
| Methylene chloride | ~~< 500~~ 456 JB |
| 1,1,2,2-Tetrachloroethane | < 200 |
| Tetrachloroethene | < 200 |
| 1,1,1-Trichloroethane | < 200 |
| 1,1,2-Trichloroethane | < 200 |
| Trichloroethene | < 200 |
| Trichlorofluoromethane | < 200 |
| Vinyl chloride | < 200 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | 1,290 |
| Chlorobenzene | < 200 |
| Ethylbenzene | 2,020 |
| Toluene | 2,340 |
| m,p-Xylene | 14,600 |
| o-Xylene | 6,600 |
| Styrene | ~~< 500~~ 208 J |
| 1,2-Dichlorobenzene | < 200 |
| 1,3-Dichlorobenzene | < 200 |
| 1,4-Dichlorobenzene | < 200 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | J B 876 |
| 2-Butanone | ~~< 1,000~~ 666.4 JB |
| 2-Hexanone | < 500 |
| 4-Methyl-2-pentanone | < 500 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 200 |
| Vinyl acetate | < 500 |

ELAP Number 10958 Method: EPA 8260B Data File: V92793.D

Comments: ug / L = microgram per Liter
Surrogate outliers indicate probable matrix interference

Signature: _____
Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15397 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | DUP 10-20-11-1 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 45 |
| Chloroform | ~~< 2.00~~ .40 J |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 0.700 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | < 2.00 |
| m,p-Xylene | ~~< 2.00~~ .41 J |
| o-Xylene | < 2.00 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | ~~< 10.0~~ 4.70 JB |
| 2-Butanone | ~~< 10.0~~ .81 JB |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92786.D

Comments: ug / L = microgram per Liter

Signature: _____
Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15398 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-27 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | < 2.00 |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | 3.00 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | J 1.15 |
| m,p-Xylene | 2.32 |
| o-Xylene | ~~< 2.00~~ .95 J |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | < 10.0 |
| 2-Butanone | ~~< 10.0~~ 3.44 JB |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92794.D

Comments: ug / L = microgram per Liter
Surrogate outliers indicate probable matrix interference

Signature: _____
Bruce Hoogesteger: Technical Director

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179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15399 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-3 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | < 2.00 |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 0.700 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | < 2.00 |
| m,p-Xylene | < 2.00 |
| o-Xylene | < 2.00 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | ~~< 10.0~~ 4.24 JB |
| 2-Butanone | < 10.0 |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92787.D

Comments: ug / L = microgram per Liter

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15400 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-2 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 20.0 |
| Bromomethane | < 20.0 |
| Bromoform | < 50.0 |
| Carbon Tetrachloride | < 20.0 |
| Chloroethane | < 20.0 |
| Chloromethane | ~~< 20.0~~ 5.74 J |
| 2-Chloroethyl vinyl Ether | < 100 UJ |
| Chloroform | ~~< 20.0~~ 5.97 J |
| Dibromochloromethane | < 20.0 |
| 1,1-Dichloroethane | < 20.0 |
| 1,2-Dichloroethane | < 20.0 |
| 1,1-Dichloroethene | < 20.0 |
| cis-1,2-Dichloroethene | < 20.0 |
| trans-1,2-Dichloroethene | < 20.0 |
| 1,2-Dichloropropane | < 20.0 |
| cis-1,3-Dichloropropene | < 20.0 |
| trans-1,3-Dichloropropene | < 20.0 |
| Methylene chloride | ~~< 50.0~~ 38.9 JB |
| 1,1,2,2-Tetrachloroethane | < 20.0 |
| Tetrachloroethene | < 20.0 |
| 1,1,1-Trichloroethane | < 20.0 |
| 1,1,2-Trichloroethane | < 20.0 |
| Trichloroethene | < 20.0 |
| Trichlorofluoromethane | < 20.0 |
| Vinyl chloride | < 20.0 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 7.00 |
| Chlorobenzene | < 20.0 |
| Ethylbenzene | 178 |
| Toluene | ~~< 20.0~~ 9.68 J |
| m,p-Xylene | 1,500 |
| o-Xylene | 302 |
| Styrene | ~~< 50.0~~ 9.48 J |
| 1,2-Dichlorobenzene | < 20.0 |
| 1,3-Dichlorobenzene | < 20.0 |
| 1,4-Dichlorobenzene | < 20.0 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | B 293 |
| 2-Butanone | B J 98.5 |
| 2-Hexanone | ~~< 50.0~~ 4.87 J |
| 4-Methyl-2-pentanone | < 50.0 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 20.0 |
| Vinyl acetate | ~~< 50.0~~ 3.61 J |

ELAP Number 10958 Method: EPA 8260B Data File: V92788.D

Comments: ug / L = microgram per Liter
Surrogate outliers indicate probable matrix interference

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15401 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-35 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | < 2.00 |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 0.700 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | < 2.00 |
| m,p-Xylene | ~~< 2.00~~ .51 J |
| o-Xylene | < 2.00 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | J B 5.73 |
| 2-Butanone | ~~< 10.0~~ .57 JB |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92789.D

Comments: ug / L = microgram per Liter

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15402 |
| **Field Location:** | MW-28 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | ~~< 2.00~~ .51 J |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 0.700 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | < 2.00 |
| m,p-Xylene | < 2.00 |
| o-Xylene | < 2.00 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | ~~< 10.0~~ 4.64 J B |
| 2-Butanone | < 10.0 |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92790.D

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15403 |
| **Field Location:** | MW-29 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | < 2.00 |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | ~~< 2.00~~ .45 J |
| cis-1,2-Dichloroethene | ~~< 2.00~~ .52 J |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 0.700 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | ~~< 2.00~~ .62 J |
| Toluene | J 1.09 |
| m,p-Xylene | 7.22 |
| o-Xylene | J 1.51 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | < 10.0 |
| 2-Butanone | < 10.0 |
| 2-Hexanone | ~~< 5.00~~ .92 J |
| 4-Methyl-2-pentanone | ~~< 5.00~~ 1.64 J |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | ~~< 5.00~~ .68 J |

ELAP Number 10958 Method: EPA 8260B Data File: V92795.D

Comments: ug / L = microgram per Liter
Surrogate outliers indicate probable matrix interference

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15404 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-12R | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L | |
|---|---|---|
| Bromodichloromethane | < 2.00 | |
| Bromomethane | < 2.00 | |
| Bromoform | < 5.00 | |
| Carbon Tetrachloride | < 2.00 | |
| Chloroethane | < 2.00 | |
| Chloromethane | < 2.00 | |
| 2-Chloroethyl vinyl Ether | < 10.0 | UJ |
| Chloroform | ~~< 2.00~~ .39 | J |
| Dibromochloromethane | < 2.00 | |
| 1,1-Dichloroethane | < 2.00 | |
| 1,2-Dichloroethane | < 2.00 | |
| 1,1-Dichloroethene | < 2.00 | |
| cis-1,2-Dichloroethene | < 2.00 | |
| trans-1,2-Dichloroethene | < 2.00 | |
| 1,2-Dichloropropane | < 2.00 | |
| cis-1,3-Dichloropropene | < 2.00 | |
| trans-1,3-Dichloropropene | < 2.00 | |
| Methylene chloride | < 5.00 | |
| 1,1,2,2-Tetrachloroethane | < 2.00 | |
| Tetrachloroethene | < 2.00 | |
| 1,1,1-Trichloroethane | < 2.00 | |
| 1,1,2-Trichloroethane | < 2.00 | |
| Trichloroethene | < 2.00 | |
| Trichlorofluoromethane | < 2.00 | |
| Vinyl chloride | < 2.00 | |

| Aromatics | Results in ug / L | |
|---|---|---|
| Benzene | 55.5 | |
| Chlorobenzene | < 2.00 | |
| Ethylbenzene | 5.20 | |
| Toluene | ~~< 2.00~~ .54 | J |
| m,p-Xylene | ~~< 2.00~~ .50 | J |
| o-Xylene | < 2.00 | |
| Styrene | < 5.00 | |
| 1,2-Dichlorobenzene | < 2.00 | |
| 1,3-Dichlorobenzene | < 2.00 | |
| 1,4-Dichlorobenzene | < 2.00 | |

| Ketones | Results in ug / L | |
|---|---|---|
| Acetone | < 10.0 | |
| 2-Butanone | ~~< 10.0~~ .70 | JB |
| 2-Hexanone | < 5.00 | |
| 4-Methyl-2-pentanone | < 5.00 | |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92791.D

Comments: ug / L = microgram per Liter
Surrogate outliers indicate probable matrix interference

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15405 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-36 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | ~~< 2.00~~ .55 J |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | < 2.00 |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | < 5.00 |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | J 0.370 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | < 2.00 |
| m,p-Xylene | < 2.00 |
| o-Xylene | < 2.00 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | J B 6.68 |
| 2-Butanone | ~~< 10.0~~ 7.7 J B |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92792.D

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | Water LRB 10/26 |
| **Field Location:** | N/A | **Date Sampled:** | N/A |
| **Field ID Number:** | N/A | **Date Received:** | N/A |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Halocarbons | Results in ug / L |
|---|---|
| Bromodichloromethane | < 2.00 |
| Bromomethane | < 2.00 |
| Bromoform | < 5.00 |
| Carbon Tetrachloride | < 2.00 |
| Chloroethane | < 2.00 |
| Chloromethane | < 2.00 |
| 2-Chloroethyl vinyl Ether | < 10.0 UJ |
| Chloroform | < 2.00 |
| Dibromochloromethane | < 2.00 |
| 1,1-Dichloroethane | < 2.00 |
| 1,2-Dichloroethane | < 2.00 |
| 1,1-Dichloroethene | < 2.00 |
| cis-1,2-Dichloroethene | < 2.00 |
| trans-1,2-Dichloroethene | < 2.00 |
| 1,2-Dichloropropane | < 2.00 |
| cis-1,3-Dichloropropene | < 2.00 |
| trans-1,3-Dichloropropene | < 2.00 |
| Methylene chloride | ~~< 5.00~~ 4.26 J |
| 1,1,2,2-Tetrachloroethane | < 2.00 |
| Tetrachloroethene | < 2.00 |
| 1,1,1-Trichloroethane | < 2.00 |
| 1,1,2-Trichloroethane | < 2.00 |
| Trichloroethene | < 2.00 |
| Trichlorofluoromethane | < 2.00 |
| Vinyl chloride | < 2.00 |

| Aromatics | Results in ug / L |
|---|---|
| Benzene | < 0.700 |
| Chlorobenzene | < 2.00 |
| Ethylbenzene | < 2.00 |
| Toluene | < 2.00 |
| m,p-Xylene | < 2.00 |
| o-Xylene | < 2.00 |
| Styrene | < 5.00 |
| 1,2-Dichlorobenzene | < 2.00 |
| 1,3-Dichlorobenzene | < 2.00 |
| 1,4-Dichlorobenzene | < 2.00 |

| Ketones | Results in ug / L |
|---|---|
| Acetone | J 9.01 |
| 2-Butanone | ~~< 10.0~~ 1.56 J |
| 2-Hexanone | < 5.00 |
| 4-Methyl-2-pentanone | < 5.00 |

| Miscellaneous | Results in ug / L |
|---|---|
| Carbon disulfide | < 2.00 |
| Vinyl acetate | < 5.00 |

ELAP Number 10958 Method: EPA 8260B Data File: V92779.D

Comments: ug / L = microgram per Liter

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15395 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-18 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59416.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15396 |
| **Field Location:** | MW-8 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 100 | Dibenz (a,h) anthracene | < 100 |
| Anthracene | < 100 | Fluoranthene | < 100 |
| Benzo (a) anthracene | < 100 | Fluorene | < 100 |
| Benzo (a) pyrene | < 100 | Indeno (1,2,3-cd) pyrene | < 100 |
| Benzo (b) fluoranthene | < 100 | Naphthalene | 954 |
| Benzo (g,h,i) perylene | < 100 | Phenanthrene | < 100 |
| Benzo (k) fluoranthene | < 100 | Pyrene | < 100 |
| Chrysene | < 100 | Acenaphthylene | < 100 |
| Diethyl phthalate | < 100 | 1,2-Dichlorobenzene | < 100 |
| Dimethyl phthalate | < 250 | 1,3-Dichlorobenzene | < 100 |
| Butylbenzylphthalate | < 100 | 1,4-Dichlorobenzene | < 100 |
| Di-n-butyl phthalate | < 100 | 1,2,4-Trichlorobenzene | < 100 |
| Di-n-octylphthalate | < 100 | Nitrobenzene | < 100 |
| Bis (2-ethylhexyl) phthalate | < 100 | 2,4-Dinitrotoluene | < 100 |
| 2-Chloronaphthalene | < 100 | 2,6-Dinitrotoluene | < 100 |
| Hexachlorobenzene | < 100 | Bis (2-chloroethyl) ether | < 100 |
| Hexachloroethane | < 100 | Bis (2-chloroisopropyl) ether | < 100 |
| Hexachlorocyclopentadiene | < 100 | Bis (2-chloroethoxy) methane | < 100 |
| Hexachlorobutadiene | < 100 | 4-Bromophenyl phenyl ether | < 100 |
| N-Nitroso-di-n-propylamine | < 100 | 4-Chlorophenyl phenyl ether | < 100 |
| N-Nitrosodiphenylamine | < 100 | Benzidine | < 250 |
| N-Nitrosodimethylamine | < 100 | 3,3'-Dichlorobenzidine | < 100 |
| Isophorone | < 100 | 4-Chloroaniline | < 100 |
| Benzyl alcohol | < 250 | 2-Nitroaniline | < 250 |
| Dibenzofuran | < 100 | 3-Nitroaniline | < 250 |
| 2-Methylnapthalene | 618 | 4-Nitroaniline | < 250 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 100 | 2-Methylphenol | < 100 |
| 2-Chlorophenol | < 100 | 3&4-Methylphenol | < 100 |
| 2,4-Dichlorophenol | < 100 | 2,4-Dimethylphenol | J 65.7 |
| 2,6-Dichlorophenol | < 100 | 2-Nitrophenol | < 100 |
| 2,4,5-Trichlorophenol | < 250 | 4-Nitrophenol | < 250 |
| 2,4,6-Trichlorophenol | < 100 | 2,4-Dinitrophenol | < 250 |
| Pentachlorophenol | < 250 | 4,6-Dinitro-2-methylphenol | < 250 |
| 4-Chloro-3-methylphenol | < 100 | Benzoic acid | < 250 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59433.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15397 |
| **Field Location:** | DUP 10-20-11-1 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59420.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15398 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-27 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 Analytical Method: EPA 8270C Data File: S59421.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15399 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-3 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59422.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15400 |
| **Field Location:** | MW-2 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 50.0 | Dibenz (a,h) anthracene | < 50.0 |
| Anthracene | < 50.0 | Fluoranthene | < 50.0 |
| Benzo (a) anthracene | < 50.0 | Fluorene | < 50.0 |
| Benzo (a) pyrene | < 50.0 | Indeno (1,2,3-cd) pyrene | < 50.0 |
| Benzo (b) fluoranthene | < 50.0 | Naphthalene | 283 |
| Benzo (g,h,i) perylene | < 50.0 | Phenanthrene | < 50.0 |
| Benzo (k) fluoranthene | < 50.0 | Pyrene | < 50.0 |
| Chrysene | < 50.0 | Acenaphthylene | < 50.0 |
| Diethyl phthalate | < 50.0 | 1,2-Dichlorobenzene | < 50.0 |
| Dimethyl phthalate | < 125 | 1,3-Dichlorobenzene | < 50.0 |
| Butylbenzylphthalate | < 50.0 | 1,4-Dichlorobenzene | < 50.0 |
| Di-n-butyl phthalate | < 50.0 | 1,2,4-Trichlorobenzene | < 50.0 |
| Di-n-octylphthalate | < 50.0 | Nitrobenzene | < 50.0 |
| Bis (2-ethylhexyl) phthalate | < 50.0 | 2,4-Dinitrotoluene | < 50.0 |
| 2-Chloronaphthalene | < 50.0 | 2,6-Dinitrotoluene | < 50.0 |
| Hexachlorobenzene | < 50.0 | Bis (2-chloroethyl) ether | < 50.0 |
| Hexachloroethane | < 50.0 | Bis (2-chloroisopropyl) ether | < 50.0 |
| Hexachlorocyclopentadiene | < 50.0 | Bis (2-chloroethoxy) methane | < 50.0 |
| Hexachlorobutadiene | < 50.0 | 4-Bromophenyl phenyl ether | < 50.0 |
| N-Nitroso-di-n-propylamine | < 50.0 | 4-Chlorophenyl phenyl ether | < 50.0 |
| N-Nitrosodiphenylamine | < 50.0 | Benzidine | < 125 |
| N-Nitrosodimethylamine | < 50.0 | 3,3'-Dichlorobenzidine | < 50.0 |
| Isophorone | < 50.0 | 4-Chloroaniline | < 50.0 |
| Benzyl alcohol | < 125 | 2-Nitroaniline | < 125 |
| Dibenzofuran | < 50.0 | 3-Nitroaniline | < 125 |
| 2-Methylnapthalene | 403 | 4-Nitroaniline | < 125 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 50.0 | 2-Methylphenol | < 50.0 |
| 2-Chlorophenol | < 50.0 | 3&4-Methylphenol | < 50.0 |
| 2,4-Dichlorophenol | < 50.0 | 2,4-Dimethylphenol | < 50.0 |
| 2,6-Dichlorophenol | < 50.0 | 2-Nitrophenol | < 50.0 |
| 2,4,5-Trichlorophenol | < 125 | 4-Nitrophenol | < 125 |
| 2,4,6-Trichlorophenol | < 50.0 | 2,4-Dinitrophenol | < 125 |
| Pentachlorophenol | < 125 | 4,6-Dinitro-2-methylphenol | < 125 |
| 4-Chloro-3-methylphenol | < 50.0 | Benzoic acid | < 125 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59434.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15401 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-35 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59424.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15402 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-28 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59425.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15403 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-29 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 Analytical Method: EPA 8270C Data File: S59426.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client: ACP**

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15404 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-12R | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 Analytical Method: EPA 8270C Data File: S59427.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
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# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15405 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-36 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 Analytical Method: EPA 8270C Data File: S59428.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Semi -Volatile Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | Water PB 01/25 |
| **Field Location:** | N/A | **Date Sampled:** | N/A |
| **Field ID Number:** | N/A | **Date Received:** | N/A |
| **Sample Type:** | Water | **Date Analyzed:** | 10/26/2011 |

| Base / Neutrals | Results in ug / L | Base / Neutrals | Results in ug / L |
|---|---|---|---|
| Acenaphthene | < 10.0 | Dibenz (a,h) anthracene | < 10.0 |
| Anthracene | < 10.0 | Fluoranthene | < 10.0 |
| Benzo (a) anthracene | < 10.0 | Fluorene | < 10.0 |
| Benzo (a) pyrene | < 10.0 | Indeno (1,2,3-cd) pyrene | < 10.0 |
| Benzo (b) fluoranthene | < 10.0 | Naphthalene | < 10.0 |
| Benzo (g,h,i) perylene | < 10.0 | Phenanthrene | < 10.0 |
| Benzo (k) fluoranthene | < 10.0 | Pyrene | < 10.0 |
| Chrysene | < 10.0 | Acenaphthylene | < 10.0 |
| Diethyl phthalate | < 10.0 | 1,2-Dichlorobenzene | < 10.0 |
| Dimethyl phthalate | < 25.0 | 1,3-Dichlorobenzene | < 10.0 |
| Butylbenzylphthalate | < 10.0 | 1,4-Dichlorobenzene | < 10.0 |
| Di-n-butyl phthalate | < 10.0 | 1,2,4-Trichlorobenzene | < 10.0 |
| Di-n-octylphthalate | < 10.0 | Nitrobenzene | < 10.0 |
| Bis (2-ethylhexyl) phthalate | < 10.0 | 2,4-Dinitrotoluene | < 10.0 |
| 2-Chloronaphthalene | < 10.0 | 2,6-Dinitrotoluene | < 10.0 |
| Hexachlorobenzene | < 10.0 | Bis (2-chloroethyl) ether | < 10.0 |
| Hexachloroethane | < 10.0 | Bis (2-chloroisopropyl) ether | < 10.0 |
| Hexachlorocyclopentadiene | < 10.0 | Bis (2-chloroethoxy) methane | < 10.0 |
| Hexachlorobutadiene | < 10.0 | 4-Bromophenyl phenyl ether | < 10.0 |
| N-Nitroso-di-n-propylamine | < 10.0 | 4-Chlorophenyl phenyl ether | < 10.0 |
| N-Nitrosodiphenylamine | < 10.0 | Benzidine | < 25.0 |
| N-Nitrosodimethylamine | < 10.0 | 3,3'-Dichlorobenzidine | < 10.0 |
| Isophorone | < 10.0 | 4-Chloroaniline | < 10.0 |
| Benzyl alcohol | < 25.0 | 2-Nitroaniline | < 25.0 |
| Dibenzofuran | < 10.0 | 3-Nitroaniline | < 25.0 |
| 2-Methylnapthalene | < 10.0 | 4-Nitroaniline | < 25.0 |

| Acids | Results in ug / L | Acids | Results in ug / L |
|---|---|---|---|
| Phenol | < 10.0 | 2-Methylphenol | < 10.0 |
| 2-Chlorophenol | < 10.0 | 3&4-Methylphenol | < 10.0 |
| 2,4-Dichlorophenol | < 10.0 | 2,4-Dimethylphenol | < 10.0 |
| 2,6-Dichlorophenol | < 10.0 | 2-Nitrophenol | < 10.0 |
| 2,4,5-Trichlorophenol | < 25.0 | 4-Nitrophenol | < 25.0 |
| 2,4,6-Trichlorophenol | < 10.0 | 2,4-Dinitrophenol | < 25.0 |
| Pentachlorophenol | < 25.0 | 4,6-Dinitro-2-methylphenol | < 25.0 |
| 4-Chloro-3-methylphenol | < 10.0 | Benzoic acid | < 25.0 |

ELAP Number 10958 | Analytical Method: EPA 8270C | Data File: S59414.D

Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15395 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-18 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | J 0.0942 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | ~~< 0.100~~ .0263B |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15396 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-8 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L | |
|---|---|---|
| Aldrin | < 0.100 | |
| alpha-BHC | C 0.177 | |
| beta-BHC | ~~< 0.100~~ | .064 J |
| delta-BHC | C 0.128 | |
| gamma-BHC | ~~< 0.100~~ | .075 JB |
| gamma-Chlordane | < 0.100 | |
| alpha-Chlordane | < 0.100 | |
| 4,4'-DDD | < 0.100 | |
| 4,4'-DDE | < 0.100 | |
| 4,4'-DDT | < 0.100 | |
| Dieldrin | ~~< 0.100~~ | .037 J |
| Endosulfan I | < 0.100 | |
| Endosulfan II | < 0.100 | |
| Endosulfan Sulfate | < 0.100 | |
| Endrin | ~~< 0.100~~ | .048 |
| Endrin Aldehyde | < 0.100 | |
| Endrin Ketone | < 0.100 | |
| Heptachlor | < 0.100 | |
| Heptachlor Epoxide | < 0.100 | |
| Methoxychlor | ~~< 0.100~~ | .023 J |
| Toxaphene | < 0.500 | |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Qualifier: C denotes that the concentration differs by more than 40% between the primary and secondary columns

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15397 |
| **Field Location:** | DUP 10-20-11-1 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | J 0.0967 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | ~~< 0.100~~ .0175 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt.

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# Pesticide Analysis Report for Non-potable Water

**Client: ACP**

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15398 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-27 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | C 0.111 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Qualifier: C denotes that the concentration differs by more than 40% between the primary and secondary columns

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15399 |
| **Field Location:** | MW-3 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | C 0.443 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxapherie | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Qualifier: C denotes that the concentration differs by more than 40% between the primary and secondary columns

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15400 |
| **Field Location:** | MW-2 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | J C 0.0911 |
| beta-BHC | < 0.100 |
| delta-BHC | 0.101 |
| gamma-BHC | ~~< 0.100~~ 0.054 JB |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Qualifier: C denotes that the concentration differs by more than 40% between the primary and secondary columns

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client: ACP**

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15401 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-35 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | C 0.138 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Qualifier: C denotes that the concentration differs by more than 40% between the primary and secondary columns

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15402 |
| **Field Location:** | MW-28 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | C 0.159 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Qualifier: C denotes that the concentration differs by more than 40% between the primary and secondary columns

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15403 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-29 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | C 0.533 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | ~~< 0.100~~ 0075 J |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Qualifier: C denotes that the concentration differs by more than 40% between the primary and secondary columns

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15404 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-12R | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L | |
|---|---|---|
| Aldrin | < 0.100 | |
| alpha-BHC | < 0.100 | |
| beta-BHC | < 0.100 | |
| delta-BHC | < 0.100 | |
| gamma-BHC | ~~< 0.100~~ | .0061 JB |
| gamma-Chlordane | < 0.100 | |
| alpha-Chlordane | < 0.100 | |
| 4,4'-DDD | < 0.100 | |
| 4,4'-DDE | < 0.100 | |
| 4,4'-DDT | < 0.100 | |
| Dieldrin | < 0.100 | |
| Endosulfan I | < 0.100 | |
| Endosulfan II | < 0.100 | |
| Endosulfan Sulfate | < 0.100 | |
| Endrin | < 0.100 | |
| Endrin Aldehyde | ~~< 0.100~~ | .0103 JB |
| Endrin Ketone | < 0.100 | |
| Heptachlor | < 0.100 | |
| Heptachlor Epoxide | < 0.100 | |
| Methoxychlor | ~~< 0.100~~ | .0072 J |
| Toxaphene | < 0.500 | |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# Pesticide Analysis Report for Non-potable Water

**Client: ACP**

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15405 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-36 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | 0.132 |
| gamma-BHC | < 0.100 |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | < 0.100 |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
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# Pesticide Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | Water PB 10/21 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | N/A | **Date Sampled:** | N/A |
| **Field ID Number:** | N/A | **Date Received:** | N/A |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| Pesticide Identification | Results in ug / L |
|---|---|
| Aldrin | < 0.100 |
| alpha-BHC | < 0.100 |
| beta-BHC | < 0.100 |
| delta-BHC | < 0.100 |
| gamma-BHC | ~~< 0.100~~ .046 J |
| gamma-Chlordane | < 0.100 |
| alpha-Chlordane | < 0.100 |
| 4,4'-DDD | < 0.100 |
| 4,4'-DDE | < 0.100 |
| 4,4'-DDT | < 0.100 |
| Dieldrin | < 0.100 |
| Endosulfan I | < 0.100 |
| Endosulfan II | < 0.100 |
| Endosulfan Sulfate | < 0.100 |
| Endrin | < 0.100 |
| Endrin Aldehyde | ~~< 0.100~~ .011 J |
| Endrin Ketone | < 0.100 |
| Heptachlor | < 0.100 |
| Heptachlor Epoxide | < 0.100 |
| Methoxychlor | < 0.100 |
| Toxaphene | < 0.500 |

ELAP Number 10958

Analytical Method: EPA 8081B
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15395 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-18 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15396 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-8 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15397 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | DUP 10-20-11-1 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15398 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-27 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15399 |
| **Field Location:** | MW-3 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt.

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15400 |
| **Field Location:** | MW-2 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15401 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-35 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15402 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-28 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| | | **Lab Sample Number:** | 15403 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | MW-29 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15404 |
| **Field Location:** | MW-12R | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger: Technical Director

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# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | 15405 |
| **Field Location:** | MW-36 | **Date Sampled:** | 10/20/2011 |
| **Field ID Number:** | N/A | **Date Received:** | 10/21/2011 |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# PCB Analysis Report for Non-potable Water

**Client:** ACP

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project, Buffalo General Hospital | **Lab Project Number:** | 11-4536A |
| **Client Job Number:** | N/A | **Lab Sample Number:** | Water PB 10/21 |
| **Field Location:** | N/A | **Date Sampled:** | N/A |
| **Field ID Number:** | N/A | **Date Received:** | N/A |
| **Sample Type:** | Water | **Date Analyzed:** | 10/24/2011 |

| PCB Identification | Results in ug / L |
|---|---|
| Aroclor 1016 | < 1.00 |
| Aroclor 1221 | < 1.00 |
| Aroclor 1232 | < 1.00 |
| Aroclor 1242 | < 1.00 |
| Aroclor 1248 | < 1.00 |
| Aroclor 1254 | < 1.00 |
| Aroclor 1260 | < 1.00 |

ELAP Number 10958

Analytical Method: EPA 8082A
Prep Method: EPA 3510C

Comments: ug / L = microgram per Liter

Signature:

Bruce Hoogesteger: Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC.
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# LABORATORY REPORT FOR METAL ANALYSIS IN WATER

**Client:** ACP
**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A
**Field Location:** MW-18
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15395
**Sample Type:** Water
**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | | |
|---|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 1.31 | DM | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | <0.010 | | |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.176 | M | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | ~~<0.005~~ .00020 | | J |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | M | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 307 | | |
| Chromium | 10/26/2011 | SW846 3005/6010 | 0.006 J | DM | B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | ~~<0.050~~ .0014 | M | J |
| Copper | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .011 J | | B |
| Iron | 10/26/2011 | SW846 3005/6010 | 2.63 | | |
| Lead | 10/26/2011 | SW846 3005/6010 | 0.006 J | DM | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 56.7 | M | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.063 | M | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | | |
| Nickel | 10/26/2011 | SW846 3005/6010 | ~~<0.040~~ .0025 | M | J |
| Potassium | 10/26/2011 | SW846 3005/6010 | 50.3 | M | B J+ |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 2040 | | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | M | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0033 | | J |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.076 | | |

ELAP ID No.:10958

Comments:

**Approved By:** _____
Bruce Hoogesteger, Technical Director

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# *LABORATORY REPORT FOR METAL ANALYSIS IN WATER*

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-8
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15396

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) |
|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 1.11 |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 |
| Arsenic | 10/26/2011 | SW846 3005/6010 | 0.010 |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.354 |
| Beryllium | 10/26/2011 | SW846 3005/6010 | <0.005 |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 |
| Calcium | 10/26/2011 | SW846 3005/6010 | 166 |
| Chromium | 10/26/2011 | SW846 3005/6010 | <0.010 |
| Cobalt | 10/26/2011 | SW846 3005/6010 | ~~<0.050~~ .0018 J |
| Copper | 10/26/2011 | SW846 3005/6010 | 0.014 J B |
| Iron | 10/26/2011 | SW846 3005/6010 | 14.3 |
| Lead | 10/26/2011 | SW846 3005/6010 | 0.058 |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 43.4 |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.198 |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 |
| Potassium | 10/26/2011 | SW846 3005/6010 | 7.66 B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 |
| Sodium | 10/27/2011 | SW846 3005/6010 | 481 B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0041 J |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.034 J |

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# LABORATORY REPORT FOR METAL ANALYSIS IN WATER

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** DUP 10-20-11-1
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15397

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 5.82 | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | ~~<0.010~~ .0033 | J |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.155 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | ~~<0.005~~ .00020 | J |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 162 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | 0.005 J | B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | ~~<0.050~~ .0050 | J |
| Copper | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .012 | JB |
| Iron | 10/26/2011 | SW846 3005/6010 | 6.88 | |
| Lead | 10/26/2011 | SW846 3005/6010 | 0.007 J | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 51.0 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.518 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 11.2 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 1050 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0102 | J |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.062 | |

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# LABORATORY REPORT FOR METAL ANALYSIS IN WATER

**Client:** ACP
**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A
**Field Location:** MW-27
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15398
**Sample Type:** Water
**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 5.22 | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | ~~<0.010~~ .0032 | J |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.150 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | ~~<0.005~~ .00050 | J |
| Cadmium | 10/26/2011 | SW846 3005/6010 | ~~<0.005~~ .00050 | J |
| Calcium | 10/26/2011 | SW846 3005/6010 | 268 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | 0.008 J | B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | ~~<0.050~~ .0027 | J |
| Copper | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .012 | JB |
| Iron | 10/26/2011 | SW846 3005/6010 | 8.72 | |
| Lead | 10/26/2011 | SW846 3005/6010 | 0.013 | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 85.4 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.633 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 10.0 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 442 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | 0.013 J | |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.081 | |

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# LABORATORY REPORT FOR METAL ANALYSIS IN WATER

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-3
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15399

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 0.296 | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.321 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 174 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | ~~<0.010~~ .0014 | JB |
| Cobalt | 10/26/2011 | SW846 3005/6010 | <0.050 | |
| Copper | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0023 | JB |
| Iron | 10/26/2011 | SW846 3005/6010 | 0.400 | |
| Lead | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 50.4 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.012 J | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 10.2 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 1720 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0012 | J |
| Zinc | 10/26/2011 | SW846 3005/6010 | <0.060 .019 | J |

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Comments:

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# LABORATORY REPORT FOR METAL ANALYSIS IN WATER

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-2
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15400

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 0.174 J | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | ~~<0.010~~ .0028 | J |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.328 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 205 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Cobalt | 10/26/2011 | SW846 3005/6010 | ~~<0.050~~ .0026 | J |
| Copper | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Iron | 10/26/2011 | SW846 3005/6010 | 1.96 | |
| Lead | 10/26/2011 | SW846 3005/6010 | 0.073 | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 38.4 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.649 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 54.7 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 1810 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .00090 | J |
| Zinc | 10/26/2011 | SW846 3005/6010 | <0.060 .017 | J |

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Comments:

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Bruce Hoogesteger, Technical Director

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# *LABORATORY REPORT FOR METAL ANALYSIS IN WATER*

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-35
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15401

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 0.174 J | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Barium | 10/26/2011 | SW846 3005/6010 | <0.100 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 60.0 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | ~~<0.010~~ .0032 | J B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | <0.050 | |
| Copper | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Iron | 10/26/2011 | SW846 3005/6010 | 0.280 | |
| Lead | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 22.1 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.026 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 3.17 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 91.5 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.141 | |

ELAP ID No.:10958

Comments:

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# LABORATORY REPORT FOR METAL ANALYSIS IN WATER

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-28
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15402

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 0.208 | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.252 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 168 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | 0.006 J | B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | <0.050 | |
| Copper | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0023 | JB |
| Iron | 10/26/2011 | SW846 3005/6010 | 0.544 | |
| Lead | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 37.3 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.033 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 6.72 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 757 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0010 | J |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.073 | |

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# *LABORATORY REPORT FOR METAL ANALYSIS IN WATER*

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-29
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15403

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 1.19 | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Barium | 10/26/2011 | SW846 3005/6010 | <0.100 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 14.7 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | 0.008 J | B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | <0.050 | |
| Copper | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0092 | JB |
| Iron | 10/26/2011 | SW846 3005/6010 | 1.60 | |
| Lead | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 2.52 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.035 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 1.59 J | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 1.38 J | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0040 | J |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.056 J | |

ELAP ID No.:10958

Comments:

**Approved By:** _____
Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.

File ID:114536A.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

# LABORATORY REPORT FOR METAL ANALYSIS IN WATER

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-12R
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15404

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 2.05 | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | ~~<0.010~~ .0031 | J |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.097 J | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | ~~<0.005~~ .00020 | J |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 419 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | 0.005 J | B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | ~~<0.050~~ .0021 | J |
| Copper | 10/26/2011 | SW846 3005/6010 | <0.025 .0025 | J B |
| Iron | 10/26/2011 | SW846 3005/6010 | 13.7 | |
| Lead | 10/26/2011 | SW846 3005/6010 | 0.005 J | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 197 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.783 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | <0.040 | |
| Potassium | 10/26/2011 | SW846 3005/6010 | 23.3 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 1290 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0054 | J |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.050 J | |

ELAP ID No.:10958

Comments:

**Approved By:** _____

Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.

File ID:114536A.xls

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue, Rochester, NY 14608 (585) 647-2530 FAX (585) 647-3311

# *LABORATORY REPORT FOR METAL ANALYSIS IN WATER*

**Client:** ACP

**Client Job Site:** MOB Project, Buffalo General Hospital
**Client Job No.:** N/A

**Field Location:** MW-36
**Field ID No.:** N/A

**Lab Project No.:** 11-4536A
**Lab Sample No.:** 15405

**Sample Type:** Water

**Date Sampled:** 10/20/2011
**Date Received:** 10/21/2011

| Parameter | Date Analyzed | Analytical Method | Result (mg/L) | |
|---|---|---|---|---|
| Aluminum | 10/26/2011 | SW846 3005/6010 | 15.9 | |
| Antimony | 10/26/2011 | SW846 3005/6010 | <0.060 | |
| Arsenic | 10/26/2011 | SW846 3005/6010 | 0.006 J | |
| Barium | 10/26/2011 | SW846 3005/6010 | 0.305 | |
| Beryllium | 10/26/2011 | SW846 3005/6010 | <0.005 .00060 | J |
| Cadmium | 10/26/2011 | SW846 3005/6010 | <0.005 | |
| Calcium | 10/26/2011 | SW846 3005/6010 | 198 | |
| Chromium | 10/26/2011 | SW846 3005/6010 | 0.016 | B |
| Cobalt | 10/26/2011 | SW846 3005/6010 | ~~<0.050~~ .0098 | J |
| Copper | 10/26/2011 | SW846 3005/6010 | 0.027 | B |
| Iron | 10/26/2011 | SW846 3005/6010 | 18.4 | |
| Lead | 10/26/2011 | SW846 3005/6010 | 0.026 | |
| Magnesium | 10/26/2011 | SW846 3005/6010 | 66.9 | |
| Manganese | 10/26/2011 | SW846 3005/6010 | 0.743 | |
| Mercury | 10/27/2011 | SW846 7470 | <0.0002 | |
| Nickel | 10/26/2011 | SW846 3005/6010 | ~~<0.040~~ .0111 | J |
| Potassium | 10/26/2011 | SW846 3005/6010 | 15.3 | B |
| Selenium | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Silver | 10/26/2011 | SW846 3005/6010 | <0.010 | |
| Sodium | 10/27/2011 | SW846 3005/6010 | 1100 | B |
| Thallium | 10/26/2011 | SW846 3005/6010 | <0.025 | |
| Vanadium | 10/26/2011 | SW846 3005/6010 | ~~<0.025~~ .0262 | |
| Zinc | 10/26/2011 | SW846 3005/6010 | 0.170 | |

ELAP ID No.:10958

Comments:

**Approved By:** _____
Bruce Hoogesteger, Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional sample information, including compliance with sample condition requirements upon receipt.

File ID:114536A.xls

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CONVENTIONALS ANALYSIS DATA SHEET

MW-2

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-008

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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CONVENTIONALS ANALYSIS DATA SHEET

MW-3

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-007

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | ~~10~~ 9.55 | ~~U~~ | J | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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CONVENTIONALS ANALYSIS DATA SHEET

MW-8

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-004

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments

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CONVENTIONALS ANALYSIS DATA SHEET

MW-12R

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-012

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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CONVENTIONALS ANALYSIS DATA SHEET

MW-18

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-001

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 19 | | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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CONVENTIONALS ANALYSIS DATA SHEET

MW-27

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-006

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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U.S. EPA - CLP

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CONVENTIONALS ANALYSIS DATA SHEET

MW-28

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-010

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 12 | | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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U.S. EPA - CLP

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CONVENTIONALS ANALYSIS DATA SHEET

MW-29

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-011

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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CONVENTIONALS ANALYSIS DATA SHEET

MW-35

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-009

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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U.S. EPA - CLP

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CONVENTIONALS ANALYSIS DATA SHEET

MW-36

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-013

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

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CONVENTIONALS ANALYSIS DATA SHEET

DUP 10-20-11-1

LAB NAME: Adirondack Environmental CONTRACT:

LAB CODE: AES Case No.: PA 1122 SAS No.: SDG No.: MW-2

Matrix (soil/water): Water Lab Sample ID: 111021017-005

Level (Low/Med): Low Date Received: 10/21/11

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

| Analyte | Concentration | C | Q | Method |
|---|---|---|---|---|
| Total Kjeldahl Nitrogen, as N | | | | SM 4500 NH3 C |
| Ammonia, as N | | | | EPA 350.1 |
| Nitrate | | | | EPA 300.0 |
| Chemical Oxygen Demand (COD) | | | | EPA 410.4 |
| Biochemical Oxygen Demand (BOD 5) | | | | SM 5210B |
| Total Organic Carbon (TOC) | | | | SM 5310C |
| Total Dissolved Solids (TDS) | | | | SM 2540C |
| Sulfate | | | | EPA 300.0 |
| Alkalinity | | | | SM 2320B |
| Total Phenols | | | | EPA 420.1 |
| Chloride | | | | EPA 300.0 |
| Bromide | | | | EPA 300.0 |
| Nitrite | | | | SM 4500 N02 B |
| Specific Conductance | | | | EPA 120.1 |
| Cyanide | 10 | U | | EPA 335.4 |
| pH | | | | SM 4500 H+ B |
| Turbidity | | | | EPA 180.1 |
| Color | | | | SM 2120B |
| Hexavalent Chromium | | | | SM 3500 CR D |
| | | | | |

Comments _____

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FORM I - CONV

PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: Paradigm Environmental Services Client Name: ACP
Lab Project #: 11-4536A Client Project #: N/A SDG#: 15395
Client Project Name: MOB Project, Buffalo General Hospital
Lab File ID: P0811ISA.M Date Analyzed: 8/10/2011
Instrument ID: Instrument 1-Dual ECD1 Column: ECD1 A Time Analyzed: PM

| | INITIAL CALIBRATION STANDARDS | IS AREA | BNB RT |
|---|---|---|---|
| | Pest ICAL L-1 0.005 | 164069 | 2.30 |
| | Pest ICAL L-2 0.010 | 175605 | 2.30 |
| | Pest ICAL L-3 0.020 | 175838 | 2.30 |
| | Pest ICAL L-4 0.050 | 183583 | 2.30 |
| | Pest ICAL L-5 0.100 | 189323 | 2.30 |
| | Pest ICAL L-6 0.200 | 192158 | 2.30 |
| | Pest ICAL L-7 0.400 | 177250 | 2.30 |
| | Average | 179689 | 2.30 |
| | UPPER LIMIT | 269534 | 2.80 |
| | LOWER LIMIT | 89845 | 1.80 |
| | LAB SAMPLE# | | |
| 1 | Water PB 10/21 | 206344 | 2.27 |
| 2 | Water LCS 10/21 | 202686 | 2.27 |
| 3 | Water LCS2 10/21 | 184459 | 2.27 |
| 4 | MW-18 15395 | 197536 | 2.27 |
| 5 | MW-18 15395 MS | 197346 | 2.26 |
| 6 | MW-18 15395 MSD | 210373 | 2.26 |
| 7 | MW-8 15396 | 271994 * | 2.25 |
| 8 | DUP 10-20-11-1 15397 | 193775 | 2.26 |
| 9 | MW-27 15398 | 212812 | 2.26 |
| 10 | MW-3 15399 | 218137 | 2.26 |
| 11 | MW-2 15400 | 263857 | 2.26 |
| 12 | MW-35 15401 | 199458 | 2.26 |
| 13 | MW-28 15402 | 216146 | 2.26 |
| 14 | MW-29 15403 | 191629 | 2.26 |
| 15 | MW-12R 15404 | 191360 | 2.26 |
| 16 | MW-36 15405 | 212965 | 2.26 |

IS=1-Bromo-2-nitrobenzene
AREA UPPER LIMIT=+50% of internal standard area
AREA LOWER LIMIT=-50% of internal standard area
RT UPPER LIMIT=+.50 minutes of internal standard RT
RT LOWER LIMIT=-.50 minutes of internal standard RT
*Values outside of QC limits

IS FORM PESTICIDES

# APPENDIX B
# 2012 HYDROLOGY STUDY REPORT

American Consulting Professionals of New York, PLLC
403 Main Street, Suite 320
Buffalo, NY 14203
Tel 716.533.4100 • Fax 716.533.4101
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February 21, 2012

Mr. Robert Bragg
Kaleida Health
VP Project Management Services
Larking Building, Suite 200
726 Exchange Street
Buffalo, New York 14210

RE: Pre-Construction Hydrogeologic Studies and Aquifer Pump Testing Data
1001 Main Street; Buffalo, New York

Dear Mr. Bragg:

This report provides a summary of the aquifer pump testing that was completed as part of pre-construction activities for the medical office building that will be built at 1001 Main Street in Buffalo, New York. Water management contractors requested data to assess the volume water that will be encountered during deep remedial excavation and/or construction of the subgrade parking.

The following provides an overview of the tasks that were completed to provide this information along with the preliminary results of these studies. We understand that L.P. Ciminelli's dewatering contractor (MoreTrench) will use the data to model hydraulic conductivity and water draw down across the site.

## PUMP TESTS

### *Installation of Pumping Well*

A four inch diameter pumping well (RW – 2) was installed at the location shown on Figure A. The boring was advanced to 55 feet BGS using 6.25 hollow stem augers. A 4-inch diameter well was constructed in the borehole with a 30-foot slotted PVC screen from 55 feet to 25 feet BGS and 4 inch PVC riser pipe to ground surface. The well was finished at the surface with a curb box with a lockable cap. The well construction diagram is attached in Appendix A.

### *Pump Test at RW - 2*

The pump test was started at RW – 2 on February 3rd, 2012. The pump was placed so the pump impeller was at 50 +/- feet BGS. Troll 700 data loggers were placed in the pumping well (RW – 2), MW – 05, MW – 13, MW – 31, MW – 08, and MW – 34 to measure draw-down of water levels from the pump test in adjacent wells.

The initial pumping rate started at approximately 5 gallons per minute (GPM). The water table was immediately drawn down in the pumping well to the level of the submersible pump. Since a sustainable pumping rate could not be achieved with a conventional submersible pump, the pump test was suspended for the day until a low-flow pump could be obtained.

The pump test at RW – 2 was again started on Saturday, February 4th with a Redi-Flo II submersible sampling pump with a capable of variable low flow pumping rates. The test was started with a pumping rate of approximately of one GPM. Again, the water level in the well was immediately drawn down, so the pumping rate was adjusted downward until a sustainable pumping rate could be established. After several hours, a pumping rate of one-quart per 5 minutes, or 0.04 GPM, was established with 18 feet of draw down. The flow rate was so low that flow could not be consistently maintained, and pumping interruptions to the test could not be controlled. Less than 10 gallons of water were pumped during this 1 ½ hour pump test, and there was no discernible draw down or impact to the water table in adjacent wells.

Because of the very low flow rate attained in RW - 2, American decided to check several adjoining wells for flow rates by bailing water from monitoring wells MW – 13 and MW – 32 and monitoring the recovery rates. MW – 32 was the quickest to recover to equilibrium conditions, so American decided to complete an additional pump test in MW – 32. Note that MW-32 was installed into a four-foot layer of coarse sand present at 28 feet below grade (See Appendix A).

***Pump Test at MW – 32.***

The pump test was started at MW – 32 on February 6th, 2012. Prior to the start of the pump test, the bottom of the well was sounded as a soft bottom at 33.4 feet BGS. The pump impeller was placed at approximately 30.5 feet BGS in this 35 foot deep 4 inch diameter groundwater monitoring well. Static water level was manually measured at 26.76 feet BGS.

Prior to the commencement of pumping, Troll 700 data loggers were placed at 6 monitoring points to record the effect of pumping activities (draw-down) on water levels in the respective wells. The monitoring points were as follows:

- MW – 32;
- MW – 5 (~44 feet west of pumping well MW – 32);
- MW – 35 (~60 feet northeast of pumping well MW – 32);
- AS – 01 (~34 feet due east of the pumping point);
- MW – 12R (~48 feet south-southeast of the pumping point): and
- MW – 34 (~54 feet south-southwest of the pumping point).

The static water levels were measured prior to the placement of the Trolls and manually three times a day to evaluate hydrogeologic impacts on a real time basis. In addition to these monitoring points, several water levels were also collected in the bedrock well NW – BR – 1 and the intermediate depth well NW – I – 1. Static water levels are summarized on Table 1A.

The step draw-down test began at 9:50 am on Monday, February 6, 2012 at a rate of 0.8 gallons per minute. Water table drawdown was immediately recorded, so the pump rate was decreased, and drawdown stabilized at 11:05 am at a rate of 0.5 GPM. This rate was maintained with only a minor increase in drawdown to the water table, so the flow rate was adjusted downward to 0.4 GPM and constant rate test was started at 12:30 pm on February 6th with a draw down in MW – 32 of 2.37 feet.

Water levels, flow rate and total gallons pumped were checked three times daily at approximately 8:00 am, 2:00 pm and 8:00 pm from Monday through Friday, February 10th, 2012 at 12:30 pm. Flow rate during the constant rate pumping test varied from 0.38 to 0.46 GPM with a total of 2,506 gallons of groundwater.

Throughout the test, groundwater level in MW – 32 continued to decrease from an initial stabilized pumping level of approximately 29.3 feet BGS at 10:53 on February 6th, to a final level of 29.63 at 12:30 pm on Friday, February 10th, 2012. Manually measured water table drawdown information is provided on Tables 1A, 1B, and 1C, with average water table drawdown shown as a bar graph on Table 1D.

The effects of the pumping test on groundwater levels at the pumping well MW – 32 as well as monitoring points MW – 5, MW – 35, MW – 12R, MW – 34 and AS – 01 are represented as graphs in Appendix D and are summarized below:

- MW – 32 drawdown remained somewhat flat until February 7th, and then increased slightly throughout the rest of the pump test.
- MW – 5 drawdown increased through February 8th, then increased and plateaued through February 8th, and again decreased on February 9th. This increase in the water level may be related to a change in barometric pressure or the slight decrease in the pump rate that was need to maintain equilibrium pumping conditions.
- MW – 35 drawdown also increased through February 8th, then increased and plateaued through February 8th, and again decreased on February 9th. This increase in the water level may be related to a change in barometric pressure or the slight decrease in the pump rate that was need to maintain equilibrium pumping conditions.
- MW – 12R drawdown also increased through February 8th, then increased and plateaued through February 8th, and again decreased on February 9th. This increase in the water level may be related to a change in barometric pressure or the slight decrease in the pump rate that was need to maintain equilibrium pumping conditions.
- MW – 34 drawdown also increased through February 8th, then increased and plateaued through February 8th, and again decreased on February 9th. This increase in the water level may be related to a change in barometric pressure or the slight decrease in the pump rate that was need to maintain equilibrium pumping conditions.
- AS – 01 drawdown increased until approximately 10:00 pm on February 6th. For the next 24 hours, the groundwater level at AS – 01 increased 0.3 feet and actually increased to 0.155 feet above its static water level prior to the start of the test. Since sparge points are often attached in the subsurface by laterals, the results encountered at AS – 01 likely indicates that water was entering AS – 01 from other AS "sparge points" that were laterally attached.

The pumping system was dismantled and all equipment was removed from the Site by Monday, February 13th, 2012.

Preliminary results of the two pump tests completed onsite indicate that groundwater flow conditions are variable across the site, but in all instances, groundwater flow is very low, ranging from 0.04 GPM at RW – 2 to 0.4 GPM at MW – 32. While pumping rates were very low, impacts to the water table were observed as far away as MW – 34, located 54 feet from the pumping at MW – 32 where the water table was depressed in MW - 34 by 2.87 feet over a period of four days. Of the five shallow monitoring points that were observed, all five points showed varying amounts of drawdown in response to the groundwater pumping at MW – 32.

The following field data is attached in this report in the following Appendices:

- Appendix A: Well Diagrams from Pumping Wells RW – 2 and Mw – 32
- Appendix B: Water Level Measurements – Manual Readings
- Appendix C: Water Level Measurements – Data Loggers

**CLOSURE**

If you have any questions or require additional information, please contact Mark Colmerauer, at 716-570-4567.

Sincerely,
American Consulting Professionals of New York, PLLC

Mark Colmerauer
Principal

CC: D. Elia, L.P. Ciminelli
T. Vaeth, Ciminelli Real Estate

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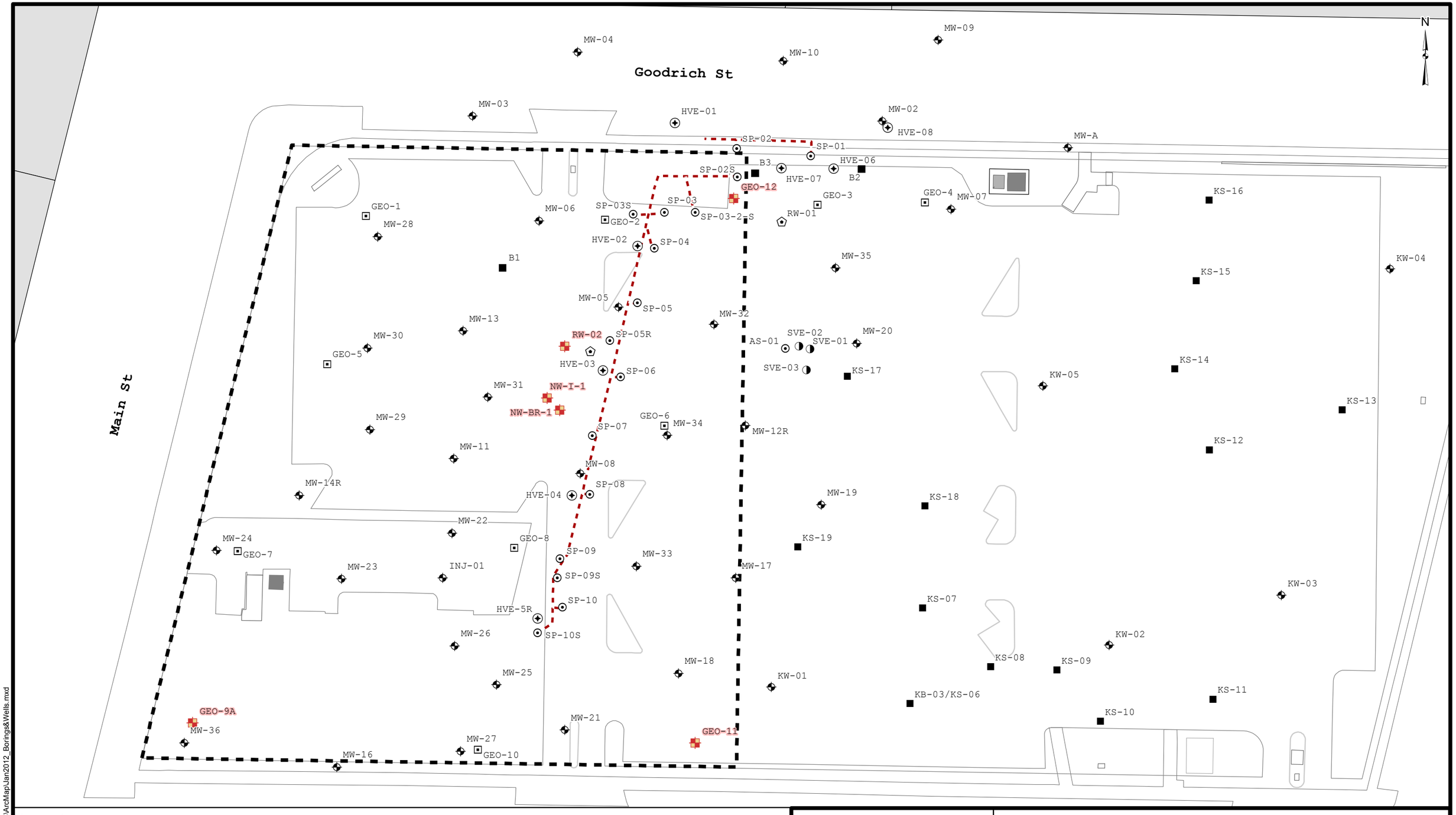



**Legend**

- Bedrock Borings and Wells Installed January 2012
- Monitoring Well
- Sparge Well
- Extraction Well
- Soil Vapor Extraction Well
- Geotechnical Boring
- Soil Boring
- Recovery Well
- Sparge Pipeline
- Project Footprint

0 20 40 80 Feet

1 inch = 40 feet

| | |
|---|---|
| NYSDEC BCP | BEDROCK BORINGS AND WELLS INSTALLED JANUARY 2012 |
| American Consulting Professionals of New York, PLLC | MOB BROWNFIELD REDEVELOPMENT / FIGURE A |

Path: F:\PROJECT\510NY051\GIS\ArcMap\Jan2012_Borings&Wells.mxd

# APPENDIX A: PUMPING WELL CONSTRUCTION DIAGRAMS

# Monitoring Well

ID NO. **MW-32**

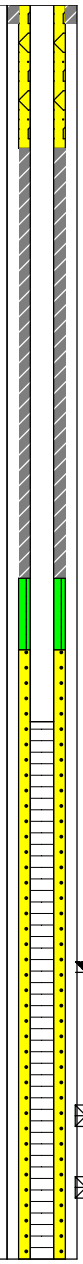
**Groundwater & Environmental Services, Inc.**



| | | | | | |
|---|---|---|---|---|---|
| PROJECT: | **99-MST** | SURFACE ELEV.: | **NA** | TOTAL DEPTH: | **35 ftbg** |
| ADDRESS: | **979 Main Street, Buffalo, NY** | WATER DEPTH: | **27 ftbg** | CASING EL.: | **NA** |
| JOB NO. | **0901222** | BOREHOLE DIA.: | **8''** | WELL DIA.: | **4''** |

| | | | |
|---|---|---|---|
| Logged By: | **Eric Popken** | Drilling Method: | **Hollow Stem Auger** |
| Dates Drilled: | **September 12, 2008** | Sampling Method: | **Split Spoon** |
| Drilling Company: | **SJB Services, Inc.** | Soil Class. System: | **Modified Burmeister** |
| Drill Rig Type: | **CME-75 Truck-Mounted Auger Rig** | Field Screening: | **MiniRAE 2000 PID w/10.6 eV lamp** |

| Depth (feet) | Sample Interval | Field Screen | Blow Counts | Rec. | SAMPLE LITHOLOGY | COMMENTS | COMPLETION DETAILS |
|---|---|---|---|---|---|---|---|
| 0 | 0-2 | 0.1 | NA | NA | Asphalt, binder | Boring was hand cleared to 5 ftbg | Road box |
| | 2-4 | 0.0 | NA | NA | FILL-brown fine to coarse SAND, little fine to coarse Gravel, trace asphalt and bricks (dry) | | Clean soil cuttings 0-4 ftbg |
| | 4-5 | 0.1 | NA | NA | Tan fine to medium SAND, trace-little Silt (dry-moist) | | |
| 5 | 5-7 | 0.7 | 5-7-11-17 | 22" | | | Grout from 4-16 ftbg |
| | 7-9 | 1.1 | 37-30-44-50/4 | 19" | | | |
| | 9-11 | 1.6 | 9-17-44-41 | 19" | | | |
| 10 | 11-13 | 1.3 | 45-50/3 | 12" | | | Schedule 40 PVC riser from 0-20 ftbg |
| | 13-15 | 0.6 | 12-31-50/3 | 14" | | | |
| 15 | 15-17 | 1.1 | 10-8-42-40 | 19" | | | |
| | 17-19 | 0.4 | 17-33-40-50/3 | 19" | | | Bentonite seal from 16-18 ftbg |
| | 19-21 | 0.4 | 10-8-12-16 | 12" | | | |
| 20 | 21-23 | 0.6 | 12-12-10-15 | 24" | Brown fine to medium SAND, some Silt (moist) | | Schedule 40 0.10 slot PVC screen from 20-35 ftbg |
| | 23-25 | 0.7 | 8-7-14-18 | 24" | Brown fine to medium SAND, trace-little Silt (moist) | | |
| 25 | 25-27 | 1.2 | 6-12-23-38 | 19" | | Groundwater was encountered at approx. 27 ftbg | |
| | 27-29 | 478 | 12-15-22-20 | 24" | Black fine to coarse SAND, little Silt, trace fine to coarse gravel, sheen and SPH noted (wet) | Soil sample collected from 31-32' interval for VOC analysis (8260 STARS) | |
| 30 | 29-31 | 465 | 15-20-24-25 | 24" | | | |
| | 31-32 | 622 | 2-19 | 24" | | Soil sample collected from 33-35' interval for VOC analysis (8260 STARS) | Sand pack from 18-35 ftbg |
| | 32-33 | 104 | 21-50/2 | 24" | Brown Silty CLAY, little fine to coarse gravel, trace fine to coarse sand (moist) | | |
| 35 | 33-35 | 15.6 | 15-6-50/2 | 24" | | | |



**Location:**

Northing/Latitude: **NA**

Easting/Longitude: **NA**

Horizontal Datum: **NA**

Vertical Datum: **NA**

**General Comments:**

ftbg = feet below grade

NA = Not Applicable

NR = Not Recorded

**Symbol Key:**

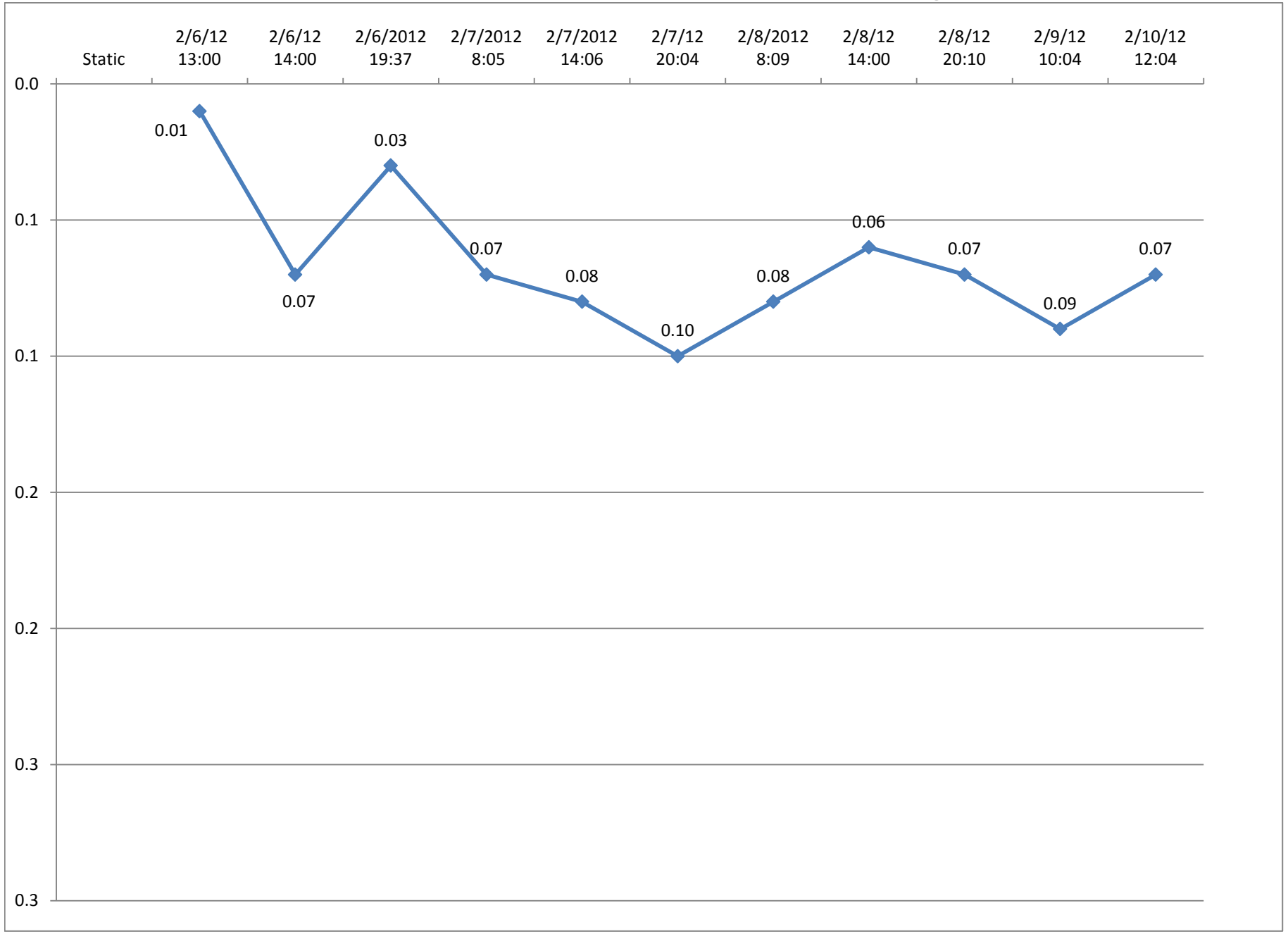
Apparent Water Level

Lab Sample Location

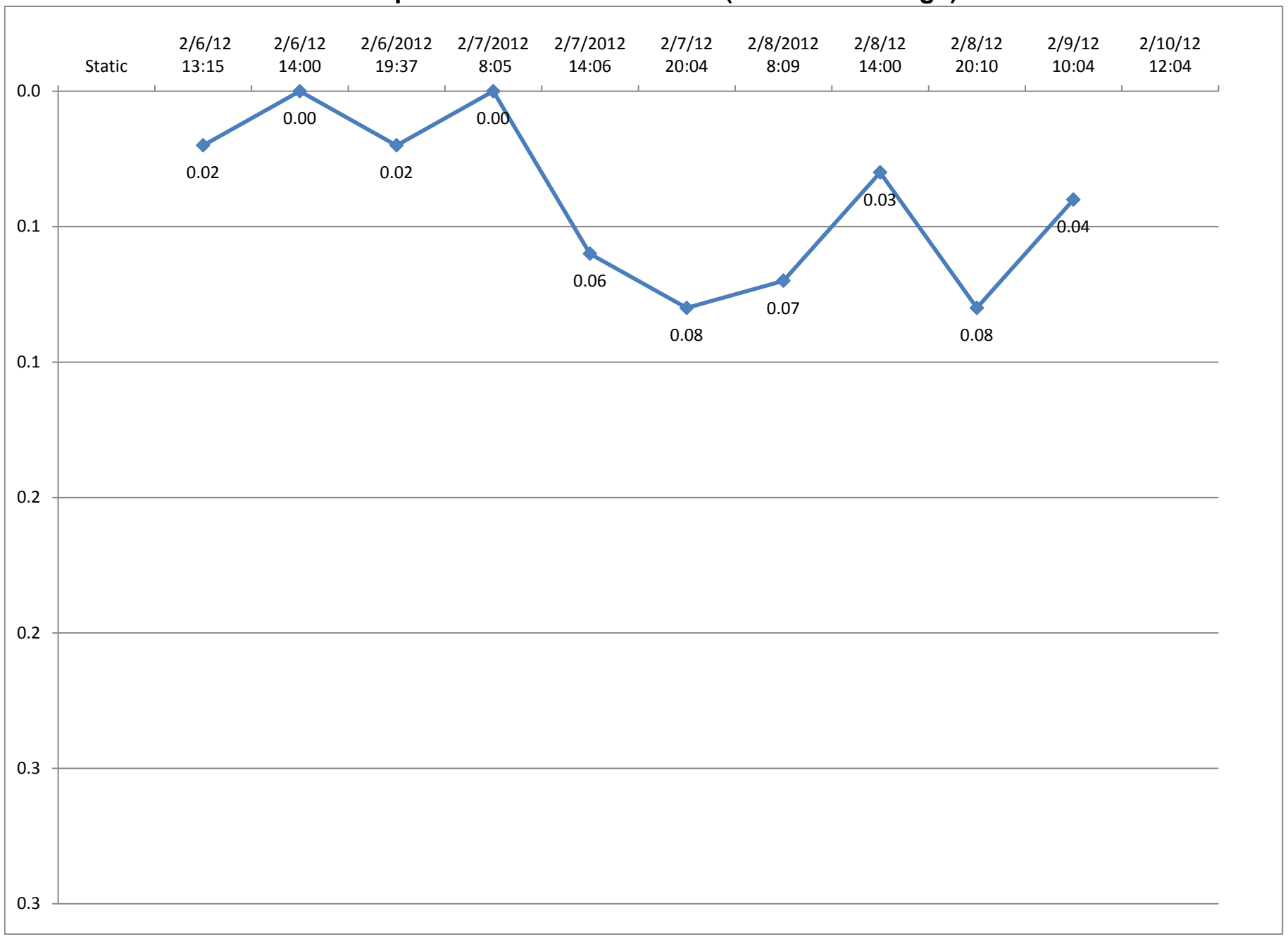
# APPENDIX B: WATER LEVEL MEASUREMENTS – Manual Data

# Graph of Drawdown: MW - 34 (Manual Readings)

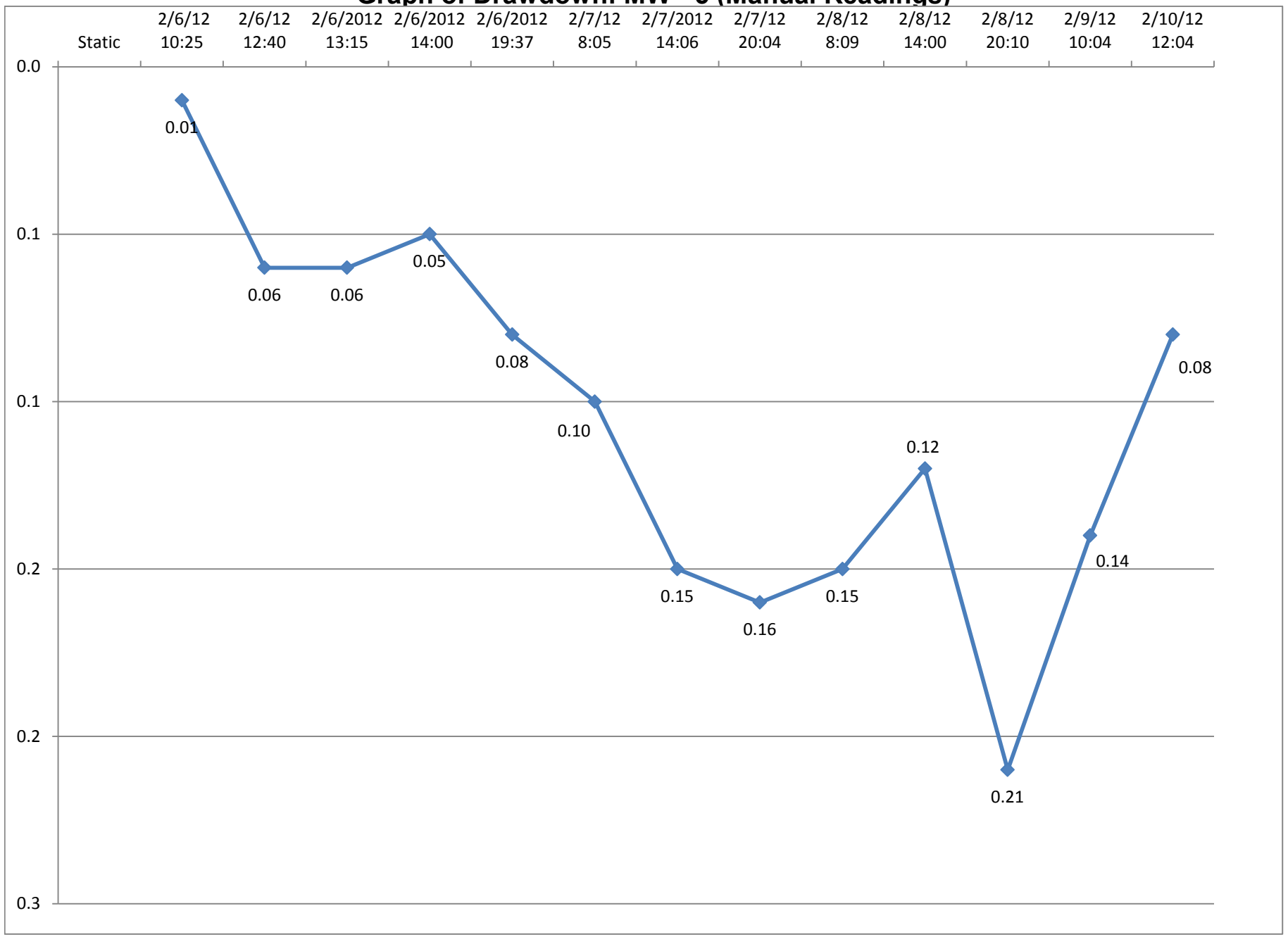
# Graph of Drawdown: MW - 12R (Manual Readings)



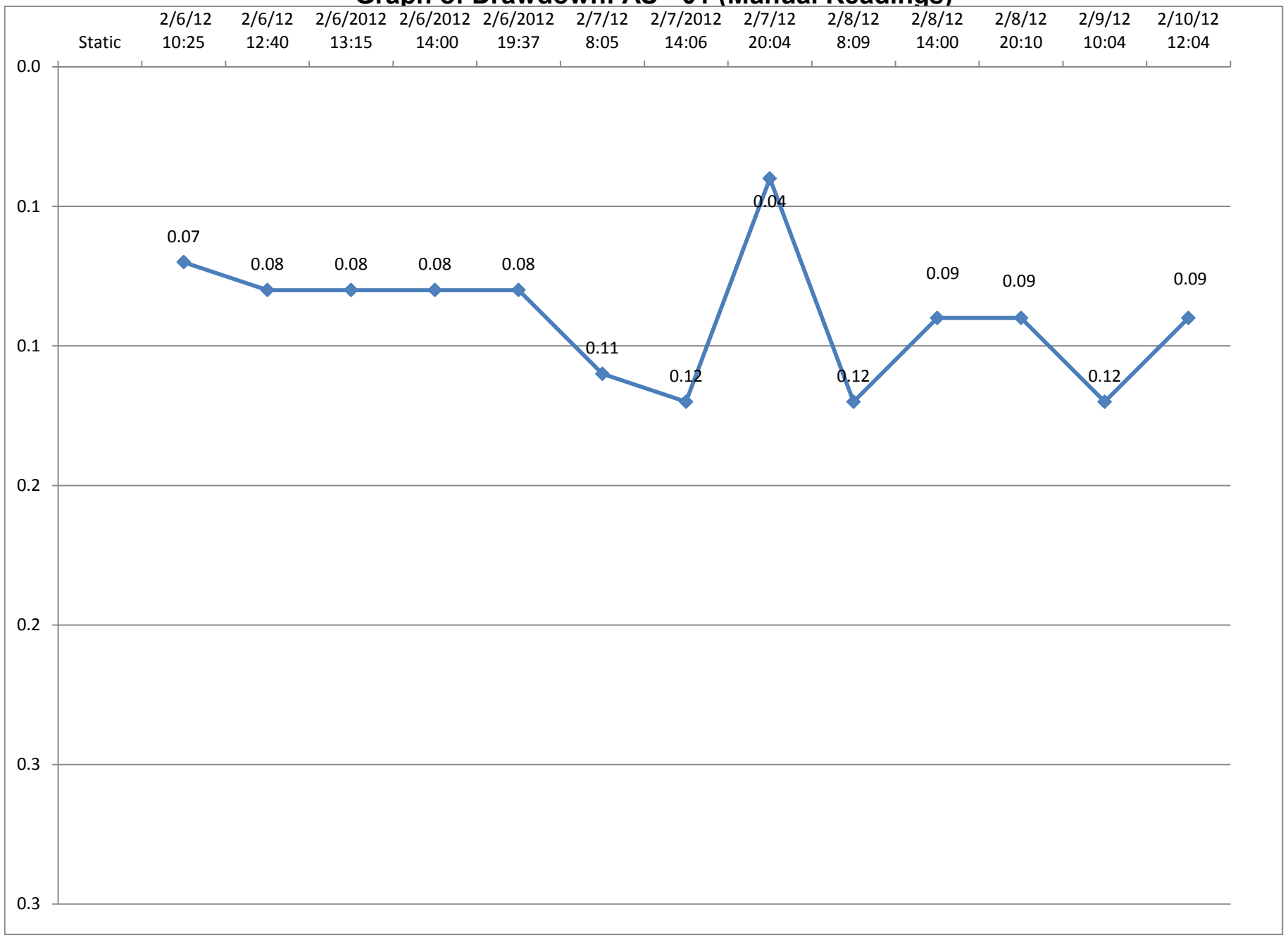
# Graph of Drawdown: MW - 35 (Manual Readings)



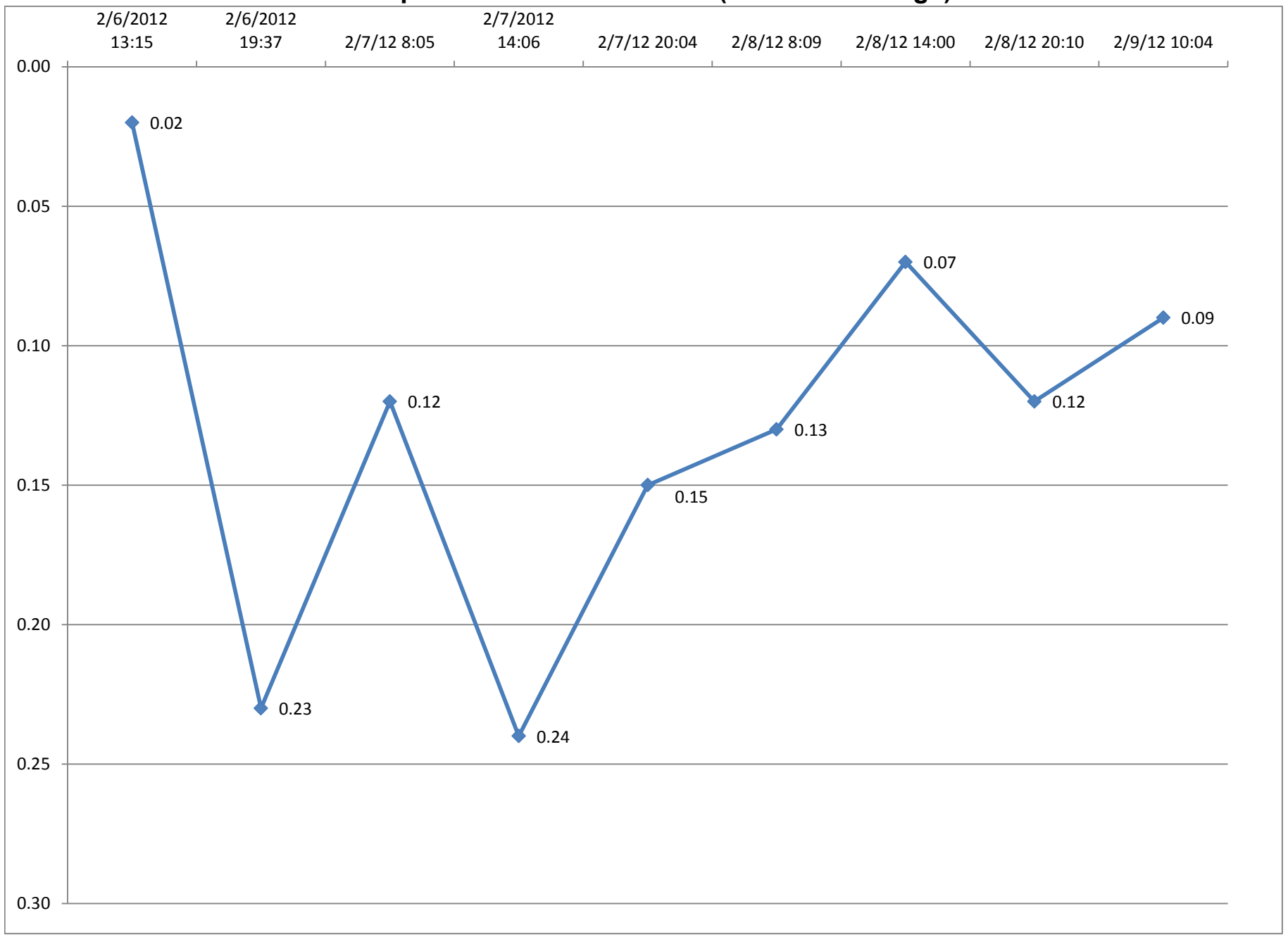
# Graph of Drawdown: MW - 5 (Manual Readings)

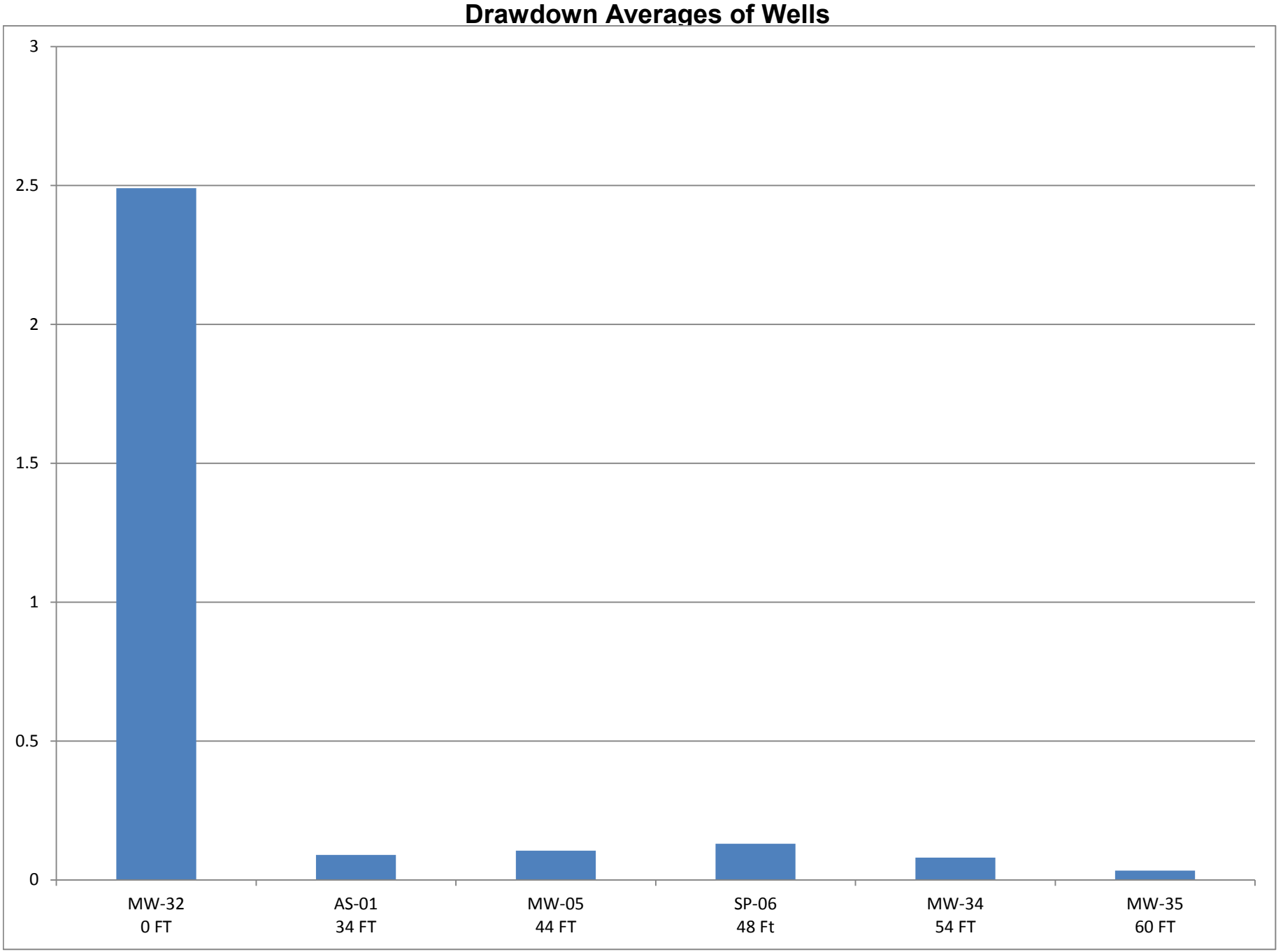


# Graph of Drawdown: AS - 01 (Manual Readings)



# Graph of Drawdown: SP - 06 (Manual Readings)




Drawdown Averages of Wells
3
2.5
2
1.5
1
0.5
0
MW-32
0 FT
AS-01
34 FT
MW-05
44 FT
SP-06
48 Ft
MW-34
54 FT
MW-35
60 FT

Feb-12 American

**TABLE 1 A - PUMP TEST WATER LEVELS - PUMPING WELL MW - 32 (Manual Readings)**

| *DATE* | *TIME* | *PUMP RATE gpm* | *METER READING* | *Gallons Pumped (Total)* | *MONITORING WELL* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **MW - 32** | **MW - 34** | **MW - 35** | **MW - 12R** | **MW - 05** | **AS - 01** | **SP - 06** | **NW - I - 1** | **NW - BR - 1** |
| Feb 6/ 2012 | Static 8:09 to 9:46 | 0 | 494 | | 26.76 | 28.04 | 24.73 | 27.25 | 26.97 | 26.15 | 31.48 | 51.22 | 53.06 |
| ***BEGIN PUMP TEST AT 9:50*** | | | | | | | | | | | | | |
| Feb 6/2012 | 9:52 | V | | | 28.5 | | | | | | | | |
| | 9:55 | A | | | 28.84 | | | | | | | | |
| | 10:02 | R | | | 29.13 | | | | | | | | |
| | 10:10 | I | | | 29.267 | | | | | | | | |
| | 10:15 | A | | | 29.24 | | | | | | | | |
| | 10:18 | B | | | | | | | | 26.22 | | | |
| | 10:25 to 10:30 | L | | | 29.28 | | | | 26.96 | 26.22 | | | |
| | 10:40 | E | | | 29.29 | | | | | | | | |
| | 10:53 | 0.5 | | | 29.39 | | | | | | | | |
| | 11:10 | 0.5 | | | 29.05 | | | | | | | | |
| | 11:25 | 0.5 | | | 28.98 | | | | | | | | |
| | 11:30 | 0.5 | | | 28.98 | | | | | | | | |
| | 11:40 | 0.5 | | | 29.01 | | | | | | | | |
| | 11:50 | 0.5 | | | 29.01 | | | | | | | | |
| | 12:00 | 0.5 | | | 29.00 | | | | | | | | |
| | 12:15 | 0.5 | | | 29.01 | | | | | | | | |
| | 12:30 | 0.4 | | | 29.10 | | | | | | | | |
| | 12:40 to 12:43 | 0.4 | | | 29.13 | | | | 27.03 | 26.23 | | | |
| | 13:00 | 0.4 | | | 29.02 | 28.09 | | 27.26 | | | 31.5 | | |
| | 13:15 | 0.4 | | | 29.1 | | 24.75 | | 27.03 | 26.23 | | | |
| | 13:30 | 0.4 | | | 29.14 | | | | | | | | |
| | 14:00 | 0.4 | | | 29.10 | 28.09 | 24.75 | 27.32 | 27.02 | 26.23 | | | |
| Feb 6/2012 | 19:37 to 19:49 | 0.46 | 790 | 296 | 29.25 | 28.09 | 24.75 | 27.28 | 27.05 | 26.23 | 31.25 | | |
| Feb 7/2012 | 8:04 to 8:12 | 0.38 | 1130 | 636 | 29.13 | 28.15 | 24.73 | 27.32 | 27.07 | 26.26 | 31.60 | | |
| Feb 7/2012 | 13:55 to 14:06 | 0.4 | | | | | | | | | | | |
| | 14:54 | | 1284 | 790 | 29.28 | 28.15 | 24.79 | 27.33 | 27.12 | 26.27 | 31.72 | | |
| Feb 7/2012 | 20:04 to 20:18 | | | | | | | | | | | | |
| | 20:00 | 0.46 | 1419 | 925 | 29.28 | 28.16 | 24.81 | 27.35 | 27.13 | 26.31 | 31.63 | 51.38 | 53.15 |
| Feb 8/2012 | 8:09 to 8:17 | 0.4 | N R | N R | 29.35 | 28.15 | 24.8 | 27.33 | 27.12 | 26.27 | 31.61 | | |
| Feb 8/ 2012 | 13:49 to 14:00 | 0.4 | NR | NR | 29.35 | 28.12 | 24.76 | 27.31 | 27.09 | 26.24 | 31.55 | | |
| Feb 8/ 2012 | 20:10 to 20:21 | 0.4 | 1980 | 1486 | 29.35 | 28.12 | 24.75 | 27.32 | 27.18 | 26.24 | 31.36 | 51.33 | |
| Feb 9/ 2012 | 10:04 to 10:20 | 0.4 | 2312 | 1818 | 29.49 | 28.15 | 24.77 | 27.34 | 27.11 | 26.27 | 31.39 | | |
| Feb 10/ 2012 | 12:04 to 12:20 | 0.4 | 3000 | 2506 | 29.63 | 28.14 | | 27.32 | 27.05 | 26.24 | | | |

F: 061/Env/Geology/Pump Test/Water Levels

Feb-12

American

**TABLE 1B - PUMP TEST INTERVALWATER LEVEL DRAWDOWN FROM MANUAL READINGS**

| | | | | | MONITORING WELL | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *DATE* | *TIME* | *PUMP RATE gpm* | *METER READING* | *Gallons Pumped* | MW - 32 | WL Up | MW - 34 | WL Up | MW - 35 | WL Up | MW - 12R | WL Up | MW - 05 | WL Up | AS - 01 | WL Up | SP - 06 | WL Up | NW - I - 1 | WL Up | NW - BR - 1 | WL Up |
| **Feb 6/ 2012** | 8:09 to 9:46 | 0 | 494 | | 26.76 | | 28.04 | | 24.73 | | 27.25 | | 26.97 | | 26.15 | | 31.48 | | 51.22 | | 53.06 | |
| **Static** | | | | | | | | | | | | | | | | | | | | | | |
| ***BEGIN PUMP TEST AT 9:50*** | | | | | | | | | | | | | | | | | | | | | | |
| **Feb 6/2012** | 9:52 | V | | | 28.5 | -1.74 | | | | | | | | | | | | | | | | |
| | 9:55 | A | | | 28.84 | -0.34 | | | | | | | | | | | | | | | | |
| | 10:02 | R | | | 29.13 | -0.29 | | | | | | | | | | | | | | | | |
| | 10:10 | I | | | 29.267 | -0.137 | | | | | | | | | | | | | | | | |
| | 10:15 | A | | | 29.24 | 0.027 | | | | | | | | | | | | | | | | |
| | 10:18 | B | | | | | | | | | | | | | 26.22 | -0.07 | | | | | | |
| | 10:25 to 10:30 | L | | | 29.28 | -0.04 | | | | | | | 26.96 | 0.01 | 26.22 | 0 | | | | | | |
| | 10:40 | E | | | 29.29 | -0.01 | | | | | | | | | | | | | | | | |
| | 10:53 | 0.5 | | | 29.39 | -0.1 | | | | | | | | | | | | | | | | |
| | 11:10 | 0.5 | | | 29.05 | 0.34 | | | | | | | | | | | | | | | | |
| | 11:25 | 0.5 | | | 28.98 | 0.07 | | | | | | | | | | | | | | | | |
| | 11:30 | 0.5 | | | 28.98 | 0 | | | | | | | | | | | | | | | | |
| | 11:40 | 0.5 | | | 29.01 | -0.03 | | | | | | | | | | | | | | | | |
| | 11:50 | 0.5 | | | 29.01 | 0 | | | | | | | | | | | | | | | | |
| | 12:00 | 0.5 | | | 29.00 | 0.01 | | | | | | | | | | | | | | | | |
| | 12:15 | 0.5 | | | 29.01 | -0.01 | | | | | | | | | | | | | | | | |
| | 12:30 | 0.4 | | | 29.10 | -0.09 | | | | | | | | | | | | | | | | |
| | 12:40 to 12:43 | 0.4 | | | 29.13 | -0.03 | | | | | | | 27.03 | -0.07 | 26.23 | -0.01 | | | | | | |
| | 13:00 | 0.4 | | | 29.02 | 0.11 | 28.09 | -0.05 | | | 27.26 | -0.01 | | | | | 31.5 | -0.02 | | | | |
| | 13:15 | 0.4 | | | 29.1 | -0.08 | | | 24.75 | -0.02 | | | 27.03 | 0 | 26.23 | 0 | | | | | | |
| | 13:30 | 0.4 | | | 29.14 | -0.04 | | | | | | | | | | | | | | | | |
| | 14:00 | 0.4 | | | 29.10 | 0.04 | 28.09 | 0 | 24.75 | 0 | 27.32 | -0.06 | 27.02 | 0.01 | 26.23 | 0 | | | | | | |
| **Feb 6/2012** | 19:37 to 19:49 | 0.46 | 790 | 296 | 29.25 | -0.15 | 28.09 | 0 | 24.75 | 0 | 27.28 | 0.04 | 27.05 | -0.03 | 26.23 | 0 | 31.25 | 0.25 | | | | |
| **Feb 7/2012** | 8:04 to 8:12 | 0.38 | 1130 | 636 | 29.13 | 0.12 | 28.15 | -0.06 | 24.73 | 0.02 | 27.32 | -0.04 | 27.07 | -0.02 | 26.26 | -0.03 | 31.60 | -0.35 | | | | |
| **Feb 7/2012** | 13:55 to 14:06 | 0.4 | | | | | | | | | | | | | | | | | | | | |
| | 14:54 | | 1284 | 790 | 29.28 | -0.15 | 28.15 | 0 | 24.79 | -0.06 | 27.33 | -0.01 | 27.12 | -0.05 | 26.27 | -0.01 | 31.72 | -0.12 | | | | |
| **Feb 7/2012** | 20:04 to 20:18 | | | | | | | | | | | | | | | | | | | | | |
| | 20:00 | 0.46 | 1419 | 925 | 29.28 | 0 | 28.16 | -0.01 | 24.81 | -0.02 | 27.35 | -0.02 | 27.13 | -0.01 | 26.31 | -0.04 | 31.63 | 0.09 | 51.38 | -0.16 | 53.15 | -0.09 |
| **Feb 8/2012** | 8:09 to 8:17 | 0.4 | N R | N R | 29.35 | -0.07 | 28.15 | 0.01 | 24.8 | 0.01 | 27.33 | 0.02 | 27.12 | 0.01 | 26.27 | 0.04 | 31.61 | 0.02 | | | | |
| **Feb 8/ 2012** | 13:49 to 14:00 | 0.4 | NR | N R | 29.35 | 0 | 28.12 | 0.03 | 24.76 | 0.04 | 27.31 | 0.02 | 27.09 | 0.03 | 26.24 | 0.03 | 31.55 | 0.06 | | | | |
| **Feb 8/ 2012** | 20:10 to 20:21 | 0.4 | 1980 | 1486 | 29.35 | 0 | 28.12 | 0 | 24.75 | 0.01 | 27.32 | -0.01 | 27.18 | -0.09 | 26.24 | 0 | 31.36 | 0.19 | 51.33 | 0.05 | | |
| **Feb 9/ 2012** | 10:04 to 10:20 | 0.4 | 2312 | 1818 | 29.49 | -0.14 | 28.15 | -0.03 | 24.77 | -0.02 | 27.34 | -0.02 | 27.11 | 0.07 | 26.27 | -0.03 | 31.39 | -0.03 | | | | |
| **Feb 10/ 2012** | 12:04 to 12:20 | 0.4 | 3000 | 2506 | 29.63 | -0.14 | 28.14 | 0.01 | | | 27.32 | | 27.05 | 0.06 | 26.24 | 0.03 | | | | | | |

Feb-12

American

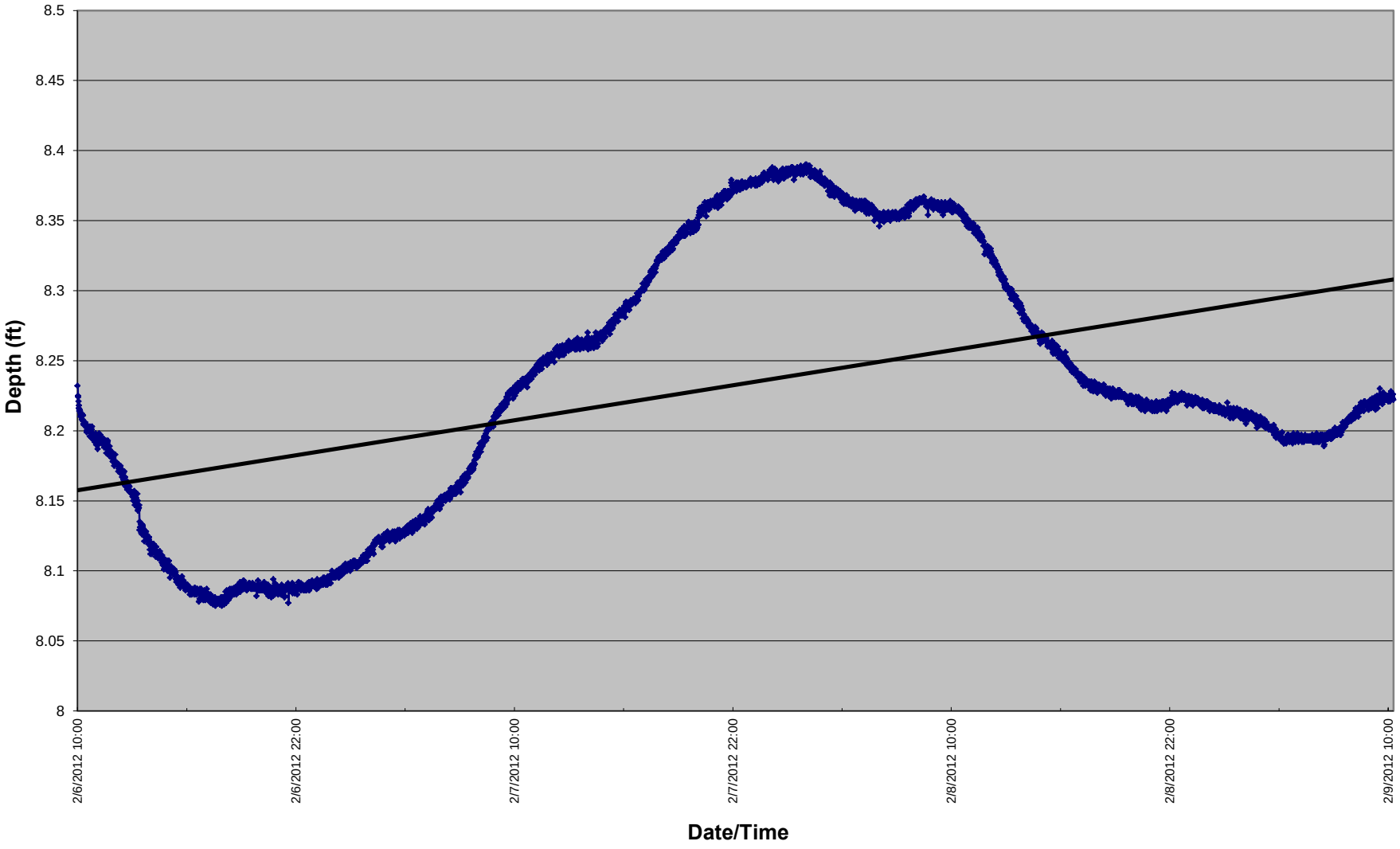
**TABLE 1C: PUMP TEST WATER LEVELS - DRAWDOWN VS BAROMETRIC PRESSURE IMPACTS**

| | | | | | | *MONITORING WELL* | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *DATE* | *TIME* | *PUMP RATE gpm* | *METER READING* | *Gallons Pumped* | *Bar. Pressure* | MW - 32 | Delta | MW - 34 | Delta | MW - 35 | Delta | MW - 12R | Delta | MW - 05 | Delta | AS - 01 | Delta | SP - 06 | Delta | NW - I - 1 | Delta | NW - BR - 1 | Delta |
| **Feb 6/ 2012** | 8:09 to 9:46 | 0 | 494 | | (in.) | 26.76 | | 28.04 | | 24.73 | | 27.25 | | 26.97 | | 26.15 | | 31.48 | | 51.22 | | 53.06 | |
| **Static** | | | | | 30.07 | | | | | | | | | | | | | | | | | | |
| ***BEGIN PUMP TEST AT 9:50*** | | | | | | | | | | | | | | | | | | | | | | | |
| | 10:25 to 10:30 | 0.5 | | | 30.04 | 29.28 | -2.52 | | | | | | | 26.96 | 0.01 | 26.22 | -0.07 | | | | | | |
| | 12:40 to 12:43 | 0.4 | | | 30.01 | 29.13 | -2.37 | | | | | | | 27.03 | -0.06 | 26.23 | -0.08 | | | | | | |
| | 13:00 | 0.4 | | | 30.00 | 29.02 | -2.26 | 28.09 | -0.05 | | | 27.26 | -0.01 | | | | | 31.5 | -0.02 | | | | |
| | 13:15 | 0.4 | | | 30.00 | 29.1 | -2.34 | | | 24.75 | -0.02 | | | 27.03 | -0.06 | 26.23 | -0.08 | | | | | | |
| | 13:30 | 0.4 | | | 30.00 | 29.14 | -2.38 | | | | | | | | | | | | | | | | |
| | 14:00 | 0.4 | | | 30.00 | 29.10 | -2.34 | 28.09 | -0.05 | 24.75 | 0 | 27.32 | -0.07 | 27.02 | -0.05 | 26.23 | -0.08 | | | | | | |
| **Feb 6/2012** | 19:37 to 19:49 | 0.46 | 790 | 296 | 30.00 | 29.25 | -2.49 | 28.09 | -0.05 | 24.75 | -0.02 | 27.28 | -0.03 | 27.05 | -0.08 | 26.23 | -0.08 | 31.25 | 0.23 | | | | |
| **Feb 7/2012** | 8:04 to 8:12 | 0.38 | 1130 | 636 | 30.32 | 29.13 | -2.37 | 28.15 | -0.11 | 24.73 | 0 | 27.32 | -0.07 | 27.07 | -0.1 | 26.26 | -0.11 | 31.60 | -0.12 | | | | |
| **Feb 7/2012** | 13:55 to 14:06 | 0.4 | | | | | | | | | | | | | | | | | | | | | |
| | 14:54 | | 1284 | 790 | 30.20 | 29.28 | -2.52 | 28.15 | -0.11 | 24.79 | -0.06 | 27.33 | -0.08 | 27.12 | -0.15 | 26.27 | -0.12 | 31.72 | -0.24 | | | | |
| **Feb 7/2012** | 20:04 to 20:18 | | | | | | | | | | | | | | | | | | | | | | |
| | 20:00 | 0.46 | 1419 | 925 | 30.16 | 29.28 | -2.52 | 28.16 | -0.12 | 24.81 | -0.08 | 27.35 | -0.1 | 27.13 | -0.16 | 26.31 | -0.04 | 31.63 | -0.15 | 51.38 | -0.16 | 53.15 | -0.09 |
| **Feb 8/2012** | 8:09 to 8:17 | 0.4 | N R | N R | 30.32 | 29.35 | -2.59 | 28.15 | -0.11 | 24.8 | -0.07 | 27.33 | -0.08 | 27.12 | -0.15 | 26.27 | -0.12 | 31.61 | -0.13 | | | | |
| **Feb 8/ 2012** | 13:49 to 14:00 | 0.4 | NR | N R | 30.22 | 29.35 | -2.59 | 28.12 | -0.08 | 24.76 | -0.03 | 27.31 | -0.06 | 27.09 | -0.12 | 26.24 | -0.09 | 31.55 | -0.07 | | | | |
| **Feb 8/ 2012** | 20:10 to 20:21 | 0.4 | 1980 | 1486 | 30.16 | 29.35 | -2.59 | 28.12 | -0.08 | 24.75 | -0.02 | 27.32 | -0.07 | 27.18 | -0.21 | 26.24 | -0.09 | 31.36 | 0.12 | 51.33 | -0.11 | | |
| **Feb 9/ 2012** | 10:04 to 10:20 | 0.4 | 2312 | 1818 | 30.17 | 29.49 | -2.73 | 28.15 | -0.11 | 24.77 | -0.04 | 27.34 | -0.09 | 27.11 | -0.14 | 26.27 | -0.12 | 31.39 | 0.09 | | | | |
| **Feb 10/ 2012** | 12:04 to 12:20 | 0.4 | 3000 | 2506 | 30.02 | 29.63 | -2.87 | 28.14 | -0.1 | | | 27.32 | -0.07 | 27.05 | -0.08 | 26.24 | -0.09 | | | | | | |

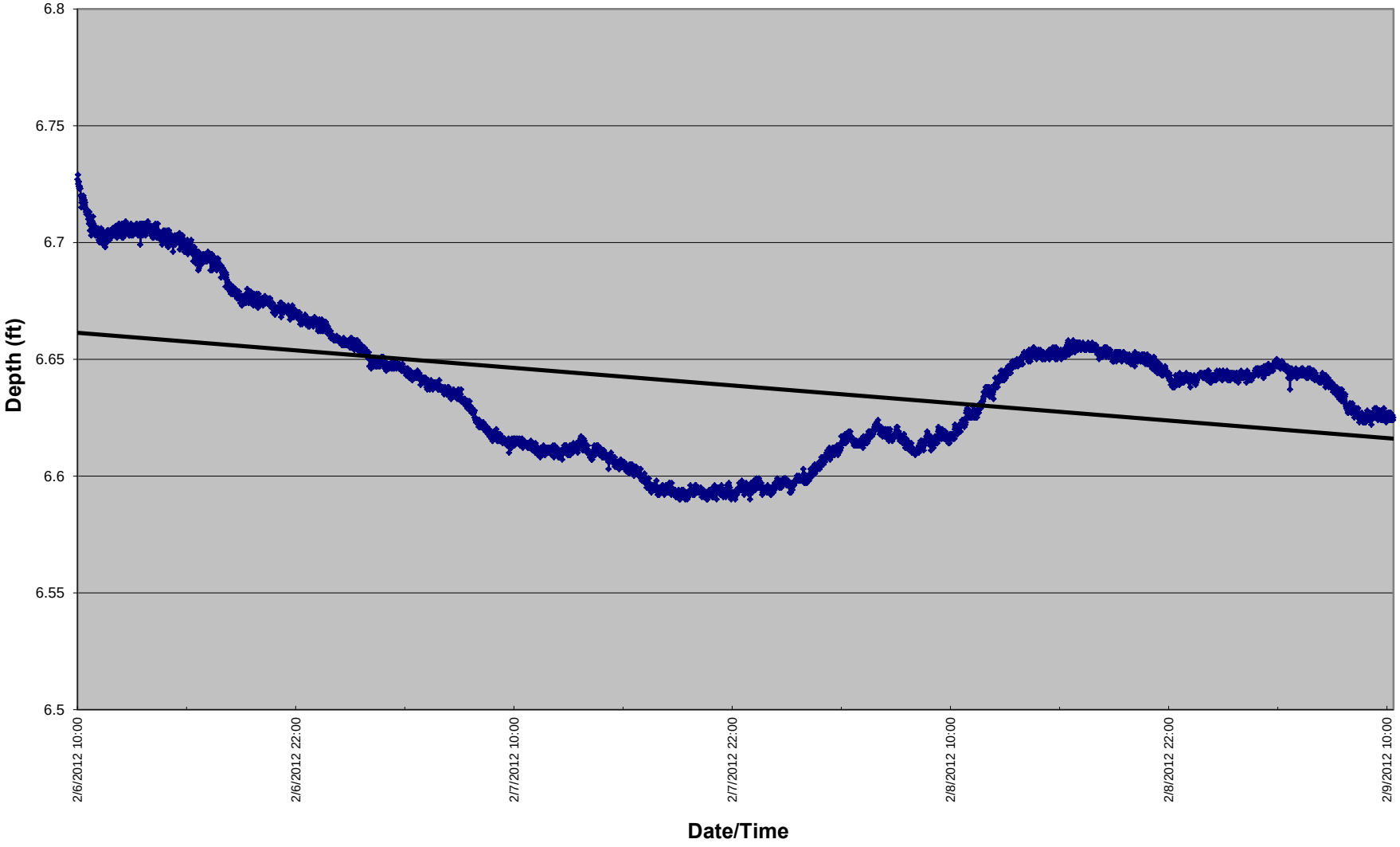
F: 061/Env/Geology/Pump Test/Drawdown/Sheet 3

# APPENDIX C: Water Level Measurements – Data Loggers

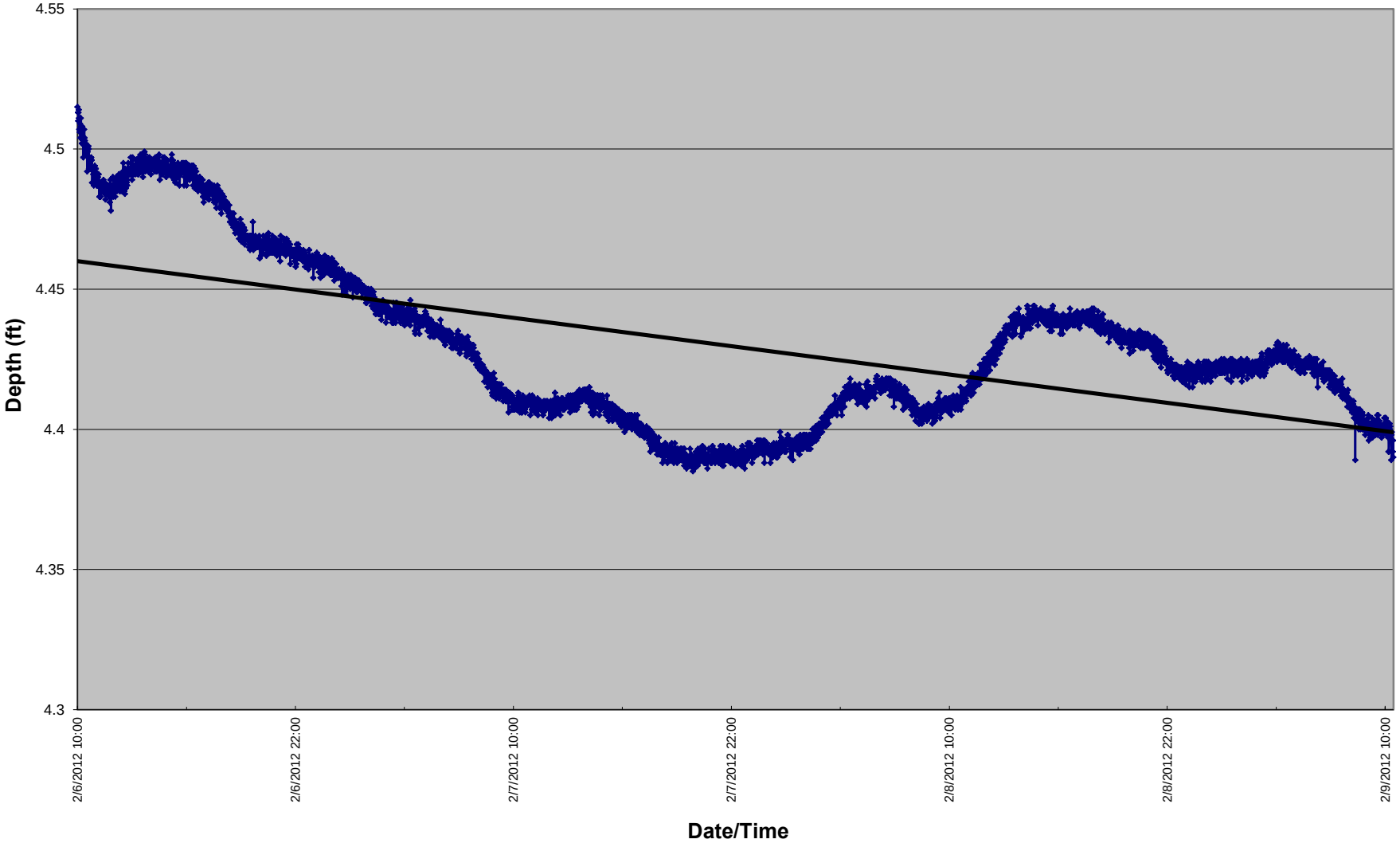
# Pump Test Results for AS-01



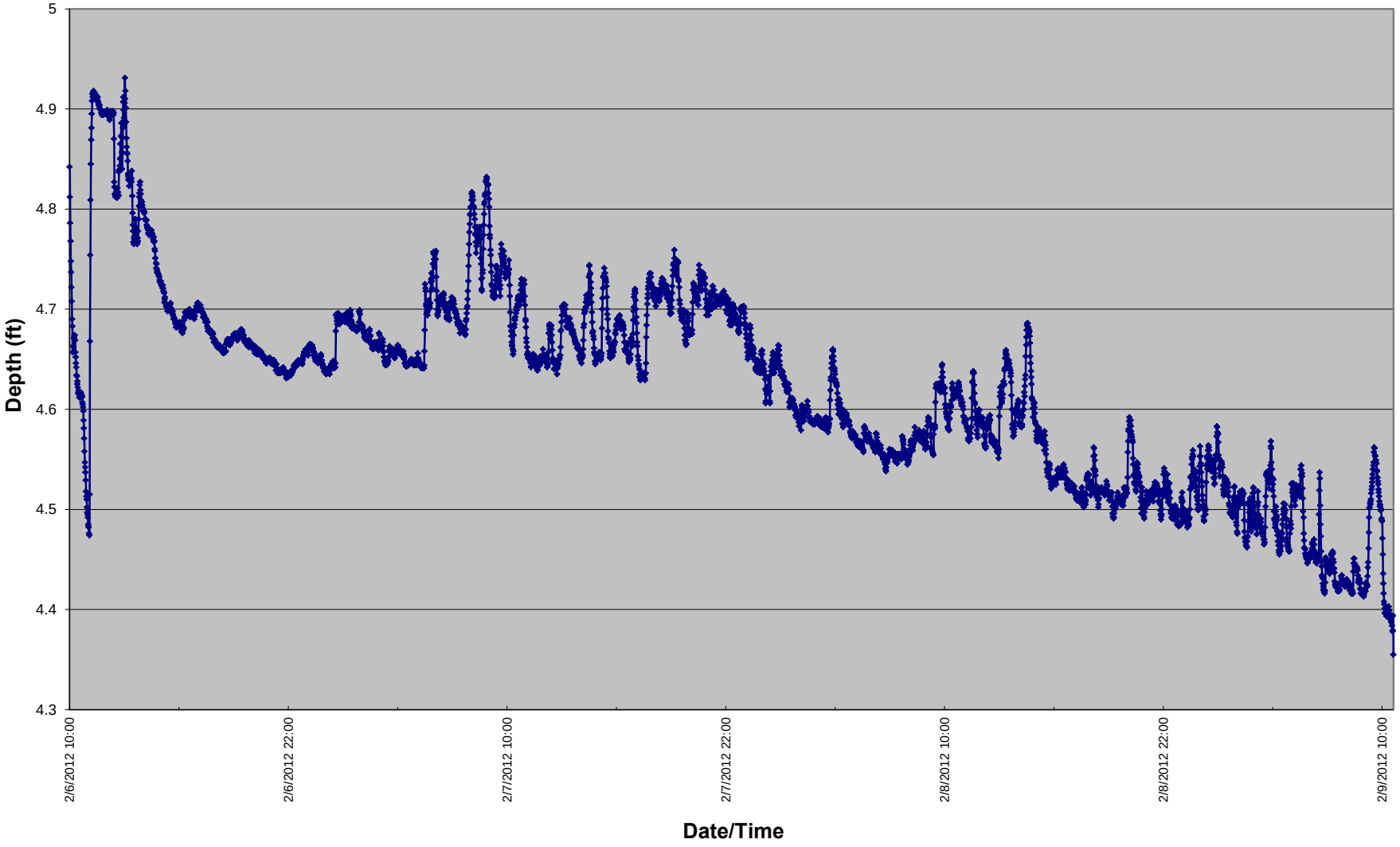
# Pump Test Results for MW-05



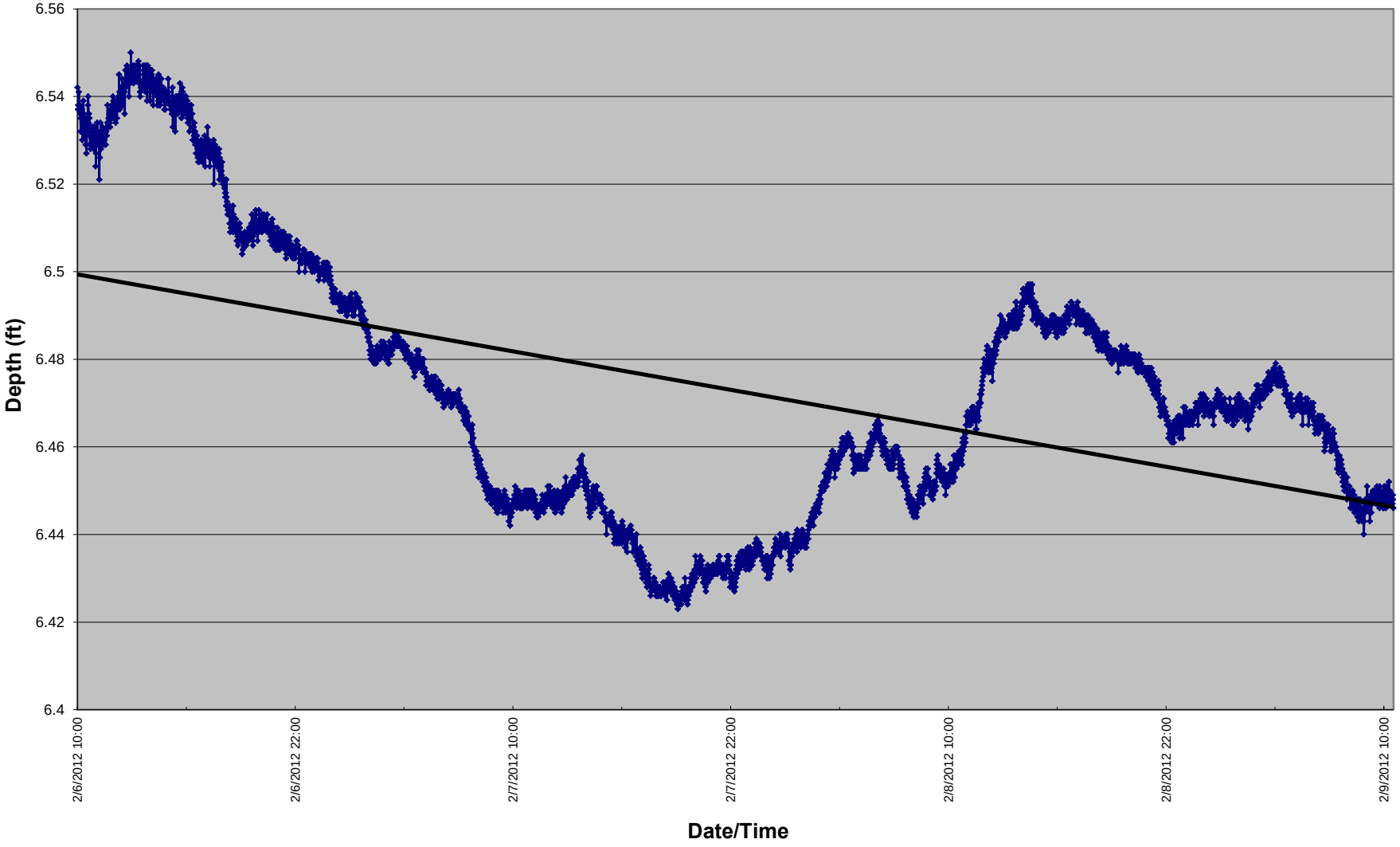
# Pump Test Results for MW-12R



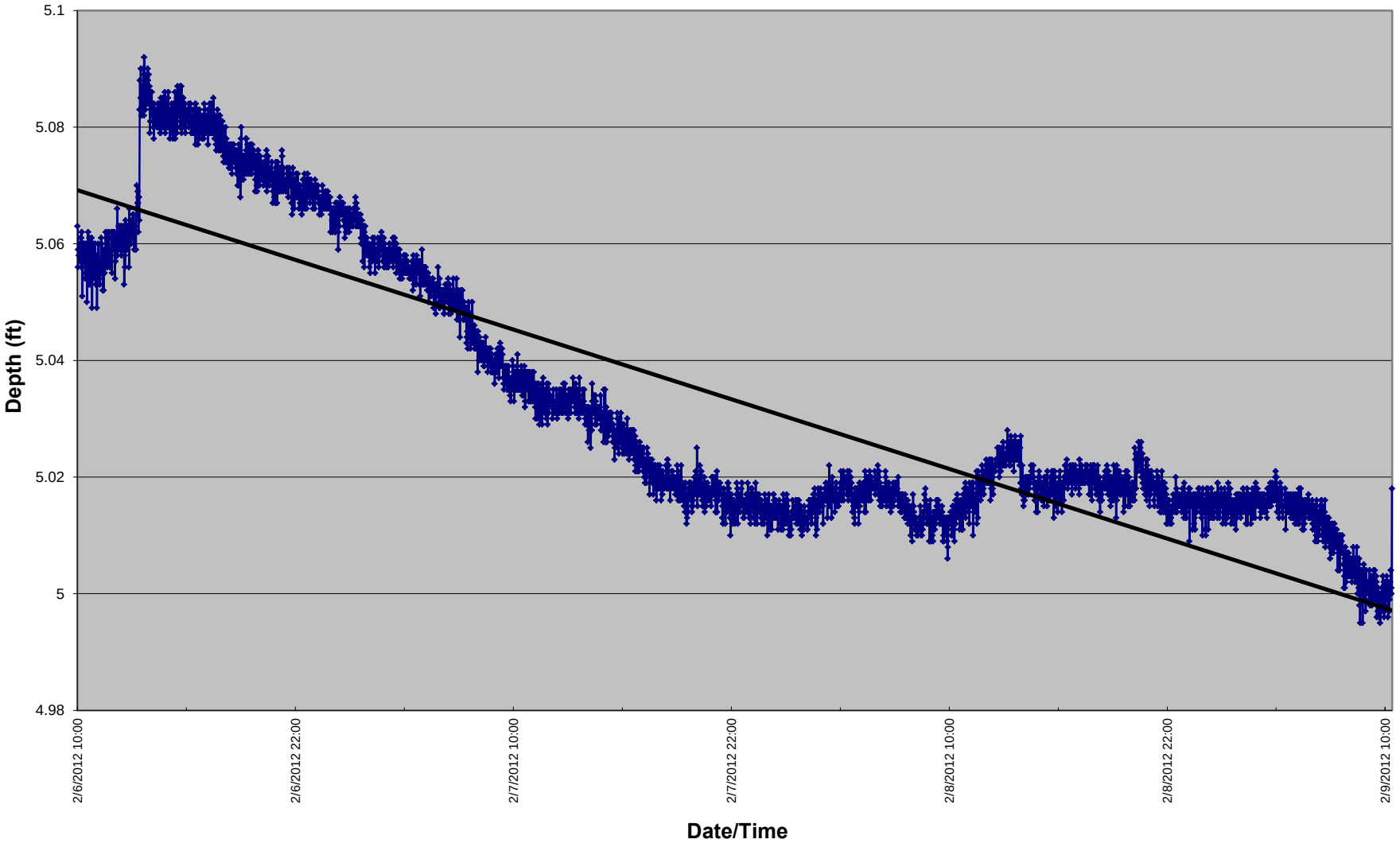
# Pump Test Results for MW-32



# Pump Test Results for MW-34



# Pump Test Results for MW-35



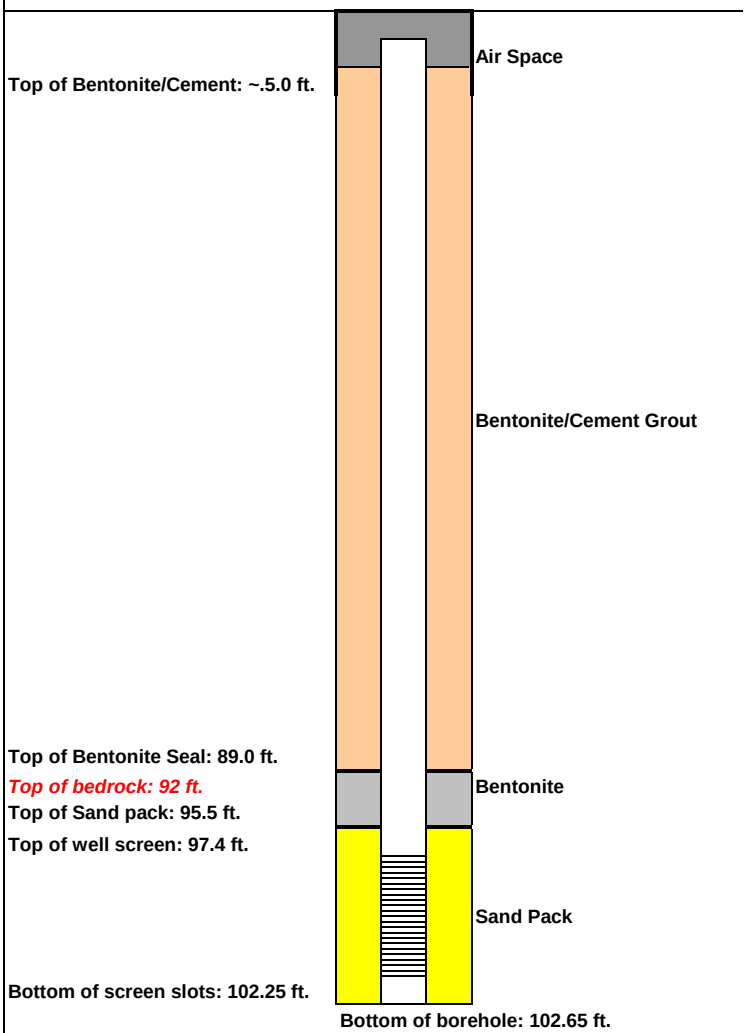
| AMERICAN CONSULTING | MONITORING WELL INSTALLATION REPORT | Well No.GEO-9A<br>Boring ID: GEO-9A |
|---|---|---|

| | | |
|---|---|---|
| Project Number: 511NY061 | Geologist: G. Combes | Ground El.: Not Surveyed |
| Client: Kaleida Health | Project Manager: N. Wohlabaugh | El. Datum: |
| Location (City, State): 979 Main St - Buffalo, New York | Installation Date: 1/10/2012 | Stick-up: Curb Box □ |
| Contractor: SJB Drilling Services, Inc. | Depth to Water: 52.57 ft. | Top of Riser: XXX |
| | | |

| Soil/Rock Conditions | Borehole Backfill |
|---|---|

## WELL CONSTRUCTION DIAGRAM

Location Notes: N1056941.89666; E1071675.06211




Type of Lock: None

**Installation Notes:** Diagram represents depth as feet below ground surface.

Well riser material: Schedule 40 PVC pipe
Diameter: 1 inch

| Well Material Types | Top Depth | Bottom Depth |
|---|---|---|
| Bentonite/Cement | ~.5 ft. | 89.0 ft |
| Bentonite Seal | 89.0 ft. | 95.5 ft. |
| Sand Pack | 95.5 ft. | 102.65 ft. |

Borehole diameter: Nominal 8 inch

Sand Pack Type: 0 Morie
Well Screen Material: Schedule 40 PVC
Well Screen Diameter: 1 inch
Well Screen Slot Size: 0.010 inch

Bottom of Well Screen: 102.25 ft

| AMERICAN CONSULTING | MONITORING WELL INSTALLATION REPORT | Well No.NW-I - 1<br>Boring ID: NW-I-1 |
|---|---|---|

| | | |
|---|---|---|
| Project Number: 511NY061 | Geologist: G. Combes | Ground El.: Not Surveyed. |
| Client: Kaleida Health | Project Manager: N. Wohlabaugh | El. Datum: |
| Location (City, State): 979 Main St - Buffalo, New York | Installation Date: 1/19/2012 | Stick-up: Curb Box □ |
| Contractor: SJB Drilling Services, Inc. | Depth to Water: 51.22 ft. | Top of Riser: XXX |

Soil/Rock Conditions | Borehole Backfill

## WELL CONSTRUCTION DIAGRAM

Location Notes: N1057081.69084; E1071839.06246


Type of Lock: None

Installation Notes: Augers locked in hole due to bentonite mix. Hole needed to be redrilled and the well reinstalled.

Well riser material: Schedule 40 PVC pipe
Diameter: 2 inch

| Well Material Types | Top Depth | Bottom Depth |
|---|---|---|
| Bentonite/Cement | ~.5 ft. | 50.0 ft. |
| Bentonite Seal | 50.0 ft. | 52.2 ft. |
| Sand Pack | 52.2 ft. | 60.0 ft. |

Borehole diameter: Nominal 8 inch

Sand Pack Type: 0 Morie
Well Screen Material: Schedule 40 PVC
Well Screen Diameter: 1 inch
Well Screen Slot Size: 0.010 inch

Bottom of Well Screen: 60.0 ft

| AMERICAN CONSULTING | MONITORING WELL INSTALLATION REPORT | Well No.NW-BR-1<br>Boring ID: NW-BR-1 |
|---|---|---|

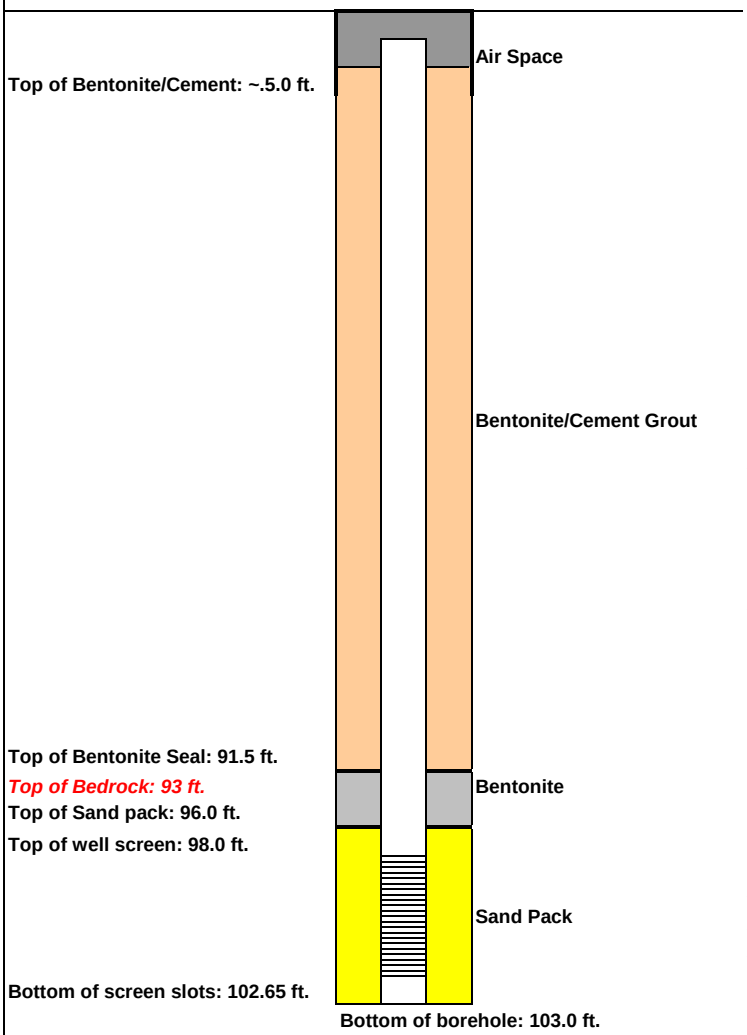
| | | |
|---|---|---|
| Project Number: 511NY061 | Geologist: G. Combes | Ground El.: Not Surveyed |
| Client: Kaleida Health | Project Manager: N. Wohlabaugh | El. Datum: |
| Location (City, State): 979 Main St - Buffalo, New York | Installation Date: 1/10/2012 | Stick-up: Curb Box □ |
| Contractor: SJB Drilling Services, Inc. | Depth to Water: 53.06 ft. | Top of Riser: XXX |

Soil/Rock Conditions

Borehole Backfill

## WELL CONSTRUCTION DIAGRAM

Location Notes: N1057086.98302; E1071833.55713




Type of Lock: None

**Installation Notes:** Diagram represents depth as feet below ground surface.

Well riser material: Schedule 40 PVC pipe
Diameter: 1 inch

| Well Material Types | Top Depth | Bottom Depth |
|---|---|---|
| Bentonite/Cement | ~.5 ft. | 91.5 ft |
| Bentonite Seal | 91.5 ft. | 96.0 ft. |
| Sand Pack | 96.0 ft. | 103.0 ft. |

Borehole diameter: Nominal 8 inch

Sand Pack Type: 0 Morie
Well Screen Material: Schedule 40 PVC
Well Screen Diameter: 1 inch
Well Screen Slot Size: 0.010 inch

Bottom of Well Screen: 103.0 ft

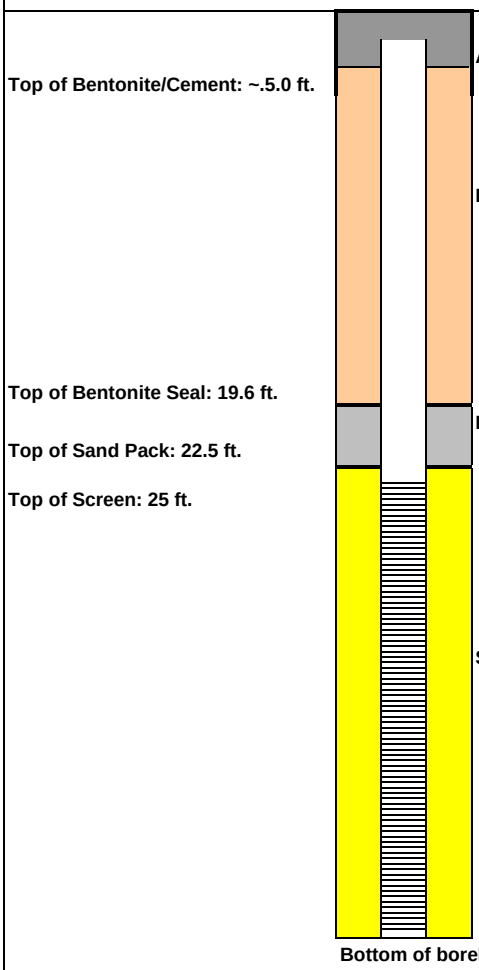
| AMERICAN CONSULTING | MONITORING WELL INSTALLATION REPORT | Well No.RW - 2<br>Boring ID: RW - 2 |
|---|---|---|

| | | |
|---|---|---|
| Project Number: 511NY061 | Geologist: G. Combes | Ground El.: Not Surveyed. |
| Client: Kaleida Health | Project Manager: N. Wohlabaugh | El. Datum: |
| Location (City, State): 979 Main St - Buffalo, New York | Installation Date: 1/19/2012 | Stick-up: Curb Box ☐ |
| Contractor: SJB Drilling Services, Inc. | Depth to Water: 30.13 ft. | Top of Riser: XXX |

Soil/Rock Conditions | Borehole Backfill

## WELL CONSTRUCTION DIAGRAM

Location Notes: N1057081.69084; E1071839.06246




Type of Lock: None

Well Riser Material: Schedule 40 PVC pipe
Diameter: 4 inch

| Well Material Types | Top Depth | Bottom Depth |
|---|---|---|
| Bentonite/Cement | ~ 0.5 ft. | 19.6 ft. |
| Bentonite Seal | 19.6 ft. | 22.5 ft. |
| Sand Pack | 22.5 ft. | 55.0 ft. |

Borehole Diameter: Nominal 10 inch

Sand Pack: Native Sands

Well Screen: Schedule 40 PVC
Well Screen Diameter: 4 inch
Well Screen Slot Size: 0 010 inch

Bottom of Well Screen: 55.0 ft.

# APPENDIX C
# 2012 COMMERCIAL USE CLEANUP ASSESSMENT REPORT

# COMMERCIAL USE ASSESSMENT REPORT

## PROPOSED MEDICAL OFFICE BUILDING
## 1001 MAIN STREET
## BUFFALO, NEW YORK 14203

***Prepared by:***

**C&S ENGINEERS, INC.**
90 BROADWAY
BUFFALO, NEW YORK 14203

***Prepared for:***

**KALEIDA HEALTH**
LARKIN BUILDING
726 EXCHANGE STREET, SUITE 200
BUFFALO, NY 14203

**MAY 2012**

# TABLE OF CONTENTS

# 1.0 INTRODUCTION

C&S Engineers, Inc. has completed a Commercial Use Assessment on 1001 Main Street located in the City of Buffalo, Erie County, New York. This property is the proposed location of a Medical Office Building (MOB) and will be referenced as the "Site" in this report. This assessment included the advancement of five soil borings across the Site from April 24 to 26, 2012. The subsurface investigation and the lab analytical results are described in this report. The data collected from this investigation supplemented the data collected in the 2008 Groundwater Environmental Services, Inc. ("GES") study conducted for Exxon-Mobil.

As part of the ongoing remedial investigation of the Site, C&S Engineers, Inc. was contracted by Kaleida Health to determine the limits of excavation required to meet the Remedial Soil Cleanup Objectives for "Commercial Use" (per 6 NYCRRR 375-6.) The excavation limits will support Kaleida Health in assessing the viability of reaching Commercial Use soil standards as an option for remedial cleanup. The commercial use category, as defined in New York State Department of Environmental Conservation ("NYSDEC") DER-10, "restricts the use to commercial activities including the buying and/or selling of goods or services, or other uses identified in subparagraph iii below." Subparagraph iii defines additional appropriate site uses as, "(1) health care facilities, including hospitals, clinics etc.; or (2) college academic and administrative facilities…" The Commercial Use Soil Cleanup Objectives (SCOs) are presented in *6 NYCRR 375-6: Remedial Program Soil Cleanup Objectives.*

# 2.0 SITE DESCRIPTION

## 2.1 LOCATION AND DESCRIPTION

The Site is located in City of Buffalo, New York between High, Main and Goodrich Streets, and is within the Buffalo Niagara Medical Campus ("BNMC"). Currently, the Site is portion of an asphalt parking lot, approximately 1.9 acres, operated by Allpro Parking for visitors and staff coming to the BNMC. In addition, the Site includes the former Physician's Imaging building (now demolished) located at the southwestern corner, along Main and High Streets.

***Figure 1 – Site Map*** is provided after the text with this report.

## 2.2 SITE CHARACTERISTICS

The southwestern corner of the Site was operated from 1950 to 1982 as an Exxon-Mobil gas station. In 1981, within the area of the former gas station one 4,000 gallon and one 3,000 gallon underground petroleum storage tanks were removed (NYSDEC Spill #9500234).

Over thirty-six groundwater monitoring wells and multiple soil borings were installed from 1981 to present in order delineate the extent and depth of soil and groundwater

contamination. Based on these investigations, contaminates of concern are benzene, toluene, ethylbenzene and xylene ("BTEX") compounds associated with the operations of the Exxon-Mobil gas station.

The main area of contamination exists within the center to western boundary of the Site. Free product still exists within this area and the depth of contamination is located at the shallowest 10 feet below ground surface ("ftbgs"). Generally, the depth of contamination exists within this area from 20 ftbgs to 40 ftbgs.

The contamination has migrated from the center of the Site northeast following a five foot coarse sand/gravel layer generally 30 to 35 ftbgs. The contamination within the coarse sand/gravel zone has migrated as the result of preferential groundwater flow.

Groundwater depth and contamination has been defined through quarterly monitoring well sampling. Groundwater investigations indicate the potentiometric depth to water between 25 to 27 ftbgs. Groundwater contamination consists primarily of BTEX compounds and the groundwater plume extends from the southwest corner to the northeast corner of the Site. In addition, the groundwater plume extends off-site past the western boundary onto Main Street and the northern boundary onto Goodrich Street.

***Figure 2- Sample Locations*** shows the extent of soil and groundwater contamination.

## 3.0 ENVIRONMENTAL SITE ASSESSMENT OBJECTIVES AND METHODOLOGIES

### 3.1 OBJECTIVE

The objective of this Commercial Use Assessment is to determine the limits of excavation for reaching the Commercial Use SCOs as the remedial goal for the Site's participation in the NYSDEC Brownfield Cleanup Program ("BCP"). Previous BCP remedial scenarios analyzed the viability of meeting Unrestricted or Restricted Residential Use SCOs. Based on this study, the applicants will present the final SCO goal in the Alternatives Analysis Report, which is filed as part of the BCP process.

The sections below describe the methods used to determine the Commercial Use excavation limits.

### 3.2 METHODS

*Subsurface Investigation*

SJB, Inc was contracted to drill five soil borings from a depth of approximately 5 ftbgs to approximately 40 ftbgs using a truck mounted CME – 85 drilling unit. Boring locations were selected to delineate the vertical and horizontal limits of soils that exceeded Commercial Use SCOs. Each boring location was continuously sampled in accordance

with guidelines provided by ASTM D-1586 Standard Penetration Test using 140 lb. auto-hammer; driving a 24 inch long 2 inch wide split spoon. All sampling equipment was decontaminated between runs and between drill locations to avoid potential cross contamination of samples.

***Figure 2- Sampling Locations*** shows the locations (CB-01 through CB-05) that were drilled for this assessment.

Blow counts, material description and physical evidence of petroleum contamination (staining or sheen) of each split spoon sample was recorded and organized into soil boring logs provided in Appendix A.

*Field Screening and Sampling*

A portion of each split spoon sample was collected and placed in a plastic zip lock bag. Head space readings for each sample were conducted using a Mini-Rae 2000 photo-ionization detector (PID) with an 11.7 volt lamp.

At each boring location 2 – 4 samples were selected for lab analysis based on staining, odor or PID readings. The PID head space readings for all samples and the depths of the selected lab analysis samples are recorded on the soil boring logs provided in Appendix A.

*Analytical Testing*

Soil samples were analyzed for volatile organic compounds ("VOC"). Paradigm Environmental Services, Inc was contracted to analyze soil samples for VOCs using Method 8260B Target Compound List ("TCL").

*Data Usability Summary Report ("DUSR")*

The DUSR was not conducted for this assessment. However, sample analysis was conducted as a "Category B" deliverable to allow for a DUSR review in the future.

## 4.0 FINDINGS

### 4.1 SUBSURFACE INVESTIGATION FINDINGS

Drilling started April 24, 2012 and continued through April 26, 2012. Five borings were advanced to approximately 40 ftbgs and total of 14 samples were taken for lab analysis. The table below summarizes the depth and number of samples taken for lab analysis for each boring.

**Table 1: Boring Results**

| *BORING ID* | *BEGINNING DEPTH (ftbgs)* | *END DEPTH (ftbgs)* | *TOTAL SAMPLES COLLECTED* |
|---|---|---|---|
| CB-01 | 4 | 42 | 3 |
| CB-02 | 8 | 44 | 2 |
| CB-03 | 4 | 42 | 4 |
| CB-04 | 4 | 44 | 3 |
| CB-05 | 5 | 39 | 2 |

CB-01 is located along the western boundary of the Site parallel with Main Street. MW-24 is located approximately 7 ft south of CB-01. CB-01 was located in this area in order to determine the excavation limit within the western boundary of the free product zone. Strong petroleum and black stained sand / silty sand was encountered from 35 to 41 ftbgs. Samples were taken at three locations: 26-28 ftbgs; 36-38 ftbgs and 38-40 ftbgs.

CB-02 is located within the center of the Site adjacent to the former Physician's Imaging Center and north of the free product zone. Black stained sand was observed from 38 to 40 ftbgs. A buried concrete foundation was encountered from approximately 4 to 8 ftbgs, split spoon sampling began at 8 ftbgs. Strong petroleum odor and high PID readings were observed 26 to 42 ftbgs. Samples were taken at two locations 30-32 ftbgs and 40-42 ftbgs.

CB-03 is located within the former Physician's Imaging Center and within the center of the free product zone. MW-23 is located approximately 6 ft east of CB-03. Strong odor and high PID readings were observed from 6 to 38 ftbgs. Black stained sand was encountered from 37 to 41 ftbgs and sheen was observed 36-38 ftbgs. Samples were taken at four locations: 22-24 ftbgs; 36-38 ftbgs; 38-40 ftbgs and 40-42ftbgs.

CB-04 is located at the southeastern property corner of the former Physician's Imaging Center. CB-04 was located in this area in order to determine the excavation limit for the southern boundary of the free product zone. Black stained sand was observed only within the top 8 inches of the 38-40 ftbgs split spoon sample. Strong odor and high PID readings were found from 22 to 42 ftbgs. Samples were taken at three locations: 24-26 ftbgs; 30-32 ftbgs and 42-44 ftbgs.

CB-05 is located at the northeastern corner of the Site adjacent to Goodrich Street. CB-05 was located to determine whether the deep contamination soil layer is above Commercial Use SCOs. Black stained sand and high PID readings were observed from 31 to 35 ftbgs. Samples were collected at two locations 31-33 ftbgs and 37-39 ftbgs.

## 4.2 LAB ANALYTICAL FINDINGS

Soil samples were analyzed for VOC using Method 8260B TCL. Analytical results were compared with NYSDEC 6 NYCRR Part 375-6: Soil Cleanup Objective for Commercial Use.

Only one sample, CB-03 (22-24 ftbgs), exceeded a Commercial Use SCO (for total xylenes.) All other samples collected were below Commercial and Restricted Residential Use SCOs; except for CB-02 (30-32 ftbgs), which exceeded residential SCOs for ethyl benzene and total xylenes. Table 2 briefly details the analytical results.

A summary table of the detected VOCs is provided in Appendix B and soil analytical results are provided in Appendix C.

**Table 2: Analytical Results**

| *BORING ID* | *SAMPLE DEPTH (ftbgs)* | *COMMENTS* |
|---|---|---|
| CB-01 | 26-28 | A total of four VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| | 38-40 | A total of three VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| | 40-42 | A total of four VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| CB-02 | 30-32 | A total of five VOCs were detected. Commercial Use SCOs were not exceeded. Ethyl benzene and total xylenes exceed Restricted Residential Use SCOs. |
| | 40-42 | A total of five VOCs were detected. None exceeded commercial or restricted residential SCOs. |
| CB-03 | 22-24 | Four VOCs were detected. Total xylenes exceeded Commercial Use SCO. |
| | 36-38 | A total of five VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| | 38-40 | A total of five VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| | 40-42 | A total of five VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| CB-04 | 24-26 | Four VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| | 30-32 | Four VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| | 42-44 | Four VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |
| CB-05 | 31-33 | Two VOCs were detected. None exceeded commercial or restricted residential SCOs. |
| | 37-39 | Five VOCs were detected. None exceeded Commercial or Restricted Residential Use SCOs. |

## 4.3 GEOLOGIC CONDITIONS AND CONTAMINANTS

The subsurface geological environment of the Site is complex and variable. Glacial depositions have resulted in an environment that contains a mixed matrix of soil types and lenses across the Site. Petroleum contamination entered into the soil from leaking underground tanks; the present location of the contamination and its migration path has resulted from the geological conditions on the Site.

*General Site Geology*

Based on numerous subsurface studies conducted on the Site, the geologic conditions have been well defined. The most important data has been collected in four studies collected in the last 4 years:

- 2008 subsurface environmental investigation conducted by GES, on behalf of Exxon-Mobil;
- 2010 subsurface geotechnical investigation conducted by McMahon & Mann for Ciminelli development;
- 2012 subsurface geotechnical and hydro-geological investigation conducted by American Consulting Professionals of NY and McMahon & Mann on behalf of Kaleida Health and Ciminelli Development; and
- this 2012 subsurface environmental investigation conducted by C&S Engineers, Inc. on behalf of Kaleida Health and Ciminelli Development.

The soils beneath the site extend to approximately 95 ftbgs, and are underlain by limestone bedrock. Near surface soils that would be impacted by remediation or construction (50 ftbgs or less in depth) are generally more consistent in type. Till deposits consisting of a dense fine sand and silt with alternating concentrations clay is generally present. A large portion of the site contains a saturated layer of medium to coarse sand and gravel of varying thickness, generally found between 32 to 38 ftbgs. This layer is discontinuous (i.e. not uniformly present across the site) in deposition. Underlying this layer is dense fine sand-silt/clayey silt till.

Soil variability is most common at depth (greater than 50 ftbgs) with alternating deposits of silty-clays, clayey-silts and saturated sand and gravel deposits across the site. Large boulders are also present at depth (60 to 80 ftbgs).

*Groundwater*

Groundwater on-site is semi-confined. Layers of bedrock and soil at varying depths retard the upward movement of groundwater. As a result, groundwater is found at different depths across the Site. Generally, groundwater is found at the following depths:

- Top of bedrock (approximately 100 ftbgs)
- discontinuous lenses of sand and gravel encountered, with some areas of "running sands"; and (45 to 90 ftbgs)

- shallow sand and gravel layer (32 to 38 ftbgs)

Contaminant transport is influenced by the shallow sand and gravel layer which provides a preferential pathway for groundwater and contaminant flow to the west and northeast. This groundwater formation is semi-confined by dense silt and clay below and fine sand and silt above. While the formation is present 32 ftbgs or greater in depth, monitoring wells that are screened across the formation exhibit a groundwater elevation of approximately 25 ftbgs, a difference of at least 7-feet or more in formation depth compared to the potentiometric head.

*Contamination*

Contamination is sourced from the center of the site and is related to the former Mobil station operations. MW-22 and MW-23 are located within the area of the contamination source; shallow soils are impacted within this area between 10 to 12 ftbgs. Overtime underground tanks released gasoline into the shallow soils within the area of MW-22 and MW-23. Contamination further filtered through the subsurface and into the saturated sand and gravel formation at approximately 38 ftbgs. After entering into the sand and gravel layer the contamination migrated to the northeast; influenced by the groundwater flow direction and formational area of the sand and gravel deposits.

The depth to top of soil contamination increases with distance from this MW-22/MW-23 until it is limited to the sand and gravel formation at 32 ftbgs or greater. Contamination appears to be vertically limited in depth by the underlying clayey-silt till which limits the contamination to moving horizontally in the saturated sand and gravel layer above.

Separate phase product is present in the wells in and around the release area (MW22 and MW-23). Product moved vertically downward from the release area until it encountered the sand and gravel formation below 32 ftbgs. Product is present in this area and has spread laterally to the west and east/northeast (MW-24, MW-11, MW026 and HVE-04) within this semi-confined formation.

## 4.4 EXCAVATION AREA

The excavation area required to meet Commercial Use SCOs was based on the soil analytical results from the 2008 subsurface investigation, ongoing quarterly groundwater gauge and sample events and observations made during this investigation.

Soil sample analytical results from this study and the 2008 GES study were used to develop the vertical and horizontal extent of the soils that would exceed Commercial Use cleanup standards. The quarterly gauging events were used to assess the horizontal limit of the separate phase product contained within the sand

and gravel formation. The quarterly groundwater sampling results were used to help define soil excavation limits by relating groundwater VOC concentration contours to wells with both known soil and groundwater VOC concentrations.

While soil analysis indicated that some contaminated soils did not exceed Commercial Use SCOs, the soils were underlain by the sand and gravel formation that was preferentially transporting product east and west of the release area. Therefore, an excavation depth of 40-42 feet was assumed to remove this layer.

Based on VOC analysis in the soils, horizontal limits of the excavation are:

- North: between MW-14R/MW-11 and MW-29/MW-31;
- East: between MW-25/SP-10/HVE-04 and MW-27/MW-33/MW-34;
- South: between MW-25/MW-24 and MW-27/MW-36; and
- West: BCP boundary line (concurrent with western parcel line.)

The horizontal excavation limits are shown in ***Figure 3- Estimated Commercial Use Excavation Area***

The total volume of excavation materials was estimated using the assumptions above and calculations presented in Table 4.

**Table 4: Estimated Soil Volumes for Commercial Use SCO**

| | | | | ***Total Vertical Volume Moved[2]*** | | ***Total Volume Disposed[3]*** | |
|---|---|---|---|---|---|---|---|
| *Contamination Thickness[4] (ft)* | *Median Range* | *Contaminated Area[1]* | *Median Total Depth* | *Volume (cu. ft.)* | *Volume (cu. yds.)* | *Volume (cu. ft.)* | *Volume (cu. yds.)* |
| 20-25 | 22.5 | 12,542 | 40 | 501,680 | 18,581 | 282,195 | 10,452 |
| 25-30 | 27.5 | 5,534 | 42 | 232,448 | 8,609 | 152,198 | 5,637 |
| | | | **Total →** | 734,128 | **27,190** | 434,393 | **16,089** |

Notes:
1: *Contaminated Area* – as measured on map with GIS spatial analysis
2: *Total Vertical Volume Moved* -total volume of soil to be removed, including clean overburden (does not included benching or sloped sides)
3: *Total Volume Disposed* – volume of soil to be disposed off-site
4: *Contamination Thickness* – based on top of contamination depth and maximum depth of bottom of sand-gravel formation

## 5.0 SUMMARY

C&S Engineers, Inc completed a Commercial Use SCO Assessment for the proposed Medical Office Building located on 1001 Main Street Buffalo, New York. The primary objective of this assessment was to determine the limits of excavation to meet the Remedial Soil Cleanup Objectives for Commercial Use; based on the standards in 6 NYCRRR 375-6.

Petroleum contamination from a former Exxon-Mobil gas station has migrated into the soil and groundwater. Contamination has spread downward and laterally from the center

of the Site to the west and northeast following coarse sand/gravel formation present 30 to 35 ftbgs. The contamination within the coarse sand/gravel zone has migrated as the result of preferential groundwater flow.

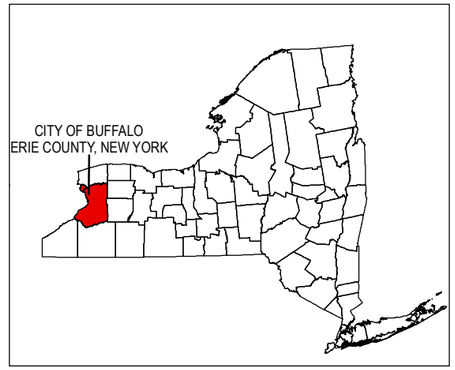
Soil samples were collected and analyzed for VOCs within the area of the former Exxon-Mobil gas station. The results of the lab analysis revealed only one sample location, CB-03 (24-26 ftbgs), located within the center of the free product zone, exceeded its Commercial Use SCO for total xylenes. All other samples were under Residential Use SCOs, except for CB-02 (30-32 ftbgs), which exceeded Residential Use SCOs for ethylbenzene and xylenes.

Revised excavation limits were determined based the current and past lab analytical data. The horizontal excavation limits are shown in ***Figure 3- Estimated Commercial Use Excavation Area***. However, due to the complex geology of the Site and the confined conditions of the contamination, the limits of excavation illustrated in Figure 3 should not be considered absolute.

F:\Project\K11-Kaleida Health\K11.002.001 - MOB Brownfield Cleanup Program\Environmental-study\Reports\Final report\Commercial Use Assessment - May 23 2012\Commercial_Use_Assessment.doc

# FIGURES


## Location Map




## Legend

- Medical Office Building (MOB) Parcel
- Parcels
- Commercial Use Sample Locations

## Notes

1) 2011 High Resolution Digital Orthoimagery obtained from New York GIS Clearinghouse. Natural color 1ft resolution.

0 100 200 Feet

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Syracuse, New York 14203
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**NYSDEC**
Brownfield Cleanup Program

N

**MEDICAL OFFICE BUILDING**
**1001 MAIN STREET**
**CITY OF BUFFALO, NY**

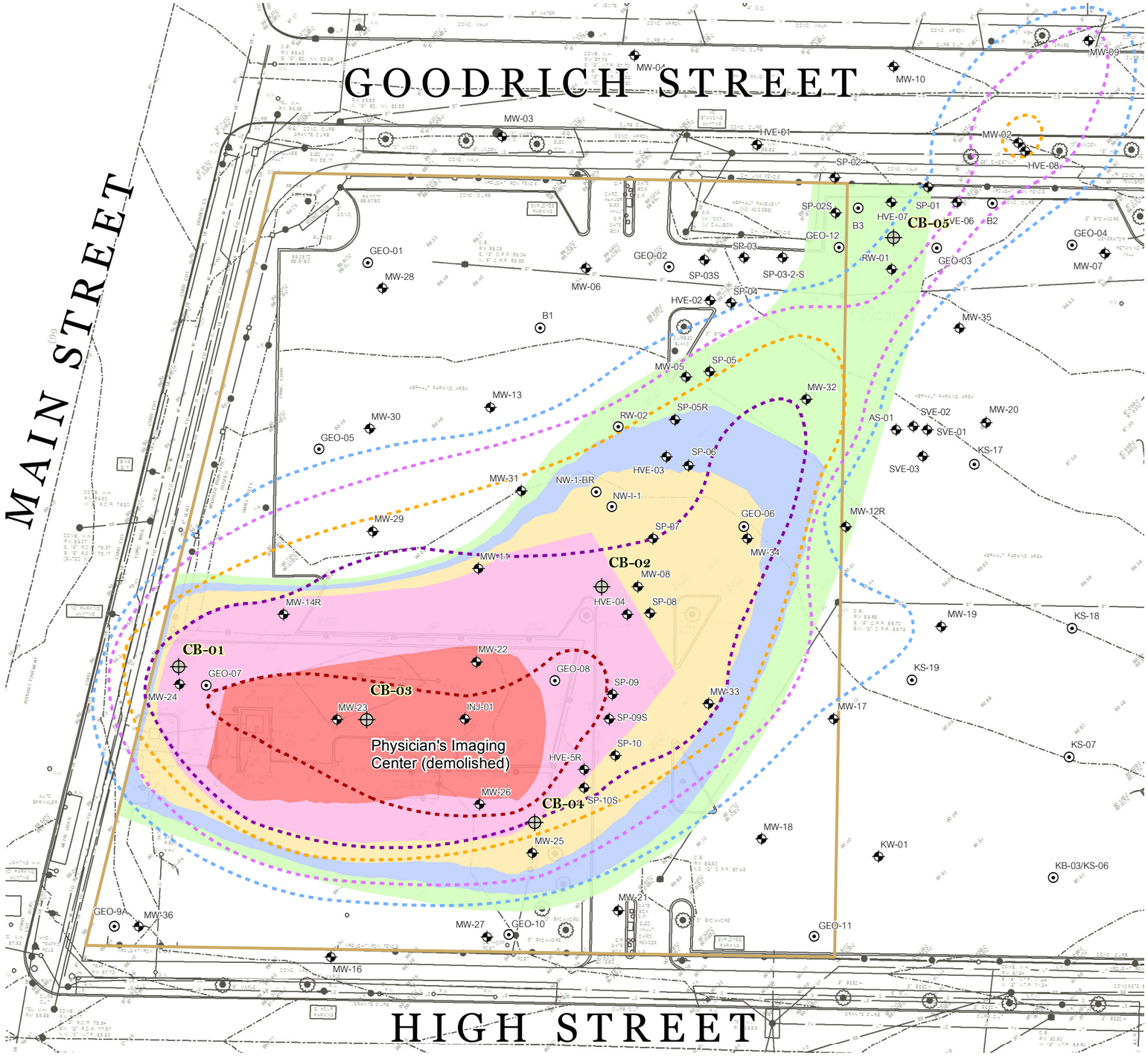
| No. | DATE | REVISIONS |
|---|---|---|

| | |
|---|---|
| PROJECT NO: | K11.002.001 |
| DATE: | May 23, 2012 |
| SCALE: | 1" = 100' |
| DRAWN BY: | CAM |
| DESIGNED BY: | CAM |
| CHECKED BY: | MJC |

SITE MAP

FIGURE 1

Path: F:\Project\K11-Kaleida Health\K11.002.001 - MOB Brownfield Cleanup Program\Environmental-study\CADD-GIS\GIS\Projects\Commercial_Cleanup_SiteMap.mxd




## Legend

- MOB Parcel
- Commercial Use Sample Locations (April 2012)
- Geotechnical / Environmental Boring
- Monitoring Well

**Approximate Thickness (feet)**
**Soils Exceeding Unrestricted Use SCO**

- 5 - 10 ft
- 10 - 15 ft
- 15 - 20 ft
- 20 - 25 ft
- 25 - 30 ft

**Total BTEX Isoconcentration Contours for Groundwater (ug/L)**
**February 2012**

- >10
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 50,000
- >50,000

## Notes

1) Survey data from McIntosh & McIntosh P.C. "Topographical Map of Part of Lot-29, TWP.-11, R.-8, Holland Purchase" Job No. 7669-B(2) September 24, 2008.

2) The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities, either in service or abandoned. The surveyor has not physically located the underground utilities.

3) NAD 83 State Plane New York West (feet).

0 40 80 Feet

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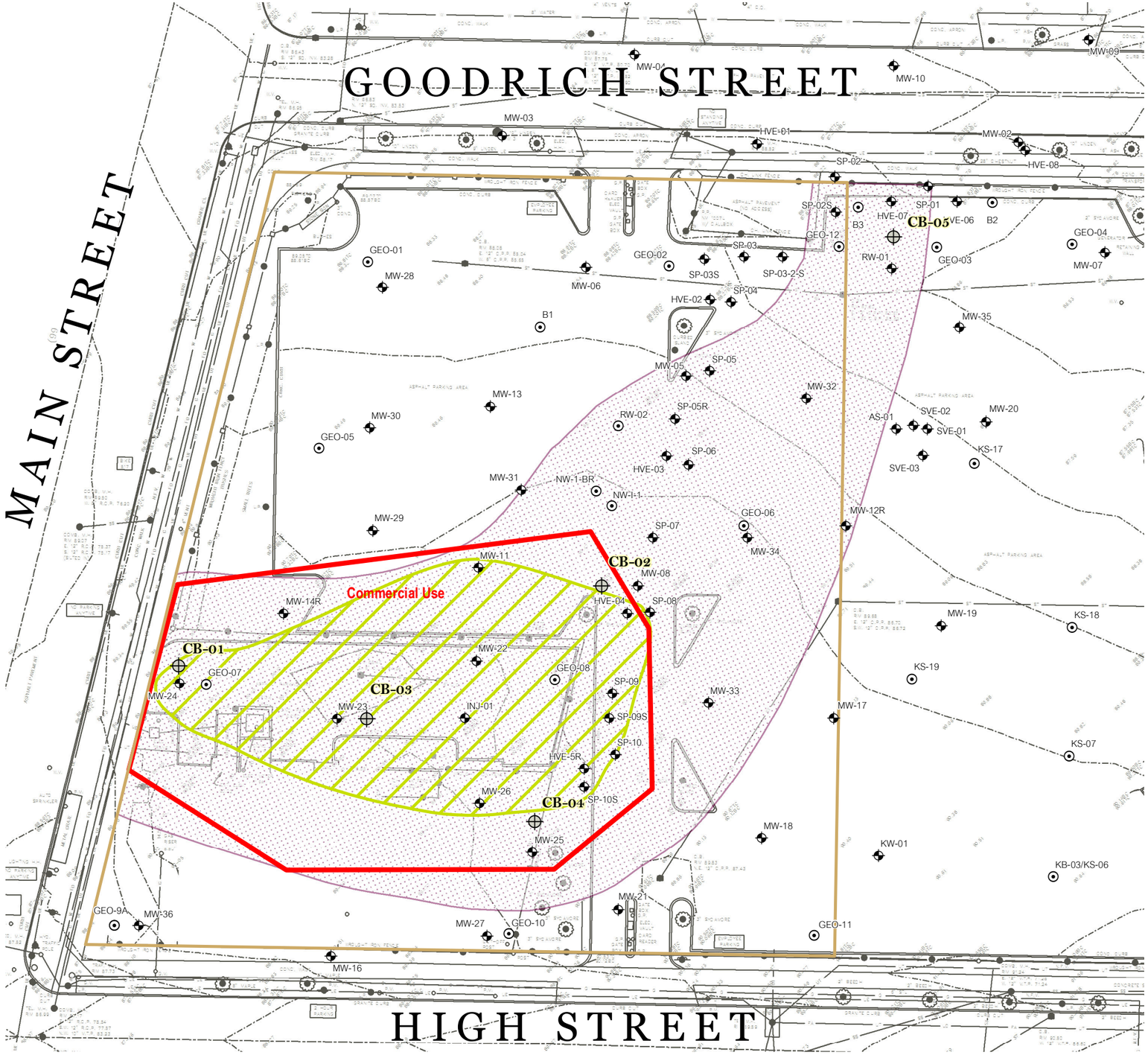
| No. | DATE | REVISIONS |
|---|---|---|
| | | |

| | |
|---|---|
| PROJECT NO: | K11.002.001 |
| DATE: | May 23, 2012 |
| SCALE: | 1" = 40' |
| DRAWN BY: | CAM |
| DESIGNED BY: | CAM |
| CHECKED BY: | MJC |

SAMPLE LOCATIONS

FIGURE 2

Path: F:\Project\K11-Kaleida Health\K11.002.001 - MOB Brownfield Cleanup Program\Environmental-study\CADD-GIS\GIS\Projects\Commercial_Cleanup_Samples.mxd




## Legend

- MOB Parcel
- Estimated Limits of Excavation to meet Commercial Use Criteria
- Separate Phase Hydrocarbon Plume ("Free Product Zone") February 2012 Max. Depth < 40 ftbgs
- Extent of Soil Contamination Above Unrestricted Use Criteria
- Commercial Use Sample Locations (April 2012)
- Geotechnical / Environmental Boring
- Monitoring Well

## Notes

1) Survey data from McIntosh & McIntosh P.C. "Topographical Map of Part of Lot-29, TWP.-11, R.-8, Holland Purchase" Job No. 7669-B(2) September 24, 2008.

2) The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities, either in service or abandoned. The surveyor has not physically located the underground utilities.

3) NAD 83 State Plane New York West (feet).

0 40 80 Feet

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**CITY OF BUFFALO, NY**

| No. | DATE | REVISIONS |
|---|---|---|
| | | |

| | |
|---|---|
| PROJECT NO: | K11.002.001 |
| DATE: | May 23, 2012 |
| SCALE: | 1" = 40' |
| DRAWN BY: | CAM |
| DESIGNED BY: | CAM |
| CHECKED BY: | MJC |

ESTIMATED COMMERCIAL USE EXCAVATION AREA

FIGURE 3

Path: F:\Project\K11-Kaleida Health\K11.002.001 - MOB Brownfield Cleanup Program\Environmental-study\CADD-GIS\GIS\Projects\Commercial_Cleanup_ExcavationArea.mxd

# APPENDICIES

# APPENDIX A

## SOIL BORING LOGS

**C&S Engineers, Inc.**
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www.cscos.com

# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-01** |
| **Sheet 1 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Surface Elev.:** | |
| **Datum:** | Ground Surface |
| **Start Date:** | 4/25/12 |
| **Finish Date:** | 4/25/12 |
| **Inspector:** | E. Daniel |

| | |
|---|---|
| **Project Name:** | MOB Commercial Use Assessment |
| **Location:** | MOB Site - Buffalo, NY |
| **Client:** | Kaleida Health |
| **Drilling Firm:** | SJB |
| **Driller:** | Steven Gorski |

| Groundwater | Depth | Date & Time |
|---|---|---|
| While Drilling: | 30 | 04/25/12 |
| Before Casing Removal: | | |
| After Casing Removal: | | |

| | | | |
|---|---|---|---|
| **Drill Rig:** | CME-85 | | |
| **Casing:** | | **Rock Core:** | **Undist:** |
| **Sampler:** | 2" Split Spoon | **Other:** | |
| **Hammer:** | Auto | | |

(N -- No. of blows to drive sampler 12" w/140 lb. hammer falling 30" ASTM D-1586, Standard Penetration Test)

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | c - coarse, m - medium, f - fine | MATERIAL DESCRIPTION (S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey; a - and - 35-50%, s - some - 20-35%, l - little - 10-20%, t - trace - 0-10%) | COMMENTS (e.g., N-value, recovery, relative moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| | | | | | | |
| 2 | | | | | ***Augered to 4 ftbg*** | |
| | | | | | | |
| 3 | | | | | | |
| | | | | | | |
| 4 | | | 5 | 6"- | ***CLAY (red brown)*** | 13" rec |
| | | | 4 | 4"- | ***SAND (tan - fine) with little Silt*** | 3.4 ppm |
| 5 | | | 6 | 3"- | ***CLAY (red)*** | |
| | | | 7 | | | |
| 6 | | | 7 | 16"- | ***CLAY (red brown)*** | 16" rec |
| | | | 7 | | | 4.1 ppm |
| 7 | | | 5 | | | |
| | | | 6 | | | |
| 8 | | | 8 | 4"- | ***fine Sandy SILT (fine - Brown)*** | 17" rec |
| | | | 14 | 13"- | ***Silty SAND (Brown - fine)*** | 4.8 ppm |
| 9 | | | 17 | | | |
| | | | 14 | | | |
| 10 | | | 15 | 16"- | ***Silty SAND (Brown - fine - dry)*** | 24" rec |
| | | | 19 | 12"- | ***Silty SAND (Tan - fine - dry)*** | 4.7 ppm |
| 11 | | | 27 | | | |
| | | | 31 | | | |
| 12 | | | | 8"- | ***Silty SAND (Tan)*** | 22" rec |
| | | | | 14"- | ***Sandy SILT (Brown - fine)*** | 3.1 ppm |
| 13 | | | | | | |
| | | | | | | |
| 14 | | | | | | |
| | | | 32 | | | |
| 15 | | | 13 | 24"- | ***Silty SAND (Brown - fine)*** | 24" rec |
| | | | 29 | | | 3.8 ppm |
| 16 | | | 39 | | | |
| | | | 37 | | | |
| 17 | | | 27 | 24"- | ***Silty SAND (Brown - fine)*** | 24" rec |
| | | | 26 | | | 3.8 ppm |
| 18 | | | 26 | | | |
| | | | 21 | | | |
| 19 | | | 20 | 6"- | ***Silty SAND (Brown - fine)*** | 22" rec |
| | | | 10 | 4"- | ***Silty SAND (Brown - fine - wet)*** | 3.5 ppm |
| 20 | | | 11 | 12"- | ***Sandy SILT (Brown - fine - wet)*** | |
| | | | 10 | | | |
| 21 | | | 3 | 19"- | ***Sandy SILT (Brown - fine - wet)*** | 19" rec |
| | | | 4 | | | 2.6 ppm |
| 22 | | | 5 | | | |
| | | | 6 | | | |
| 23 | | | 5 | 23"- | ***Sandy SILT (Brown - fine - wet)*** | 23" rec |
| | | | 7 | | | 4.6 ppm |

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# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-01** |
| **Sheet 2 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Start Date:** | 4/25/12 |
| **Finish Date:** | 4/25/12 |
| **Inspector:** | E. Daniel |

**Project Name:** MOB Commercial Use Assessment
**Location:** MOB Site - Buffalo, NY
**Client:** Kaleida Health

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | MATERIAL DESCRIPTION (c - coarse, m - medium, f - fine; a - and - 35-50%, s - some - 20-35%, l - little - 10-20%, t - trace - 0-10%; S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey) | COMMENTS (e.g., N-value, recovery, moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|
| | | | 7 | | |
| 24 | | | 6 | | |
| | | | WH | 2"- ***Sandy SILT (Brown - moist - fine)*** | 24" rec |
| 25 | | | WH | 22"- ***Silty CLAY (Brown - moist to wet)*** | 7.1 ppm |
| | | | WH | | |
| 26 | | | 2 | | 15" rec |
| | | | 2 | 4"- ***Silty CLAY (Brown - moist)*** | 7.5 ppm |
| 27 | | | 3 | 2"- ***Silty SAND (Brown - moist)*** | |
| | S-1 | | 2 | 9"- ***Silty CLAY (Brown - wet)*** | |
| 28 | | | 3 | | |
| | | | 8 | 10"- ***Silty CLAY (Brown)*** | 14" rec |
| 29 | | | 5 | 2"- ***Sandy SILT(Brown - moist - fine)*** | 7.2 ppm |
| | | | 6 | 2"- ***Silty CLAY (Brown - wet)*** | |
| 30 | ▼ | | 5 | | |
| | | | 3 | 10"- ***Silty SAND (staurated)*** | 10" rec |
| 31 | | | 4 | | 19.8 ppm |
| | | | 5 | | odor |
| 32 | | | 5 | | |
| | | | 3 | 15"- ***Silty SAND (Brown - saturated)*** | 20" rec |
| 33 | | | 5 | 2"- ***CLAY (Brown)*** | 47 ppm |
| | | | 5 | 3"- ***Silty SAND (Gray - saturated)*** | strong odor |
| 34 | | | 7 | | |
| | | | 5 | 4"- ***Silty SAND (Black - saturated)*** | 24" rec |
| 35 | | | 11 | 18"- ***SAND (Black - med to coarse - little Silt - saturated)*** | 53 ppm |
| | | | 3 | 2"- ***Silty SAND (Black - fine - saturated)*** | strong odor; septic |
| 36 | | | 24 | | |
| | | | 20 | 6"- ***SAND (Black - med to coarse - little Silt - saturated)*** | 22" rec |
| 37 | | | 19 | 2"- ***Silty SAND (Gray - saturated)*** | strong odor |
| | | | 23 | 6"- ***SAND (Gray - med - little Silt - saturated)*** | |
| 38 | | | 27 | 8"- ***SAND (Black - med - little Silt - saturated) w/ 2" Sand (Gray - little Silt)*** | |
| | | | 15 | | 24" rec |
| 39 | | | 25 | 19"- ***SAND (Black - saturated) w/ little Silt trace Gravel*** | 35 ppm |
| | S-2 | | 16 | 5"- ***SAND (Black - fine - saturated) w/ little Silt*** | strong odor |
| 40 | | | 14 | | |
| | | | WH | 14"- ***SAND (Black fine - saturated) w/ little Silt*** | 24" rec |
| 41 | | | 2 | 10"- ***SILT and CLAY with some imbedded gravel (fine to coarse)*** | 42 ppm |
| | S-3 | | 4 | | strong odor |
| 42 | | | 8 | | |
| | | | | | |
| 43 | | | | ***SOIL SAMPLES COLLECTED FOR VOC ANALYSIS (METHOD 8260)*** | |
| | | | | ***S-1 = CB-01: 26-28'*** | |
| 44 | | | | ***S-2 = CB-01: 38-40'*** | |
| | | | | ***S-3 = CB-01: 40-42'*** | |
| 45 | | | | | |
| | | | | | |
| 46 | | | | | |
| | | | | | |
| 47 | | | | | |
| | | | | | |
| 48 | | | | | |
| | | | | | |
| 49 | | | | | |

| C&S Engineers, Inc. 90 Broadway Buffalo, New York 14203 Phone: 716-847-1630 Fax: 716-847-1454 www.cscos.com | **BORING LOG** | **Boring No.** | **CB-02** |
|---|---|---|---|
| | | **Sheet 1 of:** | 2 |
| | | **Project No.:** | K11.002.003 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Project Name:** | MOB Commercial Use Assessment | | | | | | | **Surface Elev.:** | |
| **Location:** | MOB Site - Buffalo, NY | | | | | | | **Datum:** | Ground Surface |
| **Client:** | Kaleida Health | | | | | | | **Start Date:** | 4/24/12 |
| **Drilling Firm:** | SJB | | | **Driller:** | **Steven Gorski** | | | **Finish Date:** | 4/24/12 |
| **Groundwater** | **Depth** | **Date & Time** | | **Drill Rig:** | CME-85; method - HSA | | | **Inspector:** | C. Martin |
| **While Drilling:** | 29 | 04/24/12 | | **Casing:** | | **Rock Core:** | | **Undist:** | |
| | 38.2 | 04/24/12 | | **Sampler:** | 2" Spilt Spoon | **Other:** | | | |
| **After Casing Removal:** | | | | **Hammer:** | Auto | | | | |

(N -- No. of blows to drive sampler 12" w/140 lb. hammer falling 30" ASTM D-1586, Standard Penetration Test)

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | c - coarse m - medium f - fine<br>**MATERIAL DESCRIPTION**<br>S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey<br>a - and - 35-50% s - some - 20-35% l - little - 10-20% t - trace - 0-10% | **COMMENTS** (e.g., N-value, recovery, relative moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|
| 1 | | | | ***Weather: cool; temperature ~40 F; windy; rain*** | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | ***Hit buried foundation. Augered through to 8 ftbg. Sampling to begin at 8-10 ftbg.*** | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | 3<br>4 | 24"- ***CLAY (Brown/red - med dense) w/thin beds of SAND (Brown -fine to med)*** | 24" rec<br>3.3 ppm |
| 10 | | | 4<br>13 | | |
| 11 | | | 17<br>16 | 12"- ***SAND (Brown - med -) w/ 1" bed of Clay (Brown)***<br>8"- ***Sandy SILT (Brown red - med - dense)*** | 20" rec<br>2.5 ppm |
| 12 | | | 29<br>34 | | |
| 13 | | | 29<br>33 | 19"- ***SAND (Brown - fine to med - loose - dry to moist) w/ 1" beds of CLAY (Brown red) trace 0-5% pea size Gravel (Grey - round)*** | 19" rec<br>4.3 ppm |
| 14 | | | 31<br>28 | | |
| 15 | | | 19<br>27 | 24" ***SAND (Brown - fine to med - dry) w/ trace 0-5% Gravel(Grey - angular)*** | 24" rec<br>2.5 ppm |
| 16 | | | 37<br>45 | | |
| 17 | | | 32<br>28 | 24"- ***SAND (Brown- fine to coarse) w/ little 10-20% Gravel (Dark grey - angular- 0.5" to 1" size)*** | 24" rec<br>4.3 ppm |
| 18 | | | 45<br>43 | | |
| 19 | | | 14<br>26 | 10"- ***Sandy SILT (Brown red - fine to med)***<br>9"- ***SAND(Brown - dry - dense) w/ trace 0-1% Gravel (Grey-rounded)*** | 19" rec<br>7.4 ppm |
| 20 | | | 33<br>30 | | |
| 21 | | | 8<br>18 | 13"- ***SAND (Fine, Brown - moist - dense) w/ trace 0-1% Gravel (Grey-rounded)*** | 22" rec<br>8.1 ppm |
| 22 | | | 28<br>35 | 9"- ***SAND (Brown - fine to med - moist) w/ trace 0-1% Gravel (Grey - 0.5" to 1"- subrounded) 0.5" lens SILT (Red brown)*** | |
| 23 | | | 29<br>27 | 4"- ***SAND (Lt Brown -fine to med-dry) w/ 2" bed of CLAY (Red brown)***<br>5"- ***SAND (Brown - med - dense - dry to moist)*** | 21" rec<br>27.3 ppm |

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# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-02** |
| **Sheet 2 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Start Date:** | 4/24/12 |
| **Finish Date:** | 4/24/12 |
| **Inspector:** | C. Martin |

**Project Name:** MOB Commercial Use Assessment
**Location:** MOB Site - Buffalo, NY
**Client:** Kaleida Health

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | MATERIAL DESCRIPTION (c - coarse, m - medium, f - fine; a - and 35-50%, s - some 20-35%, l - little 10-20%, t - trace 0-10%; S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey) | COMMENTS (e.g., N-value, recovery, moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|
| | | | 31 | 5"- ***Clayey SILT (Red brown) w/ Gravel (1" pieces to pea size)*** | 24" rec |
| 24 | | | 29 | 2"- ***SAND (Lt Brown - fine to med -dry - loose)*** | 10.7 ppm |
| | | | 25 | 4"- ***Sandy Clay SILT (Brown - moist) w/Gravel (Dark grey-subround-*** | |
| 25 | | | 34 | ***pea size)*** | |
| | | | 41 | 20"- ***SAND (Brown - med - dry to moist - dense)*** | |
| 26 | | | 58 | | |
| | | | 35 | 4"- ***SAND (Lt Brown - med -dry)*** | 22" rec |
| 27 | | | 36 | 8"- ***SAND (Brown - moist) w/ Clayey SILT*** | 714 ppm |
| | | | 38 | 8"- ***SAND (Lt Brown - med -dry)*** | |
| 28 | | | 39 | | |
| | | | 18 | 2"- ***SAND (Brown - fine - moist)*** | 19" rec |
| 29 | ▼ | | 24 | 17"- ***SAND (Lt Brown - med - moist to wet - odor)*** | >1200 ppm |
| | | | 29 | | strong odor |
| 30 | | | 43 | | |
| | | | 18 | 18"- ***SAND (Lt Brown - fine to med - loose - wet)*** | 18" rec |
| 31 | | | 22 | | 1634 ppm |
| | S-1 | | 29 | | |
| 32 | | | 38 | | |
| | | | 27 | 24"- ***SAND (Lt Brown - fine - dense - moist) grades into SAND (Brown*** | 24" rec |
| 33 | | | 31 | ***med - moist - dense)*** | 1780 ppm |
| | | | 55 | | |
| 34 | | | 51 | | |
| | | | 15 | 24"- ***SAND (Brown - med - moist - dense)*** | 24" rec |
| 35 | | | 33 | | 1630 ppm |
| | | | 45 | | |
| 36 | | | 50 | | |
| | | | 28 | 24"- ***SAND (Brown w/ slight stain - med) w/ Clayey SILT*** | 24" rec |
| 37 | | | 34 | | 1700 ppm |
| | | | 41 | | |
| 38 | ▼ | | 31 | | |
| | | | 29 | 5"- ***SAND (Brown w/ slight stain - med) w/ Clayey SAND*** | 24" rec |
| 39 | | | 30 | 19"- ***SAND (Black stained - med)*** | 1700 ppm |
| | | | 40 | | |
| 40 | | | 32 | | |
| | | | 8 | 16"- ***Clayey SILT (Red brown - dense)*** | 24" rec |
| 41 | | | 10 | 8"- ***Clayey SILT (Red brown - dense)*** | 560 ppm |
| | S-2 | | 17 | | odor |
| 42 | | | 26 | | |
| | | | 33 | 24"- ***Clayey SILT (Red brown - dense)*** | 24" rec |
| 43 | | | 53 | | 215 ppm |
| | | | 55 | | |
| 44 | | | 52 | | |
| | | | | ***SAMPLES COLLECTED FOR VOC ANALYSIS (METHOD 8260)*** | |
| 45 | | | | ***S-1 = CB-02: 30-32'*** | |
| | | | | ***S-2 = CB-02: 40-41'*** | |
| 46 | | | | | |
| | | | | | |
| 47 | | | | | |
| | | | | | |
| 48 | | | | | |
| | | | | | |
| 49 | | | | | |

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# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-03** |
| **Sheet 1 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Surface Elev.:** | |
| **Datum:** | Ground Surface |
| **Start Date:** | 4/26/12 |
| **Finish Date:** | 4/26/12 |
| **Inspector:** | C. Martin |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Project Name:** | MOB Commercial Use Assessment | | | | | | | | |
| **Location:** | MOB Site - Buffalo, NY | | | | | | | | |
| **Client:** | Kaleida Health | | | | | | | | |
| **Drilling Firm:** | SJB | | | **Driller:** | **Steven Gorski** | | | | |
| **Groundwater** | | **Depth** | **Date & Time** | **Drill Rig:** | CME -85; Method-HAS | | | | |
| **While Drilling:** | | 33.5 | 04/26/12 | **Casing:** | | **Rock Core:** | | **Undist:** | |
| **Before Casing Removal:** | | | | **Sampler:** | 2" Split Spoon | **Other:** | | | |
| **After Casing Removal:** | | | | **Hammer:** | Auto | | | | |

(N -- No. of blows to drive sampler 12" w/140 lb. hammer falling 30" ASTM D-1586, Standard Penetration Test)

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | c - coarse<br>m - medium<br>f - fine | **MATERIAL DESCRIPTION**<br>S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey | a - and - 35-50%<br>s - some - 20-35%<br>l - little - 10-20%<br>t - trace - 0-10% | **COMMENTS**<br>(e.g., N-value, recovery, relative moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 1 | | | | | ***Weather: sunny with increasing clouds; calm winds; temp ~50 F*** | | |
| | | | | | | | |
| 2 | | | | | ***Augered to 4 ftbg*** | | |
| | | | | | | | |
| 3 | | | | | | | |
| | | | 11 | 11"- | ***SAND (Brown - moist - fine to med) some Silt*** | | 15" rec |
| 4 | | | 8 | 4"- | ***Silty CLAY (Red brown - med dense)*** | | 1.4 ppm |
| | | | 7 | | | | |
| 5 | | | 9 | | | | |
| | | | 9 | 4"- | ***SAND and GRAVEL (35-50% - dark grey - pea to 0.5" size)*** | | 24" rec |
| 6 | | | 7 | 4"- | ***SAND (Brown - moist - fine to med)*** | | 1685 ppm |
| | | | 9 | 18" | ***Silty CLAY (Red brown - soft to med dense)*** | | odor |
| 7 | | | 10 | | | | |
| | | | 8 | 5"- | ***SAND (Brown - moist - fine to med - loose)*** | | 24" rec |
| 8 | | | 10 | 2.5"- | ***CLAY (Red brown - soft to med dense) some Silt*** | | 232 ppm |
| | | | 14 | 5"- | ***SAND (Brown - wet - fine to med - loose)*** | | |
| 9 | | | 10 | 11"- | ***Clayey SILT (Red brown - soft to med dense) w/ some grey layers*** | | |
| | | | WH | 6"- | ***SILT (Grey - moist) odor*** | | 19" rec |
| 10 | | | 4 | 7"- | ***Clayey SILT (Red brown - soft to med dense)*** | | 1702 ppm |
| | | | 20 | 3"- | ***Silty SAND (Lt Brown - fine Sand - dry)*** | | |
| 11 | | | 30 | 5"- | ***Silty SAND (Red - fine Sand - dry)*** | | |
| | | | 25 | | | | |
| 12 | | | 43 | 24"- | ***Silty SAND (Red - fine Sand - dry)*** | | 24" rec |
| | | | 38 | | | | 1915 ppm |
| 13 | | | 47 | | | | |
| | | | 21 | 21"- | ***Sandy SILT (Lt Brown - dry - fine Sand) w/ 1-2" layers of Sandy*** | | 21" rec |
| 14 | | | 50 | | ***SILT (med dense - red)*** | | 1901 ppm |
| | | | 52 | | | | |
| 15 | | | 59 | | | | |
| | | | 55 | 21"- | ***SAND (Brown - dry to moist - fine) some Silt*** | | 21" rec |
| 16 | | | 56 | | | | 1586 ppm |
| | | | 50/3 | | | | |
| 17 | | | | | | | |
| | | | 12 | 17"- | ***SAND (Brown - moist - dense) w/ one 2" thick Sand (Black stain)*** | | 17" rec |
| 18 | | | 32 | | | | 1666 ppm |
| | | | 48 | | | | |
| 19 | | | 50/3 | | | | |
| | | | 24 | 16"- | ***SAND (Brown - moist - loose - fine to med)*** | | 16" rec |
| 20 | | | 51 | | | | 2170 ppm |
| | | | 50/4 | | | | |
| 21 | | | | | | | |
| | | | 25 | 13"- | ***Same as pervious*** | | 18" rec |
| 22 | | | 55 | 5"- | ***SILT ( Brown red - loose) odor*** | | 2219 ppm |
| | S-1 | | 45 | | | | |
| 23 | | | 50/2 | | | | |

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# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-03** |
| **Sheet 2 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Start Date:** | 4/26/12 |
| **Finish Date:** | 4/25/12 |
| **Inspector:** | C. Martin |

**Project Name:** MOB Commercial Use Assessment
**Location:** MOB Site - Buffalo, NY
**Client:** Kaleida Health

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | MATERIAL DESCRIPTION (c - coarse, m - medium, f - fine; a - and - 35-50%, s - some - 20-35%, l - little - 10-20%, t - trace - 0-10%; S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey) | COMMENTS (e.g., N-value, recovery, moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|
| | | | 12 | 20.5"- ***SILT (Red brown- loose - moist) trace Sand*** | 20.5" rec |
| 24 | | | 34 | | 601 ppm |
| | | | 22 | | |
| 25 | | | 20 | | |
| | | | 18 | 20.5"- ***Same as previous*** | 20.5" rec |
| 26 | | | 15 | | 327 ppm |
| | | | 14 | | |
| 27 | | | 15 | | |
| | | | 27 | 24"- ***SILT (Red brown- loose - moist) trace imbedded Gravel (Dark*** | 24" rec |
| 28 | | | 15 | ***grey - pea size - 0-1% - subrounded)*** | 1020 ppm |
| | | | 15 | | |
| 29 | | | 15 | | |
| | | | 6 | 21"- ***SILT (Red brown - loose - moist) w/ 6" bed Clay (Brown red -*** | 21" rec |
| 30 | | | 4 | ***med dense) Gravel (0-1% - round - smooth - 0.5-1" size)*** | 839 ppm |
| | | | 9 | | |
| 31 | | | 5 | | |
| | | | 11 | 24"- ***Same as previous*** | |
| 32 | | | 9 | ***One 1" layer SAND (Brown - moist - loose)*** | |
| | | | 8 | | |
| 33 | | | 9 | | |
| | | | 2 | 17"- ***Silty CLAY (Brown - dense) w/ trace 0-1% Gravel (pea size - grey)*** | 17" rec |
| 34 | | | 5 | | 1000 ppm |
| | | | 8 | | |
| 35 | | | 8 | | |
| | ▼ | | 24 | 9"- ***SILT (Brown)*** | 24" rec |
| 36 | | | 28 | 15"- ***SAND (Black stain - sheen - fine to med - saturated)*** | 1186 ppm |
| | S-2 | | 25 | | |
| 37 | | | 26 | | |
| | | | 3 | 21"- ***SAND (Black stain - fine to med)*** | 23" rec |
| 38 | | | 5 | 2"- ***GRAVEL/SAND/SILT/CLAY (Brown - med Sand - moist) w/ Gravel*** | 284 ppm |
| | S-3 | | 20 | ***(mult. Colors - pea to coarse Sand size - subround)*** | strong odor |
| 39 | | | 20 | | |
| | | | 4 | 9"- ***SAND (Black stain -med to coarse) layer of Gravel (0.5 to 1" size*** | |
| 40 | | | 13 | ***round to angular - multi color)*** | |
| | S-4 | | 16 | 4"- ***SAND/SILT/GRAVEL (Brown - med to coarse Sand)*** | |
| 41 | | | 18 | 12"- ***CLAY (dense massive -Brown) w/ trace of Gravel (pea size - dark*** | |
| | | | | ***grey)*** | |
| 42 | | | | | |
| | | | | ***Split Spoon stuck in augers. All efforts to release SS fail;augers*** | |
| 43 | | | | ***and SS removed from hole. (41 feet depth)*** | |
| | | | | | |
| 44 | | | | ***SOIL SAMPLES FOR VOC ANALYSIS (METHOD 8260)*** | |
| | | | | ***S-1 = CB-03: 22-24'*** | |
| 45 | | | | ***S-2 = CB-03: 35-37'*** | |
| | | | | ***S-3 = CB-03: 37-39'*** | |
| 46 | | | | ***S-4 = CB-03: 39-41'*** | |
| | | | | | |
| 47 | | | | | |
| | | | | | |
| 48 | | | | | |
| | | | | | |
| 49 | | | | | |

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# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-04** |
| **Sheet 1 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Surface Elev.:** | |
| **Datum:** | Ground Surface |
| **Start Date:** | 4/25/12 |
| **Finish Date:** | 4/25/12 |
| **Inspector:** | E. Daniel |

| | |
|---|---|
| **Project Name:** | MOB Commercial Use Assessment |
| **Location:** | MOB Site - Buffalo, NY |
| **Client:** | Kaleida Health |
| **Drilling Firm:** | SJB |
| **Driller:** | **Steven Gorski** |
| **Drill Rig:** | CME -85; Method HAS |
| **Casing:** | |
| **Rock Core:** | |
| **Undist:** | |
| **Sampler:** | 2" Split Spoon |
| **Other:** | |
| **Hammer:** | Auto |

| **Groundwater** | **Depth** | **Date & Time** |
|---|---|---|
| **While Drilling:** | 33.1 | 04/25/12 |
| **Before Casing Removal:** | | |
| **After Casing Removal:** | | |

(N -- No. of blows to drive sampler 12" w/140 lb. hammer falling 30" ASTM D-1586, Standard Penetration Test)

c - coarse
m - medium
f - fine

a - and - 35-50%
s - some - 20-35%
l - little - 10-20%
t - trace - 0-10%

S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | MATERIAL DESCRIPTION | COMMENTS (e.g., N-value, recovery, relative moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|
| 1 | | | | | |
| | | | | | |
| 2 | | | | 4"- ***GRAVEL*** | |
| | | | | | |
| 3 | | | | | |
| | | | 12 | 4"- ***GRAVEL (moist) grades down into Sandy SILT (moist)*** | 6.5 rec |
| 4 | | | 15 | ***Bottom 2.5" Sand*** | 1.3 ppm |
| | | | 16 | | |
| 5 | | | 19 | | 19" rec |
| | | | 17 | 7"- ***SAND (Lt brown - fine - dense)*** | 3.4 ppm |
| 6 | | | 14 | 2.5"- ***SAND (Dark brown - med)*** | |
| | | | 10 | 7.5"- ***Sandy SILT (Lt brown - moist)*** | |
| 7 | | | 9 | 2"- ***Silty CLAY (Redish brown)*** | |
| | | | 11 | 7"- ***Silty SAND (Lt brown - moist)*** | 13.5" rec |
| 8 | | | 11 | 2"- ***Sandy SILT (Brown - moist)*** | 0.7 ppm |
| | | | 10 | 2"- ***Sandy SILT (Lt brown - moist)*** | |
| 9 | | | 10 | 2.5"- ***Silty CLAY (Gray)*** | |
| | | | 4 | 2"- ***Silty SAND (Lt brown - moist)*** | 23.5" rec |
| 10 | | | 6 | 2"- ***Silty SAND (Lt brown - saturated)*** | 10.4 ppm |
| | | | 12 | 8.5"- ***SILT (Redish brown - dense)*** | |
| 11 | | | 20 | 5"- ***Sandy SILT (Lt brown - moist) / 6"- Sandy Silt (Lt Brown - moist)*** | |
| | | | 21 | 4"- ***Sandy SILT (Lt brown)*** | 24" rec |
| 12 | | | 42 | 3"- ***Sandy SILT (Red brown - firm)*** | 13.1 ppm |
| | | | 37 | 17"- ***Silty SAND (Brown - moist)*** | |
| 13 | | | 35 | | |
| | | | 10 | 24"- ***Silty SAND (Brown - fine)*** | 24" rec |
| 14 | | | 23 | | 7.2 ppm |
| | | | 30 | | odor |
| 15 | | | 49 | | |
| | | | 43 | 20"- ***Silty SAND (Brown - fine)*** | 20" rec |
| 16 | | | 47 | | 11.4 ppm |
| | | | 50/4 | | odor |
| 17 | | | | | |
| | | | 18 | 13"- ***Silty SAND (Lt brown - fine)*** | 13" rec |
| 18 | | | 44 | | 17.3 ppm |
| | | | 50/4 | | odor |
| 19 | | | | | |
| | | | 28 | 24"- ***Silty SAND (Brown - fine)*** | 24" rec |
| 20 | | | 32 | | 16 ppm |
| | | | 52 | | odor |
| 21 | | | 56 | | |
| | | | 58 | 15"- ***Silty SAND (Brown - fine)*** | 15" rec |
| 22 | | | 50/4 | | 348 ppm |
| | | | | | odor |
| 23 | | | | | |

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# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-04** |
| **Sheet 2 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Start Date:** | 4/25/12 |
| **Finish Date:** | 4/25/12 |
| **Inspector:** | E. Daniel |

**Project Name:** MOB Commercial Use Assessment
**Location:** MOB Site - Buffalo, NY
**Client:** Kaleida Health

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | MATERIAL DESCRIPTION (c - coarse, m - medium, f - fine; a - and - 35-50%, s - some - 20-35%, l - little - 10-20%, t - trace - 0-10%; S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey) | COMMENTS (e.g., N-value, recovery, moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|
| | | | 15 | 24"- ***Sandy SILT (Lt brown)*** | 24" rec |
| 24 | S-1 | | 30 | | 1780 ppm |
| | | | 54 | | strong odor |
| 25 | | | 50/3 | | |
| | | | 37 | 8"- ***Sandy SILT (Lt Brown - fine)*** | 19" rec |
| 26 | | | 35 | 7"- ***Silty SAND (Tan - fine)*** | 1461 ppm |
| | | | 42 | 4"- ***Sandy SILT (Lt brown - fine)*** | strong odor |
| 27 | | | 54 | | |
| | | | 48 | 24"- ***Sandy SILT (Brown - fine - moist to wet)*** | 24" rec |
| 28 | | | 56 | | 1276 ppm |
| | | | 49 | | strong odor |
| 29 | ▼ | | 52 | | |
| | | | 6 | 16"- ***Silty SAND (Brown - saturated)*** | 16" rec |
| 30 | | | 10 | ***Top 8" strong odor. Bottom 8" little to no odor.*** | 1320 ppm |
| | S-2 | | 11 | | strong odor |
| 31 | | | 10 | | |
| | | | 8 | 8"- ***Silty SAND (Brown)*** | 24" rec |
| 32 | | | 8 | 12"- ***Silty SAND (fine - saturated)*** | 730 ppm |
| | | | 8 | 4"- ***Silty SAND (Brownish gray - med to coarse)*** | strong odor |
| 33 | | | 13 | | |
| | | | WH | 17"- ***Silty SAND (Brown - fine - saturated) water running out of*** | 17" rec |
| 34 | | | 3 | ***sample*** | 1340 ppm |
| | | | 8 | | strong odor |
| 35 | | | 15 | | |
| | | | 5 | 9"- ***Silty SAND (Brown - fine - saturated)*** | 24" rec |
| 36 | | | 12 | 15"- ***SAND (Black stained - little Silt - med to coarse)*** | 1390 ppm |
| | | | 14 | | strong odor; septic |
| 37 | | | 32 | | |
| | | | 17 | 8"- ***SAND (Black stained, med to coarse - little Silt)*** | 23" rec |
| 38 | | | 24 | 15"- ***SAND (Tan - fine - little Silt - saturated)*** | 389 ppm |
| | | | 29 | | strong odor; septic |
| 39 | | | 32 | | |
| | | | WOH | 24"- ***SAND (Tan - fine - little Silt - saturated) trace Gravel*** | 24" rec |
| 40 | | | 9 | | 1120 ppm |
| | | | 19 | | no odor |
| 41 | | | 37 | | |
| | | | 25 | 22"- ***SAND (Tan - fine - little Silt - saturated) trace Gravel*** | 24" rec |
| 42 | | | 41 | 2"- ***SILT and CLAY little imbedded Gravel*** | 1415 ppm |
| | S-3 | | 50 | | little odor |
| 43 | | | 53 | | |
| | | | | | |
| 44 | | | | ***SOIL SAMPLES COLLECTED FOR VOC ANALYSIS*** | |
| | | | | ***S-1 = CB-04: 23-25'*** | |
| 45 | | | | ***S-2 = CB-04: 29-31'*** | |
| | | | | ***S-3 = CB-04: 41-43'*** | |
| 46 | | | | | |
| | | | | | |
| 47 | | | | | |
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| 48 | | | | | |
| | | | | | |
| 49 | | | | | |

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# BORING LOG

| | |
|---|---|
| Boring No. | CB-05 |
| Sheet 1 of: | 2 |
| Project No.: | K11.002.001 |
| Surface Elev.: | |
| Datum: | Ground Surface |
| Start Date: | 4/24/12 |
| Finish Date: | 4/24/12 |
| Inspector: | C. Martin |

| | |
|---|---|
| Project Name: | MOB Commercial Use Assessment |
| Location: | MOB Site - Buffalo, NY |
| Client: | Kaleida Health |
| Drilling Firm: | SJB |
| Driller: | Steven Gorski |
| Drill Rig: | CME -85; method - HAS |
| Casing: | |
| Rock Core: | |
| Undist: | |
| Sampler: | 2" Split Spoon |
| Other: | |
| Hammer: | Auto |

| Groundwater | Depth | Date & Time |
|---|---|---|
| While Drilling: | 27 | 04/24/12 |
| Before Casing Removal: | | |
| After Casing Removal: | | |

(N -- No. of blows to drive sampler 12" w/140 lb. hammer falling 30" ASTM D-1586, Standard Penetration Test)

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | c - coarse m - medium f - fine | MATERIAL DESCRIPTION S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey a - and - 35-50% s - some - 20-35% l - little - 10-20% t - trace - 0-10% | COMMENTS (e.g., N-value, recovery, relative moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|---|
| | | | | | | |
| 1 | | | | | ***Weather: cool; temp ~40 F; windy; rain and snow*** | |
| | | | | | | |
| 2 | | | | | ***Auger to 5 ftbg*** | |
| | | | | | | |
| 3 | | | | | | |
| | | | | | | |
| 4 | | | | | | |
| | | | 4 | | ***No Recovery*** | |
| 5 | | | 3 | | | |
| | | | 2 | | | |
| 6 | | | 1 | | | |
| | | | 3 | 7"- | ***SAND (Brown - fine to med - dry) w/ ashpalt and Gravel piceces*** | 14" rec |
| 7 | | | 2 | 2"- | ***SAND (Brown - fine to med - dry)*** | 0.1 ppm |
| | | | 6 | 4"- | ***SAND (Brown - fine to med) w/ Silt Sand laminations 0.25" thick*** | |
| 8 | | | 10 | 1"- | ***SAND (Tan - fine to med)*** | |
| | | | 10 | | | |
| 9 | | | 20 | 15"- | ***SAND (Tan to Lt brown - med - dry)*** | 15" rec |
| | | | 23 | | | 0.5 ppm |
| 10 | | | 22 | | | |
| | | | 18 | 17"- | ***SAND (Tan to Lt brown - med - dry) laminated w/ Silty Sand (Br -*** | 17" rec |
| 11 | | | 22 | | ***med - dense)*** | 0.2 ppm |
| | | | 21 | | | |
| 12 | | | 22 | | | |
| | | | 11 | 18"- | ***SAND (Tan to Lt brown - med - moist) laminated w/ Silt Sand*** | 18" rec |
| 13 | | | 6 | | | 0.1 ppm |
| | | | 6 | | | |
| 14 | | | 6 | | | |
| | | | 6 | 13"- | ***Same as previous*** | 13" rec |
| 15 | | | 5 | | | 0.4 ppm |
| | | | 5 | | | |
| 16 | | | 6 | | | |
| | | | 5 | 11.5"- | ***Same as previous*** | 16.5" rec |
| 17 | | | 2 | 5"- | ***SAND (Brown - med - moist) w/ trace Clay and Silt*** | 0.4 ppm |
| | | | 2 | | | |
| 18 | | | 1 | | | |
| | | | 2 | 7"- | ***SAND (Brown - med - moist) w/ trace Clay and Silt*** | 13" rec |
| 19 | | | 1 | 6"- | ***SAND (Brown -loose - med - dry to moist) w/ trace of Clay & Silt*** | 0.2 ppm |
| | | | 1 | | | |
| 20 | | | 1 | | | |
| | | | 1 | 8"- | ***SAND (Brown - med - moist) w/ trace Clay and Silt*** | 17.5" rec |
| 21 | | | 4 | | ***grades into*** | 0.1 ppm |
| | | | 7 | 9"- | ***SAND (Tan - fine to med - dry to moist)*** | |
| 22 | | | 9 | | | |
| | | | 8 | 15"- | ***SAND (Tan - moist - med - dense) w/ brown Silt laminates*** | 15" rec |
| 23 | | | 22 | | | 0.6 ppm |

C&S Engineers, Inc.
90 Broadway
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com

# BORING LOG

| | |
|---|---|
| **Boring No.** | **CB-05** |
| **Sheet 2 of:** | 2 |
| **Project No.:** | K11.002.001 |
| **Start Date:** | 4/24/12 |
| **Finish Date:** | 4/24/12 |
| **Inspector:** | C. Martin |

**Project Name:** MOB Commercial Use Assessment
**Location:** MOB Site - Buffalo, NY
**Client:** Kaleida Health

| Depth (ft) | Sample No. | Symbol | Blows on Sampler per 6" | MATERIAL DESCRIPTION (c - coarse, m - medium, f - fine; a - and 35-50%, s - some 20-35%, l - little 10-20%, t - trace 0-10%; S - Sand, $ - Silt, G - Gravel, C - Clay, cly - clayey) | COMMENTS (e.g., N-value, recovery, moisture, core run, RQD, % recovered) |
|---|---|---|---|---|---|
| | | | 26 | | |
| 24 | | | 33 | | |
| | | | 15 | 10"- ***SAND (Tan to Lt brown - med -moist)*** | 17" rec |
| 25 | | | 21 | 7"- ***SAND (Brown - fine to med) w/ little 10-20% Silt dense*** | 0.6 ppm |
| | | | 22 | | |
| 26 | | | 20 | | |
| | | | 13 | 11"- ***SAND (Brown - fine to med - moist)*** | 19" rec |
| 27 | ▼ | | 9 | 8"- ***Sandy SILT (Brown red - wet - dense)*** | 0.2 ppm |
| | | | 5 | | |
| 28 | | | 6 | | |
| | | | 3 | 10"- ***Sandy SILT (Brown red - wet - dense)*** | 19" rec |
| 29 | | | 10 | 9"- ***SAND (Brown - fine to med - dense) trace Silt*** | 0.3 ppm |
| | | | 24 | | |
| 30 | | | 29 | | |
| | | | 23 | 15"- ***SAND (Tan - fine to med - wet - loose to med dense)*** | 24" rec |
| 31 | S-1 | | 20 | 9"- ***SAND (Black stain - med -wet)*** | 1025 ppm |
| | | | 28 | | strong odor |
| 32 | | | 25 | | |
| | | | 13 | 5"- ***SAND (Black stain - med -wet)*** | 20" rec |
| 33 | | | 28 | 15"- ***SAND (Black stain - med to coarse -wet) w/ Gravel (pea size -*** | 418 ppm |
| | | | 18 | ***rounded some angular piceces)*** | strong odor |
| 34 | | | 17 | | |
| | | | 8 | 12"- ***Same as previous*** | 24" rec |
| 35 | | | 12 | 12"- ***CLAY (Red brown - dense - some Silt)*** | 301 ppm |
| | | | 13 | | |
| 36 | | | 22 | | |
| | | | 22 | 12"- ***CLAY (Red brown - dense - some Silt)*** | 12" rec |
| 37 | | | 41 | | 21.7 ppm |
| | S-2 | | 39 | | |
| 38 | | | 43 | | |
| | | | | ***SOIL SAMPLES COLLECTED FOR VOC ANALYSIS*** | |
| 39 | | | | ***S-1 = CB-05: 31-33'*** | |
| | | | | ***S-2 = CB-05: 37-39'*** | |
| 40 | | | | | |
| | | | | | |
| 41 | | | | | |
| | | | | | |
| 42 | | | | | |
| | | | | | |
| 43 | | | | | |
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| 44 | | | | | |
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| 45 | | | | | |
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| 46 | | | | | |
| | | | | | |
| 47 | | | | | |
| | | | | | |
| 48 | | | | | |
| | | | | | |
| 49 | | | | | |

# APPENDIX B

## SUMMARY OF DETECTED VOLATILE ORGANIC COMPOUNDS

## APPENDIX B

## SUMMARY OF DETECTED VOLATILE ORGANIC COMPOUNDS

## MOB - BUFFALO NY APRIL 2012 BORINGS

| BORING NAME AND DEPTH | BENZENE | ETHYLBENZENE | TOLUENE | XYLENES | ACETONE |
|---|---|---|---|---|---|
| unit | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Restricted Residential Use SCO | 4.8 | **41** | **100** | **100** | 100 |
| Commercial Use SCO | 44.0 | 390 | 500 | **500** | 500 |
| **CB-01** | | | | | |
| 26-28 | 0.0162 | ND<.0035 | 0.0219 | 0.00285 | .0173 JB |
| 38-40 | ND<.51 | ND<.51 | .379 J | 0.0963 | 0.136 JB |
| 40-42 | ND<.0042 | 0.0106 | 0.0264 | 0.0622 | .0145 JB |
| **CB-02** | | | | | |
| 30-32 | ND<3.18 | 25.2 | 60.0 | **254.3** | 39 |
| 40-42 | 0.0384 | 0.0564 | 0.104 | 0.426 | ND<0.0407 |
| **CB-03** | | | | | |
| 22-24 | ND<19.1 | **46.0** | **145** | **516** | ND<95.3 |
| 36-38 | 0.984 | 0.35 | 2.08 | 2.232 | ND<0.724 |
| 38-40 | .0319 J | 0.183 | 0.322 | 1.399 | ND<0.274 |
| 40-42 | 0.00345 | 0.00624 | 0.0205 | 0.0512 | 0.197 J |
| **CB-04** | | | | | |
| 24-26 | ND<0.119 | 1.3 | 0.799 | 20.86 | 0.516 JB |
| 30-32 | ND<0.255 | 7.7 | 16.6 | 53.2 | ND<1.270 |
| 42-44 | ND<0.0751 | 0.845 | 1.73 | 6.46 | 0.47 B |
| **CB-05** | | | | | |
| 31-33 | ND<.0818 | 0.21 | ND<.0818 | 0.32 | ND<0.409 |
| 37-39 | 0.00727 | 0.0484 | 0.0149 | 1.289 | ND<0.0224 |

Notes:

1) Analytical results in mg/kg = milligrams per Kilogram

2) EPA Data Qualifiers: J = Estimated value; B = Possible cross contamination of the blank

# APPENDIX C

## SOIL ANALYTICAL RESULTS

PARADIGM
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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-01 26-28'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-04

**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 3.54 |
| Bromomethane | < 3.54 |
| Bromoform | < 8.84 |
| Carbon Tetrachloride | < 3.54 |
| Chloroethane | < 3.54 |
| Chloromethane | < 3.54 |
| 2-Chloroethyl vinyl Ether | < 17.7 |
| Chloroform | < 3.54 |
| Dibromochloromethane | < 3.54 |
| 1,1-Dichloroethane | < 3.54 |
| 1,2-Dichloroethane | < 3.54 |
| 1,1-Dichloroethene | < 3.54 |
| cis-1,2-Dichloroethene | < 3.54 |
| trans-1,2-Dichloroethene | < 3.54 |
| 1,2-Dichloropropane | < 3.54 |
| cis-1,3-Dichloropropene | < 3.54 |
| trans-1,3-Dichloropropene | < 3.54 |
| Methylene chloride | < 8.84 |
| 1,1,2,2-Tetrachloroethane | < 3.54 |
| Tetrachloroethene | < 3.54 |
| 1,1,1-Trichloroethane | < 3.54 |
| 1,1,2-Trichloroethane | < 3.54 |
| Trichloroethene | < 3.54 |
| Trichlorofluoromethane | < 3.54 |
| Vinyl chloride | < 3.54 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 16.2 |
| Chlorobenzene | < 3.54 |
| Ethylbenzene | < 3.54 |
| Toluene | 21.9 |
| m,p-Xylene | J 2.85 |
| o-Xylene | < 3.54 |
| Styrene | < 8.84 |
| 1,2-Dichlorobenzene | < 3.54 |
| 1,3-Dichlorobenzene | < 3.54 |
| 1,4-Dichlorobenzene | < 3.54 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | J B 17.3 |
| 2-Butanone | < 17.7 |
| 2-Hexanone | < 8.84 |
| 4-Methyl-2-pentanone | < 8.84 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 3.54 |
| Vinyl acetate | < 8.84 |

ELAP Number 10958 Method: EPA 8260B Data File: V96484.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

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ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-01 38-40'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-05
**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 51.0 |
| Bromomethane | < 51.0 |
| Bromoform | < 128 |
| Carbon Tetrachloride | < 51.0 |
| Chloroethane | < 51.0 |
| Chloromethane | < 51.0 |
| 2-Chloroethyl vinyl Ether | < 255 |
| Chloroform | < 51.0 |
| Dibromochloromethane | < 51.0 |
| 1,1-Dichloroethane | < 51.0 |
| 1,2-Dichloroethane | < 51.0 |
| 1,1-Dichloroethene | < 51.0 |
| cis-1,2-Dichloroethene | < 51.0 |
| trans-1,2-Dichloroethene | < 51.0 |
| 1,2-Dichloropropane | < 51.0 |
| cis-1,3-Dichloropropene | < 51.0 |
| trans-1,3-Dichloropropene | < 51.0 |
| Methylene chloride | < 128 |
| 1,1,2,2-Tetrachloroethane | < 51.0 |
| Tetrachloroethene | < 51.0 |
| 1,1,1-Trichloroethane | < 51.0 |
| 1,1,2-Trichloroethane | < 51.0 |
| Trichloroethene | < 51.0 |
| Trichlorofluoromethane | < 51.0 |
| Vinyl chloride | < 51.0 |

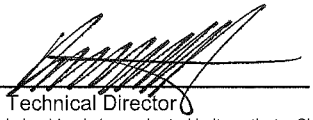
| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 51.0 |
| Chlorobenzene | < 51.0 |
| Ethylbenzene | < 51.0 |
| Toluene | J 37.9 |
| m,p-Xylene | 65.5 |
| o-Xylene | J 30.8 |
| Styrene | < 128 |
| 1,2-Dichlorobenzene | < 51.0 |
| 1,3-Dichlorobenzene | < 51.0 |
| 1,4-Dichlorobenzene | < 51.0 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | J B 136 |
| 2-Butanone | < 255 |
| 2-Hexanone | < 128 |
| 4-Methyl-2-pentanone | < 128 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 51.0 |
| Vinyl acetate | < 128 |

ELAP Number 10958 Method: EPA 8260B Data File: V96486.D

Comments: ug / Kg = microgram per Kilogram

Signature: 

Bruce Hoogesteger: Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-01 40-42'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-06
**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 4.22 |
| Bromomethane | < 4.22 |
| Bromoform | < 10.5 |
| Carbon Tetrachloride | < 4.22 |
| Chloroethane | < 4.22 |
| Chloromethane | < 4.22 |
| 2-Chloroethyl vinyl Ether | < 21.1 |
| Chloroform | < 4.22 |
| Dibromochloromethane | < 4.22 |
| 1,1-Dichloroethane | < 4.22 |
| 1,2-Dichloroethane | < 4.22 |
| 1,1-Dichloroethene | < 4.22 |
| cis-1,2-Dichloroethene | < 4.22 |
| trans-1,2-Dichloroethene | < 4.22 |
| 1,2-Dichloropropane | < 4.22 |
| cis-1,3-Dichloropropene | < 4.22 |
| trans-1,3-Dichloropropene | < 4.22 |
| Methylene chloride | < 10.5 |
| 1,1,2,2-Tetrachloroethane | < 4.22 |
| Tetrachloroethene | < 4.22 |
| 1,1,1-Trichloroethane | < 4.22 |
| 1,1,2-Trichloroethane | < 4.22 |
| Trichloroethene | < 4.22 |
| Trichlorofluoromethane | < 4.22 |
| Vinyl chloride | < 4.22 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 4.22 |
| Chlorobenzene | < 4.22 |
| Ethylbenzene | 10.6 |
| Toluene | 26.4 |
| m,p-Xylene | 45.5 |
| o-Xylene | 16.7 |
| Styrene | < 10.5 |
| 1,2-Dichlorobenzene | < 4.22 |
| 1,3-Dichlorobenzene | < 4.22 |
| 1,4-Dichlorobenzene | < 4.22 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | J B 14.5 |
| 2-Butanone | < 21.1 |
| 2-Hexanone | < 10.5 |
| 4-Methyl-2-pentanone | < 10.5 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 4.22 |
| Vinyl acetate | < 10.5 |

ELAP Number 10958 Method: EPA 8260B Data File: V96485.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

PARADIGM
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179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project<br>Buffalo General Hospital | **Lab Project Number:** | 12:1749 |
| | | **Lab Sample Number:** | 12:1749-03 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | CB-02 / 30-32 | **Date Sampled:** | 04/24/2012 |
| **Field ID Number:** | N/A | **Date Received:** | 04/25/2012 |
| **Sample Type:** | Soil | **Date Analyzed:** | 04/25/2012 |

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 3,180 |
| Bromomethane | < 3,180 |
| Bromoform | < 7,960 |
| Carbon Tetrachloride | < 3,180 |
| Chloroethane | < 3,180 |
| Chloromethane | < 3,180 |
| 2-Chloroethyl vinyl Ether | < 15,900 |
| Chloroform | < 3,180 |
| Dibromochloromethane | < 3,180 |
| 1,1-Dichloroethane | < 3,180 |
| 1,2-Dichloroethane | < 3,180 |
| 1,1-Dichloroethene | < 3,180 |
| cis-1,2-Dichloroethene | < 3,180 |
| trans-1,2-Dichloroethene | < 3,180 |
| 1,2-Dichloropropane | < 3,180 |
| cis-1,3-Dichloropropene | < 3,180 |
| trans-1,3-Dichloropropene | < 3,180 |
| Methylene chloride | < 7,960 |
| 1,1,2,2-Tetrachloroethane | < 3,180 |
| Tetrachloroethene | < 3,180 |
| 1,1,1-Trichloroethane | < 3,180 |
| 1,1,2-Trichloroethane | < 3,180 |
| Trichloroethene | < 3,180 |
| Trichlorofluoromethane | < 3,180 |
| Vinyl chloride | < 3,180 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 3,180 |
| Chlorobenzene | < 3,180 |
| Ethylbenzene | 25,200 |
| Toluene | 60,000 |
| m,p-Xylene | 189,000 |
| o-Xylene | 65,300 |
| Styrene | < 7,960 |
| 1,2-Dichlorobenzene | < 3,180 |
| 1,3-Dichlorobenzene | < 3,180 |
| 1,4-Dichlorobenzene | < 3,180 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | 39,000 |
| 2-Butanone | < 15,900 |
| 2-Hexanone | < 7,960 |
| 4-Methyl-2-pentanone | < 7,960 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 3,180 |
| Vinyl acetate | < 7,960 |

ELAP Number 10958 Method: EPA 8260B Data File: V96476.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project<br>Buffalo General Hospital | **Lab Project Number:** | 12:1749 |
| | | **Lab Sample Number:** | 12:1749-04 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | CB-02 / 40-42 | **Date Sampled:** | 04/24/2012 |
| **Field ID Number:** | N/A | **Date Received:** | 04/25/2012 |
| **Sample Type:** | Soil | **Date Analyzed:** | 04/25/2012 |

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 8.13 |
| Bromomethane | < 8.13 |
| Bromoform | < 20.3 |
| Carbon Tetrachloride | < 8.13 |
| Chloroethane | < 8.13 |
| Chloromethane | < 8.13 |
| 2-Chloroethyl vinyl Ether | < 40.7 |
| Chloroform | < 8.13 |
| Dibromochloromethane | < 8.13 |
| 1,1-Dichloroethane | < 8.13 |
| 1,2-Dichloroethane | < 8.13 |
| 1,1-Dichloroethene | < 8.13 |
| cis-1,2-Dichloroethene | < 8.13 |
| trans-1,2-Dichloroethene | < 8.13 |
| 1,2-Dichloropropane | < 8.13 |
| cis-1,3-Dichloropropene | < 8.13 |
| trans-1,3-Dichloropropene | < 8.13 |
| Methylene chloride | < 20.3 |
| 1,1,2,2-Tetrachloroethane | < 8.13 |
| Tetrachloroethene | < 8.13 |
| 1,1,1-Trichloroethane | < 8.13 |
| 1,1,2-Trichloroethane | < 8.13 |
| Trichloroethene | < 8.13 |
| Trichlorofluoromethane | < 8.13 |
| Vinyl chloride | < 8.13 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 38.4 |
| Chlorobenzene | < 8.13 |
| Ethylbenzene | 56.4 |
| Toluene | 104 |
| m,p-Xylene | 320 |
| o-Xylene | 106 |
| Styrene | < 20.3 |
| 1,2-Dichlorobenzene | < 8.13 |
| 1,3-Dichlorobenzene | < 8.13 |
| 1,4-Dichlorobenzene | < 8.13 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 40.7 |
| 2-Butanone | < 40.7 |
| 2-Hexanone | < 20.3 |
| 4-Methyl-2-pentanone | < 20.3 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 8.13 |
| Vinyl acetate | < 20.3 |

ELAP Number 10958 Method: EPA 8260B Data File: V96455.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/40-42
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-01
**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/27/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 4.17 |
| Bromomethane | < 4.17 |
| Bromoform | < 10.4 |
| Carbon Tetrachloride | < 4.17 |
| Chloroethane | < 4.17 |
| Chloromethane | < 4.17 |
| 2-Chloroethyl vinyl Ether | < 20.9 |
| Chloroform | < 4.17 |
| Dibromochloromethane | < 4.17 |
| 1,1-Dichloroethane | < 4.17 |
| 1,2-Dichloroethane | < 4.17 |
| 1,1-Dichloroethene | < 4.17 |
| cis-1,2-Dichloroethene | < 4.17 |
| trans-1,2-Dichloroethene | < 4.17 |
| 1,2-Dichloropropane | < 4.17 |
| cis-1,3-Dichloropropene | < 4.17 |
| trans-1,3-Dichloropropene | < 4.17 |
| Methylene chloride | < 10.4 |
| 1,1,2,2-Tetrachloroethane | < 4.17 |
| Tetrachloroethene | < 4.17 |
| 1,1,1-Trichloroethane | < 4.17 |
| 1,1,2-Trichloroethane | < 4.17 |
| Trichloroethene | < 4.17 |
| Trichlorofluoromethane | < 4.17 |
| Vinyl chloride | < 4.17 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | J 3.45 |
| Chlorobenzene | < 4.17 |
| Ethylbenzene | 6.24 |
| Toluene | 20.5 |
| m,p-Xylene | 36.6 |
| o-Xylene | 14.6 |
| Styrene | < 10.4 |
| 1,2-Dichlorobenzene | < 4.17 |
| 1,3-Dichlorobenzene | < 4.17 |
| 1,4-Dichlorobenzene | < 4.17 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | J 19.7 |
| 2-Butanone | < 20.9 |
| 2-Hexanone | < 10.4 |
| 4-Methyl-2-pentanone | < 10.4 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 4.17 |
| Vinyl acetate | < 10.4 |

ELAP Number 10958 Method: EPA 8260B Data File: V96523.D

Comments: ug / Kg = microgram per Kilogram
Surrogate outliers indicate probable matrix interference

Signature: Val Mueller for

Bruce Hoogesteger: Technical Director

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/38-40
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-02
**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/27/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 54.8 |
| Bromomethane | < 54.8 |
| Bromoform | < 137 |
| Carbon Tetrachloride | < 54.8 |
| Chloroethane | < 54.8 |
| Chloromethane | < 54.8 |
| 2-Chloroethyl vinyl Ether | < 274 |
| Chloroform | < 54.8 |
| Dibromochloromethane | < 54.8 |
| 1,1-Dichloroethane | < 54.8 |
| 1,2-Dichloroethane | < 54.8 |
| 1,1-Dichloroethene | < 54.8 |
| cis-1,2-Dichloroethene | < 54.8 |
| trans-1,2-Dichloroethene | < 54.8 |
| 1,2-Dichloropropane | < 54.8 |
| cis-1,3-Dichloropropene | < 54.8 |
| trans-1,3-Dichloropropene | < 54.8 |
| Methylene chloride | < 137 |
| 1,1,2,2-Tetrachloroethane | < 54.8 |
| Tetrachloroethene | < 54.8 |
| 1,1,1-Trichloroethane | < 54.8 |
| 1,1,2-Trichloroethane | < 54.8 |
| Trichloroethene | < 54.8 |
| Trichlorofluoromethane | < 54.8 |
| Vinyl chloride | < 54.8 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | J 31.9 |
| Chlorobenzene | < 54.8 |
| Ethylbenzene | 183 |
| Toluene | 322 |
| m,p-Xylene | 1,050 |
| o-Xylene | 349 |
| Styrene | < 137 |
| 1,2-Dichlorobenzene | < 54.8 |
| 1,3-Dichlorobenzene | < 54.8 |
| 1,4-Dichlorobenzene | < 54.8 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 274 |
| 2-Butanone | < 274 |
| 2-Hexanone | < 137 |
| 4-Methyl-2-pentanone | < 137 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 54.8 |
| Vinyl acetate | < 137 |

ELAP Number 10958 Method: EPA 8260B Data File: V96524.D

Comments: ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/36-38
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-03

**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/27/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 145 |
| Bromomethane | < 145 |
| Bromoform | < 362 |
| Carbon Tetrachloride | < 145 |
| Chloroethane | < 145 |
| Chloromethane | < 145 |
| 2-Chloroethyl vinyl Ether | < 724 |
| Chloroform | < 145 |
| Dibromochloromethane | < 145 |
| 1,1-Dichloroethane | < 145 |
| 1,2-Dichloroethane | < 145 |
| 1,1-Dichloroethene | < 145 |
| cis-1,2-Dichloroethene | < 145 |
| trans-1,2-Dichloroethene | < 145 |
| 1,2-Dichloropropane | < 145 |
| cis-1,3-Dichloropropene | < 145 |
| trans-1,3-Dichloropropene | < 145 |
| Methylene chloride | < 362 |
| 1,1,2,2-Tetrachloroethane | < 145 |
| Tetrachloroethene | < 145 |
| 1,1,1-Trichloroethane | < 145 |
| 1,1,2-Trichloroethane | < 145 |
| Trichloroethene | < 145 |
| Trichlorofluoromethane | < 145 |
| Vinyl chloride | < 145 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 984 |
| Chlorobenzene | < 145 |
| Ethylbenzene | 350 |
| Toluene | 2,080 |
| m,p-Xylene | 1,660 |
| o-Xylene | 572 |
| Styrene | < 362 |
| 1,2-Dichlorobenzene | < 145 |
| 1,3-Dichlorobenzene | < 145 |
| 1,4-Dichlorobenzene | < 145 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 724 |
| 2-Butanone | < 724 |
| 2-Hexanone | < 362 |
| 4-Methyl-2-pentanone | < 362 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 145 |
| Vinyl acetate | < 362 |

ELAP Number 10958 Method: EPA 8260B Data File: V96525.D

Comments: ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/22-24
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-04

**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/28/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 19,100 |
| Bromomethane | < 19,100 |
| Bromoform | < 47,600 |
| Carbon Tetrachloride | < 19,100 |
| Chloroethane | < 19,100 |
| Chloromethane | < 19,100 |
| 2-Chloroethyl vinyl Ether | < 95,300 |
| Chloroform | < 19,100 |
| Dibromochloromethane | < 19,100 |
| 1,1-Dichloroethane | < 19,100 |
| 1,2-Dichloroethane | < 19,100 |
| 1,1-Dichloroethene | < 19,100 |
| cis-1,2-Dichloroethene | < 19,100 |
| trans-1,2-Dichloroethene | < 19,100 |
| 1,2-Dichloropropane | < 19,100 |
| cis-1,3-Dichloropropene | < 19,100 |
| trans-1,3-Dichloropropene | < 19,100 |
| Methylene chloride | < 47,600 |
| 1,1,2,2-Tetrachloroethane | < 19,100 |
| Tetrachloroethene | < 19,100 |
| 1,1,1-Trichloroethane | < 19,100 |
| 1,1,2-Trichloroethane | < 19,100 |
| Trichloroethene | < 19,100 |
| Trichlorofluoromethane | < 19,100 |
| Vinyl chloride | < 19,100 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 19,100 |
| Chlorobenzene | < 19,100 |
| Ethylbenzene | 46,000 |
| Toluene | 145,000 |
| m,p-Xylene | 377,000 |
| o-Xylene | 139,000 |
| Styrene | < 47,600 |
| 1,2-Dichlorobenzene | < 19,100 |
| 1,3-Dichlorobenzene | < 19,100 |
| 1,4-Dichlorobenzene | < 19,100 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 95,300 |
| 2-Butanone | < 95,300 |
| 2-Hexanone | < 47,600 |
| 4-Methyl-2-pentanone | < 47,600 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 19,100 |
| Vinyl acetate | < 47,600 |

ELAP Number 10958 Method: EPA 8260B Data File: V96557.D

Comments: ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-04 24-26'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-01
**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 119 |
| Bromomethane | < 119 |
| Bromoform | < 297 |
| Carbon Tetrachloride | < 119 |
| Chloroethane | < 119 |
| Chloromethane | < 119 |
| 2-Chloroethyl vinyl Ether | < 594 |
| Chloroform | < 119 |
| Dibromochloromethane | < 119 |
| 1,1-Dichloroethane | < 119 |
| 1,2-Dichloroethane | < 119 |
| 1,1-Dichloroethene | < 119 |
| cis-1,2-Dichloroethene | < 119 |
| trans-1,2-Dichloroethene | < 119 |
| 1,2-Dichloropropane | < 119 |
| cis-1,3-Dichloropropene | < 119 |
| trans-1,3-Dichloropropene | < 119 |
| Methylene chloride | < 297 |
| 1,1,2,2-Tetrachloroethane | < 119 |
| Tetrachloroethene | < 119 |
| 1,1,1-Trichloroethane | < 119 |
| 1,1,2-Trichloroethane | < 119 |
| Trichloroethene | < 119 |
| Trichlorofluoromethane | < 119 |
| Vinyl chloride | < 119 |

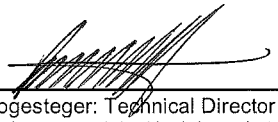
| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 119 |
| Chlorobenzene | < 119 |
| Ethylbenzene | 1,340 |
| Toluene | 799 |
| m,p-Xylene | 14,800 |
| o-Xylene | 6,060 |
| Styrene | < 297 |
| 1,2-Dichlorobenzene | < 119 |
| 1,3-Dichlorobenzene | < 119 |
| 1,4-Dichlorobenzene | < 119 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | J B 516 |
| 2-Butanone | < 594 |
| 2-Hexanone | < 297 |
| 4-Methyl-2-pentanone | < 297 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 119 |
| Vinyl acetate | < 297 |

ELAP Number 10958 Method: EPA 8260B Data File: V96488.D

Comments: ug / Kg = microgram per Kilogram

Signature: 

Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-04 30-32'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-02
**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 255 |
| Bromomethane | < 255 |
| Bromoform | < 637 |
| Carbon Tetrachloride | < 255 |
| Chloroethane | < 255 |
| Chloromethane | < 255 |
| 2-Chloroethyl vinyl Ether | < 1,270 |
| Chloroform | < 255 |
| Dibromochloromethane | < 255 |
| 1,1-Dichloroethane | < 255 |
| 1,2-Dichloroethane | < 255 |
| 1,1-Dichloroethene | < 255 |
| cis-1,2-Dichloroethene | < 255 |
| trans-1,2-Dichloroethene | < 255 |
| 1,2-Dichloropropane | < 255 |
| cis-1,3-Dichloropropene | < 255 |
| trans-1,3-Dichloropropene | < 255 |
| Methylene chloride | < 637 |
| 1,1,2,2-Tetrachloroethane | < 255 |
| Tetrachloroethene | < 255 |
| 1,1,1-Trichloroethane | < 255 |
| 1,1,2-Trichloroethane | < 255 |
| Trichloroethene | < 255 |
| Trichlorofluoromethane | < 255 |
| Vinyl chloride | < 255 |

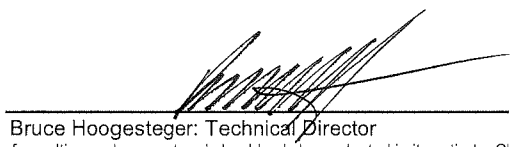
| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 255 |
| Chlorobenzene | < 255 |
| Ethylbenzene | 7,690 |
| Toluene | 16,600 |
| m,p-Xylene | 38,700 |
| o-Xylene | 14,500 |
| Styrene | < 637 |
| 1,2-Dichlorobenzene | < 255 |
| 1,3-Dichlorobenzene | < 255 |
| 1,4-Dichlorobenzene | < 255 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 1,270 |
| 2-Butanone | < 1,270 |
| 2-Hexanone | < 637 |
| 4-Methyl-2-pentanone | < 637 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 255 |
| Vinyl acetate | < 637 |

ELAP Number 10958 Method: EPA 8260B Data File: V96489.D

Comments: ug / Kg = microgram per Kilogram

Signature: 

Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-04 42-44'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-03
**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 75.1 |
| Bromomethane | < 75.1 |
| Bromoform | < 188 |
| Carbon Tetrachloride | < 75.1 |
| Chloroethane | < 75.1 |
| Chloromethane | < 75.1 |
| 2-Chloroethyl vinyl Ether | < 376 |
| Chloroform | < 75.1 |
| Dibromochloromethane | < 75.1 |
| 1,1-Dichloroethane | < 75.1 |
| 1,2-Dichloroethane | < 75.1 |
| 1,1-Dichloroethene | < 75.1 |
| cis-1,2-Dichloroethene | < 75.1 |
| trans-1,2-Dichloroethene | < 75.1 |
| 1,2-Dichloropropane | < 75.1 |
| cis-1,3-Dichloropropene | < 75.1 |
| trans-1,3-Dichloropropene | < 75.1 |
| Methylene chloride | < 188 |
| 1,1,2,2-Tetrachloroethane | < 75.1 |
| Tetrachloroethene | < 75.1 |
| 1,1,1-Trichloroethane | < 75.1 |
| 1,1,2-Trichloroethane | < 75.1 |
| Trichloroethene | < 75.1 |
| Trichlorofluoromethane | < 75.1 |
| Vinyl chloride | < 75.1 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 75.1 |
| Chlorobenzene | < 75.1 |
| Ethylbenzene | 845 |
| Toluene | 1,730 |
| m,p-Xylene | 4,610 |
| o-Xylene | 1,850 |
| Styrene | < 188 |
| 1,2-Dichlorobenzene | < 75.1 |
| 1,3-Dichlorobenzene | < 75.1 |
| 1,4-Dichlorobenzene | < 75.1 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | B 470 |
| 2-Butanone | < 376 |
| 2-Hexanone | < 188 |
| 4-Methyl-2-pentanone | < 188 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 75.1 |
| Vinyl acetate | < 188 |

ELAP Number 10958 Method: EPA 8260B Data File: V96487.D

Comments: ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project<br>Buffalo General Hospital | **Lab Project Number:** | 12:1749 |
| | | **Lab Sample Number:** | 12:1749-01 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | CB-05 / 31-33 | **Date Sampled:** | 04/24/2012 |
| **Field ID Number:** | N/A | **Date Received:** | 04/25/2012 |
| **Sample Type:** | Soil | **Date Analyzed:** | 04/25/2012 |

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 81.8 |
| Bromomethane | < 81.8 |
| Bromoform | < 204 |
| Carbon Tetrachloride | < 81.8 |
| Chloroethane | < 81.8 |
| Chloromethane | < 81.8 |
| 2-Chloroethyl vinyl Ether | < 409 |
| Chloroform | < 81.8 |
| Dibromochloromethane | < 81.8 |
| 1,1-Dichloroethane | < 81.8 |
| 1,2-Dichloroethane | < 81.8 |
| 1,1-Dichloroethene | < 81.8 |
| cis-1,2-Dichloroethene | < 81.8 |
| trans-1,2-Dichloroethene | < 81.8 |
| 1,2-Dichloropropane | < 81.8 |
| cis-1,3-Dichloropropene | < 81.8 |
| trans-1,3-Dichloropropene | < 81.8 |
| Methylene chloride | < 204 |
| 1,1,2,2-Tetrachloroethane | < 81.8 |
| Tetrachloroethene | < 81.8 |
| 1,1,1-Trichloroethane | < 81.8 |
| 1,1,2-Trichloroethane | < 81.8 |
| Trichloroethene | < 81.8 |
| Trichlorofluoromethane | < 81.8 |
| Vinyl chloride | < 81.8 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 81.8 |
| Chlorobenzene | < 81.8 |
| Ethylbenzene | 210 |
| Toluene | < 81.8 |
| m,p-Xylene | 320 |
| o-Xylene | < 81.8 |
| Styrene | < 204 |
| 1,2-Dichlorobenzene | < 81.8 |
| 1,3-Dichlorobenzene | < 81.8 |
| 1,4-Dichlorobenzene | < 81.8 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 409 |
| 2-Butanone | < 409 |
| 2-Hexanone | < 204 |
| 4-Methyl-2-pentanone | < 204 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 81.8 |
| Vinyl acetate | < 204 |

ELAP Number 10958 Method: EPA 8260B Data File: V96452.D

Comments: ug / Kg = microgram per Kilogram

Signature: 

Bruce Hoogesteger: Technical Director

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ENVIRONMENTAL SERVICES, INC.
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project<br>Buffalo General Hospital | **Lab Project Number:** | 12:1749 |
| | | **Lab Sample Number:** | 12:1749-02 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | CB-05 / 37-39 | **Date Sampled:** | 04/24/2012 |
| **Field ID Number:** | N/A | **Date Received:** | 04/25/2012 |
| **Sample Type:** | Soil | **Date Analyzed:** | 04/25/2012 |

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 4.48 |
| Bromomethane | < 4.48 |
| Bromoform | < 11.2 |
| Carbon Tetrachloride | < 4.48 |
| Chloroethane | < 4.48 |
| Chloromethane | < 4.48 |
| 2-Chloroethyl vinyl Ether | < 22.4 |
| Chloroform | < 4.48 |
| Dibromochloromethane | < 4.48 |
| 1,1-Dichloroethane | < 4.48 |
| 1,2-Dichloroethane | < 4.48 |
| 1,1-Dichloroethene | < 4.48 |
| cis-1,2-Dichloroethene | < 4.48 |
| trans-1,2-Dichloroethene | < 4.48 |
| 1,2-Dichloropropane | < 4.48 |
| cis-1,3-Dichloropropene | < 4.48 |
| trans-1,3-Dichloropropene | < 4.48 |
| Methylene chloride | < 11.2 |
| 1,1,2,2-Tetrachloroethane | < 4.48 |
| Tetrachloroethene | < 4.48 |
| 1,1,1-Trichloroethane | < 4.48 |
| 1,1,2-Trichloroethane | < 4.48 |
| Trichloroethene | < 4.48 |
| Trichlorofluoromethane | < 4.48 |
| Vinyl chloride | < 4.48 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 7.27 |
| Chlorobenzene | < 4.48 |
| Ethylbenzene | 48.4 |
| Toluene | 14.9 |
| m,p-Xylene | 99.9 |
| o-Xylene | 29.0 |
| Styrene | < 11.2 |
| 1,2-Dichlorobenzene | < 4.48 |
| 1,3-Dichlorobenzene | < 4.48 |
| 1,4-Dichlorobenzene | < 4.48 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 22.4 |
| 2-Butanone | < 22.4 |
| 2-Hexanone | < 11.2 |
| 4-Methyl-2-pentanone | < 11.2 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 4.48 |
| Vinyl acetate | < 11.2 |

ELAP Number 10958 Method: EPA 8260B Data File: V96453.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____

Bruce Hoogesteger: Technical Director

# Data Validation Services

120 Cobble Creek Road P.O. Box 208
North Creek, NY 12853

Phone 518-251-4429
Facsimile 518-251-4428

August 1, 2012

Cody Martin
C&S Engineers
90 Broadway
Buffalo, NY 14203

RE: Validation of the MOB Buffalo General Hospital Site Analytical Data Packages
Paradigm SDG No. 1749-01

Dear Mr. Martin:

Review has been completed for the data package generated by Paradigm Analytical Services that pertains to samples collected between 04/24/12 and 04/26/12 at the MOB site. Fourteen soil samples were analyzed for TCL volatile analytes by method EPA 8260B.

The data packages submitted by the laboratory contain full deliverables for validation, but this usability report is generated from review of the QC summary form information, with full review of sample raw data and limited review of associated QC raw data. Full validation has not been performed. However, the reported QC summary forms and sample raw data have been reviewed for application of validation qualifiers, with guidance from the USEPA national and regional validation documents, and in consideration for the specific requirements of the analytical methodology. The following items were reviewed:

* Data Completeness
* Case Narrative
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Method Blanks
* Laboratory Control Sample (LCS)
* Instrumental Tunes
* Initial and Continuing Calibration Standards
* Method Compliance
* Sample Result Verification

Those items listed above which show deficiencies are discussed within the text of this narrative. All of the other items were determined to be acceptable.

**In summary**, results for the target analytes are usable, either as reported or with qualification. However, due to processing, all results for eight of the fourteen field samples are qualified as estimated.

Copies of the client sample identifications and the laboratory case narrative are attached to this text, and should be reviewed in conjunction with this report. Also attached are sample results forms, with recommended qualifiers applied in red ink.

**Chain-of-Custody**

The year of collection was not present on the entry for samples collected April 24. The year was present on the relinquish and laboratory receipt entries.

**Volatile Analyses by EPA8260B**

Samples CB-05/31-33, CB-04 24-26, CB-04 30-32, CB-04 42-44, CB-01 38-40, CB-03/38-40, and CB-03/36-38 were processed using sample analysis weights between 0.046 grams and 0.23 grams. Volatile analytical protocols allow for lesser sample weights, below the preferred level of 5 grams, but they do not permit levels below 0.5 grams for NYS or USEPA CLP preparation/analysis or below 1 gram for USEPA SW846 volatile soil preparation/analysis (method 5035/8260B). This is due both to the potential for a non-homogenous, non-representative weight aliquot and to the disproportionate contribution of human and instrument error when weighing such small quantities. Those factors can result in a significant bias of unknown direction to the reported results. With the exception of the CB-01 38-40, those samples should have been processed at the medium level. Based on review of the chromatogram and detected concentrations, sample CB-01 38-40 could have been processed at a weight of at least 2 grams, thereby producing reporting limits an order of magnitude lower than those reported. The results for the forementioned seven samples have been qualified as estimated in value.

The result for benzene in CB-03/40-42 is qualified as tentative in identification and estimated in value due to mass spectral interferences.

Due to a marginally low recovery (75%, below the limit of 76%) for surrogate standard BFB, the results for CB-03/40-42 have been qualified as estimated in value, and may have a slight low bias. Although required of the analytical protocol, sample matrix effect was not confirmed by reanalysis.

Results for acetone in CB-04 24-26, CB-04 42-44, CB-01 26-28, CB-01 38-40, and CB-01 40-42 are considered external contamination and edited to reflect non-detection due to presence in the associated method blank.

Holding time requirements were met, and instrument tunes meet fragmentation requirements.

Matrix spikes were not performed. LCS recoveries of the five evaluated analytes were acceptable. Analytical protocol requires that all reported analytes be evaluated in the LCS.

Initial and continuing calibration standard (ICV and CCV) responses are within protocol and validation guidelines, with the following exceptions, results for which are qualified as estimated in the indicated samples:

- acetone in all samples (very poor linearity)
- methylene chloride (34%D) in CB-03/22-24

Volatile laboratory sample report forms should have included information such as moisture/

solids content, weights and volumes used for analysis, and analysis level. Preparation logs for the methanol extractions should have been generated and included in the data package. Example calculations, also required for the package deliverables, were requested during validation review.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

Judy Harry

## VALIDATION DATA QUALIFIER DEFINITIONS

| | |
|---|---|
| **U** | The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit. |
| **J** | The analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample. |
| **UJ** | The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise. |
| **NJ** | The detection is tentative in identification and estimated in value. Although there is presumptive evidence of the analyte, the result should be used with caution as a potential false positive and/or elevated quantitative value. |
| **R** | The data are unusable. The analyte may or may not be present. |
| **EMPC** | The results do not meet all criteria for a confirmed identification. The quantitative value represents the Estimated Maximum Possible Concentration of the analyte in the sample. |

# CLIENT and LABORATORY SAMPLE IDs and CASE NARRATIVE

SDG# : 1749-01
LAB PROJECT #: 12:1749-1779-1804
CLIENT: C&S Eng.
PROJECT NAME: MOB

BATCH COMPLETE: 4/27/2012
DATE: 5/14/2012
DATE DUE: 5/29/2012
PROTOCOL: SW846

| LAB.SAMPLE# | FIELD ID | MATRIX | REQUESTED ANALYSIS | DATE SAMPLED | DATE REC'D |
|---|---|---|---|---|---|
| 12:1749-01 | CB-05/31-33 | Soil | VOA | 4/24/2012 | 4/25/2012 |
| 12:1749-02 | CB-05/37-39 | Soil | VOA | 4/24/2012 | 4/25/2012 |
| 12:1749-03 | CB-02/30-32 | Soil | VOA | 4/24/2012 | 4/25/2012 |
| 12:1749-04 | CB-02/40-42 | Soil | VOA | 4/24/2012 | 4/25/2012 |
| 12:1779-01 | CB-04 24-26' | Soil | VOA | 4/25/2012 | 4/26/2012 |
| 12:1779-02 | CB-04 30-32' | Soil | VOA | 4/25/2012 | 4/26/2012 |
| 12:1779-03 | CB-04 42-44' | Soil | VOA | 4/25/2012 | 4/26/2012 |
| 12:1779-04 | CB-01 26-28 | Soil | VOA | 4/25/2012 | 4/26/2012 |
| 12:1779-05 | CB-01 38-40 | Soil | VOA | 4/25/2012 | 4/26/2012 |
| 12:1779-06 | CB-01 40-42 | Soil | VOA | 4/25/2012 | 4/26/2012 |
| 12:1804-01 | CB-03/40-42 | Soil | VOA | 4/26/2012 | 4/27/2012 |
| 12:1804-02 | CB-03/38-40 | Soil | VOA | 4/26/2012 | 4/27/2012 |
| 12:1804-03 | CB-03/36-38 | Soil | VOA | 4/26/2012 | 4/27/2012 |
| 12:1804-04 | CB-03/22-24 | Soil | VOA | 4/26/2012 | 4/27/2012 |
| | | | | | |
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| | | | | | |

LAB PROJECT NARRATIVE: 12:1749-1779-1804
PROJECT NAME: MOB Project
Buffalo General Hospital
SDG: 1749-01
CLIENT: C & S Engineers

Fourteen soil samples were collected by C&S personnel on 04/24-04/26/2012 and received at the Paradigm laboratory on 04/25-04/27/2012. Container and holding times were acceptable at time of receipt; the samples were received at 1-6° Centigrade and were on ice. Samples were submitted with the Chains-of-Custody requesting TCL list VOCs. All analyses were performed using EPA SW-846 methods and holding times.

## GENERAL NOTES

The initial and continuing calibration reports are only evaluated for compounds that are on the sample summary report.

Regarding results on QC summary forms versus included raw data, due to calculations made at the instrument where many significant figures may be used, there may be slight discrepancies between the summary report result and that recorded on the raw data. This does not affect data usability.

Regarding initial calibrations, it should be noted that the Quantitation Report concentrations supplied for the initial calibration reflect the calibration prior to updating. The response factors and areas are correct.

Regarding Quantitation Reports, it should be noted that the "#" symbol that appears on some of the Quantitation Reports is a software artifact and should be disregarded.

## VOLATILES

Holding times were met for all samples.

Samples CB-02/30-32 and CB-03/22-24 required medium level extraction to bring high target results within instrument range and, thus, Medium Level Blanks were analyzed and reported.

All surrogate recoveries for the samples and associated QC were within acceptable limits, except the following: 4-Bromofluorobenzene was out low in CB-03/40-42, 1,2-Dichloroethane-d4 was out high in both Medium Level Blanks, and this same surrogate was out low in Water LCS 04/27. All outliers were flagged with a "*" on the summary report and notated on the reports accordingly. Matrix interference is suspected in the case of the sample outlier. As the LCS spikes were all compliant, this QC sample was deemed as usable and no further action was taken. The high surrogate outliers associated with blanks were considered a non-issue and the data was

deemed as usable. Sample CB-03/22-24 required a dilution so the surrogates were diluted out, reported as "D" on the summary form, and could not be evaluated.

Site specific QC was not requested on this SDG. The laboratory control samples recovered within acceptance limits.

The method blanks were free from contamination within the reportable range, except an Acetone hit of 21.3 ug/Kg in Soil LRB 04/26 and a Methylene Chloride hit of 1300J ug/kg in Soil PB 04/27 M/L. Acetone hits in any associated samples have been flagged with a "B" accordingly. There was no Methylene Chloride found in the PB's associated sample so no further action was required with this outlier.

The instrument tunes passed all criteria.

The internal standards areas and retention times were within acceptance ranges.

All data for the initial calibration was within acceptance limits. Compounds flagged with an "*" on the summary table have been calibrated using a non-average Response Factor calibration curve. The supporting curves are located after the initial calibration table. (see method 8000B, section 7.5.1.2.1).

All continuing calibration data was within acceptance limits.

(signed)_____ (date) 6/1/2012

Bruce Hoogesteger, Technical Director

# QUALIFIED SAMPLE RESULTS FORMS

PARADIGM
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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project<br>Buffalo General Hospital | **Lab Project Number:** | 12:1749 |
| | | **Lab Sample Number:** | 12:1749-01 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | CB-05 / 31-33 | **Date Sampled:** | 04/24/2012 |
| **Field ID Number:** | N/A | **Date Received:** | 04/25/2012 |
| **Sample Type:** | Soil | **Date Analyzed:** | 04/25/2012 |

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 81.8 UJ |
| Bromomethane | < 81.8 |
| Bromoform | < 204 |
| Carbon Tetrachloride | < 81.8 |
| Chloroethane | < 81.8 |
| Chloromethane | < 81.8 |
| 2-Chloroethyl vinyl Ether | < 409 |
| Chloroform | < 81.8 |
| Dibromochloromethane | < 81.8 |
| 1,1-Dichloroethane | < 81.8 |
| 1,2-Dichloroethane | < 81.8 |
| 1,1-Dichloroethene | < 81.8 |
| cis-1,2-Dichloroethene | < 81.8 |
| trans-1,2-Dichloroethene | < 81.8 |
| 1,2-Dichloropropane | < 81.8 |
| cis-1,3-Dichloropropene | < 81.8 |
| trans-1,3-Dichloropropene | < 81.8 |
| Methylene chloride | < 204 |
| 1,1,2,2-Tetrachloroethane | < 81.8 |
| Tetrachloroethene | < 81.8 |
| 1,1,1-Trichloroethane | < 81.8 |
| 1,1,2-Trichloroethane | < 81.8 |
| Trichloroethene | < 81.8 |
| Trichlorofluoromethane | < 81.8 |
| Vinyl chloride | < 81.8 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 81.8 UJ |
| Chlorobenzene | < 81.8 UJ |
| Ethylbenzene | 210 J |
| Toluene | < 81.8 UJ |
| m,p-Xylene | 320 J |
| o-Xylene | < 81.8 UJ |
| Styrene | < 204 |
| 1,2-Dichlorobenzene | < 81.8 |
| 1,3-Dichlorobenzene | < 81.8 |
| 1,4-Dichlorobenzene | < 81.8 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 409 UJ |
| 2-Butanone | < 409 |
| 2-Hexanone | < 204 |
| 4-Methyl-2-pentanone | < 204 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 81.8 UJ |
| Vinyl acetate | < 204 UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96452.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project<br>Buffalo General Hospital | **Lab Project Number:** | 12:1749 |
| | | **Lab Sample Number:** | 12:1749-02 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | CB-05 / 37-39 | **Date Sampled:** | 04/24/2012 |
| **Field ID Number:** | N/A | **Date Received:** | 04/25/2012 |
| **Sample Type:** | Soil | **Date Analyzed:** | 04/25/2012 |

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 4.48 |
| Bromomethane | < 4.48 |
| Bromoform | < 11.2 |
| Carbon Tetrachloride | < 4.48 |
| Chloroethane | < 4.48 |
| Chloromethane | < 4.48 |
| 2-Chloroethyl vinyl Ether | < 22.4 |
| Chloroform | < 4.48 |
| Dibromochloromethane | < 4.48 |
| 1,1-Dichloroethane | < 4.48 |
| 1,2-Dichloroethane | < 4.48 |
| 1,1-Dichloroethene | < 4.48 |
| cis-1,2-Dichloroethene | < 4.48 |
| trans-1,2-Dichloroethene | < 4.48 |
| 1,2-Dichloropropane | < 4.48 |
| cis-1,3-Dichloropropene | < 4.48 |
| trans-1,3-Dichloropropene | < 4.48 |
| Methylene chloride | < 11.2 |
| 1,1,2,2-Tetrachloroethane | < 4.48 |
| Tetrachloroethene | < 4.48 |
| 1,1,1-Trichloroethane | < 4.48 |
| 1,1,2-Trichloroethane | < 4.48 |
| Trichloroethene | < 4.48 |
| Trichlorofluoromethane | < 4.48 |
| Vinyl chloride | < 4.48 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 7.27 |
| Chlorobenzene | < 4.48 |
| Ethylbenzene | 48.4 |
| Toluene | 14.9 |
| m,p-Xylene | 99.9 |
| o-Xylene | 29.0 |
| Styrene | < 11.2 |
| 1,2-Dichlorobenzene | < 4.48 |
| 1,3-Dichlorobenzene | < 4.48 |
| 1,4-Dichlorobenzene | < 4.48 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 22.4 UJ |
| 2-Butanone | < 22.4 |
| 2-Hexanone | < 11.2 |
| 4-Methyl-2-pentanone | < 11.2 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 4.48 |
| Vinyl acetate | < 11.2 |

ELAP Number 10958 Method: EPA 8260B Data File: V96453.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____

Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

| | | | |
|---|---|---|---|
| **Client Job Site:** | MOB Project<br>Buffalo General Hospital | **Lab Project Number:** | 12:1749 |
| | | **Lab Sample Number:** | 12:1749-03 |
| **Client Job Number:** | N/A | | |
| **Field Location:** | CB-02 / 30-32 | **Date Sampled:** | 04/24/2012 |
| **Field ID Number:** | N/A | **Date Received:** | 04/25/2012 |
| **Sample Type:** | Soil | **Date Analyzed:** | 04/25/2012 |
| | | **Date Reissued:** | 05/24/2012 |

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 3,180 |
| Bromomethane | < 3,180 |
| Bromoform | < 7,960 |
| Carbon Tetrachloride | < 3,180 |
| Chloroethane | < 3,180 |
| Chloromethane | < 3,180 |
| 2-Chloroethyl vinyl Ether | < 15,900 |
| Chloroform | < 3,180 |
| Dibromochloromethane | < 3,180 |
| 1,1-Dichloroethane | < 3,180 |
| 1,2-Dichloroethane | < 3,180 |
| 1,1-Dichloroethene | < 3,180 |
| cis-1,2-Dichloroethene | < 3,180 |
| trans-1,2-Dichloroethene | < 3,180 |
| 1,2-Dichloropropane | < 3,180 |
| cis-1,3-Dichloropropene | < 3,180 |
| trans-1,3-Dichloropropene | < 3,180 |
| Methylene chloride | J 4,510 |
| 1,1,2,2-Tetrachloroethane | < 3,180 |
| Tetrachloroethene | < 3,180 |
| 1,1,1-Trichloroethane | < 3,180 |
| 1,1,2-Trichloroethane | < 3,180 |
| Trichloroethene | < 3,180 |
| Trichlorofluoromethane | < 3,180 |
| Vinyl chloride | < 3,180 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 3,180 |
| Chlorobenzene | < 3,180 |
| Ethylbenzene | 25,200 |
| Toluene | 60,000 |
| m,p-Xylene | 189,000 |
| o-Xylene | 65,300 |
| Styrene | < 7,960 |
| 1,2-Dichlorobenzene | < 3,180 |
| 1,3-Dichlorobenzene | < 3,180 |
| 1,4-Dichlorobenzene | < 3,180 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | 39,000 J |
| 2-Butanone | < 15,900 |
| 2-Hexanone | < 7,960 |
| 4-Methyl-2-pentanone | < 7,960 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 3,180 |
| Vinyl acetate | < 7,960 |

ELAP Number 10958 Method: EPA 8260B Data File: V96476.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____

Bruce Hoogesteger: Technical Director

PARADIGM
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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB Project
Buffalo General Hospital
**Client Job Number:** N/A
**Field Location:** CB-02 / 40-42
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1749
**Lab Sample Number:** 12:1749-04

**Date Sampled:** 04/24/2012
**Date Received:** 04/25/2012
**Date Analyzed:** 04/25/2012
**Date Reissued:** 05/24/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 8.13 |
| Bromomethane | < 8.13 |
| Bromoform | < 20.3 |
| Carbon Tetrachloride | < 8.13 |
| Chloroethane | < 8.13 |
| Chloromethane | < 8.13 |
| 2-Chloroethyl vinyl Ether | < 40.7 |
| Chloroform | < 8.13 |
| Dibromochloromethane | < 8.13 |
| 1,1-Dichloroethane | < 8.13 |
| 1,2-Dichloroethane | < 8.13 |
| 1,1-Dichloroethene | < 8.13 |
| cis-1,2-Dichloroethene | < 8.13 |
| trans-1,2-Dichloroethene | < 8.13 |
| 1,2-Dichloropropane | < 8.13 |
| cis-1,3-Dichloropropene | < 8.13 |
| trans-1,3-Dichloropropene | < 8.13 |
| Methylene chloride | < 20.3 |
| 1,1,2,2-Tetrachloroethane | < 8.13 |
| Tetrachloroethene | < 8.13 |
| 1,1,1-Trichloroethane | < 8.13 |
| 1,1,2-Trichloroethane | < 8.13 |
| Trichloroethene | < 8.13 |
| Trichlorofluoromethane | < 8.13 |
| Vinyl chloride | < 8.13 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 38.4 |
| Chlorobenzene | < 8.13 |
| Ethylbenzene | 56.4 |
| Toluene | 104 |
| m,p-Xylene | 320 |
| o-Xylene | 106 |
| Styrene | < 20.3 |
| 1,2-Dichlorobenzene | < 8.13 |
| 1,3-Dichlorobenzene | < 8.13 |
| 1,4-Dichlorobenzene | < 8.13 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | J 27.5 J |
| 2-Butanone | < 40.7 |
| 2-Hexanone | < 20.3 |
| 4-Methyl-2-pentanone | < 20.3 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 8.13 |
| Vinyl acetate | < 20.3 |

ELAP Number 10958 Method: EPA 8260B Data File: V96455.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger, Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-04 24-26'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-01
**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 119 UJ |
| Bromomethane | < 119 |
| Bromoform | < 297 |
| Carbon Tetrachloride | < 119 |
| Chloroethane | < 119 |
| Chloromethane | < 119 |
| 2-Chloroethyl vinyl Ether | < 594 |
| Chloroform | < 119 |
| Dibromochloromethane | < 119 |
| 1,1-Dichloroethane | < 119 |
| 1,2-Dichloroethane | < 119 |
| 1,1-Dichloroethene | < 119 |
| cis-1,2-Dichloroethene | < 119 |
| trans-1,2-Dichloroethene | < 119 |
| 1,2-Dichloropropane | < 119 |
| cis-1,3-Dichloropropene | < 119 |
| trans-1,3-Dichloropropene | < 119 |
| Methylene chloride | < 297 |
| 1,1,2,2-Tetrachloroethane | < 119 |
| Tetrachloroethene | < 119 |
| 1,1,1-Trichloroethane | < 119 |
| 1,1,2-Trichloroethane | < 119 |
| Trichloroethene | < 119 |
| Trichlorofluoromethane | < 119 |
| Vinyl chloride | < 119 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 119 UJ |
| Chlorobenzene | < 119 UJ |
| Ethylbenzene | 1,340 J |
| Toluene | 799 J |
| m,p-Xylene | 14,800 J |
| o-Xylene | 6,060 J |
| Styrene | < 297 UJ |
| 1,2-Dichlorobenzene | < 119 |
| 1,3-Dichlorobenzene | < 119 |
| 1,4-Dichlorobenzene | < 119 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < ~~JB 516~~ 594 UJ |
| 2-Butanone | < 594 UJ |
| 2-Hexanone | < 297 |
| 4-Methyl-2-pentanone | < 297 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 119 UJ |
| Vinyl acetate | < 297 UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96488.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt.

PARADIGM
179 Lake Avenue Rochester, New York 14608 (585) 647 - 2530 FAX (585) 647 - 3311

# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-04 30-32'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-02

**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 255 UJ |
| Bromomethane | < 255 |
| Bromoform | < 637 |
| Carbon Tetrachloride | < 255 |
| Chloroethane | < 255 |
| Chloromethane | < 255 |
| 2-Chloroethyl vinyl Ether | < 1,270 |
| Chloroform | < 255 |
| Dibromochloromethane | < 255 |
| 1,1-Dichloroethane | < 255 |
| 1,2-Dichloroethane | < 255 |
| 1,1-Dichloroethene | < 255 |
| cis-1,2-Dichloroethene | < 255 |
| trans-1,2-Dichloroethene | < 255 |
| 1,2-Dichloropropane | < 255 |
| cis-1,3-Dichloropropene | < 255 |
| trans-1,3-Dichloropropene | < 255 |
| Methylene chloride | < 637 |
| 1,1,2,2-Tetrachloroethane | < 255 |
| Tetrachloroethene | < 255 |
| 1,1,1-Trichloroethane | < 255 |
| 1,1,2-Trichloroethane | < 255 |
| Trichloroethene | < 255 |
| Trichlorofluoromethane | < 255 |
| Vinyl chloride | < 255 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 255 UJ |
| Chlorobenzene | < 255 UJ |
| Ethylbenzene | 7,690 J |
| Toluene | 16,600 |
| m,p-Xylene | 38,700 |
| o-Xylene | 14,500 |
| Styrene | < 637 UJ |
| 1,2-Dichlorobenzene | < 255 |
| 1,3-Dichlorobenzene | < 255 |
| 1,4-Dichlorobenzene | < 255 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 1,270 UJ |
| 2-Butanone | < 1,270 |
| 2-Hexanone | < 637 |
| 4-Methyl-2-pentanone | < 637 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 255 UJ |
| Vinyl acetate | < 637 UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96489.D

Comments: ug / Kg = microgram per Kilogram

Signature:

Bruce Hoogesteger: Technical Director

This report is part of a multipage document and should only be evaluated in its entirety. Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt.

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-04 42-44'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-03

**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 75.1 UJ |
| Bromomethane | < 75.1 |
| Bromoform | < 188 |
| Carbon Tetrachloride | < 75.1 |
| Chloroethane | < 75.1 |
| Chloromethane | < 75.1 |
| 2-Chloroethyl vinyl Ether | < 376 |
| Chloroform | < 75.1 |
| Dibromochloromethane | < 75.1 |
| 1,1-Dichloroethane | < 75.1 |
| 1,2-Dichloroethane | < 75.1 |
| 1,1-Dichloroethene | < 75.1 |
| cis-1,2-Dichloroethene | < 75.1 |
| trans-1,2-Dichloroethene | < 75.1 |
| 1,2-Dichloropropane | < 75.1 |
| cis-1,3-Dichloropropene | < 75.1 |
| trans-1,3-Dichloropropene | < 75.1 |
| Methylene chloride | < 188 |
| 1,1,2,2-Tetrachloroethane | < 75.1 |
| Tetrachloroethene | < 75.1 |
| 1,1,1-Trichloroethane | < 75.1 |
| 1,2-Trichloroethane | < 75.1 |
| Trichloroethene | < 75.1 |
| Trichlorofluoromethane | < 75.1 |
| Vinyl chloride | < 75.1 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 75.1 UJ |
| Chlorobenzene | < 75.1 UJ |
| Ethylbenzene | 845 J |
| Toluene | 1,730 |
| m,p-Xylene | 4,610 |
| o-Xylene | 1,850 |
| Styrene | < 188 UJ |
| 1,2-Dichlorobenzene | < 75.1 |
| 1,3-Dichlorobenzene | < 75.1 |
| 1,4-Dichlorobenzene | < 75.1 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < ~~B~~ 470 UJ |
| 2-Butanone | < 376 |
| 2-Hexanone | < 188 |
| 4-Methyl-2-pentanone | < 188 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 75.1 UJ |
| Vinyl acetate | < 188 UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96487.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-01 26-28'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-04

**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 3.54 |
| Bromomethane | < 3.54 |
| Bromoform | < 8.84 |
| Carbon Tetrachloride | < 3.54 |
| Chloroethane | < 3.54 |
| Chloromethane | < 3.54 |
| 2-Chloroethyl vinyl Ether | < 17.7 |
| Chloroform | < 3.54 |
| Dibromochloromethane | < 3.54 |
| 1,1-Dichloroethane | < 3.54 |
| 1,2-Dichloroethane | < 3.54 |
| 1,1-Dichloroethene | < 3.54 |
| cis-1,2-Dichloroethene | < 3.54 |
| trans-1,2-Dichloroethene | < 3.54 |
| 1,2-Dichloropropane | < 3.54 |
| cis-1,3-Dichloropropene | < 3.54 |
| trans-1,3-Dichloropropene | < 3.54 |
| Methylene chloride | < 8.84 |
| 1,1,2,2-Tetrachloroethane | < 3.54 |
| Tetrachloroethene | < 3.54 |
| 1,1,1-Trichloroethane | < 3.54 |
| 1,1,2-Trichloroethane | < 3.54 |
| Trichloroethene | < 3.54 |
| Trichlorofluoromethane | < 3.54 |
| Vinyl chloride | < 3.54 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 16.2 |
| Chlorobenzene | < 3.54 |
| Ethylbenzene | < 3.54 |
| Toluene | 21.9 |
| m,p-Xylene | J 2.85 |
| o-Xylene | < 3.54 |
| Styrene | < 8.84 |
| 1,2-Dichlorobenzene | < 3.54 |
| 1,3-Dichlorobenzene | < 3.54 |
| 1,4-Dichlorobenzene | < 3.54 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | ~~JB 17.3~~ < 17.7 UJ |
| 2-Butanone | < 17.7 |
| 2-Hexanone | < 8.84 |
| 4-Methyl-2-pentanone | < 8.84 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 3.54 |
| Vinyl acetate | < 8.84 |

ELAP Number 10958 Method: EPA 8260B Data File: V96484.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

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121779V4.XLS

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-01 38-40'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-05

**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 51.0 UJ |
| Bromomethane | < 51.0 |
| Bromoform | < 128 |
| Carbon Tetrachloride | < 51.0 |
| Chloroethane | < 51.0 |
| Chloromethane | < 51.0 |
| 2-Chloroethyl vinyl Ether | < 255 |
| Chloroform | < 51.0 |
| Dibromochloromethane | < 51.0 |
| 1,1-Dichloroethane | < 51.0 |
| 1,2-Dichloroethane | < 51.0 |
| 1,1-Dichloroethene | < 51.0 |
| cis-1,2-Dichloroethene | < 51.0 |
| trans-1,2-Dichloroethene | < 51.0 |
| 1,2-Dichloropropane | < 51.0 |
| cis-1,3-Dichloropropene | < 51.0 |
| trans-1,3-Dichloropropene | < 51.0 |
| Methylene chloride | < 128 |
| 1,1,2,2-Tetrachloroethane | < 51.0 |
| Tetrachloroethene | < 51.0 |
| 1,1,1-Trichloroethane | < 51.0 |
| 1,2-Trichloroethane | < 51.0 |
| Trichloroethene | < 51.0 |
| Trichlorofluoromethane | < 51.0 |
| Vinyl chloride | < 51.0 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 51.0 UJ |
| Chlorobenzene | < 51.0 |
| Ethylbenzene | < 51.0 |
| Toluene | J 37.9 J |
| m,p-Xylene | 65.5 |
| o-Xylene | J 30.8 |
| Styrene | < 128 UJ |
| 1,2-Dichlorobenzene | < 51.0 |
| 1,3-Dichlorobenzene | < 51.0 |
| 1,4-Dichlorobenzene | < 51.0 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | ~~JB 136~~ <255 UJ |
| 2-Butanone | < 255 UJ |
| 2-Hexanone | < 128 |
| 4-Methyl-2-pentanone | < 128 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 51.0 UJ |
| Vinyl acetate | < 128 UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96486.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB - Kaleida
**Client Job Number:** N/A
**Field Location:** CB-01 40-42'
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1779
**Lab Sample Number:** 12:1779-06
**Date Sampled:** 04/25/2012
**Date Received:** 04/26/2012
**Date Analyzed:** 04/26/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 4.22 |
| Bromomethane | < 4.22 |
| Bromoform | < 10.5 |
| Carbon Tetrachloride | < 4.22 |
| Chloroethane | < 4.22 |
| Chloromethane | < 4.22 |
| 2-Chloroethyl vinyl Ether | < 21.1 |
| Chloroform | < 4.22 |
| Dibromochloromethane | < 4.22 |
| 1,1-Dichloroethane | < 4.22 |
| 1,2-Dichloroethane | < 4.22 |
| 1,1-Dichloroethene | < 4.22 |
| cis-1,2-Dichloroethene | < 4.22 |
| trans-1,2-Dichloroethene | < 4.22 |
| 1,2-Dichloropropane | < 4.22 |
| cis-1,3-Dichloropropene | < 4.22 |
| trans-1,3-Dichloropropene | < 4.22 |
| Methylene chloride | < 10.5 |
| 1,1,2,2-Tetrachloroethane | < 4.22 |
| Tetrachloroethene | < 4.22 |
| 1,1,1-Trichloroethane | < 4.22 |
| 1,1,2-Trichloroethane | < 4.22 |
| Trichloroethene | < 4.22 |
| Trichlorofluoromethane | < 4.22 |
| Vinyl chloride | < 4.22 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 4.22 |
| Chlorobenzene | < 4.22 |
| Ethylbenzene | 10.6 |
| Toluene | 26.4 |
| m,p-Xylene | 45.5 |
| o-Xylene | 16.7 |
| Styrene | < 10.5 |
| 1,2-Dichlorobenzene | < 4.22 |
| 1,3-Dichlorobenzene | < 4.22 |
| 1,4-Dichlorobenzene | < 4.22 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | ~~JB 14.5~~ < 21.1 UJ |
| 2-Butanone | < 21.1 |
| 2-Hexanone | < 10.5 |
| 4-Methyl-2-pentanone | < 10.5 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 4.22 |
| Vinyl acetate | < 10.5 |

ELAP Number 10958 Method: EPA 8260B Data File: V96485.D

Comments: ug / Kg = microgram per Kilogram

Signature: _____
Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/40-42
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-01
**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/27/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 4.17 UJ |
| Bromomethane | < 4.17 |
| Bromoform | < 10.4 |
| Carbon Tetrachloride | < 4.17 |
| Chloroethane | < 4.17 |
| Chloromethane | < 4.17 |
| 2-Chloroethyl vinyl Ether | < 20.9 |
| Chloroform | < 4.17 |
| Dibromochloromethane | < 4.17 |
| 1,1-Dichloroethane | < 4.17 |
| 1,2-Dichloroethane | < 4.17 |
| 1,1-Dichloroethene | < 4.17 |
| cis-1,2-Dichloroethene | < 4.17 |
| trans-1,2-Dichloroethene | < 4.17 |
| 1,2-Dichloropropane | < 4.17 |
| cis-1,3-Dichloropropene | < 4.17 |
| trans-1,3-Dichloropropene | < 4.17 |
| Methylene chloride | < 10.4 |
| 1,1,2,2-Tetrachloroethane | < 4.17 |
| Tetrachloroethene | < 4.17 |
| 1,1,1-Trichloroethane | < 4.17 |
| 1,1,2-Trichloroethane | < 4.17 |
| Trichloroethene | < 4.17 |
| Trichlorofluoromethane | < 4.17 |
| Vinyl chloride | < 4.17 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | J 3.45 NJ |
| Chlorobenzene | < 4.17 UJ |
| Ethylbenzene | 6.24 J |
| Toluene | 20.5 |
| m,p-Xylene | 36.6 |
| o-Xylene | 14.6 |
| Styrene | < 10.4 UJ |
| 1,2-Dichlorobenzene | < 4.17 |
| 1,3-Dichlorobenzene | < 4.17 |
| 1,4-Dichlorobenzene | < 4.17 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | J 19.7 J |
| 2-Butanone | < 20.9 UJ |
| 2-Hexanone | < 10.4 |
| 4-Methyl-2-pentanone | < 10.4 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 4.17 UJ |
| Vinyl acetate | < 10.4 UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96523.D

Comments: ug / Kg = microgram per Kilogram
Surrogate outliers indicate probable matrix interference

Signature: Valmiller for
Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/38-40
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-02
**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/27/2012

| Halocarbons | Results in ug / Kg | |
|---|---|---|
| Bromodichloromethane | < 54.8 | UJ |
| Bromomethane | < 54.8 | |
| Bromoform | < 137 | |
| Carbon Tetrachloride | < 54.8 | |
| Chloroethane | < 54.8 | |
| Chloromethane | < 54.8 | |
| 2-Chloroethyl vinyl Ether | < 274 | |
| Chloroform | < 54.8 | |
| Dibromochloromethane | < 54.8 | |
| 1,1-Dichloroethane | < 54.8 | |
| 1,2-Dichloroethane | < 54.8 | |
| 1,1-Dichloroethene | < 54.8 | |
| cis-1,2-Dichloroethene | < 54.8 | |
| trans-1,2-Dichloroethene | < 54.8 | |
| 1,2-Dichloropropane | < 54.8 | |
| cis-1,3-Dichloropropene | < 54.8 | |
| trans-1,3-Dichloropropene | < 54.8 | |
| Methylene chloride | < 137 | |
| 1,1,2,2-Tetrachloroethane | < 54.8 | |
| Tetrachloroethene | < 54.8 | |
| 1,1,1-Trichloroethane | < 54.8 | |
| 1,1,2-Trichloroethane | < 54.8 | |
| Trichloroethene | < 54.8 | |
| Trichlorofluoromethane | < 54.8 | |
| Vinyl chloride | < 54.8 | |

| Aromatics | Results in ug / Kg | |
|---|---|---|
| Benzene | J 31.9 | J |
| Chlorobenzene | < 54.8 | UJ |
| Ethylbenzene | 183 | J |
| Toluene | 322 | |
| m,p-Xylene | 1,050 | |
| o-Xylene | 349 | |
| Styrene | < 137 | UJ |
| 1,2-Dichlorobenzene | < 54.8 | |
| 1,3-Dichlorobenzene | < 54.8 | |
| 1,4-Dichlorobenzene | < 54.8 | |

| Ketones | Results in ug / Kg | |
|---|---|---|
| Acetone | < 274 | UJ |
| 2-Butanone | < 274 | |
| 2-Hexanone | < 137 | |
| 4-Methyl-2-pentanone | < 137 | |

| Miscellaneous | Results in ug / Kg | |
|---|---|---|
| Carbon disulfide | < 54.8 | UJ |
| Vinyl acetate | < 137 | UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96524.D

Comments: ug / Kg = microgram per Kilogram

Signature: Valerie Mills for:
Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/36-38
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-03
**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/27/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 145 UJ |
| Bromomethane | < 145 |
| Bromoform | < 362 |
| Carbon Tetrachloride | < 145 |
| Chloroethane | < 145 |
| Chloromethane | < 145 |
| 2-Chloroethyl vinyl Ether | < 724 |
| Chloroform | < 145 |
| Dibromochloromethane | < 145 |
| 1,1-Dichloroethane | < 145 |
| 1,2-Dichloroethane | < 145 |
| 1,1-Dichloroethene | < 145 |
| cis-1,2-Dichloroethene | < 145 |
| trans-1,2-Dichloroethene | < 145 |
| 1,2-Dichloropropane | < 145 |
| cis-1,3-Dichloropropene | < 145 |
| trans-1,3-Dichloropropene | < 145 |
| Methylene chloride | < 362 |
| 1,1,2,2-Tetrachloroethane | < 145 |
| Tetrachloroethene | < 145 |
| 1,1,1-Trichloroethane | < 145 |
| 1,1,2-Trichloroethane | < 145 |
| Trichloroethene | < 145 |
| Trichlorofluoromethane | < 145 |
| Vinyl chloride | < 145 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | 984 J |
| Chlorobenzene | < 145 UJ |
| Ethylbenzene | 350 J |
| Toluene | 2,080 |
| m,p-Xylene | 1,660 |
| o-Xylene | 572 |
| Styrene | < 362 UJ |
| 1,2-Dichlorobenzene | < 145 |
| 1,3-Dichlorobenzene | < 145 |
| 1,4-Dichlorobenzene | < 145 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 724 UJ |
| 2-Butanone | < 724 |
| 2-Hexanone | < 362 |
| 4-Methyl-2-pentanone | < 362 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 145 UJ |
| Vinyl acetate | < 362 UJ |

ELAP Number 10958 Method: EPA 8260B Data File: V96525.D

Comments: ug / Kg = microgram per Kilogram

Signature: Bruce Hoogesteger: Technical Director

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# Volatile Analysis Report for Soils/Solids/Sludges

**Client:** C&S Engineers

**Client Job Site:** MOB
**Client Job Number:** N/A
**Field Location:** CB-03/22-24
**Field ID Number:** N/A
**Sample Type:** Soil

**Lab Project Number:** 12:1804
**Lab Sample Number:** 12:1804-04

**Date Sampled:** 04/26/2012
**Date Received:** 04/27/2012
**Date Analyzed:** 04/28/2012

| Halocarbons | Results in ug / Kg |
|---|---|
| Bromodichloromethane | < 19,100 |
| Bromomethane | < 19,100 |
| Bromoform | < 47,600 |
| Carbon Tetrachloride | < 19,100 |
| Chloroethane | < 19,100 |
| Chloromethane | < 19,100 |
| 2-Chloroethyl vinyl Ether | < 95,300 |
| Chloroform | < 19,100 |
| Dibromochloromethane | < 19,100 |
| 1,1-Dichloroethane | < 19,100 |
| 1,2-Dichloroethane | < 19,100 |
| 1,1-Dichloroethene | < 19,100 |
| cis-1,2-Dichloroethene | < 19,100 |
| trans-1,2-Dichloroethene | < 19,100 |
| 1,2-Dichloropropane | < 19,100 |
| cis-1,3-Dichloropropene | < 19,100 |
| trans-1,3-Dichloropropene | < 19,100 |
| Methylene chloride | < 47,600 UJ |
| 1,1,2,2-Tetrachloroethane | < 19,100 |
| Tetrachloroethene | < 19,100 |
| 1,1,1-Trichloroethane | < 19,100 |
| 1,1,2-Trichloroethane | < 19,100 |
| Trichloroethene | < 19,100 |
| Trichlorofluoromethane | < 19,100 |
| Vinyl chloride | < 19,100 |

| Aromatics | Results in ug / Kg |
|---|---|
| Benzene | < 19,100 |
| Chlorobenzene | < 19,100 |
| Ethylbenzene | 46,000 |
| Toluene | 145,000 |
| m,p-Xylene | 377,000 |
| o-Xylene | 139,000 |
| Styrene | < 47,600 |
| 1,2-Dichlorobenzene | < 19,100 |
| 1,3-Dichlorobenzene | < 19,100 |
| 1,4-Dichlorobenzene | < 19,100 |

| Ketones | Results in ug / Kg |
|---|---|
| Acetone | < 95,300 UJ |
| 2-Butanone | < 95,300 |
| 2-Hexanone | < 47,600 |
| 4-Methyl-2-pentanone | < 47,600 |

| Miscellaneous | Results in ug / Kg |
|---|---|
| Carbon disulfide | < 19,100 |
| Vinyl acetate | < 47,600 |

ELAP Number 10958 Method: EPA 8260B Data File: V96557.D

Comments: ug / Kg = microgram per Kilogram

Signature:
Bruce Hoogesteger: Technical Director

# APPENDIX D

## SUMMARY OF COMMERCIAL USE SOIL CLEANUP OBJECTIVES

# SUMMARY OF COMMERCIAL USE
# SOIL CLEANUP OBJECTIVES

| CONTAMINANT | CAS NUMBER | COMMERCIAL USE SCO |
|---|---|---|
| Arsenic | 7440-38-2 | 16 |
| Barium | 7440-39-3 | 400 |
| Beryllium | 7440-41-7 | 590 |
| Cadmium | 7440-43-9 | 9.3 |
| Chromium, hexavalent | 18540-29-9 | 400 |
| Chromium, trivalent | 16065-83-1 | 1,500 |
| Copper | 7440-50-8 | 270 |
| Total Cyanide | | 27 |
| Lead | 7439-92-1 | 1,000 |
| Manganese | 7439-96-5 | 10,000 |
| Total Mercury | | 2.8 |
| Nickel | 7440-02-0 | 310 |
| Selenium | 7782-49-2 | 1,500 |
| Silver | 7440-22-4 | 1,500 |
| Zinc | 7440-66-6 | 10,000 |
| 2,4,5-TP Acid (Silvex) | 93-72-1 | 500 |
| 4,4'-DDE | 72-55-9 | 62 |
| 4,4'-DDT | 50-29-3 | 47 |
| 4,4'-DDD | 72-54-8 | 92 |
| Aldrin | 309-00-2 | 0.68 |
| alpha-BHC | 319-84-6 | 3.4 |
| beta-BHC | 319-85-7 | 3 |
| Chlordane (alpha) | 5103-71-9 | 24 |
| delta-BHC | 319-86-8 | 500 |
| Dibenzofuran | 132-64-9 | 350 |
| Dieldrin | 60-57-1 | 1.4 |
| Endosulfan I | 959-98-8 | 200 |
| Endosulfan II | 33213-65-9 | 200 |
| Endosulfan sulfate | 1031-07-8 | 200 |
| Endrin | 72-20-8 | 89 |
| Heptachlor | 76-44-8 | 15 |
| Lindane | 58-89-9 | 9.2 |
| Polychlorinated biphenyls | 1336-36-3 | 1 |
| Acenaphthene | 83-32-9 | 500 |
| Acenapthylene | 208-96-8 | 500 |
| Anthracene | 120-12-7 | 500 |
| Benz(a)anthracene | 56-55-3 | 5.6 |
| Benzo(a)pyrene | 50-32-8 | 1 |
| Benzo(b)fluoranthene | 205-99-2 | 5.6 |
| Benzo(g,h,i)perylene | 191-24-2 | 500 |
| Benzo(k)fluoranthene | 207-08-9 | 56 |
| Chrysene | 218-01-9 | 56 |

| | | |
|---|---|---|
| Dibenz(a,h)anthracene | 53-70-3 | 0.56 |
| Fluoranthene | 206-44-0 | 500 |
| Fluorene | 86-73-7 | 500 |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 5.6 |
| m-Cresol | 108-39-4 | 500 |
| Naphthalene | 91-20-3 | 500 |
| o-Cresol | 95-48-7 | 500 |
| p-Cresol | 106-44-5 | 500 |
| Pentachlorophenol | 87-86-5 | 6.7 |
| Phenanthrene | 85-01-8 | 500 |
| Phenol | 108-95-2 | 500 |
| Pyrene | 129-00-0 | 500 |
| 1,1,1-Trichloroethane | 71-55-6 | 500 |
| 1,1-Dichloroethane | 75-34-3 | 240 |
| 1,1-Dichloroethene | 75-35-4 | 500 |
| 1,2-Dichlorobenzene | 95-50-1 | 500 |
| 1,2-Dichloroethane | 107-06-2 | 30 |
| cis-1,2-Dichloroethene | 156-59-2 | 500 |
| trans-1,2-Dichloroethene | 156-60-5 | 500 |
| 1,3-Dichlorobenzene | 541-73-1 | 280 |
| 1,4-Dichlorobenzene | 106-46-7 | 130 |
| 1,4-Dioxane | 123-91-1 | 130 |
| Acetone | 67-64-1 | 500 |
| Benzene | 71-43-2 | 44 |
| Butylbenzene | 104-51-8 | 500 |
| Carbon tetrachloride | 56-23-5 | 22 |
| Chlorobenzene | 108-90-7 | 500 |
| Chloroform | 67-66-3 | 350 |
| Ethylbenzene | 100-41-4 | 390 |
| Hexachlorobenzene | 118-74-1 | 6 |
| Methyl ethyl ketone | 78-93-3 | 500 |
| Methyl tert-butyl ether | 1634-04-4 | 500 |
| Methylene chloride | 75-09-2 | 500 |
| n-Propylbenzene | 103-65-1 | 500 |
| sec-Butylbenzene | 135-98-8 | 500 |
| tert-Butylbenzene | 98-06-6 | 500 |
| Tetrachloroethene | 127-18-4 | 150 |
| Toluene | 108-88-3 | 500 |
| Trichloroethene | 79-01-6 | 200 |
| 1,2,4-Trimethylbenzene | 95-63-6 | 190 |
| 1,3,5- Trimethylbenzene | 108-67-8 | 190 |
| Vinyl chloride | 75-01-4 | 13 |
| Xylene (mixed) | 1330-20-7 | 500 |

Notes:

1) Adapted from 6 NYCRR Part 375: Remedial Program Soil Cleanup Objectives

2) Units in ppm = parts per million

# APPENDIX D
## CITIZEN PARTICIPATION PLAN

New York State Department of Environmental Conservation

## Brownfield Cleanup Program

# Citizen Participation Plan

**for**

**Proposed Medical Office Building at 977 Main Street**
**(Former Mobil Service Station)**

1001 Main Street
Buffalo
Erie County, New York

November 2012

# Contents



* * * * *

**Note:** The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **Kaleida Properties, Inc., Kaleida Health and F.L.C. 50 High Street Corporation (Applicants)**
Site Name: **Medical Office Building (Former Mobil Service Station 99-MST) (Site)**
Site Address: **977, 991 and 1001 Main Street and 24 High Street**
Site County: **Erie**
Site Number: **C915260**

## 1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants that conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: http://www.dec.ny.gov/chemical/8450.html .

## 2. Citizen Participation Activities

*Why NYSDEC Involves the Public and Why It Is Important*

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interest in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

*Project Contacts*

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

*Locations of Reports and Information*

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

*Site Contact List*

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods. The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

*CP Activities*

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

*Technical Assistance Grant*

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

| Citizen Participation Requirements (Activities) | Timing of CP Activity(ies) |
|---|---|
| **Application Process:** | |
| • Prepare site contact list<br>• Establish document repositories | At time of preparation of application to participate in the BCP. |
| • Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period<br>• Publish above ENB content in local newspaper<br>• Mail above ENB content to site contact list<br>• Conduct 30-day public comment period | When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time. |
| **After Execution of Brownfield Site Cleanup Agreement:** | |
| • Prepare Citizen Participation (CP) Plan | Before start of Remedial Investigation |
| **Before NYSDEC Approves Remedial Investigation (RI) Work Plan:** | |
| • Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan<br>• Conduct 30-day public comment period | Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet. |
| **After Applicant Completes Remedial Investigation:** | |
| • Distribute fact sheet to site contact list that describes RI results | Before NYSDEC approves RI Report |
| **Before NYSDEC Approves Remedial Work Plan (RWP):** | |
| • Distribute fact sheet to site contact list about proposed RWP and announcing 30-day public comment period<br>• Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager)<br>• Conduct 30-day public comment period | Before NYSDEC approves RWP. Thirty day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 30-day public comment period. |
| **Before Applicant Starts Cleanup Action:** | |
| • Distribute fact sheet to site contact list that describes upcoming cleanup action | Before the start of cleanup action. |
| **After Applicant Completes Cleanup Action:** | |
| • Distribute fact sheet to site contact list that announces that cleanup action has been completed and that summarizes the Final Engineering Report<br>• Distribute fact sheet to site contact list announcing issuance of Certificate of Completion (COC) | At the time NYSDEC approves Final Engineering Report. These two fact sheets are combined if possible if there is not a delay in issuing the COC. |

## 3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

The site soil and groundwater is contaminated with petroleum related compounds associated with an old gasoline release. Contamination beneath the Site presents minimal exposure risk based on its current use. Soil contamination is present from 10 to 40 feet below grade. Therefore, vapor exposure is not a risk. The Site is covered predominantly by an asphalt surface and is used for parking reducing exposure to contaminated soils. Contaminated groundwater is present about 25 feet below grade. Floating petroleum is also present in a portion of the Site. The City of Buffalo bans the use of groundwater for drinking water so there is little exposure the public from groundwater use.

If left unaddressed, it is possible groundwater contamination will migrate off-site and possibly affect indoor air in adjacent building basements. Additionally, the presence of the contamination is limiting the future use and re-investment opportunities on the parcel.

Stakeholders in the remediation of the Site include the City of Buffalo, Buffalo Niagara Medical Campus and local residents and users of adjacent buildings. See Appendix B for a contact list of stakeholders.

## 4. Site Information

Appendix C contains a map identifying the location of the site.

*Site Description*

**Location: 977, 991 and 1001 Main Street and 24 High Street, Buffalo, Erie County**
**Setting: Urban**
**Site size: 1.7 acres**
**Adjacent properties:**

- **East (parking)**
- **South (vacant office building and occupied bank)**
- **West (commercial buildings and mental health clinic)**
- **North (medical office building and parking)**

*History of Site Use, Investigation, and Cleanup*

From 1889 to 1986 the property has been used for numerous residential and commercial properties including:

- The University at Buffalo Medical and Dental School on the eastern portion of the property;

- A restaurant and hotel on the eastern portion of the property after the medical school left; and
- From 1950 to 1982 an Exxon-Mobil gas station was located at the southwestern corner of the property.

Currently, the Site is used as a parking lot and a portion is a fenced-off unused concrete slab.

The Site soil and groundwater is contaminated with petroleum related compounds from an old gasoline release associated with the Exxon-Mobil station. The contamination is contained within the boundaries of Goodrich, High, Main and Ellicott Streets. As summarized above there is no current active health risk from the contamination:

- Soil contamination is present from 10 to 40 feet below grade.
    - No subsurface structures are present on the Site, therefore, vapor exposure is not a risk, and
    - The Site is covered predominantly by an asphalt surface educing exposure to contaminated soils.
- Contaminated groundwater is present about 25 feet below grade. Floating petroleum is also present in a portion of the Site.
    - The City of Buffalo bans the use of groundwater for drinking water so there is little exposure the public from groundwater use.

The contamination has been heavily investigated since 1981. Numerous studies have been performed to define the extent of contamination and between 1998 and 2008, a series of on-site technologies have been used to reduce contamination beneath the Site.

The first indication of contamination on this site was in 1981 during the underground construction of the light rail beneath Main Street. A spark ignited a flame which burned out almost immediately. This led to the site investigations and the removal of two underground gas storage tanks, a 3,000 and a 4,000 gallon, as well as some soil that was contaminated with petroleum. In 1982, another underground storage tank was removed, this one could hold 6,000 gallons of gas.

In 1988, an investigation of the soil and groundwater at the Site determined that there was petroleum contamination in both at 997 Main Street. Later contamination was also found at 999 Main Street and 254 High Street. From 1988 to present various investigations and testing of the Site soil and groundwater has identified ongoing petroleum contamination.

In 1998, on behalf of Exxon Mobil with the knowledge and cooperation of the NYSDEC under the Spills Program, a system was installed to remove the contamination from the soil and groundwater. The contamination is present in the groundwater, soil and there is residual petroleum floating on top of the groundwater. From 1998 to 2008 this system removed an estimated 1,407 gallons of petroleum, 110 gallons of petroleum that was beginning to degrade, and 18,595 gallons of vapors. No contaminated soil was removed because this activity did not involve disturbing the soil

From 2008 to present, additional testing determined that contamination remains in the soil and groundwater, as well as some floating petroleum. The amount of contamination has been reduced and the location has moved, but even after 10 years of remediation the Site is still contaminated.

## 5. Investigation and Cleanup Process

*Application*

The Applicants have applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicants were not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a qualitative exposure assessment, a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicants in its Application proposes that the site will be used for commercial purposes.

To achieve this goal, the Applicants will conduct cleanup activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicants set forth the responsibilities of each party in conducting these activities at the site.

*Remedy Selection*

When the investigation of the Site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicants may recommend in its investigation report that no action is necessary at the Site. In this case, NYSDEC would make the investigation report available for public comment for 30 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a Certificate of Completion (described below) to the Applicants.

**or**

2. The Applicants may recommend in its investigation report that action needs to be taken to address Site contamination. After NYSDEC approves the investigation report, the Applicants may then develop a cleanup plan, officially called a Remedial Work Plan. The Remedial Work Plan describes the Applicants' proposed remedy for addressing contamination related to the Site.

When the Applicants submit a proposed Remedial Work Plan for approval, NYSDEC would announce the availability of the proposed plan for public review during a 30-day public comment

period.

*Cleanup Action*

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

The Applicants may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicants complete cleanup activities, they will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the Site.

*Certificate of Completion*

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the Site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicants from future liability for Site-related contamination, subject to certain conditions. The Applicants would be eligible to redevelop the Site after it receives a COC.

*Site Management*

Site management is the last phase of the Site cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicants under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the Site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An institutional control is a non-physical restriction on use of the Site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the Site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that is pumping and treating groundwater. Site management continues until NYSDEC determines that it is no longer needed.

# Appendix A
# Project Contacts and Locations of Reports and Information

**Project Contacts**

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

**New York State Department of Environmental Conservation (NYSDEC):**

**Jaspal Walia**
Project Manager
NYSDEC Region 9
Division of Environmental Remediation
270 Michigan Avenue
Buffalo, NY 14203-2915
716.851.7220

**Kristen Davidson**
Citizen Participation Specialist
NYSDEC Region 9
270 Michigan Avenue
Buffalo, NY 14203-2915
716.851.7220

**New York State Department of Health (NYSDOH):**

**Matthew Forcucci**
NYSDOH Project Manager
NYSDOH
584 Delaware Avenue
Buffalo, NY 14202
(716) 847-4501

**Locations of Reports and Information**

The facilities identified below are being used to provide the public with convenient access to important project documents:

Buffalo and Erie County Central Library
1 Lafayette Square
Buffalo, NY 14203
Attn: April Tompkins
Phone: 716.858.7180

NYSDEC 9
270 Michigan Avenue
Buffalo, NY 14203
Attn: Jaspal Walia
Phone: 716.851.7220
Hours: Monday to Friday 9 am to 5 pm
(call for appointment)

# Appendix B Site Contact List

*1. Local Government*

Erie County Executive:

Mark Poloncarz, County Executive
95 Franklin Street
16th Floor
Buffalo, NY 14202

Chief Executive Officer – City of Buffalo:

Mayor Byron W. Brown
City of Buffalo
201 City Hall
Buffalo, New York 14202
Mayor@city-buffalo.com

Planning Board Chairman – City of Buffalo:
James A Morrell, Chairman
City of Buffalo Planning Board
901 City Hall
Buffalo, NY 14202
(716) 851-5035
wgrillo@city-buffalo.com

James A. Lewis, Chairman
City of Buffalo Zoning Board of Appeals
Room 901, City Hall
Buffalo, NY 14202
(716) 851-5082

*2. Residents, Owners and Occupants of Property and Property Adjacent to Site:*

**Property Owners**

977 (979) Main Street
Kaleida Properties, Inc.
c/o Kaleida Health
100 High Street
Buffalo, NY 14203

991 Main Street
Kaleida Properties, Inc.

c/o Kaleida Health
100 High Street
Buffalo, NY 14203

1001 Main Street
Kaleida Properties, Inc.
c/o Kaleida Health
100 High Street
Buffalo, NY 14203

24 High Street
Kaleida Properties, Inc.
c/o Kaleida Health
100 High Street
Buffalo, NY 14203

**Adjacent Land Owners**

City of Buffalo
c/o Board of Parking
1801 City Hall
Buffalo, NY 14202

HSBC Bank USA
One HSBC Center
10TH Floor
Buffalo, NY 14203

Kaleida Health
100 High Street
Buffalo, NY 14203

Ciminelli Development
350 Essjay Road
Williamsville, NY 14221

Langston Hughes Inst.
25 High Street
Buffalo, NY14203

Salvation Army
960 Main Street
Buffalo, NY 14202

EPIC
1000 Main Street

Buffalo, NY 14202

4628 Group Inc
295 Main Street
Buffalo, NY 14203

NY State
1013-1029 Main
Buffalo, NY 14209

NY State
161 Delaware Avenue
Delmar, NY 12054

**Adjacent Occupants**

Allpro Parking
465 Main Street
Buffalo, NY 14203

Kaleida Health
726 Exchange Street
Buffalo, NY 14221
Research Institute on Addictions – University at Buffalo
1021 Main Street
Buffalo, NY14203

*3. Local Media:*

Local News Paper:

Buffalo News
1 News Plaza
Buffalo NY 14240
(716) 849-3434
http://www.buffalonews.com/classifieds/

Local Television:

WGRZ – TV Channel 2
259 Delaware Avenue
Buffalo, NY 14202
(716) 849-2200
http://www.wgrz.com/news/default.aspx

WIVB – TV Channel 4
2077 Elmwood Avenue
Buffalo, NY 14207
(716) 874-4410
http://www.wivb.com/subindex/news

WKBW – TV Channel 7
7 Broadcast Plaza
Buffalo, NY 14202
(716) 840-7777
http://www.wkbw.com/

Radio:

WBEN 930 AM Radio
500 Corporate Parkway
Amherst, NY 14226
(716) 843-0600
http://www.wben.com

WBFO 88.7 FM Radio
3435 Main Street
Buffalo, NY 14214
(716) 829-6000
http://www.wbfo.org/

*4. Local Water Supplier:*

City of Buffalo Division of Water
65 Niagara Square, Room 602 City Hall
Buffalo, NY 14202
(716) 856-4664

Buffalo Water Authority
(operated by Veolia Water)
281 Exchange Street
Buffalo, NY 14204
(716) 847-1065

*5. Schools:*

Buffalo Hearing and Speech Center, Inc.
50 North Street
Buffalo, NY 14203
(716) 885-8318

City Honors School – PS 195
186 E. North Street
Buffalo, NY 14204
(716) 816-4230

St. John Christian Academy
833 Michigan Avenue
Buffalo, NY 14203
(716) 852-3151

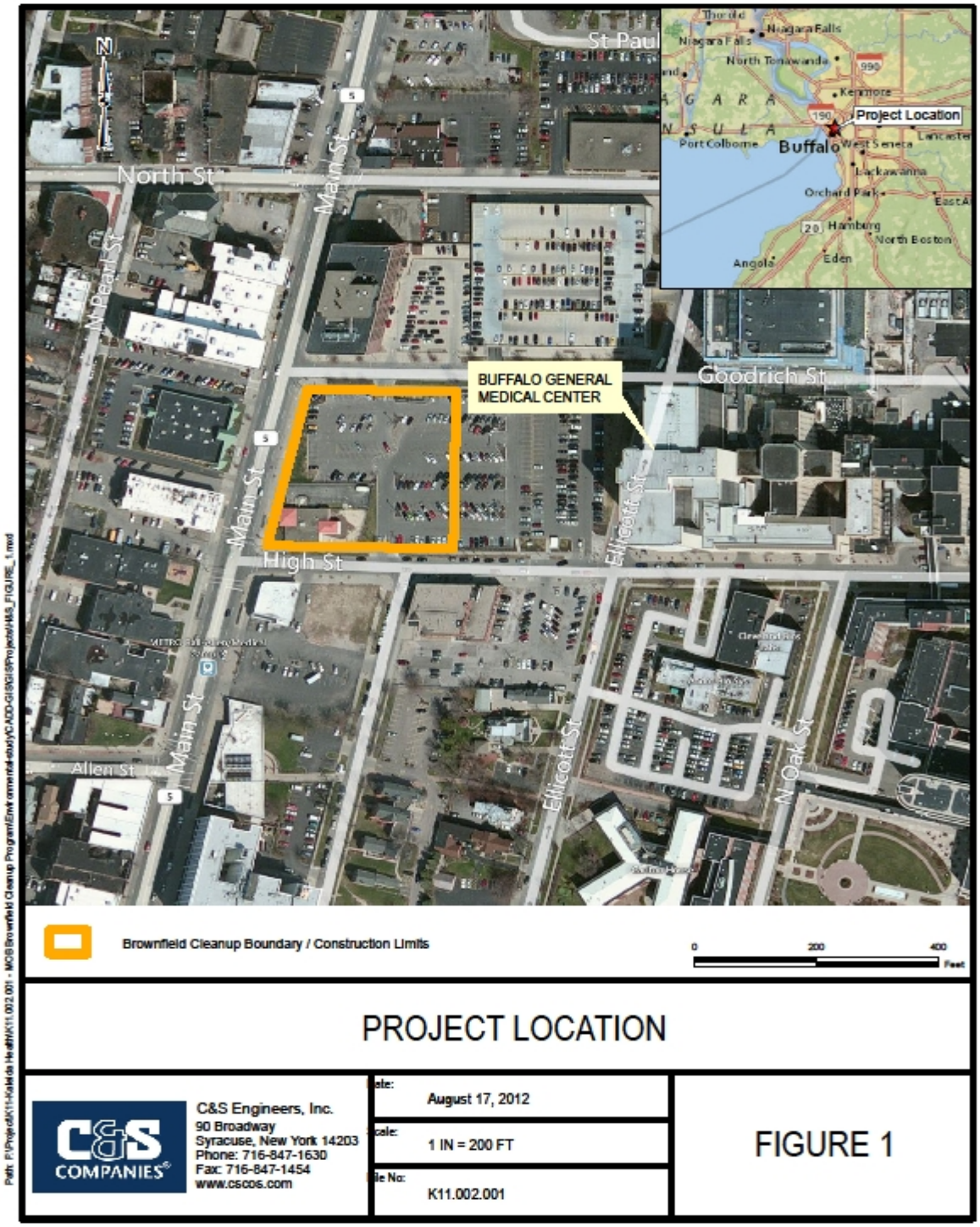
*6. Day Care Facilities:*

Angel's Day Care
41 Saint Paul Mall
Buffalo, NY 14209
(716) 883-2520

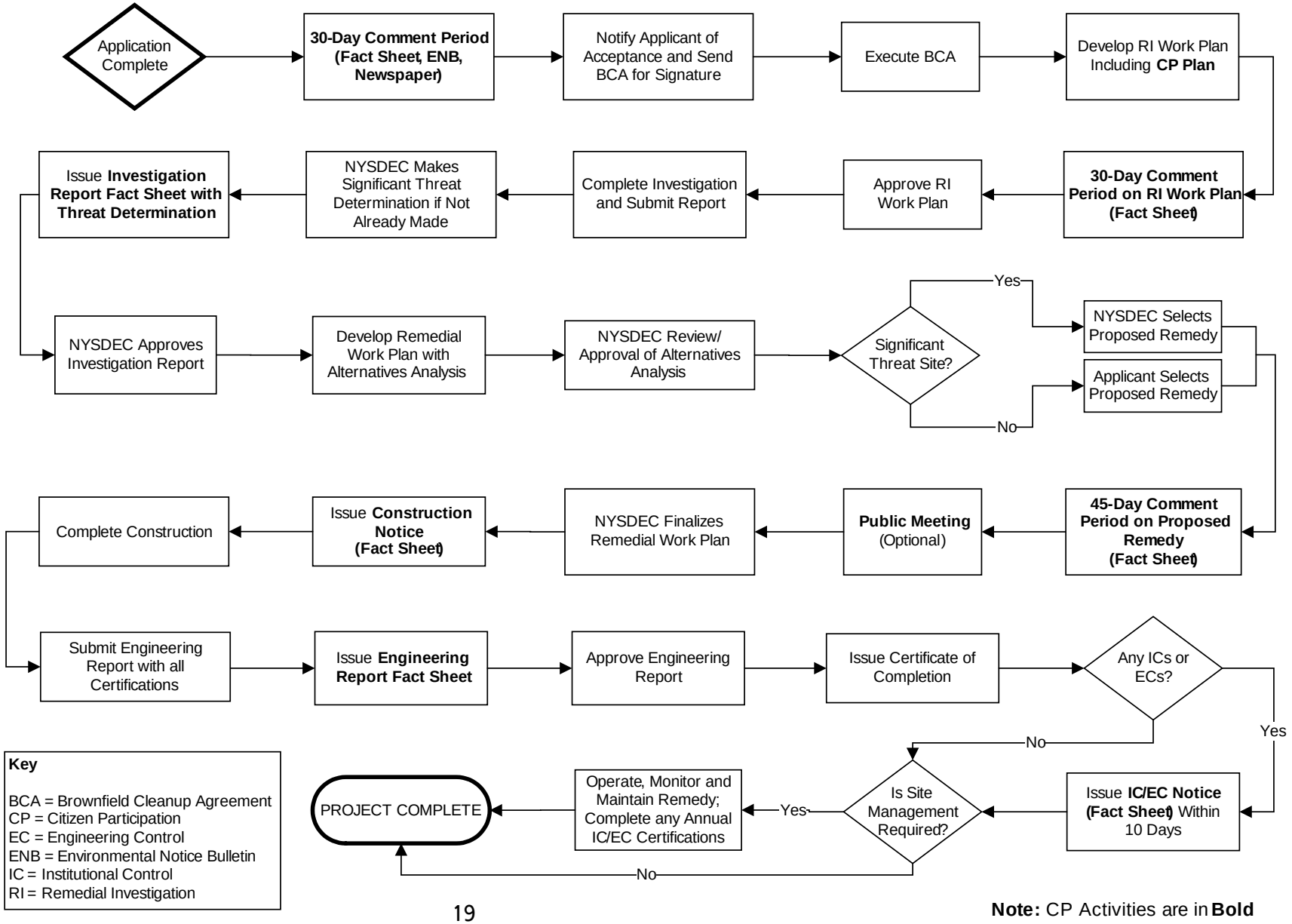
Westminster Early Childhood Program
724 Delaware Avenue
Buffalo. NY 14209
(716) 884-9438

Rainbow K
433 Franklin Street
Buffalo, NY 14202
(716) 884-0177

# Appendix C  Site Location Map



# Appendix D– Brownfield Cleanup Program Process






**Note:** CP Activities are in **Bold**

# APPENDIX E
## COMMUNITY AIR MONITORING PLAN

# Community Air Monitoring Plan

# for

# Proposed Medical Office Building
# 1001 Main Street
# Buffalo, New York 14203

## Former Mobil Station 99-MST
## Site No. C915260

**November 12, 2012**

# Community Air Monitoring Plan

## Overview

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

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Based on over 10 years of monitoring and investigation, this site contamination is known to be limited to petroleum VOCs.

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

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

<u>VOC Monitoring, Response Levels and Actions</u>

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment

should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate, such as isobutylene. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

**Fugitive Dust and Particulate Monitoring**

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number;
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50$_o$ C (14 to 122$_o$ F); and
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record-keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM-10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

# APPENDIX F
## HEALTH & SAFETY PLAN

**August 2012**

# Hazardous Material
# HEALTH & SAFETY PLAN

**For**

## Remediation and Construction Activities
## Medical Office Building
## 979 to 1001 to Main Street
## Buffalo, New York

**C&S Engineers, Inc**
**90 Broadway**
**Buffalo, New York 14203**

## Section A-1: Project Safety Orientation

## I. Policy Statement

This document, Hazardous Materials Health and Safety Plan (HASP), will guide health and safety protocols during remedial activities at the Site at 979 to 1001 Main Street (Site). It is the policy of the Construction Manager that all employees will receive Health & Safety Orientation prior to beginning work and weekly during remedial activities. Everyone working on the Site shall receive specific safety orientation prior to entering the Site.

## II. Emergency and Project Management Contact Information

Provided below is a list of telephone numbers for use in the event of an emergency onsite.

| | |
|---|---|
| Emergency Medical Service | 911 |
| Police: Buffalo Police Department (NYPD) | 911 |
| Hospital: Buffalo General Hospital | (716) 859-5600 |
| Fire: Buffalo Fire Department | 911 |
| National Response Center | (800) 424-8802 |
| Poison Control Center | (800) 222-1222 |
| Center for Disease Control | (800) 311-3435 |
| NYSDEC Region 9 (Buffalo, New York) | (716) 851-7220 |
| American Consulting Professionals | (716) 533-4105 |
| Kaleida Health | (716) 462-2510 |
| Ciminelli Development | (716) 631-6000 |
| Project Field Office Trailer | TBD |

## III. Hospital Information and Directions to Buffalo General Hospital

Buffalo General Hospital
100 High Street
Buffalo, New York
14203
(716) 859-5600

Buffalo General Hospital is within walking distance immediately east of the Site (Figure 1).

## Section A-2: Project Safety Staff Responsibilities

### I. Health and Safety Staff

This section briefly describes the health and safety responsibilities for the remedial activities to be implemented at the Site. The following staff is responsible for ensuring compliance with the HASP.

**1) Site Safety Manager/Director**

- Has the overall responsibility for coordinating and reporting all health and safety activities and the health and safety of Site Workers.
- Must have completed, at a minimum, the OSHA 30-Hour Construction Safety Training, and either the 24-Hour training course for the Occasional Hazardous Waste Site Worker or the 40-Hour training course for the Hazardous Waste Operations Worker that meets OHSA 29 CFR 1910.
- Must have completed the 8-Hour Site supervisor/manager's course for supervisors and managers having responsibilities for hazardous waste Site operations and management.
- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment (PPE).
- Conducts initial onsite specific training prior to Site Workers commencing work.
- Conducts and documents daily and periodic safety briefings.
- Ensures that field team members comply with this HASP.
- Immediately notifies the Construction Manager (CM) Project Manager and Superintendent of all accident/incidents.
- Determines upgrading or downgrading of PPE based on Site conditions and/or real time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as the manufacturer's instructions determine.
- Reports to the CM Project Manager and Superintendent to provide summaries of field operations and progress.
- Submits and maintains all documentation required in this HASP and any other pertinent health and safety documentation.

**2) Safety Representatives**

- Must be designated to the Site Safety Manager/Director by each Subcontractor as a Competent Person having, at a minimum, the OSHA 30-Hour Construction Safety Training

- Must schedule and attend a **Pre-Construction Safety Meeting** with the Site Safety Manager/Director to discuss the Subcontractor Safety Requirements and must attend the **Weekly Subcontractor Coordination Meeting**.

- Responsible for ensuring that their **lower tier contractors** comply with project safety requirements.

- Must make **frequent and regular inspections** of their work areas and activities and ensure hazards that are under their control are corrected immediately and all other hazards are reported to the Construction Manager's Project Manager and Site Safety Manager/Director.

- Must report all work related injuries, regardless of severity, to the Construction Manager's Project Manager and the Site Safety Manager/Director within 24 hours after they occur.

**3) Site Workers**

- Report any unsafe or potentially hazardous conditions to the Site Safety Manager/Director.

- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.

- Comply with rules, regulations, and procedures as set forth in this HASP, including any revisions that are instituted.

- Prevent unauthorized personnel from entering work Site.

## Section B-1: Environmental Conditions

This section of the HASP pertains to excavation of Site soils (or other activities that involve moving existing Site soils around or off the Site) and surface and groundwater management.

### I. Background

The Project will remediate volatile organic compounds (VOCs) present in Site soils and groundwater which exceed New York State Department of Environmental Conservation (NYSDEC) Guidance Levels. Site activities in connection with the construction of the Project include:

- Excavation of Site soils

- Stockpiling

- Transportation and disposal of soil materials
- Pumping and handing of groundwater

Elevated levels of VOCs have been observed as part of historic remedial activities at the Site. VOCs were detected above NYSDEC Guidance levels in shallow soils in close proximity to a former gasoline filling station in the southwest corner of the Site. VOCs are also found in deeper soils associated with a groundwater contaminant plume located in the central area of the Site (Figure 2).

Strict adherence to this HASP should protect Site workers from most potential contaminants. Although not covered under this section, the Excavation Contractor (Contractor) shall adhere to all other applicable OSHA and general construction regulations and guidance, as described in this HASP.

The designated Site Safety Manager/Director will be responsible for implementing the requirements of this section of the HASP. Compliance with this HASP is required of all Site workers who may potentially encounter contaminated materials at the Site (hereinafter referred to as Site Workers), including the Construction Manager's employees, contractors, subcontractors and all other onsite workers. In the event that a Site Worker does not follow these procedures, he or she will be required to leave the Site immediately. The content of this Section may change or undergo revisions based upon changes in the technical scope of work, the results of monitoring, and/or additional information made available to health and safety personnel. Any proposed changes must be reviewed and approved by the Site Safety Manager/Director before implementing the changes to the HASP.

Upon entering the Site, all visitors will be required to sign-in and read and comply with the provisions of this Section. Occasional Site visitors (inspectors, owners, etc.) do not need to comply if they sign a statement acknowledging that they have received Site-specific health and safety training and will comply with the procedures described in the training. In the event that a visitor does not follow these procedures, he or she will be required to leave the Site immediately.

## II. Summary of Environmental Site Investigations

The Site has been the subject of investigative activities since 1987 and remedial activities since 1997 associated with soil and groundwater contamination from leaking underground storage tanks that were located in the southwest corner of the Site. Through the course of historic investigation and remedial activities, more than 50 soil borings and 36 groundwater monitoring wells have been installed to evaluate subsurface conditions at the Site.

## III. Site Geology

The Site is immediately underlain by a generally continuous layer of historic urban fill material consisting of sand, gravel, rock fragments, brick fragments, and other manmade materials. The fill is variable in thickness across the Site from less than one foot to over 11 feet in thickness.

Underlying the fill material is a mixed deposit consisting of alternating gray and brown zones of silty sand, sand, gravel, clayey-silt, sandy-silt and glacial deposits. These zones appear discontinuous from boring to boring and is present to a depth of approximately 70 + feet.

Glacial till is present under the mixed deposit, and is comprised of varying amounts of gravel, sand, silt and clay and is dense to very dense. Where encountered, the glacial till unit is approximately 13 feet in thickness.

## IV. Soil Quality Results

In general, exceedances of soil regulatory guidance values occurred within the areas of the Site where former Underground Storage Tanks (USTs) were located, in the area where free product is present (Figure 2), and associated with the on-site groundwater contaminant plume. High levels of contaminants of concern (COCs) were detected in soil borings and groundwater monitoring wells within the area of the Site where free product is present. Moderate to low levels of COCs were detected associated with the on-site groundwater contaminant plume. In these instances, shallow soils from surface to 10 feet below ground surface (BGS) usually showed few signs of contamination; whereas concentrations of COCs in soils at depths of 10 feet to 35 feet were greatest.

## V. Groundwater Flow and Quality Results

A total of 36 groundwater monitoring wells have been installed on-site and immediately off-site as part of historic investigative activities. Groundwater grab samples have been collected on-site since 1997 on a quarterly basis. Collectively, this data provides a comprehensive characterization of groundwater quality beneath the Site.

In general, groundwater results indicate the presence of VOC contaminants in groundwater above regulatory guidance values. The primary COCs are benzene, toluene, ethylbenzene, and xylene, or BTEX compounds. Groundwater flows in a northeast direction and the contaminant plume was elongated in a northeast direction. The orientation of this plume, coupled with groundwater flow, indicated that the plume appeared to originate from the former Mobil Station in the southwest corner of the Site. Subsequent remedial activities on-site from 1998 to 2008 consisting of high vacuum extraction combined with air sparging have “mitigated" contaminant concentrations in the northeast area of the Site. However, the contaminant plume originally stretched from the southwest area of the Site onto the Goodrich Street right-of-way. The western extent of the contaminant plume along Main Street is unknown.

## VI. Potential Hazards Related to Fill/Soil

This section provides a brief summary of the potential Compounds of Concern and related hazards at the Site.

### 1) General

The following information is presented to identify the types of materials that may be encountered at the Site. The detailed information on these materials was obtained from:

- Sax’s Dangerous Properties of Industrial Materials - Lewis Eighth Edition;
- Chemical Hazards of the Workplace - Proctor/Hughes;

- Condensed Chemical Dictionary – Hawley;
- Rapid Guide to Hazardous Chemicals in the Workplace - Lewis 1990;
- NIOSH Pocket Guide to Chemical Hazards –1996; and
- ACGIH TLV Values and Biological Exposure Indices, OSHA 29 CFR 1910.1000.

**2) Compounds of Concern**

Based on the sampling results, VOCs associated with gasoline (primarily BTEX) were detected above regulatory guidance values in overburden soils primarily at depths greater than 18 feet BGS. The Summary of Toxicological Data related to COCs is found in Table 1 and provides information such as the chemical characteristics, health hazards, protection, and exposure limits.

**3) Hazard Assessment**

The potential to encounter hazards related to contaminated soil is dependent upon the type of work activity performed and the duration and location of the work activity. Potential hazards at the Site include inhalation of VOCs or particulates containing contaminants, ingestion of particulates containing contaminants and/or skin contact with contaminants and/or particulates containing contaminants.

The potential for Site Workers to be exposed to chemical hazards may occur during excavation, truck loading, truck and equipment cleaning activities, during handling of excavation waters, and/or during other activities in areas where contaminants have been identified. For chronic and acute toxicity data, refer to the Material Safety Data Sheets in Appendix A for further details on compound characteristics.

**4) Exposure Pathways and Assessment**

Exposure to these compounds during ongoing activities may occur through inhalation of dust particles containing contaminants, inhalation of VOCs and/or SVOCs, and by way of dermal absorption and accidental ingestion by either direct or indirect cross-contamination activities.

Based on known Site conditions from over 10 years of on-site investigative and remedial activities, all Site workers will be required to wear OSHA Level D PPE to minimize any potential for exposure. Level D PPE is:

- Work uniform (long pants, sleeved shirt);
- Hard hat;
- Steel toe work boots;
- Safety glasses;
- Boot covers (as necessary depending on the task);
- Hearing protection (as necessary depending on the task); and
- Reflective safety vest (as necessary depending on the task)

Additional measures for unexpected conditions are discussed below in Section VII.

In addition, inhalation of dust particles containing contaminants can occur during adverse weather conditions (high or changing wind directions) or during operations that may generate airborne dust such as excavation, loading of trucks, and grading. To minimize exposure to dust, dust control measures will be implemented in accordance with the Site-specific Community Air Monitoring Program CAMP. Where dust control measures are not feasible or exceed levels contained in Table 2, respiratory protection will be required.

**5) Excavation Stockpiles**

During the course of work at the Site, it may be necessary to temporarily stockpile excavated soil materials in advance of disposal. Although this is not expected to be a common occurrence, any stockpiled material will be covered with polyethylene (poly) sheeting with a minimum thickness of 8 mil. These stockpiles will be covered in order to limit precipitation from contacting soil materials and to avoid the generation of dust from soil materials. Covered stockpiles will be inspected daily to ensure that there has not been any damage to the poly sheeting and that the stockpile is still adequately covered.

**6) Dust Control**

Dust suppression methods will be employed by the Contractor throughout the construction project. Dust (particulate matter) will be controlled at the Site in accordance with the Site CAMP, and in compliance with all applicable federal, state, and local requirements and the requirements. The Contractor will implement necessary measures to control particulates including the following measures:

(i) Limiting on-site speed to five miles per hour.

(ii) Watering unpaved surfaces, including haul roads and excavation faces. All unpaved haul roads and excavation surfaces will be continuously watered by watering trucks or constant misting, so that surfaces remain damp at all times when in use during construction. Gravel cover shall be applied to unpaved surfaces which are regularly traveled.

(iv) Covering or water-misting of stockpiled materials. All stockpiled dry materials (e.g., sand, aggregate) will be water-misted; sprayed with non-hazardous, biodegradable suppressing agent; covered; or otherwise enclosed.

(v) Loading of any dry material which may release dust from trucks will be accompanied by manual water spraying of the material.

(vi) Covering all trucks carrying loose material such as debris, excavate or fill, and verifying that covers on all such trucks have been properly sealed. Outgoing trucks will be inspected at the gate, and not allowed to exit if covers are not properly sealed.

(vii) Washing the wheels of all trucks as they exit from the Site. A washing station will be constructed at each truck exit, whereby truck wheels will be washed, and the water shall be contained and recycled to avoid tracking mud out of the Site.

The Contractor will make provisions to have an adequate amount of water and appropriate equipment to disperse water on-site at all times.

**7) Transportation and Disposal of Soils**

Prior to the start of excavation, all soil materials will be sampled at a frequency sufficient to meet disposal facility requirements and the Contractor will secure approvals for disposal of soil materials in accordance with federal, state, and local regulations. The soil material will be loaded directly into trucks after excavation and transported to an off-site disposal facility (unless Site conditions, coordination of activities, timelines, and/or daily production limitations require temporary stockpiling prior to sampling and disposal).

The contaminated soil material will be shipped by a licensed hauler in accordance with all applicable federal, state, and local regulations. Each shipment will be transported under a non-hazardous waste manifest/bill of lading, hazardous waste manifest or other appropriate documentation based upon sampling results. All contaminated soil material will be properly disposed of at a permitted off-site Treatment, Storage and Disposal Facility (TSDF).

Before any transport vehicle leaves the Site, the sides and wheels will be inspected. If any soil materials are observed on the wheels or body of the truck, they will be removed using a shovel, broom, water hose and/or other hand tools in the designated vehicle cleaning area (Section 6.3). In addition, all trucks carrying soil material for disposal will have the soils in the truck body covered with a tarp. Outgoing trucks shall be inspected at the gate and not allowed to exit if covers are not properly utilized.

**8) Additional Precautions**

Dermal absorption or skin contact with contaminants is possible during intrusive activities and grading at the Site. The use of proper PPE, as described in Section VI (4), and proper vehicle and Site Worker cleaning procedures should significantly reduce the risk of skin contact. In addition, adhering to the dust control procedures will reduce the amount of airborne dust and therefore reduce the risk of skin contact and inhalation. The potential for accidental ingestion of contaminated particulates is expected to be remote with good hygiene practices.

**9) Hazard Assessment and Mitigation**

Hazardous conditions requiring higher levels of PPE and personal cleaning facilities are not anticipated to occur on Site given the nature of anticipated construction activities. If hazardous conditions are encountered, activities, if any, which involve direct physical contact with free phase petroleum, hazardous waste as defined by EPA or grossly contaminated soil as defined by DEC guidance (i.e. soil that contains visibly identifiable free or otherwise readily detectable free or residual product) would be addressed as set forth below.

A decision to upgrade the required level of PPE and/or withdrawal of Site Workers from an area would be made by the Site Safety Manager/Director based on atmospheric hazards, as determined by air monitoring and/or the presence of unexpected Site conditions. In addition, if, during Site work, unanticipated construction activities require direct physical contact with free phase petroleum product or soils containing materials exceeding EPA thresholds for hazardous materials, those

workers engaged in such activities will be required to increase their level of PPE to Modified Level D or higher, based on the potential for exposure and OSHA requirements. Modified Level D PPE includes:

- Outer gloves: leather, cotton, neoprene or nitrile (as specified by the Site Safety Manager/ Director);
- Inner gloves: latex or nitrile;
- Regular Tyvek coveralls (Poly-coated Tyvek, as specified by the Site Safety Manager/ Director);
- Chemical resistant boots over work boots (as specified by the Site Safety Manager/ Director);
- Steel toe work boots;
- Hard Hat;
- Safety glasses;
- Hearing protection (as necessary depending on the task); and
- Reflective safety vest (as necessary depending on the task).

## VII. Site Control for Unexpected Conditions

In the event that unexpected conditions or hazardous waste is encountered, the following four-zone approach will be employed in order to prevent the spread of the contamination from the area containing the unexpected condition and to protect Site Workers. The four-zones include the:

- Exclusion Zone;
- Contamination Reduction Zone;
- Remediated Zone; and
- Support Zone.

A stepped remedial approach will be managed and the zones modified as the work progresses. Each of the areas will be defined through the use of control barricades and/or construction/hazard fencing. A clearly marked delineation between the zones will be maintained. Signage will be posted to further identify and delineate these areas. Unexpected conditions that may be encountered include previously unknown buried drums, USTs, and grossly contaminated soil. Grossly contaminated soil is defined in the NYSDEC's Draft DER-10 Technical Guidance for Site Investigation and Remediation document as soil that contains visibly identifiable free or otherwise readily detectable free or residual product.

In order to minimize the potential for exposure in areas of grossly contaminated soil or hazardous materials, Site workers shall:

- Avoid eating or drinking in these areas;
- Take extra precautions to protect any skin injuries; and
- Not use cigarettes, cosmetics, gum, etc., in these areas.

The following subsections describe the four zones that will be utilized in the event that unexpected conditions or gross contamination is discovered at the Site.

**1) Exclusion Zone**

The area where the unexpected condition is discovered would be considered the Exclusion Zone (EZ). All excavation and handling of contaminated materials generated as a result of the discovery of an unexpected condition would take place within the EZ. This zone will be clearly delineated by hay bales, jersey barriers, and/or similar methods. Safety tape may be used as secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The Site Safety Manager/Director may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Site Workers will not be allowed in the EZ without:

- A buddy (co-worker);
- Appropriate PPE in accordance with OSHA regulations;
- Medical authorization; and
- Training certification in accordance with 29 CFR 1910.120.

**2) Contamination Reduction Zone**

A Contamination Reduction Zone (CRZ) will be established between the EZ and the property limits. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of Site Workers and equipment. The CRZ will be used for general Site entry and egress, in addition to access for heavy equipment and emergency support services. Site Workers will not be allowed in the CRZ without:

- A buddy (co-worker);
- Appropriate PPE in accordance with OSHA regulations;
- Medical authorization; and
- Training certification in accordance with 29 CFR 1910.120.

In addition, the CRZ will include a Site Worker Cleaning Area that will include a field wash station for Site Workers, equipment, and PPE to allow Site Workers to wash their hands, arms, neck, and face after exiting areas of grossly contaminated soil or hazardous materials. All Site Workers will be required to pass through the Site Worker Cleaning Area and wash their hands and remove any loose fill and soils from their clothing and boots prior to exiting the CRZ.

**3) Remediated Zone**

A Remediated Zone (RZ) will be established in portions of the Site where the remediation has been completed and only general construction work will be performed. Setup of the RZ will consist of implementing several measures designed to reduce the risk of workers' exposure and prevent non-trained workers from entering the non-remediated zone. Non-trained workers will work only in areas where the potential for exposure has been minimized by removal of all hazardous materials. The remediated zone will then be separated from the non-remediated zone by installing and maintaining temporary plywood or other construction fences along the boundary between the two zones. If potentially impacted material is uncovered in the RZ, all non-trained workers will be removed and the Site Safety Manager/Director will assess the potential risks. If, at any other time, the risk of exposure increases while non-trained workers are present in the RZ, the non-trained workers will be removed. At all times, when non- trained workers are present in the RZ, air monitoring for the presence of VOCs will be conducted in the RZ, as well as at the fence line of the non-remediated zone.

### 4) Support Zone

The Support Zone (SZ) will be an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provide for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated Site Workers or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold.

## VIII. Monitoring Procedures

In addition to the monitoring requirements set forth in the CAMP, as part of customary practice, periodic ambient air monitoring will be performed during the excavation of Site soils (or other activities that involve moving existing Site soils around or off the Site) in connection with the construction of the Project. If air monitoring results exceed the levels indicated in Table 2, the appropriate OSHA requirements will be followed. All monitoring instruments shall be operated by qualified personnel only and will be calibrated prior to use, as necessary. No excavation will be performed without the presence of the Site Safety Manager/Director or designated approved substitute at the Site, and without air monitoring as outlined in the CAMP. The Site Safety Manager/Director is responsible for ensuring that appropriate monitoring, levels of protection and safety procedures are followed.

### 1) Instrumentation

The following monitoring instruments will be supplied and utilized by the Contractor and will be available for use during field operations, as necessary. There will be a minimum of one of each piece of equipment on the Site at all times (depending on the size and locations of active work areas, it may be prudent to have multiple machines on Site):

- Photoionization Detector (PID) with 10.6 EV probe, Flame Ionization Detector (FID), or equivalent.

- Dust/Particulate Monitor (DM), MIE Miniram, or equivalent.

A PID and/or FID equipped organic vapor meter shall be used as outlined above to monitor VOCs in and around active work areas during excavation and truck loading activities, and to measure VOCs upwind of the work areas to determine background concentrations.

A particulate monitor shall be used as outlined above to measure concentrations of dust and particulate matter in and around the active work areas, and to measure particulates upwind of the work areas to determine background concentrations.

All instruments shall be calibrated daily prior to use in accordance with the manufacturer's procedures. Calibration records shall be documented and recorded daily.

The frequency of monitoring should be determined by the Site Safety Manager/Director after consultation with the Construction Manager's Project Superintendent. The rationale for any

modification must be documented and maintained by the Site Safety Manager/Director in the on-site health and safety files.

**2) Action Levels**

Action levels for the upgrading of PPE requirements in the HASP will apply to all Site work during excavation and truck loading activities at the Site. These action levels are provided in Table 2 and are for known contaminants measured using direct reading instruments in the Breathing Zone (BZ) for VOCs and particulates. The BZ will be determined by the Site Safety Manager/Director, but is typically 4 to 5 feet above the work area surface or elevation.

An air horn will be readily available in the Site trailer. An additional air horn will be located in the work area to alert Site Workers to an emergency situation. In the event of an emergency or the need to upgrade the level of personal protection, sharp blasts of the air horn will be sounded. If the level of respiratory protection needs to be upgraded, the Contractor will immediately contact the Construction Manager and Owner's Representative.

**3) Community Air Monitoring Program**

The Owners' representative will perform a Community Air Monitoring Program (CAMP) at the Site during all subsurface disturbance (i.e., during all grading, excavation, transporting, and loading of soil for disposal). The CAMP will meet the requirements of the New York State Department of Health Generic CAMP. The CAMP details are provided in the CAMP Plan, which is a separate document that will be distributed to Subcontractors in the Project Manual.

## IX. Vehicle Cleaning Areas and Disposal Procedures

This section details the specific vehicle cleaning and waste disposal procedures to be implemented at the Site during the excavation and truck loading activities.

**1) Contamination Prevention**

Contamination prevention will help to avoid spreading Site-derived fill and soil onto the public roadways and into areas of the Site where contaminated materials have been removed. Procedures for prevention include:

<u>Heavy Equipment</u>

- Care should be taken to limit the amount of contaminated material that comes in contact with heavy equipment (eg.: tires).

- If tools used in contaminated areas are to be placed on equipment for transport to an area where all contaminated material has been removed or to be cleaned, plastic should be used to keep the equipment clean.

- Heavy equipment that comes in contact with contaminated material should be decontaminated to remove any remaining contamination prior to the equipment being removed from the Site.

- Dust control measures, including water misting, will be used on roads inside the Site boundaries, as described in the CAMP.

**2) Vehicle Cleaning Area/Stabilized Construction Entrances**

One or more temporary vehicle cleaning areas will be constructed to clean disposal trucks and other vehicles and heavy equipment prior to leaving the Site. The vehicle cleaning area will be constructed of gravel and will be of sufficient size to prevent vehicles from spreading contaminated material. Before any disposal truck or other vehicle, or heavy equipment leaves the Site, the sides and wheels will be inspected. If any soil material is observed on the wheels or body of the truck or heavy equipment, the soil material will be removed and collected for disposal using a shovel, broom, and/or other methods including wet vehicle cleaning procedures (i.e., power washing or steam cleaning).

Water will be contained and recycled to avoid tracking mud out of the Site. No equipment will be allowed to leave the Site prior to inspection and verification that the equipment was properly cleaned. The Site Safety Director/Manager will inspect the streets surrounding the Site to determine whether they are becoming covered with soil from the Site; if this occurs, the Contractor will clean the streets.

**3) Disposal Procedures**

While it is not anticipated that there will be equipment, special clothing or other materials that would be required to be segregated, if unexpected conditions arise, waste would be segregated and disposed of based on its level of contamination and the requirements of the disposal facilities. All discarded materials, waste materials, or other objects will be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left onsite. If any potentially contaminated materials (e.g., clothing, gloves, etc.) are generated, they will be bagged or drummed, as necessary, labeled, and segregated for disposal. All non-contaminated materials will be collected and bagged for appropriate disposal.

**Table 1**
**Toxicological Physical and Chemical Properties of Compounds Potentially Present at the Site**

| Compound of Concern | Exposure Limits | Characteristics | Routes of Exposure | Symptoms of Overexposure |
|---|---|---|---|---|
| Benzene | 0.5 ppm (8 hr.TWA), 1ppm PEL | vapor, aromatic odor | inhalation, ingestion, skin adsorption | Dermatitis, CNS Depression |
| Ethylbenzene | PEL 435 mg/$m^3$ (100 ppm) | Liquid, aromatic odor | inhalation, ingestion, skin adsorption | Sensory irritant, CNS depression |
| Gasoline | PEL 900mg/m3 (300 ppm) | Liquid, aromatic odor | inhalation, ingestion, skin adsorption | Eye/skin irritation, CNS depression |
| Petroleum hydrocarbons (Petroleum distillates) | PEL 2000 mg/$m^3$ | colorless liquid | inhalation, ingestion, skin adsorption | respiratory irritant, skin irritant, CNS depression |
| Petroleum naphtha | PEL 400 mg/m3 (100 ppm) | reddish brown liquid, aromatic odor | inhalation, ingestion, skin adsorption | Eye/skin irritation, CNS depression |
| Toluene | PEL 188 mg/m3 (50 ppm) skin, 200 ppm inhalation | Colorless liquid, sweet odor | inhalation, ingestion, skin adsorption | Eye/skin irritation, CNS depression |
| Xylene | PEL 435 mg/m3 (100 ppm) | Liquid, aromatic odor | inhalation, ingestion, skin adsorption | Eye/skin irritation, CNS depression |

References

U.S. Department of Labor. 1990. OSHA Regulated Hazardous Substances, industrial Exposure and Control Technologies Government Institutes, Inc. Hawley's Condensed Chemical Dictionary, Sax, N. Van Nostrand and Reinhold Company, 11th Edition, 1987.

NIOSH Pocket Guide to Chemicals, 1999, National Institute for Occupational Safety and Health.

TWA - Tire Weighted Average for 8-hour workday unless otherwise noted.

Proctor, N.H., J.P. Hughes and M.L. Fischman, 1989. Chemical Hazards of the Workplace. Van Nostrand Reinhold. New York.

Sax, N.I. and R.J. Lewis. 1989. Dangerous Properties of Industrial Materials. 7th Edition. Van Nostrand Reinhold. New York.

Guide to Occupational Exposure Values. 1990. American Conference of Governmental Industrial Hygienists (ACGIH).

TLV — ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).

IDLH — Immediately Dangerous to Life and Health concentrations represent 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.

PEL — OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.

## TABLE 2

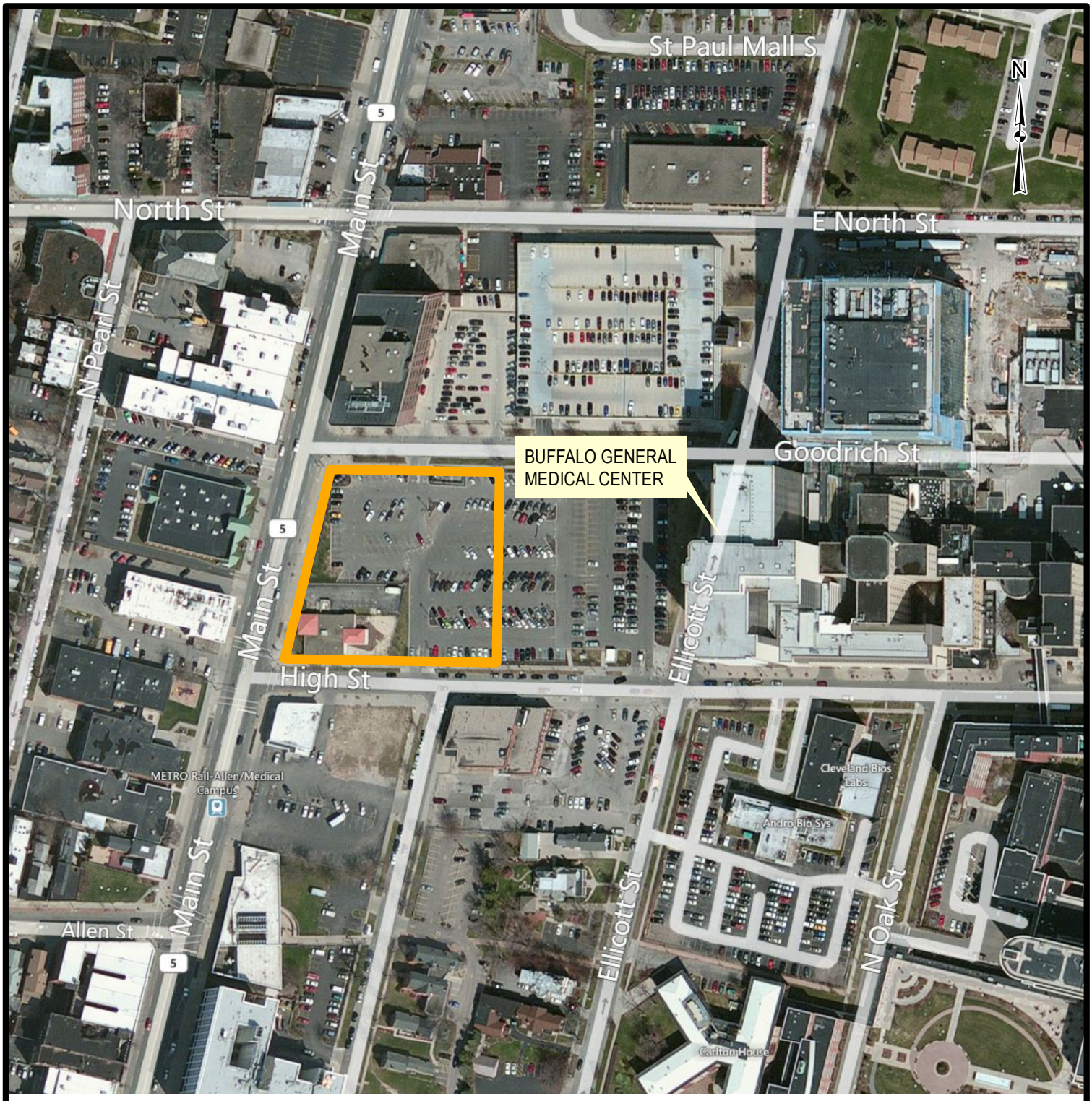
## ACTION LEVELS FOR WORKER BREATHING ZONE

| **Instrument** | **Action Level *** | **Level of Respiratory Protection/Action** |
|---|---|---|
| PID | 0 to 5 ppm (one minute sustained) | Level D * |
| PID | 5 to 50 ppm (one minute sustained) | Level C (Utilize Air Purifying Respirator) |
| PID | >50 to <100 ppm (one minute sustained) | Level B |
| PID | 100 ppm | Stop work** (ventilate, apply foam) |
| Dust Monitor | 0 – 1.0 mg/$m^3$, 5-minute average | Level D |
| Dust Monitor | >1.0 to 5.0 mg/$m^3$, 5-minute average | Level D – Institute dust suppression measures |
| Dust Monitor | >5.0 to 50 mg/$m^3$, 5-minute average | Level C – Institute dust suppression measures |

Note: Action levels are based on above background levels.

* Instrument readings will be taken in the breathing zone (BZ) of the Site Workers, unless otherwise indicated.

** Suspend work in immediate area. Conduct air monitoring periodically to determine when work can continue. Implement mitigative measures.




# PROJECT LOCATION

C&S Engineers, Inc.
90 Broadway
Syracuse, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com

Date: August 17, 2012

Scale: 1 IN = 200 FT

File No: K11.002.001

FIGURE 1

Path: F:\Project\K11-Kaleida Health\K11.002.001 - MOB Brownfield Cleanup Program\Environmental-study\CADD-GIS\GIS\Projects\H&S_FIGURE_1.mxd


## Legend

- Proposed Medical Office Building Site
- Proposed BCA Boundary
- Separate Phase Hydrocarbon Plume ("Free Product Zone") February 2012
- Proposed Limits of Excavation

**Total BTEX Concentration (ug/L) February 2012**

- Not Detected
- <10
- 10 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 50,000
- >50,000

Location Identifier — Concentration ug/L

MW-24, 42,470

ND = Not Detected

**Total BTEX Isoconcentration Contours (ug/L) February 2012**

- <10
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 50,000
- >50, 000

## Notes

1) Survey data from McIntosh & McIntosh P.C. "Topographical Map of Part of Lot-29, TWP.-11, R.-8, Holland Purchase" Job No. 7669-B(2) September 24, 2008.

2) The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities, either in service or abandoned. The surveyor has not physically located the underground utilities.

3) Groundwater sampling results from February 16, 2012 GES Monitoring Report.

4) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

0 40 80 Feet

C&S Engineers, Inc.
90 Broadway
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com

**KALEIDA HEALTH**
276 Exchange St.
Suite 200
Buffalo, New York 14210

N

**MOB - HEALTH & SAFETY PLAN**

**CITY OF BUFFALO, NY**

| No. | DATE | REVISIONS |
|---|---|---|

| | |
|---|---|
| PROJECT NO: | K11.002.001 |
| DATE: | August 17, 2012 |
| SCALE: | 1" = 40' |
| DRAWN BY: | CAM |
| DESIGNED BY: | CAM |
| CHECKED BY: | MJC |

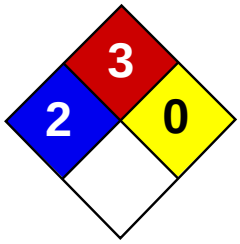
GROUNDWATER CONTAMINANT PLUME

FIGURE 2

Path: F:\Project\K11-Kaleida Health\K11.002.001 - MOB Brownfield Cleanup Program\Environmental-study\CADD-GIS\GIS\Projects\H&S_FIGURE_2.mxd

# Appendix A

# Material Safety Data Sheets





# Material Safety Data Sheet
## Benzene MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Benzene

**Catalog Codes:** SLB1564, SLB3055, SLB2881

**CAS#:** 71-43-2

**RTECS:** CY1400000

**TSCA:** TSCA 8(b) inventory: Benzene

**CI#:** Not available.

**Synonym:** Benzol; Benzine

**Chemical Name:** Benzene

**Chemical Formula:** C6-H6

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Benzene | 71-43-2 | 100 |

**Toxicological Data on Ingredients:** Benzene: ORAL (LD50): Acute: 930 mg/kg [Rat]. 4700 mg/kg [Mouse]. DERMAL (LD50): Acute: >9400 mg/kg [Rabbit]. VAPOR (LC50): Acute: 10000 ppm 7 hours [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Very hazardous in case of eye contact (irritant), of inhalation. Hazardous in case of skin contact (irritant, permeator), of ingestion. Inflammation of the eye is characterized by redness, watering, and itching.

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC. MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE]. The substance is toxic to blood, bone marrow, central nervous system (CNS). The substance may be toxic to liver, Urinary System. Repeated or prolonged exposure to the substance can produce target organs damage.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention immediately.

**Skin Contact:**
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 497.78°C (928°F)

**Flash Points:** CLOSED CUP: -11.1°C (12°F). (Setaflash)

**Flammable Limits:** LOWER: 1.2% UPPER: 7.8%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances:**
Highly flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of oxidizing materials. Non-flammable in presence of shocks.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials, of acids.

**Fire Fighting Media and Instructions:**
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:**
Extremely flammable liquid and vapor. Vapor may cause flash fire. Reacts on contact with iodine heptafluoride gas. Dioxygenyl tetrafluoroborate is as very powferful oxidant. The addition of a small particle to small samples of benzene, at ambient temperature, causes ignition. Contact with sodium peroxide with benzene causes ignition. Benzene ignites in contact with powdered chromic anhydride. Virgorous or incandescent reaction with hydrogen + Raney nickel (above 210 C) and bromine trifluoride.

**Special Remarks on Explosion Hazards:**
Benzene vapors + chlorine and light causes explosion. Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate. Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion. Interaction

of nitryl perchlorate with benzene gave a slight explosion and flash. The solution of permanganic acid ( or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene. Peroxodisulfuric acid is a very powferful oxidant. Uncontrolled contact with benzene may cause explosion. Mixtures of peroxomonsulfuric acid with benzene explodes.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

**Storage:**
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 0.5 STEL: 2.5 (ppm) from ACGIH (TLV) [United States] TWA: 1.6 STEL: 8 (mg/m3) from ACGIH (TLV) [United States] TWA: 0.1 STEL: 1 from NIOSH TWA: 1 STEL: 5 (ppm) from OSHA (PEL) [United States] TWA: 10 (ppm) from OSHA (PEL) [United States] TWA: 3 (ppm) [United Kingdom (UK)] TWA: 1.6 (mg/m3) [United Kingdom (UK)] TWA: 1 (ppm) [Canada] TWA: 3.2 (mg/m3) [Canada] TWA: 0.5 (ppm) [Canada]Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:**
Aromatic. Gasoline-like, rather pleasant. (Strong.)

**Taste:** Not available.

**Molecular Weight:** 78.11 g/mole

**Color:** Clear Colorless. Colorless to light yellow.

**pH (1% soln/water):** Not available.

**Boiling Point:** 80.1 (176.2°F)

**Melting Point:** 5.5°C (41.9°F)

**Critical Temperature:** 288.9°C (552°F)

**Specific Gravity:** 0.8787 @ 15 C (Water = 1)

**Vapor Pressure:** 10 kPa (@ 20°C)

**Vapor Density:** 2.8 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 4.68 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil; log(oil/water) = 2.1

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether, acetone.

**Solubility:**
Miscible in alcohol, chloroform, carbon disulfide oils, carbon tetrachloride, glacial acetic acid, diethyl ether, acetone. Very slightly soluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources, incompatibles.

**Incompatibility with various substances:** Highly reactive with oxidizing agents, acids.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**
Benzene vapors + chlorine and light causes explosion. Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate. Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion. Interaction of nitryl perchlorate with benzene gave a slight explosion and flash. The solution of permanganic acid ( or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene. Peroxodisulfuric acid is a very powferful oxidant. Uncontrolled contact with benzene may cause explosion. Mixtures of peroxomonsulfuric acid with benzene explodes.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 930 mg/kg [Rat]. Acute dermal toxicity (LD50): >9400 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 10000 7 hours [Rat].

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC. MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE]. Causes damage to the following organs: blood, bone marrow, central nervous system (CNS). May cause damage to the following organs: liver, Urinary System.

**Other Toxic Effects on Humans:**
Very hazardous in case of inhalation. Hazardous in case of skin contact (irritant, permeator), of ingestion.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:**
May cause adverse reproductive effects (female fertility, Embryotoxic and/or foetotoxic in animal) and birth defects. May affect genetic material (mutagenic). May cause cancer (tumorigenic, leukemia)) Human: passes the placental barrier, detected in maternal milk.

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects: Skin: Causes skin irritation. It can be absorbed through intact skin and affect the liver, blood, metabolism,and urinary system. Eyes: Causes eye irritation. Inhalation: Causes respiratory tract and mucous membrane irritation. Can be absorbed through the lungs. May affect behavior/Central and Peripheral nervous systems (somnolence, muscle weakness, general anesthetic, and other symptoms similar to ingestion), gastrointestinal tract (nausea), blood metabolism, urinary system. Ingestion: May be harmful if swallowed. May cause gastrointestinal tract irritation including vomiting. May affect behavior/Central and Peripheral nervous systems (convulsions, seizures, tremor, irritability, initial CNS stimulation followed by depression, loss of coordination, dizziness, headache, weakness, pallor, flushing), respiration (breathlessness and chest constriction), cardiovascular system, (shallow/rapid pulse), and blood.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Benzene UNNA: 1114 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Benzene California prop. 65 (no significant risk level): Benzene: 0.007 mg/day (value) California prop. 65: This product contains the following ingredients

for which the State of California has found to cause cancer which would require a warning under the statute: Benzene Connecticut carcinogen reporting list.: Benzene Connecticut hazardous material survey.: Benzene Illinois toxic substances disclosure to employee act: Benzene Illinois chemical safety act: Benzene New York release reporting list: Benzene Rhode Island RTK hazardous substances: Benzene Pennsylvania RTK: Benzene Minnesota: Benzene Michigan critical material: Benzene Massachusetts RTK: Benzene Massachusetts spill list: Benzene New Jersey: Benzene New Jersey spill list: Benzene Louisiana spill reporting: Benzene California Director's list of Hazardous Substances: Benzene TSCA 8(b) inventory: Benzene SARA 313 toxic chemical notification and release reporting: Benzene CERCLA: Hazardous substances.: Benzene: 10 lbs. (4.536 kg)

**Other Regulations:**
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**
R11- Highly flammable. R22- Harmful if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes. R45- May cause cancer. R62- Possible risk of impaired fertility. S2- Keep out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection. S46- If swallowed, seek medical advice immediately and show this container or label. S53- Avoid exposure - obtain special instructions before use.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:35 PM

**Last Updated:** 11/01/2010 12:00 PM

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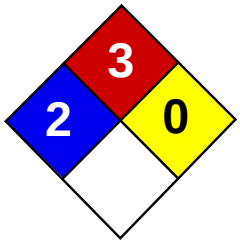


| | |
|---|---|
| Health | 2 |
| Fire | 3 |
| Reactivity | 0 |
| Personal Protection | H |

# Material Safety Data Sheet
## Ethylbenzene MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Ethylbenzene

**Catalog Codes:** SLE2044

**CAS#:** 100-41-4

**RTECS:** DA0700000

**TSCA:** TSCA 8(b) inventory: Ethylbenzene

**CI#:** Not available.

**Synonym:** Ethyl Benzene; Ethylbenzol; Phenylethane

**Chemical Name:** Ethylbenzene

**Chemical Formula:** C8H10

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:** 1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Ethylbenzene | 100-41-4 | 100 |

**Toxicological Data on Ingredients:** Ethylbenzene: ORAL (LD50): Acute: 3500 mg/kg [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

**Potential Chronic Health Effects:**
Slightly hazardous in case of skin contact (irritant, sensitizer). CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

## Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

**Skin Contact:** Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

**Serious Skin Contact:** Not available.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

**Ingestion:**
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 432°C (809.6°F)

**Flash Points:**
CLOSED CUP: 15°C (59°F). (Tagliabue.) OPEN CUP: 26.667°C (80°F) (Cleveland) (CHRIS, 2001) CLOSED CUP: 12.8 C (55 F) (Bingham et al, 2001; NIOSH, 2001) CLOSED CUP: 21 C (70 F) (NFPA)

**Flammable Limits:** LOWER: 0.8% - 1.6%UPPER: 6.7% - 7%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

**Fire Fighting Media and Instructions:**
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:**
Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. When heated to decomposition it emits acrid smoke and irritating fumes.

**Special Remarks on Explosion Hazards:** Vapors may form explosive mixtures in air.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

**Storage:**
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Sensitive to light. Store in light-resistant containers.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 100 STEL: 125 (ppm) from OSHA (PEL) [United States] TWA: 435 STEL: 545 from OSHA (PEL) [United States] TWA: 435 STEL: 545 (mg/m3) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from NIOSH [United States] TWA: 100 STEL: 125 (ppm) from ACGIH (TLV) [United States] TWA: 100 STEL: 125 (ppm) [United Kingdom (UK)] TWA: 100 STEL: 125 (ppm) [Belgium] TWA: 100 STEL: 125 (ppm) [Finland] TWA: 50 (ppm) [Norway] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Sweetish. Gasoline-like. Aromatic.

**Taste:** Not available.

**Molecular Weight:** 106.16 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 136°C (276.8°F)

**Melting Point:** -94.9 (-138.8°F)

**Critical Temperature:** 617.15°C (1142.9°F)

**Specific Gravity:** 0.867 (Water = 1)

**Vapor Pressure:** 0.9 kPa (@ 20°C)

**Vapor Density:** 3.66 (Air = 1)

**Volatility:** 100% (v/v).

**Odor Threshold:** 140 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil; log(oil/water) = 3.1

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:**
Easily soluble in diethyl ether. Very slightly soluble in cold water or practically insoluble in water. Soluble in all proportions in Ethyl alcohol. Soluble in Carbon tetrachloride, Benzene. Insoluble in Ammonia. Slightly soluble in Chloroform. Solubility in Water: 169 mg/l @ 25 deg. C.; 0.014 g/100 ml @ 15 deg. C.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ingnition sources (flames, sparks, static), incompatible materials, light

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Not considered to be corrosive for metals and glass.

**Special Remarks on Reactivity:**
Can react vigorously with oxidizing materials. Sensitive to light.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Inhalation.

**Toxicity to Animals:** Acute oral toxicity (LD50): 3500 mg/kg [Rat].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: central nervous system (CNS).

**Other Toxic Effects on Humans:**
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

**Special Remarks on Toxicity to Animals:**
Lethal Dose/Conc 50% Kill: LD50 [Rabbit] - Route: Skin; Dose: 17800 ul/kg Lowest Published Lethal Dose/Conc: LDL[Rat] - Route: Inhalation (vapor); Dose: 4000 ppm/4 H

**Special Remarks on Chronic Effects on Humans:**
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data. May cause cancer based on animals data. IARC evidence for carcinogenicity in animals is sufficient. IARC evidence of carcinogenicity in humans inadequate. May affect genetic material (mutagenic).

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects: Skin: Can cause mild skin irritation. It can be absorbed through intact skin. Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS) Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include

headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987). Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

## Section 12: Ecological Information

**Ecotoxicity:**
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Ethylbenzene UNNA: 1175 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
Connecticut hazardous material survey.: Ethylbenzene Illinois toxic substances disclosure to employee act: Ethylbenzene Illinois chemical safety act: Ethylbenzene New York release reporting list: Ethylbenzene Rhode Island RTK hazardous substances: Ethylbenzene Pennsylvania RTK: Ethylbenzene Minnesota: Ethylbenzene Massachusetts RTK: Ethylbenzene Massachusetts spill list: Ethylbenzene New Jersey: Ethylbenzene New Jersey spill list: Ethylbenzene Louisiana spill reporting: Ethylbenzene California Director's List of Hazardous Substances: Ethylbenzene TSCA 8(b) inventory: Ethylbenzene TSCA 4(a) proposed test rules: Ethylbenzene TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97 SARA 313 toxic chemical notification and release reporting: Ethylbenzene

**Other Regulations:**
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASSE D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S29- Do not empty into drains.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:**
-Manufacturer's Material Safety Data Sheet. -Fire Protection Guide to Hazardous Materials, 13th ed., National Fire Protection Association (NFPA) -Registry of Toxic Effects of Chemical Substances (RTECS) -Chemical Hazard Response Information System (CHRIS) -Hazardous Substance Data Bank (HSDB) -New Jersey Hazardous Substance Fact Sheet -Ariel Global View -Reprotext System

**Other Special Considerations:** Not available.

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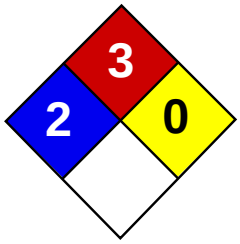



| | |
|---|---|
| Health | 2 |
| Fire | 3 |
| Reactivity | 0 |
| Personal Protection | H |

# Material Safety Data Sheet
## Toluene MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Toluene

**Catalog Codes:** SLT2857, SLT3277

**CAS#:** 108-88-3

**RTECS:** XS5250000

**TSCA:** TSCA 8(b) inventory: Toluene

**CI#:** Not available.

**Synonym:** Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol

**Chemical Name:** Toluene

**Chemical Formula:** C6-H5-CH3 or C7-H8

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:** 1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Toluene | 108-88-3 | 100 |

**Toxicological Data on Ingredients:** Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

**Skin Contact:**
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

**Ingestion:**
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 480°C (896°F)

**Flash Points:** CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).

**Flammable Limits:** LOWER: 1.1% UPPER: 7.1%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances:**
Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**
Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:**
Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide; concentrated nitric acid, sulfuric acid + nitric acid; N2O4; AgClO4; BrF3; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

**Storage:**
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States] TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 100 STEL: 150 from NIOSH [United States] TWA: 375 STEL: 560 (mg/m3) from NIOSH [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Sweet, pungent, Benzene-like.

**Taste:** Not available.

**Molecular Weight:** 92.14 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 110.6°C (231.1°F)

**Melting Point:** -95°C (-139°F)

**Critical Temperature:** 318.6°C (605.5°F)

**Specific Gravity:** 0.8636 (Water = 1)

**Vapor Pressure:** 3.8 kPa (@ 25°C)

**Vapor Density:** 3.1 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 1.6 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil; log(oil/water) = 2.7

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether, acetone.

**Solubility:**
Soluble in diethyl ether, acetone. Practically insoluble in cold water. Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide. Solubility in water: 0.561 g/l @ 25 deg. C.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources (flames, sparks, static), incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**
Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride. Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C. Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 636 mg/kg [Rat]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

**Other Toxic Effects on Humans:**
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:**
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

**Special Remarks on Chronic Effects on Humans:**
Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin. Eyes: Cauess mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abraisons. This usually resolves in 2 days. Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia, ), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite. Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation. Chronic Potential Health Effects: Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophostatemia), severe, muscle weakness and Rhabdomyolysis. Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

## Section 12: Ecological Information

**Ecotoxicity:**
Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Toluene UNNA: 1294 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene California prop. 65 (no significant risk level): Toluene: 7 mg/day (value) California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene Connecticut hazardous material survey.: Toluene Illinois

toxic substances disclosure to employee act: Toluene Illinois chemical safety act: Toluene New York release reporting list: Toluene Rhode Island RTK hazardous substances: Toluene Pennsylvania RTK: Toluene Florida: Toluene Minnesota: Toluene Michigan critical material: Toluene Massachusetts RTK: Toluene Massachusetts spill list: Toluene New Jersey: Toluene New Jersey spill list: Toluene Louisiana spill reporting: Toluene California Director's List of Hazardous Substances.: Toluene TSCA 8(b) inventory: Toluene TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/0/92 SARA 313 toxic chemical notification and release reporting: Toluene CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 kg)

**Other Regulations:**
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**
R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S25- Avoid contact with eyes. S29- Do not empty into drains. S33- Take precautionary measures against static discharges.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

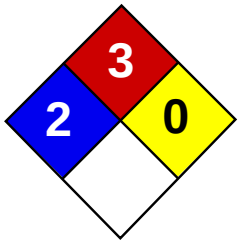
## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:30 PM

**Last Updated:** 11/01/2010 12:00 PM





# Material Safety Data Sheet
## p-Xylene MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** p-Xylene

**Catalog Codes:** SLX1120

**CAS#:** 106-42-3

**RTECS:** ZE2625000

**TSCA:** TSCA 8(b) inventory: p-Xylene

**CI#:** Not applicable.

**Synonym:** p-Methyltoluene

**Chemical Name:** 1,4-Dimethylbenzene

**Chemical Formula:** C6H4(CH3)2

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| {p-}Xylene | 106-42-3 | 100 |

**Toxicological Data on Ingredients:** p-Xylene: ORAL (LD50): Acute: 5000 mg/kg [Rat.]. DERMAL (LD50): Acute: 12400 mg/kg [Rabbit.]. VAPOR (LC50): Acute: 4550 ppm 4 hour(s) [Rat].

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Very hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**
Hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to blood, kidneys, the nervous system, liver. Repeated or prolonged exposure to the substance can produce target organs damage.

## Section 4: First Aid Measures

**Eye Contact:** Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 527°C (980.6°F)

**Flash Points:** CLOSED CUP: 25°C (77°F). OPEN CUP: 28.9°C (84°F) (Cleveland).

**Flammable Limits:** LOWER: 1.1% UPPER: 7%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**
Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:**
Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition it emits acrid smoke and irritating fumes.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as oxidizing agents.

**Storage:**
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) TWA: 434 STEL: 651 (mg/m3) from ACGIHConsult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (Liquid.)

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 106.17 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 138°C (280.4°F)

**Melting Point:** 12°C (53.6°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 0.86 (Water = 1)

**Vapor Pressure:** 9 mm of Hg (@ 20°C)

**Vapor Density:** 3.7 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.62 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, methanol, diethyl ether.

**Solubility:**
Easily soluble in methanol, diethyl ether. Insoluble in cold water, hot water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Eye contact.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 5000 mg/kg [Rat.]. Acute dermal toxicity (LD50): 12400 mg/kg [Rabbit.]. Acute toxicity of the vapor (LC50): 4550 ppm 4 hour(s) [Rat].

**Chronic Effects on Humans:** The substance is toxic to blood, kidneys, the nervous system, liver.

**Other Toxic Effects on Humans:**
Very hazardous in case of skin contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:**
0347 Animal: embryotoxic, foetotoxic, passes through the placental barrier. 0900 Detected in maternal milk in human. Narcotic effect; may cause nervous system disturbances.

**Special Remarks on other Toxic Effects on Humans:** Material is irritating to mucous membranes and upper respiratory tract.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** Class 3: Flammable liquid.

**Identification:** : Xylene : UN1307 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
Pennsylvania RTK: p-Xylene Florida: p-Xylene Massachusetts RTK: p-Xylene New Jersey: p-Xylene TSCA 8(b) inventory: p-Xylene SARA 313 toxic chemical notification and release reporting: p-Xylene CERCLA: Hazardous substances.: p-Xylene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):**
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**
R10- Flammable. R38- Irritating to skin. R41- Risk of serious damage to eyes. R48/20- Harmful: danger of serious damage to health by prolonged exposure through inhalation.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:**
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la SantÃ© et de la SÃ©curitÃ© du Travail du QuÃ©bec. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du rÃ¨glement sur le transport des marchandises dangeureuses au canada. Centre de conformitÃ© internatinal LtÃ©e. 1986.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:33 PM

**Last Updated:** 11/01/2010 12:00 PM

# MATERIAL SAFETY DATA SHEET

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT**

**Product Name:** **GASOLINE, UNLEADED AUTOMOTIVE**
**Product Description:** Hydrocarbons and Additives
**Product Code:** 123455-20, 9700, 977032, 977217, 977306, 977360, 977371, 977381, 977445, 977562, 977767, 977920, 979533, 97A039, 97A065, 97A078, 97A087, 97A102, 97A108, 97A146, 97A147, 97A152, 97A193, 97A200, 97A240, 97A266, 97A273, 97A290, 97A305, 97A316, 97A317, 97A328, 97A347, 97A380, 97A404, 97A424, 97A431, 97A441, 97A514, 97A556, 97A557, 97A613, 97A634, 97A653, 97A655, 97A659, 97A686, 97A696, 97A703, 97A712, 97A726, 97A736, 97A746, 97A767, 97A794, 97A798, 97A827, 97A848, 97A851, 97A876, 97A883, 97A907, 97A934, 97A948, 97A949, 97A960, 97A983, 97A989, 97AV99, 97AW00, 97AW01, 97AW38, 97AZ87, 97AZ88, 97AZ89, 97AZ90, 97AZ91, 97AZ92, 97AZ93, 97AZ94, 97AZ95, 97AZ96, 97AZ97, 97AZ98, 97AZ99, 97BA11, 97BA12, 97BA13, 97BA14, 97BA15, 97BA16, 97BA67, 97BA68, 97BA69, 97BA70, 97BE24, 97BE25, 97BE26, 97BE27, 97BE28, 97BE29, 97BE30, 97BE31, 97BE32, 97BE33, 97BE34, 97BE35, 97BE36, 97BE37, 97BE38, 97BE39, 97BN13, 97BN50, 97BP69, 97BP70, 97BP71, 97BR15, 97BR16, 97BR22, 97BR23, 97BR24, 97BR30, 97BR43, 97C070, 97C072, 97C075, 97C110, 97C112, 97C113, 97C118, 97C127, 97C140, 97C148, 97C166, 97C417, 97C558, 97C576, 97C632, 97C702, 97C731, 97C759, 97C770, 97C782, 97C794, 97C870, 97C917, 97D130, 97D228, 97E002, 97E010, 97E041, 97E065, 97E087, 97E103, 97E104, 97E11, 97E112, 97E113, 97E170, 97E171, 97E196, 97E197, 97E259, 97E260, 97E304, 97E305, 97E347, 97E42, 97E532, 97E564, 97E581, 97E595, 97E606, 97E611, 97E619, 97E649, 97E655, 97E66, 97E682, 97E749, 97E860, 97E88, 97E999, 97F005, 97F020, 97F030, 97F054, 97F312, 97F344, 97F952, 97M190, 97M191, 97M192, 97M193, 97M194, 97M195, 97M229, 97M230, 97M232, 97N832, 97N844, 97N848, 97N861, 97N873, 97N877, 97N879, 97N891, 97N895, 97N913, 97N917, 97N921, 97N941, 97N942, 97N954, 97Q303, 97Q763, 97Q781, 97Q782, 97R368, 97S760, 97U927, 97V321, 97V323, 97V325, 97V326, 97X113, 97X114, 97X131, 97X861, EMGF20
**Intended Use:** Fuel, Gasoline

**COMPANY IDENTIFICATION**

**Supplier:** **EXXON MOBIL CORPORATION**
3225 GALLOWS RD.
FAIRFAX, VA. 22037 USA

| | |
|---|---|
| **24 Hour Health Emergency** | 609-737-4411 |
| **Transportation Emergency Phone** | 800-424-9300 |
| **ExxonMobil Transportation No.** | 281-834-3296 |
| **Product Technical Information** | 800-662-4525, 800-947-9147 |
| **MSDS Internet Address** | http://www.exxon.com, http://www.mobil.com |

## SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

**Reportable Hazardous Substance(s) or Complex Substance(s)**

| Name | CAS# | Concentration* |
|---|---|---|
| ETHYL ALCOHOL | 64-17-5 | < 11% |
| Gasoline | 86290-81-5 | 89 - 100% |

**Hazardous Constituent(s) Contained in Complex Substance(s)**

| Name | CAS# | Concentration* |
|---|---|---|
| BENZENE | 71-43-2 | 0.1 - 5% |
| ETHYL BENZENE | 100-41-4 | 1 - 5% |
| N-HEXANE | 110-54-3 | 1 - 5% |
| NAPHTHALENE | 91-20-3 | <1% |
| PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE) | 95-63-6 | 1 - 5% |
| Toluene | 108-88-3 | 5 - 10% |
| TRIMETHYL BENZENE | 25551-13-7 | 1 - 5% |
| XYLENES | 1330-20-7 | 5 - 10% |

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

NOTE: The concentration of the components shown above may vary substantially. In certain countries, benzene content may be limited to lower levels. Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present. Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane, and isopentane. The reportable component percentages, shown in the composition/information on ingredients section, are based on API's evaluation of a typical gasoline mixture.

## SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

### POTENTIAL PHYSICAL / CHEMICAL EFFECTS

Extremely flammable. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.

### POTENTIAL HEALTH EFFECTS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anemia and to the later development of acute myelogenous leukemia (AML).

**Target Organs:** Lung | Skin |

### ENVIRONMENTAL HAZARDS

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

| | | | | | | |
|---|---|---|---|---|---|---|
| **NFPA Hazard ID:** | Health: | 1 | Flammability: | 3 | Reactivity: | 0 |
| **HMIS Hazard ID:** | Health: | 1* | Flammability: | 3 | Reactivity: | 0 |

**NOTE:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

## SECTION 4 FIRST AID MEASURES

### Inhalation

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use

adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

**SKIN CONTACT**

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

**EYE CONTACT**

Flush thoroughly with water. If irritation occurs, get medical assistance.

**Ingestion**

Seek immediate medical attention. Do not induce vomiting.

**NOTE TO PHYSICIAN**

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

**PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE**

Benzene- Individuals with liver disease may be more susceptible to toxic effects.

## SECTION 5 FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA**

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight Streams of Water

**FIRE FIGHTING**

**Fire Fighting Instructions:** Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Extremely Flammable. Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

**Hazardous Combustion Products:** Smoke, Fume, Aldehydes, Sulfur Oxides, Incomplete combustion products, Oxides of carbon

**FLAMMABILITY PROPERTIES**

**Flash Point [Method]:** <-40C (-40F) [ ASTM D-56]
**Flammable Limits (Approximate volume % in air):** LEL: 1.4 UEL: 7.6
**Autoignition Temperature:** >250°C (482°F)

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**NOTIFICATION PROCEDURES**

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

**PROTECTIVE MEASURES**

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

**SPILL MANAGEMENT**

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces. Recover by pumping or with suitable absorbent.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

**ENVIRONMENTAL PRECAUTIONS**

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

## SECTION 7 HANDLING AND STORAGE

**HANDLING**

Avoid breathing mists or vapors. Avoid contact with skin. Use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or grounding procedures. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put fuel into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapors and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

**Static Accumulator:** This material is a static accumulator.

## STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be grounded and bonded. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE LIMIT VALUES

**Exposure limits/standards (Note: Exposure limits are not additive)**

| Source | Form | Limit / Standard | | | NOTE | Source |
|---|---|---|---|---|---|---|
| BENZENE | | OSHA Action level | 0.5 ppm | | N/A | OSHA Sp.Reg. |
| BENZENE | | STEL | 5 ppm | | N/A | OSHA Sp.Reg. |
| BENZENE | | TWA | 1 ppm | | N/A | OSHA Sp.Reg. |
| BENZENE | | STEL | 2.5 ppm | | Skin | ACGIH |
| BENZENE | | TWA | 0.5 ppm | | Skin | ACGIH |
| ETHYL ALCOHOL | | TWA | 1900 mg/m3 | 1000 ppm | N/A | OSHA Z1 |
| ETHYL ALCOHOL | | STEL | 1000 ppm | | N/A | ACGIH |
| ETHYL BENZENE | | TWA | 435 mg/m3 | 100 ppm | N/A | OSHA Z1 |
| ETHYL BENZENE | | STEL | 125 ppm | | N/A | ACGIH |
| ETHYL BENZENE | | TWA | 100 ppm | | N/A | ACGIH |
| Gasoline | | STEL | 200 ppm | | N/A | ExxonMobil |
| Gasoline | | TWA | 100 ppm | | N/A | ExxonMobil |
| Gasoline | | STEL | 500 ppm | | N/A | ACGIH |
| Gasoline | | TWA | 300 ppm | | N/A | ACGIH |
| N-HEXANE | | TWA | 1800 mg/m3 | 500 ppm | N/A | OSHA Z1 |
| N-HEXANE | | TWA | 50 ppm | | Skin | ACGIH |
| NAPHTHALENE | | TWA | 50 mg/m3 | 10 ppm | N/A | OSHA Z1 |
| NAPHTHALENE | | STEL | 15 ppm | | Skin | ACGIH |
| NAPHTHALENE | | TWA | 10 ppm | | Skin | ACGIH |
| PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE) | | TWA | 25 ppm | | N/A | ACGIH |
| Toluene | | Ceiling | 300 ppm | | N/A | OSHA Z2 |
| Toluene | | Maximum concentration | 500 ppm | | N/A | OSHA Z2 |
| Toluene | | TWA | 200 ppm | | N/A | OSHA Z2 |
| Toluene | | TWA | 20 ppm | | N/A | ACGIH |
| TRIMETHYL BENZENE | | TWA | 25 ppm | | N/A | ACGIH |
| XYLENES | | TWA | 435 mg/m3 | 100 ppm | N/A | OSHA Z1 |
| XYLENES | | STEL | 150 ppm | | N/A | ACGIH |
| XYLENES | | TWA | 100 ppm | | N/A | ACGIH |

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

**ENGINEERING CONTROLS**

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:
Use explosion-proof ventilation equipment to stay below exposure limits.

**PERSONAL PROTECTION**

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

**ENVIRONMENTAL CONTROLS**
See Sections 6, 7, 12, 13.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.**

**GENERAL INFORMATION**

**Physical State:** Liquid
**Color:** Clear (May Be Dyed)
**Odor:** Petroleum/Solvent
**Odor Threshold:** N/D

**IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION**

**Relative Density (at 15 C):** 0.74
**Density (at 15 ºC):** 720 kg/m³ (6.01 lbs/gal, 0.72 kg/dm³) - 758 kg/m³ (6.33 lbs/gal, 0.76 kg/dm³)
**Flash Point [Method]:** <-40C (-40F) [ ASTM D-56]
**Flammable Limits (Approximate volume % in air):** LEL: 1.4 UEL: 7.6
**Autoignition Temperature:** >250°C (482°F)
**Boiling Point / Range:** > 20C (68F)
**Vapor Density (Air = 1):** 3 at 101 kPa
**Vapor Pressure:** > 26.6 kPa (200 mm Hg) at 20 C
**Evaporation Rate (N-Butyl Acetate = 1):** > 10
**pH:** N/A
**Log Pow (n-Octanol/Water Partition Coefficient):** > 3
**Solubility in Water:** Negligible
**Viscosity:** <1 cSt (1 mm²/sec) at 40 C
**Oxidizing Properties:** See Hazards Identification Section.

**OTHER INFORMATION**

**Freezing Point:** N/D
**Melting Point:** N/A

## SECTION 10 STABILITY AND REACTIVITY

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Avoid heat, sparks, open flames and other ignition sources.

**MATERIALS TO AVOID:** Halogens, Strong Acids, Alkalies, Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

**ACUTE TOXICITY**

| Route of Exposure | Conclusion / Remarks |
|---|---|
| **Inhalation** | |
| Toxicity (Rat): LC50 > 5000 mg/m³ | Minimally Toxic. Based on test data for structurally similar materials. |
| Irritation: No end point data. | Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components. |
| | |

| | |
|---|---|
| **Ingestion** | |
| Toxicity (Rat): LD50 > 2000 mg/kg | Minimally Toxic. Based on test data for structurally similar materials. |
| | |
| **Skin** | |
| Toxicity (Rabbit): LD50 > 2000 mg/kg | Minimally Toxic. Based on test data for structurally similar materials. |
| Irritation: No end point data. | Moderately irritating to skin with prolonged exposure. Based on test data for structurally similar materials. |
| | |
| **Eye** | |
| Irritation: Data available. | May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. |

**CHRONIC/OTHER EFFECTS**

**For the product itself:**

Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapors in the same boiling range as this product can produce adverse kidney effects in male rats. However, these effects were not observed in similar studies with female rats, male and female mice, or in limited studies with other animal species. Additionally, in a number of human studies, there was no clinical evidence of such effects at normal occupational levels. In 1991, The U.S. EPA determined that the male rat kidney is not useful for assessing human risk.
Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.
Gasoline unleaded: Caused cancer in animal tests. Chronic inhalation studies resulted in liver tumors in female mice and kidney tumors in male rats. Neither result considered significant for human health risk assessment by the United States EPA and others. Did not cause mutations In Vitro or In Vivo. Negative in inhalation developmental studies and reproductive tox studies.Inhalation of high concentrations in animals resulted in reversible central nervous system depression, but no persistent toxic effect on the nervous system. Non-sensitizing in test animals. Caused nerve damage in humans from abusive use (sniffing).

**Contains:**

BENZENE: Caused cancer (leukemia), damage to the blood-producing system, and serious blood disorders from prolonged, high exposure based on human epidemiology studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus in laboratory animal studies.
ETHANOL: Prolonged or repeated exposure to high concentrations of ethanol vapor or overexposure by ingestion may produce adverse effects to brain, kidney, liver, and reproductive organs, birth defects in offspring, and developmental toxicity in offspring.
NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.
N-HEXANE: Prolonged and/or repeated exposures to n-Hexane can cause progressive and potentially irreversible damage to the peripheral nervous system (e.g. fingers, feet, arms, legs, etc.). Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system. n-Hexane has been shown to cause testicular damage at high doses in male rats. The relevance of this effect for humans is unknown.
TOLUENE : Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects.
TRIMETHYLBENZENE: Long-term inhalation exposure of trimethylbenzene caused effects to the blood in

laboratory animals.
ETHYLBENZENE: Caused cancer in laboratory animal studies. The relevance of these findings to humans is uncertain.

Additional information is available by request.

**The following ingredients are cited on the lists below:**

| Chemical Name | CAS Number | List Citations |
|---|---|---|
| BENZENE | 71-43-2 | 1, 3, 6 |
| ETHYL BENZENE | 100-41-4 | 5 |
| Gasoline | 86290-81-5 | 5 |
| NAPHTHALENE | 91-20-3 | 2, 5 |

--REGULATORY LISTS SEARCHED--

1 = NTP CARC
2 = NTP SUS
3 = IARC 1
4 = IARC 2A
5 = IARC 2B
6 = OSHA CARC

## SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

**ECOTOXICITY**

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

**MOBILITY**

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

**PERSISTENCE AND DEGRADABILITY**

**Biodegradation:**

Majority of components -- Expected to be inherently biodegradable

**Atmospheric Oxidation:**

More volatile component -- Expected to degrade rapidly in air

**BIOACCUMULATION POTENTIAL**

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

## SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

**DISPOSAL RECOMMENDATIONS**

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

**REGULATORY DISPOSAL INFORMATION**

RCRA Information: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP). Potential RCRA characteristics: IGNITABILITY. TCLP (BENZENE)

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

## SECTION 14 TRANSPORT INFORMATION

**LAND (DOT)**

**Proper Shipping Name:** Gasoline
**Hazard Class & Division:** 3
**ID Number:** 1203
**Packing Group:** II
**Marine Pollutant:** Yes
**ERG Number:** 128
**Label(s):** 3
**Transport Document Name:** UN1203, GASOLINE, 3, PG II, MARINE POLLUTANT

**LAND (TDG)**

**Proper Shipping Name:** Gasoline
**Hazard Class & Division:** 3
**UN Number:** 1203
**Packing Group:** II
**Special Provisions:** 17

**SEA (IMDG)**

**Proper Shipping Name:** MOTOR SPIRIT or GASOLINE or PETROL
**Hazard Class & Division:** 3
**EMS Number:** F-E, S-E
**UN Number:** 1203
**Packing Group:** II
**Marine Pollutant:** Yes
**Label(s):** 3
**Transport Document Name:** UN1203, MOTOR SPIRIT or GASOLINE or PETROL, 3, PG II, (-40°C c.c.), MARINE POLLUTANT

**AIR (IATA)**

**Proper Shipping Name:** MOTOR SPIRIT or GASOLINE or PETROL
**Hazard Class & Division:** 3

**UN Number:** 1203
**Packing Group:** II
**Label(s) / Mark(s):** 3
**Transport Document Name:** UN1203, GASOLINE, 3, PG II

## SECTION 15 REGULATORY INFORMATION

**OSHA HAZARD COMMUNICATION STANDARD:** When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

**NATIONAL CHEMICAL INVENTORY LISTING:** AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

**EPCRA:** This material contains no extremely hazardous substances.

**CERCLA:** This material is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Contact local authorities to determine if other reporting requirements apply.

**SARA (311/312) REPORTABLE HAZARD CATEGORIES:** Fire. Immediate Health. Delayed Health.

**SARA (313) TOXIC RELEASE INVENTORY:**

| Chemical Name | CAS Number | Typical Value |
|---|---|---|
| PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE) | 95-63-6 | 1 - 5% |
| BENZENE | 71-43-2 | 0.1 - 5% |
| ETHYL BENZENE | 100-41-4 | 1 - 5% |
| N-HEXANE | 110-54-3 | 1 - 5% |
| NAPHTHALENE | 91-20-3 | <1% |
| Toluene | 108-88-3 | 5 - 10% |
| XYLENES | 1330-20-7 | 5 - 10% |

**The following ingredients are cited on the lists below:**

| Chemical Name | CAS Number | List Citations |
|---|---|---|
| BENZENE | 71-43-2 | 1, 2, 4, 10, 11, 13, 15, 16, 17, 18, 19 |
| ETHYL ALCOHOL | 64-17-5 | 1, 4, 13, 17, 18, 19 |
| ETHYL BENZENE | 100-41-4 | 1, 4, 10, 13, 16, 17, 18, 19 |
| Gasoline | 86290-81-5 | 1, 17, 18 |
| N-HEXANE | 110-54-3 | 1, 4, 13, 16, 17, 18, 19 |
| NAPHTHALENE | 91-20-3 | 1, 4, 5, 9, 10 |
| PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE) | 95-63-6 | 1, 13, 16, 17, 18, 19 |
| Toluene | 108-88-3 | 1, 4, 11, 13, 15, 16, 17, 18, 19 |
| TRIMETHYL BENZENE | 25551-13-7 | 1, 13, 16, 17, 18, 19 |
| XYLENES | 1330-20-7 | 1, 4, 5, 9, 13, 15, 17, 18, 19 |

--REGULATORY LISTS SEARCHED--

| | | | |
|---|---|---|---|
| 1 = ACGIH ALL | 6 = TSCA 5a2 | 11 = CA P65 REPRO | 16 = MN RTK |
| 2 = ACGIH A1 | 7 = TSCA 5e | 12 = CA RTK | 17 = NJ RTK |
| 3 = ACGIH A2 | 8 = TSCA 6 | 13 = IL RTK | 18 = PA RTK |
| 4 = OSHA Z | 9 = TSCA 12b | 14 = LA RTK | 19 = RI RTK |
| 5 = TSCA 4 | 10 = CA P65 CARC | 15 = MI 293 | |

Code key: CARC=Carcinogen; REPRO=Reproductive

## SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**
Revision Changes:
Section 01: Product Code was modified.
Section 14: Proper Shipping Name was modified.
Section 15: SARA (313) TOXIC RELEASE INVENTORY - Table was modified.
Section 09: Oxidizing Properties was modified.
Section 09: Density - Header was added.
Section 09: Density kg/m3(lbs/gal) was added.
**THIS MSDS COVERS THE FOLLOWING MATERIALS:** ESSO EXTRA MIDGRADE UNLEADED | ESSO MIDGRADE UNLEADED | ESSO PREMIUM UNLEADED | ESSO REGULAR UNLEADED | ESSO SUPER PREMIUM UNLEADED | EXXON MIDGRADE UNLEADED | EXXON PREMIUM UNLEADED | EXXON REGULAR UNLEADED | Gasoline | INDOLENE GASOLINE | MIDGRADE UNLEADED | MOBIL EXTRA UNLEADED | MOBIL REGULAR UNLEADED | MOBIL SPECIAL UNLEADED | MOBIL SUPER UNLEADED | PREMIUM UNLEADED | REGULAR UNLEADED | UNLEADED GASOLINE

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**PRECAUTIONARY LABEL TEXT:**
**Contains:** BENZENE, Gasoline
DANGER!
**HEALTH HAZARDS**
Irritating to skin. If swallowed, may be aspirated and cause lung damage. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anemia and to the later development of acute myelogenous leukemia (AML).
**Target Organs:** Lung | Skin |

**PHYSICAL HAZARDS**
Extremely flammable. Material can accumulate static charges which may cause an incendiary electrical discharge. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited.

**PRECAUTIONS**
Avoid breathing mists or vapors. Avoid contact with skin. Use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or grounding procedures.

**FIRST AID**
**Inhalation:** Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

**Eye:** Flush thoroughly with water. If irritation occurs, get medical assistance.

**Oral:** Seek immediate medical attention. Do not induce vomiting.

**Skin:** Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

**FIRE FIGHTING MEDIA**
Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

**SPILL/LEAK**
**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Recover by pumping or with suitable absorbent.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product.

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Internal Use Only
MHC: 1A, 0, 0, 0, 3, 1 PPEC: CF

DGN: 2000316XUS (1011203)

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