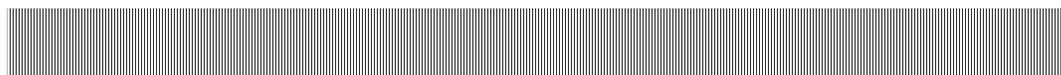


Teutonia Buena Vista, LLC

Brownfield Cleanup Program Supplemental Remedial Investigation Work Plan Former Teutonia Hall Site

(BCP Site C360085)

July 2007



Report Prepared By:

Malcolm Pirnie, Inc.

50 Fountain Plaza
Suite 600
Buffalo, NY 14202
716-667-0900

5633-002

**MALCOLM
PIRNIÉ**

Contents

1. Introduction	1-1
1.1. Site History.....	1-2
1.2. Previous Investigations.....	1-2
1.2.1. Summary.....	1-6
1.3. Site Development Plan.....	1-7
2. Purpose	2-1
3. Scope of Work	3-1
3.1. Surface Soil Sampling Program.....	3-1
3.2. Subsurface Investigation.....	3-2
3.2.1. Soil Boring Program.....	3-2
3.2.2. Soil Characterization.....	3-2
3.2.3. Groundwater Characterization.....	3-2
3.2.3.1. Monitoring Well Installation.....	3-3
3.2.3.2. Groundwater Sampling.....	3-3
3.3. Air Quality Characterization.....	3-3
3.3.1. Subsurface Soil Vapor Sampling.....	3-4
3.4. Qualitative Risk Assessment.....	3-4
3.5. Planned UST Removal.....	3-5
3.5.1. Soil Excavation Sampling.....	3-5
3.5.2. Backfilling.....	3-5
4. Quality Assurance/Quality Control (QA/QC)	4-1
4.1. Analytical Methods.....	4-1
4.2. Laboratory.....	4-1
4.3. Data Submittal.....	4-1
4.4. Data Usability Summary Reports.....	4-1
4.5. Health and Safety.....	4-2
5. Project Organization	5-1
6. Reporting	6-1
7. Project Schedule	7-1
8. References	8-1



List of Tables

Table No.	Description	Follows Page
3-1	Analytical Program Summary	3-1
3-2	TO015 Target Compounds, RLs	3-4

List of Figures

Figure No.	Description	Follows Page
1-1	Vicinity Map	1-1
1-2	Site Location	1-1
1-3	Property Outline	1-1
3-1	Proposed Sample Locations	3-2
7-1	Schedule of Planned Remedial Investigation Activities	7-1

Appendices

- A. Site Specific Health and Safety Plan

1. Introduction

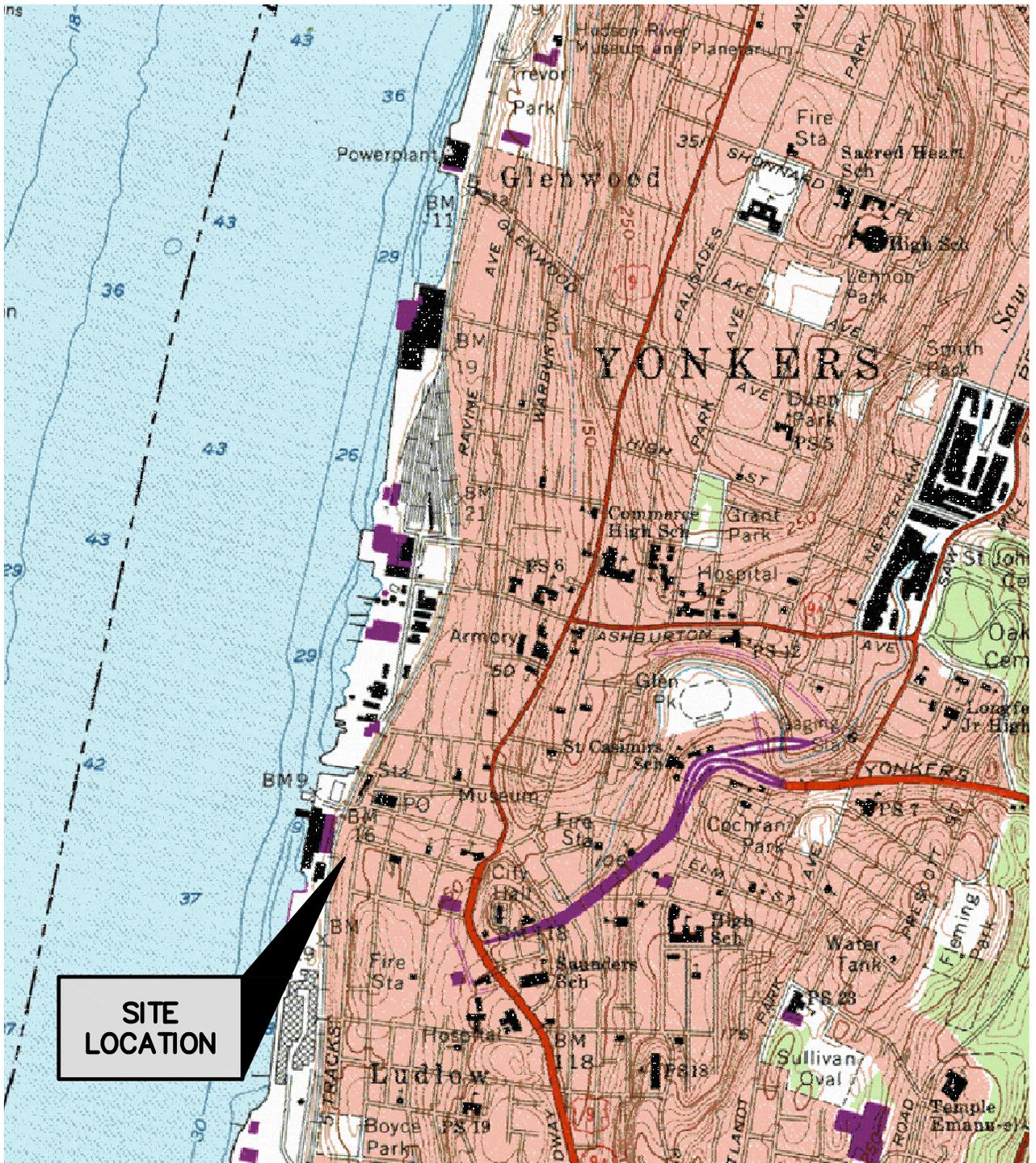
As shown on Figures 1-1, 1-2, and 1-3, the Former Teutonia Hall Site (Site) encompasses several contiguous properties located on the west side of Buena Vista Avenue in the City of Yonkers, New York. The site which is located approximately 100-200 feet south of the intersection of Buena Vista and Hudson Avenue consists of five adjoining parcels that have been developed over a period of time. The existing building structures that currently occupy the Site can generally be characterized as multi-story brick and concrete building structures identified as #41, 45 47, 51 and 53. The Site is bounded to the north and south by vacant and commercial building structures, and is flanked along the east and west boundaries by public thoroughfares.

In August 2005, an application to admit the parcels designated #41to51 into the New York State Brownfield Cleanup Program (BCP) was submitted to the New York State Department of Environmental Conservation (NYSDEC) by representatives of the Urban Group, LLC. Subsequent to NYSDEC review, the BCP application was accepted and the properties admitted into the Brownfield Cleanup Program as Site #C360085. A Brownfield Cleanup Agreement stipulating investigative and remedial considerations to be implemented for the Site properties was executed during November 2005 between Urban Group, LLC and NYSDEC. Urban Group, LLC, under contract with Ecosystems Strategies, Inc., prepared and implemented a work plan for investigation of parcels 41 to 51. A Site Investigation Report was submitted to the NYSDEC in December 2006.

Following a transfer of site ownership in October 2006 to new volunteers Teutonia Buena Vista, LLC and Buena Vista 53, LLC (collectively “Volunteer”), the original Brownfield Cleanup Agreement was amended to assign responsibility and obligations of the BCP process to the new Volunteer. In addition, by virtue of an application to admit the adjoining property located at #53-55 Buena Vista Avenue into the BCP, the Department agreed to amend the original BCP Cleanup Agreement during November 2006. Therefore, the parcels identified as # 41-55 and known as the Former Teutonia Hall Site are subject to the amended BCP Agreement.

The Volunteer plans to redevelop the Site for future residential use and associated parking. Malcolm Pirnie, Inc. (Malcolm Pirnie) has prepared this Supplemental Remedial Investigation Work Plan (SRIWP) for a supplemental investigation of the Site in accordance with New York State Department of Environmental Conservation (NYSDEC) BCP requirements.

XREFS: IMAGES:F:\Projects\5633002\CADD\Image-02.tif
 User: WELSHANS Spec: PIRNIE STANDARD File: F:\Projects\5633002\CADD\5633F005.DWG Scale: 1:1 Date: 05/11/2007 Time: 13:06 Layout: Figure 1-1



**SITE
 LOCATION**

PROJECT NO. 5633-002

**MALCOLM
 PIRNIE**

YONKERS, NEW YORK
 FORMER TEUTONIA HALL SITE
 41 TO 55 BUENA VISTA AVE.

VICINITY
 MAP

MALCOLM PIRNIE, INC.

MAY 2007
 FIGURE 1-1



PROJECT NO. 5633-002

**MALCOLM
PIRNIE**

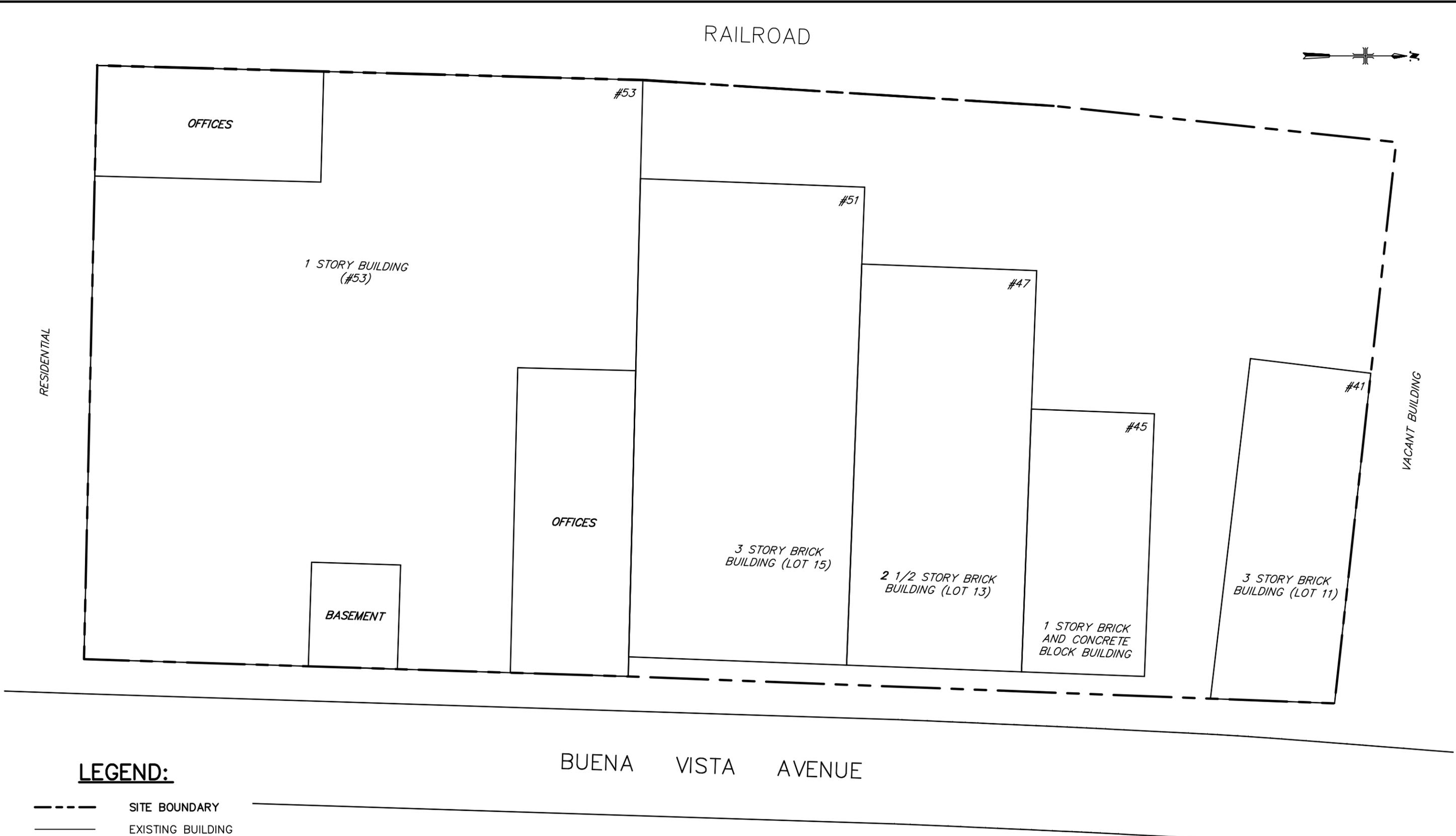
YONKERS, NEW YORK
FORMER TEUTONIA HALL SITE
41 TO 55 BUENA VISTA AVE.

SITE
LOCATION

MALCOLM PIRNIE, INC.

MAY 2007
FIGURE 1-2

XREFS: F:\Projects\5633002\CADD\XREF\B-V_AVE-GSP.dwg F:\Projects\5633002\CADD\XREF\11x17-BOR.dwg IMAGES: None
User: WELSHANS Spec: PIRNIE STANDARD File: F:\Projects\5633002\CADD\5633F003.DWG Scale: 1:1 Date: 05/11/2007 Time: 13:12 Layout: FIG 1-3



PROJECT NO. 5633-002



YONKERS, NEW YORK
FORMER TEUTONIA HALL SITE
41 TO 55 BUENA VISTA AVE.

PROPERTY OUTLINE
REMEDIAL INVESTIGATION

MALCOLM PIRNIE, INC.
MAY 2007
FIGURE 1-3

1.1. Site History

Currently, the Site is situated on approximately 0.75-acres of land located in the City of Yonkers, Westchester County, New York. The properties or parcels that comprise the BCP Area planned for redevelopment are shown on Figure 1-3 and encompass the entire Site. The Site is located approximately 500 feet east of the south-flowing Hudson River and is currently bounded to the north by a vacant building, to the south by residential property, to the east by Buena Vista Avenue and to the west by the active Metro North/Amtrak railroad line

A variety of light industrial commercial enterprises and residential buildings have occupied the property(ies) currently scheduled for investigation. Historic development of these parcels included a variety of establishments that may have impacted site media. The business ventures included: clothing, jewelry and toy manufacturing, dry cleaning, dental office facilities, warehouse storage and auto repair/parts distribution.

1.2. Previous Investigations

The following is a general summary of previous environmental investigations performed at the Site. Information for this summary was obtained from copies of reports, or portions of reports, made available by representatives of the Volunteer. This summary is intended to provide a general idea of the previous and current Site conditions and should not be considered a complete presentation of past environmental activities at the Site. Figure 3-1 illustrates a compilation of borehole, soil gas and groundwater sampling locations advanced during the investigations discussed below.

January 2005 – Working on behalf of S&B Environmental LLC, the consulting firm of Ecosystems Strategies, Inc. (ESI) was contracted to perform a Combined Phase I and II Environmental Site Assessment (ESA) at the Former Teutonia Hall BCP Site. Results of the Phase I Assessment and subsequent investigation were summarized in the January 2005 report. The report identified several environmental concerns or conditions that included:

- Two (2) inactive above ground fuel-oil storage tanks (ASTs) are encapsulated in vaults located in the basements of the buildings at 45 and 51 Buena Vista Avenue. The approximate volume of the tanks when filled is 3,000 and 1,000 gallons, respectively.
- A 55-gallon drum containing a petroleum fuel product was found in addition to the 1,000 gallon tank in the #51 property building.
- A cursory inspection identified potential asbestos containing materials and lead based paint in the 41-51 Buena Vista Avenue properties.
- A floor drainage system was identified in the basement of the 47 property.

Based on a review of historic Sanborn maps and documented on-site work practices, a limited Phase II subsurface investigation was performed during January 2005 to better characterize Site environmental conditions.

Subsequent to completion of the Phase I ESA, a subsurface drilling, and environmental media sampling program was completed at the # 41-51 Parcels of the Teutonia Hall Site. The purpose of the sampling program was to characterize the physical and chemical properties of the shallow site overburden unit. The sampling program entailed the collection of samples from borings, surface soil/sediment and soil gas samples.

A total of 8 borings designated HB-1 through HB-8 were advanced from ground surface to a maximum depth of 10 feet below ground surface (bgs). Selected soil samples were collected based on photo-ionization detector (PID) screening results coupled with visual and olfactory observations. Soil/sediment samples G-1 and G-2 were collected adjacent to the AST in Building 51 and from the floor drain in Building #47, respectively. Soil samples were submitted for Volatile Organic Compounds (VOCs), selected Semi-Volatile Organic Compound analytes (PAHs), and RCRA metals. Three soil gas samples identified as HB-2 SG, HB-3 SG and HB-5 SG were analyzed for VOCs by EPA Method TO-14A.

Analytical results for soil and sediment samples identified elevated concentrations of PAHs and selected metals above NYS TAGM 4046 guidance criteria. More specifically, benzo(k)fluoranthene (PAH) was detected at the G-1 sample location and elevated levels of arsenic, cadmium, chromium lead and mercury were detected at borehole locations HB-1 (0-2') and HB-2 (0-2') and in the sediment sample G-2. The highest concentrations of RCRA metals were detected at the G-2 floor drain sample.

Analytical results determined for soil gas samples identified a very low concentration (1.1 ppb) of toluene in the sample collected at HB-5 SG.

January 2005 Data Summary

- Overburden unit consists of Fill (0-4') overlying loose brown-red sand, fine-med. grain with trace clay. Saturated conditions >10' bgs
- Elevated concentrations exceeding NYSDEC regulatory guidelines for selected metals (i.e. chromium and mercury) were detected in soil/sediment samples collected at 0-2' bgs interval and in the floor drain sediment collected in building #47.
- Asbestos containing materials identified in Site building materials.

June 2005 – During June 2005, a supplemental soil gas sampling program was completed by ESI at the Teutonia Hall site to better delineate areas of suspected contamination and characterize soil gas within the shallow overburden unit. A total of 8 soil gas samples

designated 2SG-1 through 2SG-8 were collected from small diameter borings advanced within the confines of the on-site buildings and submitted for VOC analysis by EPA Method TO-14A.

Analysis of the soil gas samples detected concentrations of selected VOCs associated with petroleum and chlorinated solvents generally throughout the entire site (most notably tetrachloroethylene or PCE). However, the greatest concentrations of PCE and trichloroethylene (TCE) were identified in the sub-slab soil gas samples collected below the buildings located on parcels #47 and #51.

June 2005 Data Summary

- Multiple VOCs associated with BTEX and chlorinated solvent compounds were detected in soil gas samples throughout the entire site;
- Elevated concentrations of PCE identified in soil gas samples collected in the #51 property may infer a potential “Hot Spot” or source area spill.

May 2006 – During May 2006, ESI conducted a comprehensive subsurface drilling, sampling and geophysical investigation on behalf of the Urban Group LLC under the original BCP agreement. The purpose of this supplemental Site investigation was to characterize the physical and chemical properties of site soil gas, soil and groundwater and if present, identify the location and orientation of any underground storage tanks.

Prior to implementing a subsurface investigation, a non-invasive geophysical survey was completed by the subcontracted firm of NAEVA Geophysics Inc. at the BCP Site. Ground penetrating radar (GPR) was used to perform the investigation that focused on two areas located immediately west of buildings #45 and 47. Results of the gridded survey identified a semi-circular anomaly adjacent to the west wall of building #45. The floor drain found in the basement of building #47 was found to connect with a drainage system that drains toward Buena Vista Avenue. The potential manhole/drain cover found west of building #47 was determined to be connected to the municipal sewer system.

A total of nine soil borings were advanced outside of the site buildings but within the property boundaries to better characterize the physical and chemical nature of the overburden fill material. The borings advanced during the May investigation, generally confirmed a fill depth that ranged from approximately 2 to 6 feet thick. Soil borings were designated SB-1 through SB-9.

Soil samples were collected at selected borehole locations based on photo-ionization detector (PID) screening results coupled with visual and olfactory observations. Samples were submitted for Target Compound List (TCL) Semi-Volatile Organic Compounds

(SVOC) analytes, Polychlorinated Biphenyl's (PCBs) and Target Analyte List (TAL) Metals.

Analytical results of the soils testing identified elevated levels of PCE, selected SVOCs (PAHs) and metals above NYS TAGM 4046 guidance criteria, which were in effect at this time. Specifically, an elevated PCE concentration (12,000 ppb) was detected at a depth of 8-10' bgs at boring SB-3 located in the #51 building structure. PAH exceedences were detected at the borehole locations designated SB-1 (0.0-2.0'), SB-2 (0.0-0.5'), SB-3 (8.0-10.0'), and SB-8 (0.0-0.5'). Analysis of soil samples submitted from borings detected concentrations of beryllium, chromium, copper, iron, mercury, nickel and zinc that exceeded TAGM 4046 soils guidance criteria for metals. The highest concentrations of arsenic, antimony, barium, beryllium, cadmium, copper, lead, nickel, selenium, silver, sodium, thallium and zinc were detected in the surface soil sample collected at 0.0-0.5' bgs at the SB-2 location.

A total of five groundwater samples, designated MW-1 to MW-5, were collected and submitted for VOC/SVOC, PCBs and TAL metals analyses.

Results of the groundwater testing generally indicated no significant VOC/SVOC or PCB impacts to the Site groundwater. However, elevated concentrations of aluminum, antimony, iron, magnesium were detected above NYSDEC Class GA groundwater standards in the groundwater samples collected from the monitoring well network. Tentatively identified compounds (TICs) were identified for VOC and SVOC analytes in concentrations that ranged from 57 ug/l to 212 ug/l.

A total of 10 soil gas samples designated 3SG-1 through 3SG-10 were collected from sub-slab borings advanced within parcels #45 to 51 building structures. The soil gas samples were submitted for VOC analysis by EPA Method TO-15.

Analysis of the soil gas samples identified elevated concentrations of PCE in soil gas samples 3SG-6 and 3SG-7 which are centrally located in the building on parcel #51. Concentrations of selected VOCs associated with petroleum and petroleum by-products were detected above NYSDOH background level guidance criteria at the soil gas sample locations 3SG-4, 3SG-9 and 3SG-10.

Review of the report suggests that the source of the subsurface VOCs and selected metals found in surface soils may be the result of historic work practices and property use coupled with a potential release of a petroleum based product.

July 2006 – Working on behalf of Urban Group LLC, Ecosystems Strategies, Inc. (ESI) was contracted to perform a Combined Phase I and II Environmental Site Assessment (ESA) at the AVET Coach Corp. property located at 53-55 Buena Vista Avenue. The 0.25 acre property is characterized as a 1 story building containing an automotive repair

shop and office space. Phase I of the report identified several environmental concerns or conditions that included:

- One underground storage tank (UST) located on the ground floor in the southeastern quadrant of the #53 building. The 1,000 gallon tank is used for the storage of waste oil prior to off-site disposal.
- Thirty 55-gallon drums containing petroleum based oil products were staged in the auto repair shop.
- A cursory inspection identified potential asbestos containing materials and lead based paint.
- Two floor drains were identified.

Based on a review of historic Sanborn maps and documented on-site work practices, a limited Phase II investigation was performed during June 2006 to better characterize subsurface conditions with regards to potential environmental impacts.

Subsequent to completion of the Phase I ESA, a soil gas sampling program was performed on parcel #53-55. The purpose of the sampling program was to characterize the sub-slab soil gas beneath the parcel #53-55 building structure. The sampling program entailed the collection of soil gas samples from small diameter borings advanced through the concrete building slab. A total of six (6) soil gas samples identified as 4SG-1 through 4SG-6 were submitted for VOC analyses by EPA Method TO-14A.

Analytical results for soil gas samples detected a number of VOCs associated with petroleum products and chlorinated solvents. Most notable were the significantly elevated concentrations of PCE detected at the 4SG-1, 4SG-2 and 4SG-3 sampling locations where PCE concentrations ranged from 1030 ug/m³ at 4SG-2 to a maximum of 5380 ug/m³ at 4SG-1

July 2006 Data Summary

- VOCs were detected in all sub-slab soil gas samples collected beneath the parcel #53-55 building structure. The analytical data suggest/infer that soil beneath the building may be impacted by petroleum products or chlorinated solvents.
- A cursory inspection identified potential asbestos containing materials and lead based paint.

1.2.1. Summary

Results of previous environmental investigations have identified elevated concentrations of selected VOCs/SVOCs and metals in soil gas, soils and groundwater samples collected

at the Former Teutonia Hall BCP Site. Impacts to soil gas and soil contamination are attributed to historic work practices that may have included the spill or discharge of petroleum contaminants and solvents to drains and/or dry wells. Specifically, selected VOCs and PAHs were generally detected in soil gas and shallow overburden soils at discrete locations that exceed the NYSDOH / NYSDEC guidance criteria for air and soil. Metals were detected in groundwater samples collected in the northern portion of the BCP Site. The thickness of the on-site fill materials ranged from 2 to 6 feet thick and was determined to contain elevated concentrations of arsenic, antimony, barium, beryllium, cadmium, copper, lead, nickel, selenium, silver, sodium, thallium and zinc above TAGM 4046 soil guidance criteria.

1.3. Site Development Plan

The Former Teutonia Hall BCP Site encompasses an area of approximately 0.75 acres that is planned as a mixed use residential/commercial development consisting of a multi-story building that includes parking space. The Site will be covered with a concrete floor slab, concrete sidewalks and/or asphalt for parking. Landscaped areas are not contemplated at this time due to the small size of the site. The construction plan will likely include placement of a 6-inch gas venting layer consisting of sand or gravel covered with a thin layer of plastic sheeting below the building slab to act as a vapor barrier since removal of all contaminated soils that could create vapor intrusion may not be feasible. Negative pressure could be applied to the gas venting layer to mitigate the potential for soil gas intrusion.

2. Purpose

Preliminary environmental assessments and focused investigations have been performed at the Former Teutonia Hall Site to characterize contaminant impacts to soil vapor, shallow overburden soil material and groundwater media. A draft remedial investigation report for Parcels # 41-51 was submitted to the NYSDEC in December 2006. The NYSDEC subsequently provided comments on the report dated February 2, 2007 (see Appendix B). Supplemental remedial investigation (RI) is planned to address NYSDEC comments and to further delineate the nature and extent of contamination on Parcels #41-51 previously investigated and to fully characterize the contamination on Parcel #53-55 to support planned mixed use residential/commercial development in accordance with the requirements of the BCP. Based on the historical use of the Site, documented characterization results and NYSDEC comments; Malcolm Pirnie has developed a work scope to further investigate surface and subsurface conditions. This Work Plan details specific tasks that will better facilitate site characterization and compliance with the NYSDEC BCP requirements. Specifically, when used in concert with results of previous investigations, the findings of the remedial investigation will be used to:

- Describe the amount, concentration, persistence, mobility, form (e.g., solid, liquid), and other significant characteristics of the contamination potentially present.
- Define hydrogeological factors (e.g., depth to saturated zone, hydrologic gradients (if possible), proximity to a drinking water aquifer, and wetlands proximity).
- Define the aerial extent of the site fill material and characterize the chemical composition of the fill.
- Define the potential extent to which the substances have migrated or are expected to migrate, and whether potential future migration may pose a threat to human health.
- Determine the extent to which contaminant levels pose an unacceptable risk to public health.
- Provide sufficient information to allow for the identification of potentially feasible remedial alternatives.

The Remedial Action Objectives (RAOs) for the site will be developed based on the contaminant characterization results, exposure pathways, and risk evaluation data. Based on our knowledge of potential site issues, the RAOs for the Site are likely to include the following:

- Prevent direct contact or exposure to VOCs, SVOCs and metals identified in impacted soil and groundwater media to minimize potential risks to human health.

3. Scope of Work

Results of the investigations conducted to-date at the Site have documented impacts on soil and groundwater media. Examination of summary reports submitted to the NYSDEC identified specific areas of concern that can be addressed by additional investigation. A focused investigation will be conducted to better characterize soil/fill and groundwater within the Site boundaries. The proposed subsurface investigation and well installation program is intended to provide additional information as to the nature and extent of soil, soil vapor and groundwater contamination beneath the Site. Data collected during the proposed investigation is necessary to evaluate the need for and extent of any remedial action.

The investigation will require implementation of a soil vapor sampling program and a subsurface investigation program designed to supplement the existing characterization information. Up to twenty-seven (27) soil borings will be advanced on-site through the fill unit to better define areas of suspected and/or documented impacts to site environmental media.

A total of three groundwater monitoring wells will be installed within the saturated overburden unit to better define groundwater flow direction(s) and the extent of groundwater contamination. Soil and groundwater sampling will be performed.

Subsequent to NYSDEC approval of the Work Plan and requisite 30-day public comment period, Malcolm Pirnie will initiate the site investigation and prepare a Final Remedial Investigation Report documenting the findings. The purpose of the supplemental remedial investigation is to determine the horizontal and vertical extent of soil and groundwater contamination as it would relate to selection of site-specific remedial alternatives. The major tasks and elements associated with this Work Plan are described in detail within this section.

3.1. Surface Soil Sampling Program

A surface soil sampling program will be conducted to evaluate the extent of organic/inorganic contamination identified in the soil material located adjacent to the manhole cover west of the building at 47 Buena Vista Avenue. Soil material will be collected from the uppermost 6 inches of soil/fill and submitted for TCL VOCs/SVOCs, and TAL metals analyses. It is anticipated that a total of eight samples exclusive of QA/QC samples will be collected. The proposed sampling program is summarized in Table 3-1.

TABLE 3-1**Analytical Program Summary
Remedial Investigation****Former Teutonia Hall Site**

Sample Media	Number of Samples				Analyses
	Field Samples	Duplicates	MS/MSD Samples	Trip Blanks	
Subsurface Soil/Fill (27 Borings)	36	2	2/2	2	TCL VOCs TCL SVOCs Pesticides/PCBs TAL Metals
Surface Soil (8 locations)	8	1	1/1	1	TCL VOCs TCL SVOCs TAL Metals
Groundwater (3 new wells)	3	1	1/1	1	TCL VOCs TCL SVOCs Pesticides/PCBs TAL Metals (total+ dissolved)
Soil Vapor (14 points)	14	1	1/1	1	TO15 VOCs

Notes:

MS = matrix spike
 MSD = matrix spike duplicate
 SVOCs = semivolatile organic compounds
 TAL = target analyte list
 TCL = target compound list
 TO15 = Analytical method for VOCs in air
 VOCs = volatile organic compounds

3.2. Subsurface Investigation

3.2.1. Soil Boring Program

A soil boring program will be implemented to better characterize the physical nature of the overburden fill material and chemical attributes of the Site soil and shallow groundwater media. Based on accessibility, the soil boring program will consist of up to 27 soil borings advanced at predetermined locations. The proposed soil borehole locations are shown on Figure 3-1.

Field activities will be performed under the Site Specific Health and Safety protocols established in the Plan attached in Appendix A.

3.2.2. Soil Characterization

A drilling rig capable of advancing a borehole using direct push drilling methods will be used to advance up to twenty-seven (27) soil borings to a depth sufficient to collect soil and groundwater samples as well as define the base of impacted soil/fill material. Generally, the boreholes will be advanced to a depth of approximately 16 feet below ground surface (bgs). However, to facilitate groundwater sampling, select boreholes will be advanced to a maximum depth of 40 feet below ground surface (bgs). Continuous soil samples will be collected at each boring using a dual tube macro-core sampler.

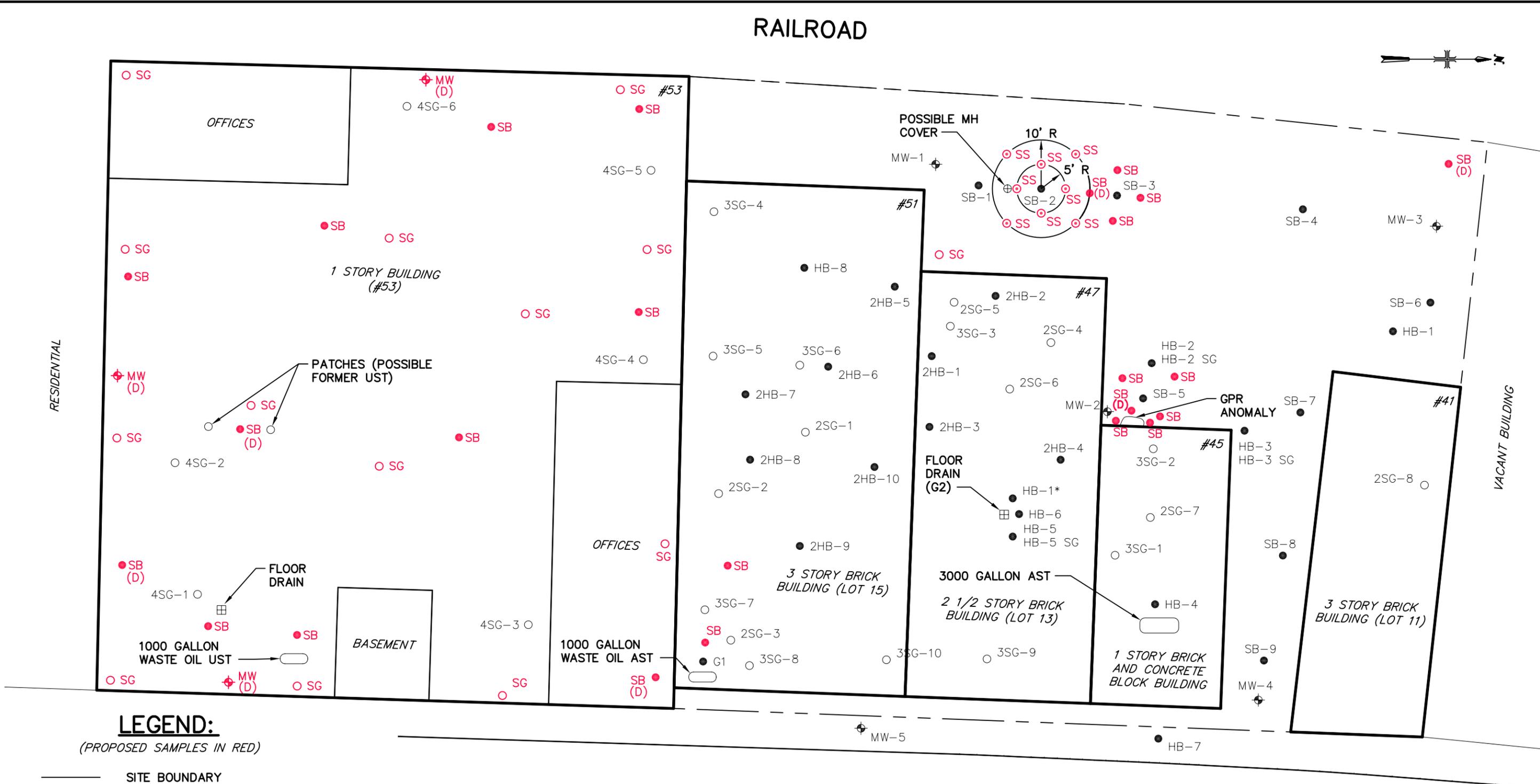
Upon retrieval, the soil samples will be screened for total organic vapors using a photo-ionization detector (PID). The organic vapor measurements will be recorded and the soil described on boring logs by a Malcolm Pirnie geologist. Up to twenty-seven soil samples will be collected for chemical analysis based on screening criteria that will include visual and olfactory observations, or elevated photo-ionization (PID) measurements. The soil samples will be collected from the discrete depth interval that displays the greatest evidence of contamination. Nine of the 27 soil samples will be collected at the base of nine deep borings to generally characterize on-site post-excavation soil material. Samples will be analyzed for Target Compound List (TCL), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals and Pesticides/PCBs. The proposed sampling and analysis plan is summarized in Table 3-1.

All non-dedicated, downhole sampling equipment will be decontaminated between soil boring locations in accordance with accepted drilling practices using high-pressure hot water (or steam cleaner) oralconox and a hot water brush.

3.2.3. Groundwater Characterization

To characterize the groundwater quality at the Site three temporary groundwater monitoring wells will be installed in select borings completed during the soil boring program. Groundwater collected from the proposed sampling locations will be sampled

XREFS: F:\Projects\5633002\CADD\XREF\B-V_AVE-GSP.dwg F:\Projects\5633002\CADD\XREF\11x17-BOR.dwg IMAGES: None
 User: DeWyer Spec: PIRNIE_STANDARD File: F:\Projects\5633002\CADD\5633F001.DWG Scale: 1:1 Date: 06/20/2007 Time: 08:38 Layout: Figure 3-1



LEGEND:

(PROPOSED SAMPLES IN RED)

- SITE BOUNDARY
- SB-4 SOIL BORING LOCATION
- (D) DEEP MONITORING WELL/SOIL BORING
- ⊕ MW-3 MONITORING WELL
- 2SG-8 SOIL GAS SAMPLE LOCATION
- ⊙ SS NEAR SURFACE SOIL SAMPLE



APPROXIMATE SCALE: 1" = 20'

PROJECT NO. 5633-002



YONKERS, NEW YORK
 FORMER TEUTONIA HALL SITE
 41 TO 55 BUENA VISTA AVE.

PROPOSED SAMPLE LOCATIONS
 REMEDIAL INVESTIGATION

MALCOLM PIRNIE, INC.
 MAY 2007
 FIGURE 3-1

for TCL VOCs, SVOCs, and TAL metals (total/dissolved) and Pesticides/PCBs. Figure 3-1 illustrates the locations of the proposed groundwater sampling points.

3.2.3.1. Monitoring Well Installation

If site conditions allow, boreholes will be advanced using direct push methods to a depth of approximately 10 feet below saturated conditions, estimated to be 30-35 feet bgs. Upon reaching total depth, each well will be constructed using 10 feet of 1-inch diameter schedule 40 PVC well screen with a 0.01-inch slot size. A bottom plug will be placed on the PVC screen, and flush-threaded PVC casing will be used to complete the well to grade level. Upon collection of ground water samples, the PVC well screen and casing will be removed and the soil borings grouted from total depth to ground surface.

3.2.3.2. Groundwater Sampling

Groundwater samples will be collected from each of the three proposed groundwater sampling locations and submitted for chemical analysis. A water level indicator will be used to measure the water table elevation from the newly installed well points. Groundwater field parameters including pH, specific conductivity, temperature, turbidity, dissolved oxygen, and redox potential will be monitored during well purging prior to sampling. Groundwater collection and sampling will be performed using a combination of new disposable bailers or dedicated plastic flex tubing.

One groundwater sample will be collected from each new well point and analyzed for TCL VOCs, SVOCs, Pest/PCBs and TAL dissolved / total metals. Groundwater samples collected for VOC analyses will be collected using a clean disposable bailer, while samples collected for TAL dissolved metals will be filtered through a 45 micron canister. All groundwater samples will be collected in the pre-cleaned and pre-preserved laboratory sample bottles in accordance with protocols shown on Table 3-1. Appropriate QA/QC samples will be collected and analyzed, including one trip blank, one MS/MSD sample, and one field duplicate sample. Subsequent to sample collection all soil and groundwater samples will be placed on ice and shipped under chain of custody to the selected analytical laboratory.

3.3. Air Quality Characterization

Based on the results of previous environmental investigations conducted at the Site, subsurface soil and fill material, and to a lesser extent groundwater in the area has been shown to contain volatile organic compounds (VOCs) and SVOCs including carcinogenic polycyclic aromatic hydrocarbons (PAHs). A potential pathway exists whereby these compounds in the vapor phase may migrate from the soil and could affect the quality of air in future buildings constructed at the site. To evaluate the potential for intrusion of vapor originating from soil and/or groundwater underlying the site, Malcolm Pirnie will collect and analyze a total of fourteen samples of subsurface soil gas vapor beneath the Site. The proposed soil vapor sampling locations are shown on Figure 3-1.

3.3.1. Subsurface Soil Vapor Sampling

Subsurface soil vapor samples will be collected by advancing a small (~3") diameter borehole to a maximum depth of 3 feet below the invert of the concrete slab floor to allow for the installation of the soil vapor sampling device. A stainless steel sampling point (KVA Shield Point or similar device) will be connected to Teflon-lined tubing and placed in the borehole. Clean silica sand will be poured around and a minimum of six inches above the sampling point. A hydrated bentonite powder will then be used to seal the sampling point from the top of the sand pack to the floor surface. A tracer gas will be used to validate the performance of the sampling equipment.

Subsequent to installation of the subsurface sampling point and placement of the surficial sampling apparatus, helium will be used to displace the air surrounding the soil vapor collection canister.

Prior to sampling, an electric peristaltic pump capable of producing a vacuum of at least 20 inches of mercury will be used to purge air from the vapor sampling borehole. Soil vapor will be purged at a rate not greater than 0.2 liters per minute for 15 minutes. Following purging, a grab sample would be collected in a six-liter Summa canister fitted with a one hour regulator (using a sampling rate of 0.1 liters per minute) resulting in a sample collection period of one hour per sample.

The subsurface soil vapor samples will be collected from fourteen subsurface sampling points and analyzed for VOCs by the analytical Laboratory using USEPA Compendium Method TO-15. The lists of compounds analyzed by method TO-15 as well as the method reporting limits are provided in Table 3-2.

3.4. Qualitative Risk Assessment

A qualitative risk assessment will be conducted to determine if the presence and concentrations of chemicals in the environmental media at the site pose potential human health concerns. The assessment will encompass both on-site and off-site risks with the results of the exposure analysis used as one of the criteria to determine the most appropriate future actions at the site. These may range from no further action, to additional data collection, to quantitative health risk assessment and the establishment of risk-based action levels. The assessment will begin with the construction of a conceptual site model, a graphic illustration that outlines chemical source areas, possible chemical release mechanisms, environmental media that currently show or may show in the future the presence of chemicals, possible exposure pathways, possible points of exposure for human receptors, possible exposure routes, and possible human receptors. The conceptual model will be based on current site conditions and surrounding land use as well as the planned future site and surrounding land uses.

TABLE 3-2
TO 15 Target Compounds¹
Remedial Investigation
Former Teutonia Hall Site

Compound	CAS Number	Proposed RL ppbv	NJTO15	Full TO15
Acetone (2-propanone)	67-64-1	5.0	X	X
Benzene	71-43-2	0.20	X	X
Bromodichloromethane	75-27-4	0.20	X	X
Bromoethene	593-60-2	0.20	X	X
Bromoform	75-25-2	0.20	X	X
Bromomethane (Methyl bromide)	74-83-9	0.20	X	X
1,3-Butadiene	106-99-0	0.20	X	X
2-Butanone (methyl ethyl ketone)	78-93-3	0.50	X	X
Carbon disulfide	75-15-0	0.50	X	X
Carbon tetrachloide	56-23-5	0.20	X	X
Chlorobenzene	108-90-7	0.20	X	X
Chloroethane	75-00-3	0.20	X	X
Chloroform	87-66-3	0.20	X	X
Chloromethane (methyl chloride)	74-87-3	0.20	X	X
3-chloropropene (allyl chloride)	107-05-1	0.20	X	X
2-chlorotoluene (o-chlorotoluene)	95-49-8	0.20	X	X
Cyclohexane	110-82-7	0.20	X	X
Dibromochloromethane	124-48-1	0.20	X	X
1,2-dibromoethane	106-93-4	0.20	X	X
1,2-dichlorobenzene	95-50-1	0.20	X	X
1,3-dichlorobenzene	541-73-1	0.20	X	X
1,4-dichlorobenzene	106-46-7	0.20	X	X
dichlorodifluoromethane	75-71-8	0.20	X	X
1,1-dichloroethane	75-34-3	0.20	X	X
1,2-dichlorethane	107-06-2	0.20	X	X
1,1-dichloroethene	75-35-4	0.20	X	X
1,2-dichloroethene (cis)	155-59-2	0.20	X	X
1,2-dichloroethene (trans)	156-605	0.20	X	X
1,2-dichloropropane	78-87-5	0.20	X	X
Cis-1,3-dichloropropene	10061-01-5	0.20	X	X
Trans-1,3-dichloropropene	10061-02-6	0.20	X	X
1,2-dichlorotetrafluoroethane (Freon 114)	76-14-2	0.20	X	X
Ethylbenzene	100-41-4	0.20	X	X
4-Ethyltoluene (p-ethyltoluene)	622-96-8	0.20	X	X
n-heptane	142-82-5	0.20	X	X
hexachlorobutadiene	87-68-3	0.20	X	X
n-hexane	110-54-3	0.20	X	X
methylene chloride	75-09-2	0.50	X	X
4-methyl-2-pentanone (MIBK)	108-10-1	0.50	X	X
MTBE (methyl tert-butyl ether)	1634-04-4	0.50	X	X
Styrene	100-42-5	5.0	X	X
Tertiary butyl alcohol (TBA)	75065-0	0.20	X	X
1,1,2,2-tetrachloroethane	79-34-5	0.20	X	X
Tetrachloroethene (PCE)	127-18-4	0.20	X	X
Toluene	108-88-3	0.50	X	X
1,2,4-trichlorobenzene	120-82-1	0.20	X	X
1,1,1-trichloroethane	71-55-6	0.20	X	X
1,1,2-trichloroethane	79-00-5	0.20	X	X
1,1,2-trichloro-1,2,2-trifluoroethane (Freon TF)	76-13-1	0.20	X	X
Trichloroethene (TCE)	79-01-6	0.20	X	X
Trichlorofluoromethane (Freon 11)	75-69-4	0.20	X	X
1,2,4-trimethylbenzene	95-63-6	0.20	X	X
1,3,5-trimethylbenzene	108-67-8	0.20	X	X
2,2,4-trimethylpentane	540-84-1	0.20	X	X
Vinyl chloride	75-01-4	0.20	X	X
Xylenes (m&p)	1330-20-7	0.20	X	X
Xylenes (o)	95-47-6	0.20	X	X
1,2-dichlorethene (total)	540-59-0	0.20		X
1,4-dioxane	123-91-1	5.		X
Isopropyl alcohol	67-63-0	5.0		X
Methyl butyl ketone	591-78-6	0.50		X
Methyl methacrylate	80-62-6	0.50		X
Naphthalene (upon request only)	91-20-3	0.50		X
tetrahydrofuran	109-99-9	5.0		X

¹NJ compounds have NJ-assigned compound names.

RL = Reporting limit

For environmental media that may be of concern, qualitative evaluations will be made for the four components that typically comprise a health risk assessment: data evaluation; exposure assessment; toxicity assessment; and risk characterization/uncertainty analysis. In the data evaluation, chemical concentrations in the various media will be compared to appropriate NYSDEC risk-based standards and criteria (e.g., 6 NYCRR Part 375-6.8 NYSDEC Soil Cleanup Objective and Cleanup Levels, Water Quality Standards, etc.). Chemicals detected in concentrations greater than these standards and criteria will be identified as chemicals of potential concern. In the exposure assessment, an evaluation will be made of the likelihood and magnitude of exposure to the chemicals of potential concern in environmental media of concern. This will involve outlining possible exposure routes and plausible exposure times, frequencies, and durations. In the toxicity assessment, the toxicity of the chemicals of concern will be outlined. This will include identifying known or suspected carcinogens and/or the target organ/system of concern for noncarcinogenic effects. In the risk characterization, information from the three components will be integrated, to estimate the likelihood and magnitude of possible health risks.

3.5. Planned UST Removal

During performance of previous investigations, a potential source of petroleum constituents was determined to be petroleum bulk storage tanks (1,000-3,000 gallons) identified in the buildings at parcels #45, 51 and 53-55 Buena Vista Avenue. A licensed tank removal contractor will be secured to extract the tanks and remove residual contents.

3.5.1. Soil Excavation Sampling

Subsequent to the removal of the tanks, a maximum of four soil samples will be collected from the excavations to characterize the extent of petroleum impacted soil material. Samples will be collected from each of the sidewalls of the excavation in accordance with the NYSDEC December 2002 Draft DER-10 Technical Guidance for Site Investigation and Remediation sampling protocols. Each of the soil/fill samples will be analyzed for Target Compound List (TCL) volatile organic compounds, semi-volatile organic compounds, and Target Analyte List (TAL) metals. If the tanks are located in concrete lined vaults, soil samples will not be collected.

3.5.2. Backfilling

Subsequent to removal of the storage tanks, the excavation(s) will be backfilled with clean select fill depending on the planned building design.

4. Quality Assurance/Quality Control (QA/QC)

Subsequent to removal of the storage tanks, the excavation(s) will be backfilled with clean select fill depending on the planned building design.

4.1. Analytical Methods

All samples collected during the supplemental BCP investigation will be analyzed using EPA-approved analytical methods that follow the most recent edition of the EPA's "Test Methods for Evaluating Solid Waste" (SW-846), Methods for Chemical Analysis of Water and Wastes" (EPA 600/4-79-020), and Standard Methods for Examination of Water and Wastewater" (prepared and published jointly by the American Public Health Association, American Waterworks Association and Water Pollution Control Federation).

4.2. Laboratory

The subcontracted laboratory will be certified by the New York State Department of Health to perform Contract Laboratory Program (CLP) analysis on all media to be sampled during this investigation. The laboratory will perform the sample analysis in accordance with the most recent NYSDEC Analytical Services Protocol (ASP).

4.3. Data Submittal

Analytical data will be submitted in complete ASP category B data packs. Procedures for chain of custody, laboratory instrumentation calibration, laboratory analyses, reporting of data, internal quality control, and corrective actions shall be followed as per SW-846 and as per the laboratory's Quality Assurance Plan. Where appropriate, trip blanks, field blanks, field duplicates, and matrix spike, matrix spike duplicate shall be performed at a rate of 5% and will be used to assess the quality of the data. The laboratory's in-house QA/QC limits will be utilized whenever they are more stringent than those suggested by the EPA methods.

4.4. Data Usability Summary Reports

The data package will be sent to a qualified, independent, data validation specialist for evaluation of the accuracy and precision of the analytical results. A Data Usability Summary Report (DUSR) will be prepared to describe the compliance of the analyses with the analytical method protocols detailed in the NYSDEC Analytical Services Protocol (ASP). The DUSR will provide a determination of whether the data meets the project-specific criteria for data quality and data use. The validation effort will be

completed in accordance with NYSDEC Division of Environmental Remediation DUSR guidelines.

4.5. Health and Safety

All field tasks will be performed using industry standard health and safety procedures. A site-specific Health and Safety Plan (HASP) has been prepared for use by the field team during all field activities. This plan details known and potential hazards of the site and field tasks as well as air monitoring and emergency procedures. The HASP is presented in Appendix A.

5. Project Organization

Malcolm Pirnie has established a project team for the Former Teutonia Hall site whose collective qualifications and experience are strongly suited for successful completion of the project. The proposed responsibilities of the key staff are summarized below:

Kent McManus, P.E., will be the Project Manager for the work. In this capacity Mr. McManus will be responsible for the successful completion of each task including coordination and supervision of engineers and scientists, and adherence to the work plan, schedule and budget.

John P. Hilton, CPG / Jim Richert, CPG, will be the Quality Leaders, responsible for the development of the work plan, coordination of subcontractors, direction of the field program including maintaining quality assurance policies that pertain to all aspects of sampling, well drilling and development.

Jeff Dekoskie, will be the field geologist responsible for implementing the field effort. Responsibilities will include directing Malcolm Pirnie's drilling subcontractors, and ensuring the successful completion of all field activities.

Shi Ng, will be the Quality Assurance Officer (QAO). Mr. Ng will assist the project manager in the development of the work plan, interface with the laboratory to make requests and resolve problems and interface with the data validator during development of Data Usability Summary Reports.

6. Reporting

Following receipt of the validated analytical results, Malcolm Pirnie will prepare a Remedial Investigation Report and a Remedial Action Work Plan (RAWP) with an attached Soil/Fill Management Plan (S/FMP). Preparation of the report will entail a summary of all fieldwork performed to date; data collected, and will include data tables, soil boring and well construction logs, analytical results, photos, and maps. The report will also include Malcolm Pirnie's recommendations for further characterization of the Site, if necessary.

The Remedial Action Work Plan will include an evaluation of remedial alternatives. Data obtained during previous investigations will be utilized along with the planned end use to identify, select, and evaluate remedial action alternatives for the site. Potential site constituents and migration pathways will be categorized as follows:

- Air and airborne dust.
- Soil/Fill.
- Groundwater.

Once the degree of contamination associated with these media and other site characteristics are quantified, General Response Actions for site remediation will be defined. The General Response Alternatives that are considered will include the "no action" measure as a baseline against which other remedial measures, if necessary, can be compared.

The RAWP will also include a S/FMP, which will describe a plan for characterization and handling of excavated soil/fill based on NYSDEC Soil Cleanup Objectives as specified in 6 NYCRR Subpart 375-6.8 and/or negotiated Track 4 site-specific action levels (SSALs).

7. Project Schedule

A schedule showing the planned remedial investigation activities and assessment of remedial alternatives is included in Figure 7-1.

8. References

Ecosystems Strategies, Inc., *Combined Phase I and Phase II Environmental Site Assessment Report. 41 – 51 Buena Vista Avenue*, January 2005

Environmental Services and Solutions, *Supplemental Soil Gas Investigation Letter Report*. June 2005

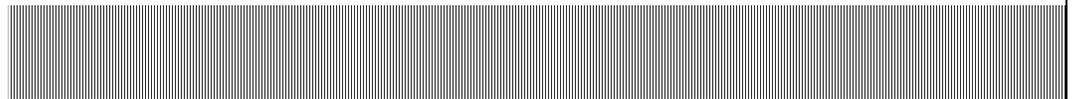
Ecosystems Strategies, Inc., *Site Investigation Report Former Teutonia Hall Site. 41 – 51 Buena Vista Avenue*, December 2006

Ecosystems Strategies, Inc., *Combined Phase I and Phase II Environmental Site Assessment Report. AVET Coach Corp. Property, 53 Buena Vista Avenue*, July 2006

Tuetonia Buena Vista, LLC
Brownfield Cleanup Program
Supplemental Remedial Investigation Work Plan
Former Teutonia Hall Site

Appendix A

Site Specific Health and Safety Plan



SITE SPECIFIC HEALTH AND SAFETY PLAN



SECTION 1: GENERAL INFORMATION AND DISCLAIMER		PROJECT NUMBER:	5633-002
PROJECT NAME:	Former Teutonia Hall Site	CLIENT NAME:	Teutonia Hall LLC
PROJECT MANAGER:	Kent R. McManus	PROJECT LEADER:	John P. Hilton
PREPARED BY:	John P. Hilton	DATE:	05/01/2007

NOTE: This site specific Health and Safety Plan - Short Form (HASP-SF) has been prepared for use by **Malcolm Pirnie, Inc.** employees for work at this site / facility. **The plan is written for the specific site / facility conditions, purposes, tasks, dates and personnel specified, and must be amended and reviewed by those personnel named in Section 4 if these conditions change.** Malcolm Pirnie, Inc. is not responsible for its use by others.

Subcontractors shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations. In accordance with 1910.120(b)(1)(iv) and (v), Malcolm Pirnie, Inc. will inform subcontractors of the site / facility emergency response procedures, and any potential fire, explosion, health, safety or other hazards by making this Site Specific Health and Safety Plan and site information obtained by others available during regular business hours. All contractors and subcontractors are responsible for: (1) developing their own Health and Safety Plan, including a written Hazard Communication Program and any other written hazard specific or safety programs required by federal, state and local laws and regulations, that details subcontractor tasks, potential or actual hazards identified as a result of a risk analysis of those tasks, and the engineering controls, work practices and personal protective equipment to be utilized to minimize or eliminate employee exposure to the hazard; (2) providing their own personal protective equipment; (3) providing documentation that their employees have been health and safety trained in accordance with applicable federal, state and local laws and regulations; (4) providing evidence of medical surveillance and medical approvals for their employees; and (5) designating their own site safety officer responsible for ensuring that their employees comply with their own Health and Safety plan and taking any other additional measures required by their site activities.

Providing a copy of this Malcolm Pirnie plan to subcontractors, does not establish, nor is it intended to establish a "joint employer" relationship between the Contractor and Malcolm Pirnie. This allowance does not establish, nor is it intended to establish, a direct or indirect employer/employee relationship with subcontractor's employees.

THIS SITE SPECIFIC HASP MUST BE REVIEWED AND APPROVED BY CORPORATE HEALTH AND SAFETY FOR ONE OR MORE OF THE FOLLOWING CONDITIONS: IF AN UPGRADE TO "LEVEL C" OR ABOVE IS ANTICIPATED; A PERMIT REQUIRED CONFINED SPACE ENTRY OR ENTRY INTO AN EXCAVATION IS ANTICIPATED; SAMPLING OF UNKNOWN DRUMS AND/OR IN UNKNOWN CONDITIONS IS ANTICIPATED, OR IF THERE MAY BE RADIATION LEVELS GREATER THAN 0.5 mR (500µR)/HOUR.

SECTION 2: EMERGENCY INFORMATION

(A) LOCAL RESOURCES	SERVICE NAME	TELEPHONE NUMBER
EMERGENCY MEDICAL SERVICES	See below	911
HOSPITAL (Map attached)	St. John's Riverside Hospital (2 Park Ave.)	911
FIRE DEPARTMENT	Yonkers New York Fire Dept	911
POLICE / SECURITY	Yonkers New York Police Dept	911
HAZMAT/ SPILL / OTHER RESPONSE	Yonkers New York FD	911

(B) CORPORATE RESOURCES

MALCOLM PIRNIE 24 / 7 EMERGENCY / INCIDENT TELEPHONE NUMBERS		(800) 478-6870 (24 HOURS)
CORPORATE HEALTH AND SAFETY **	JOSEPH GOLDEN, EMT-P, CET, CHMM	(914) 641-2978 WHI
	JANE WEBER, FIER PROJECTS	(914)641-2559 WHI
CORPORATE HEALTH PHYSICIST	LES SKOSKI	(201) 398-4377 NNJ
CORPORATE HUMAN RESOURCES **	PATRICIA OLSIEWICZ (WORKERS COMP / OSHA LOG)	(914) 641-2913 WHI
LEGAL DEPARTMENT **	JERRY CAVALUZZI	(914) 641-2950 WHI

**** TO BE NOTIFIED IN CASE OF ACCIDENT**

SECTION 3: PROJECT INFORMATION	
(A) SITE / FACILITY INFORMATION:	
SITE NAME: <u>Former Teutonia Hall Site</u> ADDRESS: <u>41 – 55 Buena Vista Avenue</u> TOWNSHIP/ COUNTY: <u>Yonkers./ Westchester County, NY</u>	SITE CLIENT CONTACT: <u>Kenneth Dearden (DW Capital)</u> PHONE NUMBER: <u>(914) 771-5824</u> SITE SAFETY CONTACT: <u>Jeff Dekoskie (201) 398-4319 or (201) 797-7400</u>
<input type="checkbox"/> FEDERAL <input type="checkbox"/> STATE	<input type="checkbox"/> MUNICIPAL / REGIONAL <input checked="" type="checkbox"/> PRIVATE

(B) SITE CLASSIFICATION: (check all that apply)

<input type="checkbox"/> HAZARDOUS (RCRA)	<input type="checkbox"/> UST / LUST	<input type="checkbox"/> REFINERY
<input type="checkbox"/> HAZARDOUS (CERCLA / STATE)	<input checked="" type="checkbox"/> BROWNFIELD	<input type="checkbox"/> WTP / WWTP
<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> CHEMICAL PLANT	<input checked="" type="checkbox"/> OTHER: <u>Former Commercial / Industrial Site</u>
<input type="checkbox"/> LANDFILL (NON-HAZARDOUS)	<input type="checkbox"/> MANUFACTURING	_____
<input type="checkbox"/> ACTIVE	<input type="checkbox"/> INACTIVE	_____

(C) TYPE OF FIELD ACTIVITY

<input type="checkbox"/> HAZARDOUS WASTE	<input type="checkbox"/> SOLID WASTE	<input type="checkbox"/> CONSTRUCTION
<input checked="" type="checkbox"/> HYDROGEOLOGY	<input type="checkbox"/> ENVIRONMENTAL	<input checked="" type="checkbox"/> AIR / ODOR
<input type="checkbox"/> WASTE WATER	<input type="checkbox"/> WATER	<input checked="" type="checkbox"/> OTHER: <u>Subsurface Soil Sampling</u>

<p>(D) FIELD OBJECTIVES (Check all that apply)</p> <input type="checkbox"/> PRE-JOB VISIT <input type="checkbox"/> AUDIT <input checked="" type="checkbox"/> CONTRACTOR OVERSIGHT <input checked="" type="checkbox"/> OTHER: _____ <input type="checkbox"/> CONSTRUCTION MGMT _____ <input type="checkbox"/> INSPECTION _____ <input type="checkbox"/> INVESTIGATION SURVEY _____	<p>SAMPLING:</p> <input checked="" type="checkbox"/> AIR <input type="checkbox"/> SEDIMENT <input type="checkbox"/> SURFACE WATER <input checked="" type="checkbox"/> SURFACE SOIL <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> LANDFILL <input type="checkbox"/> WASTE WATER <input checked="" type="checkbox"/> OTHER: <u>Subsurface Soil</u> <input type="checkbox"/> WASTE STREAM _____
DATE(S) OF FIELD ACTIVITIES: <u>July - August 2007</u>	

(E) FIELD TASKS
MALCOLM PIRNIE TASKS

M1. Soil Boring Program

M2. Groundwater Sampling

M3. Soil vapor Characterization

M4. _____

TASKS PERFORMED BY OTHERS

01. Drilling of Test Borings,

02. Monitoring well installation

03. _____

04. _____

SECTION 4: PROJECT SAFETY ORGANIZATION, HEALTH AND SAFETY TRAINING, AND MEDICAL MONITORING

(A) PROJECT HEALTH AND SAFETY ROLES, RESPONSIBILITIES AND COORDINATION

PROJECT OFFICER	The Project Officer (PO) is ultimately responsible for project performance. The PO seeks and gets appropriate approvals for risk management decisions (e.g. from Regional/Practice Director(s), Legal Council, Corporate Health and Safety), and selects and effective and qualified project team. The PO supports the Project Manager or Deputy Project Manager with appropriate resources.
PROJECT MANAGER DEPUTY PROJECT MANAGER	The Project Manager (PM) has the responsibility for executing the project in accordance with the scope of work and good engineering practice. The PM will supervise the allocation of resources and staff to implement specific aspects of this HASP and may delegate authority to expedite and facilitate any application of the program. The PM implements and executes an effective program of site-specific personnel protection and accident prevention. The Project Manager reports to the Project Officer. Deputy Project Managers (DPM) are assigned all duties and responsibilities of the Site Safety Officer in his/her absence.
CORPORATE HEALTH & SAFETY	Corporate Health and Safety is responsible for Malcolm Pirnie's overall Health and Safety Program and provides project guidance on air monitoring methodology, data interpretation and assistance in determining appropriate project engineering controls, work practices, and personal protective equipment. Corporate Health and Safety also reviews and approve HASPs in accordance with Section 1.
SITE SAFETY OFFICER ALTERNATE SITE SAFETY OFFICER (S)	The Site Safety Officer (SSO) is responsible for interpreting and implementing the site health and safety provisions set out in this HASP, and will guide the efforts of field team personnel in their day-to-day compliance with this HASP. The SSO has the ability and authority to make necessary changes or additions to this HASP and provide technical assistance to field team personnel on problems relating to worksite safety. The SSO has the authority to correct safety-related deficiencies in materials or practice and to call a Project STOP in the most serious cases. Alternate Site Safety Officer (ASSO) is assigned all duties and responsibilities of the Site Safety Officer in his/her absence.
PUBLIC INFORMATION OFFICER:	The Public Information Officer (PIO) is responsible for all public, press and other news media request for information, and is the only person authorized to provide such information
SITE RECORDKEEPER:	The Site Recordkeeper is responsible for the documentation of all related health and safety data documentation, including but not limited to metrological data, instrument calibration, accident and injury reports, and air monitoring data.
FIELD TEAM LEADER:	The Field Team Leader (FTL) is responsible for leading "on-site" activities of field team personnel, and to ensure field team personnel perform only those tasks that have been identified in this HASP.
FIELD TEAM PERSONNEL	Field personnel have the following health and safety responsibilities: <ul style="list-style-type: none"> • Implement the procedures set forth in the HASP; • Take all reasonable precautions to prevent injury to themselves and their fellow employees; and • Perform only those tasks that they believe they can do safely, and immediately report any accidents and/or unsafe conditions in accordance with Section 1.

(B) PROJECT TEAM - The following Malcolm Pirnie personnel are designated to carry out the stated project job functions on site. THE SITE SAFETY OFFICER, OR A DESIGNATED ALTERNATE WILL BE ON-SITE DURING ALL SITE ACTIVITIES. (NOTE: One person may carry out more than one job function.)

PROJECT MANAGER: Kent R. McManus

PROJECT OFFICER: Peter G. Witko

SITE SAFETY OFFICER: Jeff Dekoskie

ALTERNATE SAFETY OFFICER(S): John P. Hilton

PUBLIC INFORMATION OFFICER: Mr. Chris Milack (NYSDEC)

SITE RECORDKEEPER: Jeff Dekoskie

FIELD TEAM LEADER: Jeff Dekoskie

FIELD TEAM PERSONNEL: Jeff Dekoskie

The following subcontractors and governmental agencies have been informed by Malcolm Pirnie of emergency response procedures, and any potential fire, explosion, health, safety or other hazards of the site / facility by making this Site Specific Health and Safety Plan and site information obtained by others available during regular business hours. Subcontractors and governmental agencies shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations as described in **Section 1** of this plan.

SUBCONTRACTOR(S): TBD

FEDERAL AND STATE AGENCY REPS: Mr. Chris Milack (NYSDEC)

Ms. Becky Mitchell (NYSDOH)

OTHER AGENCY REPS: _____

(C) HEALTH AND SAFETY TRAINING, MEDICAL MONITORING, AND FIT TESTING PROGRAM

The following project staff is included in the Malcolm Pirnie Health and Safety Training and Medical Monitoring programs. The details of these programs can be found in the Health and Safety Policies and Written Programs. (NOTE: At least one CPR/First Aid Trained person must be on-site during HAZWOPER and confined space entry activities.)

NAME	HAZWOPER TRAINING				OTHER TRAINING				FIT TEST				
	INITIAL (DATE)	8HR (DATE)	MGR (DATE)	DOT (DATE)	CSE (DATE)	CPR / First Aid / (DATE)	BBP	MEDICAL (DATE)	MAKE / SIZE / TYPE			(DATE)	
<u>Jeff Dekoskie</u>	<u>06/98</u>	<u>02/06</u>	<u>06/99</u>			<u>05/05</u>	<u>02/05</u>	<u>07/99</u>	<u>09/05</u>	<u>MSA</u>	<u>LG</u>	<u>FF</u>	<u>02/05</u>
<u>Scott Compston</u>	<u>08/00</u>	<u>03/04</u>	<u>03/03</u>			<u>12/04</u>	<u>12/04</u>		<u>05/05</u>	<u>MSA</u>	<u>MED</u>	<u>FF</u>	<u>06/05</u>
<u>John Hilton</u>	<u>06/89</u>	<u>03/04</u>	<u>06/89</u>			<u>12/03</u>	<u>07/03</u>	<u>06/02</u>	<u>09/05</u>	<u>MSA</u>	<u>MED</u>	<u>FF</u>	<u>06/05</u>

SECTION 5: HAZARD ANALYSIS

(A) **ACTUAL OR POTENTIAL PHYSICAL HAZARDS** – (Check all that apply to Malcolm Pirnie activities)

- | | | | |
|---|---|---|--|
| <input type="checkbox"/> ANIMALS / PLANTS | <input type="checkbox"/> ELECTRICAL | <input type="checkbox"/> IONIZING RADIATION | <input type="checkbox"/> STEEP / UNEVEN |
| <input type="checkbox"/> ASBESTOS / LEAD | <input checked="" type="checkbox"/> EXCAVATIONS
(See Section 13) | <input type="checkbox"/> LIGHT RADIATION
(i.e., Welding, High Intensity) | <input type="checkbox"/> TERRAIN |
| <input type="checkbox"/> CHEMICAL EXPOSURE
(See Section 5B/5C) | <input type="checkbox"/> EXTREME COLD
(See Section 10) | <input type="checkbox"/> LIMITED CONTACT | <input type="checkbox"/> TRAFFIC (STRUCK BY) |
| <input type="checkbox"/> CONFINED SPACE
(See Section 12) | <input type="checkbox"/> FALL, >6' VERTICAL | <input type="checkbox"/> MOVING PARTS (LO / TO) | <input type="checkbox"/> OTHER: |
| <input type="checkbox"/> DEMOLITION | <input type="checkbox"/> FALLING OBJECTS | <input checked="" type="checkbox"/> NOISE (> 85 dB) | |
| <input checked="" type="checkbox"/> DRILLING | <input type="checkbox"/> HEAT STRESS | <input type="checkbox"/> NON-IONIZING RADIATION | |
| <input type="checkbox"/> DRUM HANDLING | <input checked="" type="checkbox"/> HEAVY EQUIPMT | <input type="checkbox"/> OVERHEAD OBJECTS | |
| <input type="checkbox"/> DUST, HARMFUL | <input type="checkbox"/> HEAVY LIFTING | <input type="checkbox"/> POWERED PLATFORMS | |
| <input type="checkbox"/> DUST, NUISANCE | <input type="checkbox"/> HOT WORK | <input type="checkbox"/> POOR VISIBILITY | |
| | <input type="checkbox"/> HUNTING SEASON | <input type="checkbox"/> ROLLING OBJECTS | |
| | <input type="checkbox"/> IMMERSION | <input type="checkbox"/> SCAFFOLDING | |
| | | <input type="checkbox"/> SHARP OBJECTS | |

(B) **PRESENCE OF HAZARDOUS MATERIALS STORED OR USED ON SITE**

- YES By Client / Owner
 YES By Malcolm Pirnie (See Section 11)
 NO

(CHECK ALL THAT APPLY)

TYPE

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> EXPLOSIVES | <input type="checkbox"/> FLAMMABLE / REACTIVE SOLIDS | <input type="checkbox"/> RADIOACTIVE | <input type="checkbox"/> HAZARDOUS WASTE (Stored) |
| <input checked="" type="checkbox"/> COMPRESSED GASES | <input type="checkbox"/> OXIDIZERS | <input type="checkbox"/> CORROSIVE | |
| <input type="checkbox"/> FLAMMABLE / COMBUSTIBLE LIQUIDS | <input type="checkbox"/> TOXIC / INFECTIOUS | <input type="checkbox"/> MISCELLANEOUS | |

(C) **CHEMICAL HAZARDS OF CONTAMINANTS INFORMATION**

IDENTIFIED CONTAMINANTS - Known or suspected hazardous/toxic materials (attach historical information, physical description, map of contamination and tabulated data, if available)

SUBSTANCES INVOLVED	CHARACTERISTICS	MEDIA	ESTIMATED CONCENTRATIONS	LOWEST PEL, or TLV
Carcinogenic PAHs	UN	SL/GW	Unknown	<input type="checkbox"/> PPM <input type="checkbox"/> mg/m ³
VOCs	VO	SL/GW	Unknown	<input type="checkbox"/> PPM <input type="checkbox"/> mg/m ³
Metals	TO	SL/GW	Unknown	<input type="checkbox"/> PPM <input type="checkbox"/> mg/m ³

Media types: GW (ground water), SW (surface water), WW (wastewater), AIR (air), SL (soil), SD (sediment), WL (waste, liquid), WS (waste, solid), WD (waste, sludge), WG (waste, gas), OT (other).

Characteristics: CA (corrosive, acid), CC (corrosive, caustic), IG (ignitable), RA (radioactive), VO (volatile), TO (toxic), RE (reactive), BIO (infectious), UN (unknown), OT (other, describe)

DESCRIBE POTENTIAL FOR CONTACT WITH EACH MEDIA TYPE FOR EACH OF THE MPI TASKS LISTED IN SEC 3 (E):

MPI TASK	ROUTE OF EXPOSURE (INHAL/INGEST/CONTACT/ABSORB)	POTENTIAL FOR CONTACT (HIGH / MEDIUM / LOW)	METHOD OF CONTROL
M1	Contact	Low	PPE
M2	Contact	Low	PPE
M3	Contact	Low	PPE
M4			

The Site Safety Officer will brief the MPI field team on symptoms and signs of overexposure to chemical hazards

SECTION 6: SITE CONTROL MEASURES

(A) WORK ZONES - EXCAVATIONS, DRILLING OPERATIONS, AND HEAVY EQUIPMENT

Jeff Dekoskie _____ has been designated to coordinate access control and security for Malcolm Pirnie operations on site. It is a Malcolm Pirnie policy that Malcolm Pirnie personnel will not enter trench or excavated areas without approval of Corporate Health and Safety. A safe perimeter has been established at the boundary of any excavation and/or a safe distance from excavators, drill rigs and other heavy equipment.

These boundaries are identified by: Orange traffic cones or caution tape.

No unauthorized person should be within this area.

(B) WORK ZONES - CONTAMINATION

The prevailing wind conditions are South southwest A wind direction indicator is used to determine daily wind direction. The Command Post is located upwind from the Exclusion Zone or at a sufficient distance to prevent exposure should a release occur.

Control boundaries have been established and Exclusion Zone(s) (the contaminated area) have been identified. (Attach site map)

These boundaries are identified by: Site Boundary

No unauthorized person should be within this area.

SECTION 7: SAFETY PROCEDURES / EQUIPMENT REQUIRED

Identify all procedures and equipment needed to eliminate or minimize exposure to hazards identified in Section 5.

- | | | |
|---|--|---|
| <input checked="" type="checkbox"/> AIR MONITORING EQUIPMENT
(See Section 9) | <input checked="" type="checkbox"/> FIRST AID KIT / BBP KIT | <input type="checkbox"/> MSDSs - FACILITY / OTHERS |
| <input checked="" type="checkbox"/> BARRIER TAPE | <input type="checkbox"/> FLOTATION DEVICE (USCG) | <input checked="" type="checkbox"/> PPE - PHYSICAL HAZARDS
(See Section 15) |
| <input checked="" type="checkbox"/> COMMUNICATIONS - ONSITE | <input type="checkbox"/> GFCI EXTENSION CORDS | <input checked="" type="checkbox"/> PPE - CHEMICAL HAZARDS
(See Section 15) |
| <input checked="" type="checkbox"/> COMMUNICATIONS - OFFSITE
(i.e., cell/digital phones if no other means) | <input type="checkbox"/> HARNESS(S) / LIFELINE(S) | <input type="checkbox"/> RESPIRATORY PROTECTION PROGRAM & EQUIPMENT (APR)
(See Section 15) |
| <input type="checkbox"/> CONFINED SPACE PROGRAM & EQUIPMENT (See Section 12) | <input type="checkbox"/> INSECT / TICK REPELLANT | <input type="checkbox"/> RESPIRATORY PROTECTION PROGRAM & EQUIPMENT (SAR)
(See Section 15) |
| <input type="checkbox"/> EYE WASH | <input type="checkbox"/> HUNTING SEASON | <input checked="" type="checkbox"/> TRAFFIC CONES |
| <input type="checkbox"/> EMERGENCY SHOWERS | <input type="checkbox"/> LADDER(S) | <input type="checkbox"/> VENTILATION EQUIPMENT |
| <input type="checkbox"/> EMERGENCY AIR HORN | <input type="checkbox"/> LIGHTING - HAND HELD | <input type="checkbox"/> OTHER:
_____ |
| <input type="checkbox"/> FALL PROTECTION PROGRAM & EQUIPMENT | <input type="checkbox"/> LIGHTING - FIXED / EMERGENCY | _____ |
| <input type="checkbox"/> FIRE EXTINGUISHER(S) - ABC | <input type="checkbox"/> LOCKOUT/TAGOUT PROGRAM & EQUIPMENT | _____ |
| | <input checked="" type="checkbox"/> MSDSs – ATTACHED
(See Section 11) | |

SECTION 8: COMMUNICATIONS AND SAFE WORK PRACTICES

(A) COMMUNICATIONS - ONSITE

Whenever possible, communications between site personnel should be face-to-face. When verbal communications is not possible, radio communications shall be established.

In case of radio communications failure, or when respiratory protection is in use, the following hand signals will be used:

OK; I AM ALL RIGHT; I UNDERSTAND	THUMBS UP
NO; NEGATIVE	THUMBS DOWN
NEED ASSISTANCE	BOTH HANDS ON TOP OF HEAD
DANGER - NEED TO LEAVE AREA, NO QUESTIONS	GRIP PARTNERS WRIST WITH BOTH HANDS
HAVING DIFFICULTY BREATHING	HANDS TO THROAT

(B) COMMUNICATIONS - OFF SITE

If applicable, telephone communication to the Command Post should be established as soon as practical.

Telephone numbers that can be used to reach the command post are: _____ and _____

(C) SAFE WORK PRACTICES

1. A "BUDDY SYSTEM" IN WHICH ANOTHER WORKER IS CLOSE ENOUGH TO RENDER IMMEDIATE AID WILL BE IN EFFECT. CLIENTS AND/OR CONTRACTORS MAY SERVE AS A "DESIGNATED BUDDY."
2. WHERE THE EYES OR BODY MAY BE EXPOSED TO CORROSIVE MATERIALS, SUITABLE FACILITIES FOR QUICK DRENCHING OR FLUSHING SHALL BE AVAILABLE FOR IMMEDIATE USE (SEE SECTION 7).
3. DO NOT KNEEL ON THE GROUND WHEN CHEMICAL PROTECTIVE CLOTHING IS BEING USE.
4. IF DRILLING EQUIPMENT IS INVOLVED, HAVE A CURRENT UTILITY SURVEY, AND KNOW WHERE THE 'KILL SWITCH' IS.
5. CONTACT WITH SAMPLES, EXCAVATED MATERIALS, OR OTHER CONTAMINATED MATERIALS MUST BE MINIMIZED.
6. ALL ELECTRICAL EQUIPMENT USED IN OUTSIDE LOCATIONS, WET AREAS OR NEAR WATER MUST BE PLUGGED INTO GROUND FAULT CIRCUIT INTERRUPTER (GFCI) PROTECTED OUTLETS (SEE SECTION 7).
7. IN THE EVENT OF TREACHEROUS WEATHER-RELATED WORKING CONDITIONS (I.E., THUNDERSTORM, LIMITED VISIBILITY, EXTREME COLD OR HEAT) FIELD TASKS WILL BE SUSPENDED UNTIL CONDITIONS IMPROVE OR APPROPRIATE PROTECTION FROM THE ELEMENTS IS PROVIDED.
8. SMOKING, EATING, CHEWING GUM OR TOBACCO, OR DRINKING ARE FORBIDDEN EXCEPT IN CLEAN OR DESIGNATED AREAS.
9. USE OF CONTACT LENSES NEAR CHEMICALS OR DURING USE OF RESPIRATORY PROTECTION IS PROHIBITED AT ALL TIMES.
10. GOOD HOUSEKEEPING PRACTICES ARE TO BE MAINTAINED.
11. SITE / FACILITY SPECIFIC SAFE WORK PRACTICES:

SECTION 9: ENVIRONMENTAL MONITORING

THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

(A) The following environmental monitoring instruments shall be used on site at the specified intervals and recorded in the site logbook. (NOTE: If monitoring period is "OTHER", monitoring schedule will be attached to this plan.)

EQUIPMENT	MONITORING PERIOD				ACTION LEVEL
<input type="checkbox"/> Combustible Gas Indicator	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
<input type="checkbox"/> O ₂ Meter	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
<input type="checkbox"/> Toxics: <input type="checkbox"/> CO <input type="checkbox"/> H ₂ S	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
<input type="checkbox"/> Other: _____	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
<input checked="" type="checkbox"/> PID (Lamp 10.6 eV)	<input checked="" type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	5 ppm sustained
<input type="checkbox"/> FID					
<input type="checkbox"/> Colorimetric tubes:					
_____	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
_____	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
<input type="checkbox"/> Radiation: <input type="checkbox"/> α <input type="checkbox"/> β <input type="checkbox"/> gamma	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
<input checked="" type="checkbox"/> Respirable Dust Meter	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input checked="" type="checkbox"/> Other	As required
<input type="checkbox"/> Noise Meter	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
<input type="checkbox"/> Other: _____	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____
_____	<input type="checkbox"/> Continuous	<input type="checkbox"/> Hourly	<input type="checkbox"/> x Day	<input type="checkbox"/> Other	_____

(B) Monitoring equipment is to be calibrated according to manufacturers' instructions. Record calibration data and air concentrations in the Health and Safety on-site log book.

(C) Recommended Action Levels for Upgrade or Downgrade of Respiratory Protection, or Site Shutdown and Evacuation. These are average values. Consideration should be given to the potential for release of highly toxic compounds from the waste or from reaction by-products. Levels are for persistent (> 10 min) breathing zone measurements in non-confined spaces. **For unexpected conditions, stop all work and contact Corporate Health and Safety.**

Oxygen Levels

Less than 19.5%

19.5% to 23.5%

Greater than 23.5%

Level B necessary for work to start / continue. Consider toxicity potential. Work may start / continue. Investigate changes. Continuous monitoring. PROHIBITED WORK CONDITION

Flammability / Explosive Hazards

Less than 10% of LEL

10% to 25% of LEL

Greater than 25% of LEL

Work may start / continue. Consider toxicity potential. Work may start / continue. Continuous monitoring. PROHIBITED WORK CONDITION.

Uncharacterized Airborne Organic Vapors or Gases

Background*

Up to 5 meter units (m.u. or "ppm") above background

Up to 50 m.u. above background

Greater than 50 m.u.

* Off-site clean air measurement

Work may start / continue. Continue to monitor conditions. Level C necessary for work to start / continue. Continuous monitoring. Use Colorimetric tubes to characterize vapors.

Level B necessary for work to start / continue. Continuous monitoring. PROHIBITED WORK CONDITION.

Characterized Airborne Organic Vapors or Gases**

Up to 50% of TLV, or PEL or REL

Up to 25 times the TLV, or PEL or REL

Up to 500 times the TLV, or PEL or REL

Greater than 500 times the TLV, or PEL or REL

** Use mixture calculations (% allowed = C_{NELN}) if more than one contaminant is present.

Work may start / continue. Continue to monitor conditions. Level C necessary for work to start / continue. Continuous monitoring. Level B necessary for work to start / continue. Continuous monitoring. PROHIBITED WORK CONDITION.

Radiation

Less than 0.5 mR/Hour (500 μ R)

Up to 1 mR/Hour above background

Greater than 1 mR/Hour above background

Work may start / continue. Continue to monitor conditions. Work may start / continue with Radiation Safety Officer present on site. PROHIBITED WORK CONDITION.

SECTION 10: PERSONAL MONITORING

THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

(A) PERSONAL EXPOSURE SAMPLING (Consider if high levels of noise or high concentrations of lead, mercury or arsenic are present)

The following personal monitoring will be in effect on site: _____

A copy of personal monitoring results is to be sent to Corporate Health and Safety for inclusion in the Employee's Confidential Exposure Record File.

(B) HEAT / COLD STRESS MONITORING

The expected air temperature will be 40 - 80 °F. If it is determined that heat stress or cold stress monitoring is required (mandatory for heavy exertion in PPE at temperatures over 70°F, or at temperatures under 40°F or wind chill equivalent), the following procedures shall be followed (describe procedures in effect, for heat stress i.e., monitoring body temperature, body weight, pulse rate; for cold stress i.e., appropriate clothing, shelter breaks):

Monitor individual for signs of cold stress (shivering, pale cold skin, confusion, memory loss, loss of coordination).
Wear appropriate clothing, with multiple layers, take frequent shelter breaks.

SECTION 11: HAZARD COMMUNICATION PROGRAM

THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

If chemicals are introduced to the site by Malcolm Pirnie (e.g., decontamination liquids, preservatives, etc.), a copy of the Malcolm Pirnie Hazard Communication Program and Material Safety Data Sheets (MSDSs) of chemicals introduced by Malcolm Pirnie to the site is attached to this plan. The Site Safety Officer will review this information with all field personnel prior to the start of the project, and will inform other employers (e.g., Owner, Contractor and Subcontractors) the availability and location of this information. The Comprehensive List of Chemicals introduced by Malcolm Pirnie to this site is:

- Alconox _____
- PID Cal-gas (Isobutylene) _____
- Multi-gas meter cal-gas (Nitrogen Balance gas) _____

All chemicals being introduced to the site, hazardous/potentially hazardous samples prepared at the site, and/or any hazardous materials previously sent to the site, **that will be stored at the site or will be transported from the site by common carrier**, will be packaged, labeled and identified as hazardous materials in accordance with U.S. Department of Transportation (DOT) and/or International Air Transport Association (IATA) regulations by a trained HazMat employee.

(NOTE: At multi-employer sites, the Site Safety Officer will obtain information, if applicable, on hazardous chemicals other employers may produce or introduce to the job site to which Malcolm Pirnie employees may be exposed, including the location of their written hazard communication program(s), labeling program(s), and Material Safety Data Sheet(s).

SECTION 12: CONFINED SPACE ENTRY

THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

If a permit-required confined space entry will be made on site, a copy of the Malcolm Pirnie Confined Space Entry Program, and a completed Malcolm Pirnie Confined Space Pre-Entry Inspection Check List will be attached to this plan. A Confined Space Entry Permit must be completed and posted outside the confined space prior to entry, and the entry will follow the Malcolm Pirnie Confined Space Entry written program. Permits are to be saved and logged with project documentation.

SECTION 13: EXCAVATION SAFETY

THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

Excavations being created in order to accomplish Malcolm Pirnie tasks or in progress during Malcolm Pirnie inspection of other activities or tasks, shall be shored or slopped or otherwise protected to prevent accidental collapse prior to entry, in accordance with Subpart F of 29 CFR 1926. It is Malcolm Pirnie policy that Malcolm Pirnie personnel will not enter trench or excavated areas without approval of Corporate Health and Safety. If an entry into an excavation by Malcolm Pirnie personnel is necessary, a Excavation Plan identifying the Competent Person and the protective measure to be used (i.e., sloping, shoring, trench box) will be attached to this plan.

SECTION 14: DECONTAMINATION PROCEDURES

THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

Personnel and equipment leaving the Exclusion Zone shall be thoroughly decontaminated. The Site Safety Officer is responsible for monitoring adherence with this decontamination plan.

A Level D decontamination protocol shall be used with the following decontamination stations:

- (1) Scrub withalconox and water mixture
- (2) Rinse with tap water
- (3) _____
- (4) _____
- (5) _____
- (6) _____
- (7) _____
- (8) _____
- (Other) Large equipment and augers will be steam cleaned.

The following decontamination equipment is required:

Decon Pad (Plastic Sheet)

Dry Brushes

Steam cleaner

Buckets

Trash Cans/Bags

Wet Brushes

Hose /

Spray

Alconox and water

Will be used as the decontamination solution

SECTION 15: PERSONAL PROTECTIVE EQUIPMENT

TASK *	RESPIRATORS & CARTRIDGE ¹	USE ** (See Section 16)	CLOTHING	GLOVES	BOOTS	OTHER
<u>M1</u>	<u>Mult/P</u>	<u>UP</u>	<u>NS</u>	<u>L</u>	<u>SL</u>	<u>HH G HP</u>
<u>M2</u>	<u>Mult/P</u>	<u>UP</u>	<u>NS</u>	<u>L</u>	<u>SL</u>	<u>HH G HP</u>
<u>M3</u>	<u>Mult/P</u>	<u>UP</u>	<u>NS</u>	<u>L</u>	<u>SL</u>	<u>HH G HP</u>
<u>M4</u>	_____	_____	_____	_____	_____	_____

* Same as Section 3E

**UP = Upgrade
CONT = Continuous

NOTE: PPE use will be in accordance with Malcolm Pirnie's Health and Safety Policy and Written Programs

CODES:

RESPIRATORS ¹	CARTRIDGES ¹	CLOTHING	GLOVES ²	BOOTS	OTHER
HF = Half Face APR	P = Particulate	N/S = No Special	Co = Cotton	SL = Leather Safety	HH = Hard Hat
FF = Full Face APR	OV = Organic Vapors	C = Coveralls	Le = Leather	H = Hip (Fireman)	G = Safety Glasses
ESCBA = Escape Bottle	AG = Acid Gas	T = Tyvek	L = Latex	O = Latex overboots	GP = Glare Protection
SAR = Airline	Mult = Multi-Gas/Vapor	Sx = Saranex	N = Nitrile		GI = Goggles - Impact
SCBA = SCBA	Other	PT = PE Tyvek	B = Butyl		GS = Goggles - Splash
			Neo = Neoprene		FS = Face Shield
			V = Viton		HP = Hearing Protection
			PVC = Polyvinyl Chloride		
			PVA = Polyvinyl Alcohol		
			Other:		

1 - List all that apply, i.e., FF w/ OV/AG/P

2 - Use same codes for clothing and boots of same material

Respiratory protection will be upgraded under the following conditions: Volatile organic compounds measured in ambient air

Greater than 5 ppm (sustained) inbreathing zone.

The following cartridge change out schedule is to be followed onsite (attach any calculations to plan): NA

SECTION 16: EMERGENCY ACTION PLAN

The following standard emergency response procedures will be used by onsite personnel. The Site Safety Officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedure are followed.

(A) EVACUATION

All work activities are suspended and the site is to be EVACUATED IMMEDIATELY, when there is a threat to life or health as determined by individual good judgement, i.e. fire, hazardous chemical spill, dangerous gas leak, severe weather (i.e., tornado); or when notified by other site / facility staff and local fire or police officials.

If an evacuation is called for, the emergency alarm system for weather-related, medical, fire and other evacuation emergencies is:

Verbal Communication

Evacuation from the Exclusion Zone should whenever possible occur through the decontamination line. In those situations where egress in this manner cannot occur, the following emergency escape routes have been designated (document on map if possible):

NA

Once evacuated off site, all staff should gather at Assembly point which is a minimum of 250 feet away from the incident

(B) FIRE OR EXPLOSION

Upon discovery of a fire or an explosion, the above-designated emergency signal shall be sounded and all personnel shall assemble at the decontamination line. The fire department is to be notified and all personnel moved to a safe distance (minimum 250') from the involved area.

If a person's clothing should catch fire, burning clothing may be extinguished by having the individual drop to the floor and roll. If necessary, physically restrain the person and roll them around on the floor to smother the flames. Use a fire blanket or extinguisher if one is readily available and you have been trained in its use. Call emergency medical services if not already done so.

If a person's clothing should become saturated with a chemical, douse the individual with water from the nearest safety shower if available. Consult the chemical Material Safety Data Sheets (MSDSs) for further information. Call emergency medical services if indicated by the MSDSs.

NEVER RE-ENTER THE SITE / FACILITY until the emergency has been declared over and permission to re-enter has been given by site / facility health and safety staff or local fire or police officials. If any staff is unaccounted for, notify an individual in charge.

(C) MEDICAL EMERGENCY

If you discover a medical emergency and are by yourself, CALL OUT FOR HELP. When someone arrives, tell them to call for help. If no one comes or you know you are alone, provide whatever care you can for 1 minute, then make the call yourself. (See Section 2)

Upon notification of an injury in the Exclusion Zone, the designated emergency signal shall be sounded. All site personnel shall assemble at the decontamination line. The SSO or alternate should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the Support Zone. The onsite CPR/FA personnel shall initiate the appropriate first aid, and contact should be made for an ambulance (and other emergency services as needed) and with the designated medical facility (if required). No persons shall reenter the Exclusion Zone until the cause of the injury or symptoms is determined.

The hospital is 20 minutes from the site. Ambulance response time is < 15 minutes. _____ of _____ was contacted on _____ and briefed on the situation, the potential hazards, and the substances involved. When IDLH conditions exist, arrangements should be made for onsite standby of emergency services.

A map for directions to the nearest hospital is attached to this plan. If not, the directions are: _____

(D) SAFETY EQUIPMENT FAILURE

If any other equipment (i.e., air monitoring) on site fails to operate properly, the FTL and/or SSO shall be notified to determine the effect of this failure on continuing operations on site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the work area until the situation is evaluated and appropriate actions taken.

(E) FOLLOW UP

In all situations, when an on site / facility emergency results in evacuation of the work area, or a "large spill" has occurred, staff shall not resume work until:

- The conditions resulting in the emergency have been corrected;
- The hazards reassessed by the SSO and Corporate Health and Safety;
- The HASP has been reviewed by the SSO and Corporate Health and Safety; and
- Site personnel have been briefed on any changes in the HASP by the SSO.

SECTION 17: SPILL CONTAINMENT / CONTROL

THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

For most chemicals introduced to the worksite, or under control of Malcolm Pirnie employees, spills of chemicals would be considered incidental and would be controlled in the immediate area of the spill. Such spills shall be handled utilizing precautions appropriate for the chemical characteristics specified in the MSDS for the chemical including spill control methods and selection and use of minimum personal protective equipment.

For chemicals introduced to the worksite, or under control of Malcolm Pirnie employees, that would cause a "large spill" (greater than 55 gallons), a copy of the appropriate Emergency Response Guidebook (ERG) guide shall be attached to this plan, and a spill response contractor shall be identified in Section 2.

SECTION 18: EMPLOYEE ACKNOWLEDGEMENTS

PLAN REVIEWED BY:

DATE

Project Manager: Kent R. McManus _____

Project Leader: John P. Hilton _____

Local H&S Coordinator: Jeff Dekoskie _____

Corporate H & S Joe Golden _____

I acknowledge that I have read the information on this HASP, attached Material Safety Data Sheets (MSDSs), DOT Emergency Response Guides, and Health and Safety Programs.
I understand the site / facility hazards as described and agree to comply with the contents of the plan.

EMPLOYEE (Print Name)

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

VISITOR (Print Name)

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

ATTACHED DOCUMENTS

- | | | | |
|---|--|---|--|
| <input checked="" type="checkbox"/> MSDS(s) | <input type="checkbox"/> Hazard Communication Written Program | <input type="checkbox"/> Confined Space Entry Written Program | <input type="checkbox"/> DOT ERG Guides |
| <input type="checkbox"/> Site Map | <input type="checkbox"/> Personal Protective Equipment Written Program | <input type="checkbox"/> Excavation Safety Plan | <input type="checkbox"/> Respiratory Protection Program |
| <input checked="" type="checkbox"/> Hospital Directions | <input type="checkbox"/> Emergency Action Plan | <input type="checkbox"/> Evacuation Routes | <input type="checkbox"/> Cartridge Change Out Calculations |
| <input type="checkbox"/> Other | | | |

Community Air Monitoring Program

Amended

HASP

Representatives of Teutonia Hall LLC have developed, as part of the HASP, a community air monitoring program (CAMP). The purpose of the CAMP is to determine that the proper level of protective equipment for personnel is used, to document that the level of worker protection is adequate, and to assess the migration of contaminants to off-site receptors in the community as a result of site work

Based on the results of historic sample analysis and the nature of the proposed work activities at the site, the possibility exists that organic vapors and/or particulates may be released to the air during intrusive construction activities.

Monitoring Instrumentation

To establish a baseline level, the Teutonia Hall representative will record wind velocity and direction and temperature at the beginning of the day, and again prior to any outdoor intrusive work. Real-time air monitoring will be conducted during all outdoor subsurface construction activities using a particulate meter and a photo-ionization detector (PID) or equivalent instrumentation capable of measuring total organic vapor concentrations.

Monitoring instruments will be calibrated in accordance with manufacturer's instructions before use. Battery charge level for each instrument will be checked at the beginning and end of each day. All instruments will be operated in accordance with manufacturer's specifications. Equipment manuals for all monitoring instruments will be present on-site during all operations.

Documentation

All air monitoring readings will be recorded and maintained in the Health and Safety Logbook. The logbook will be available for review by the NYSDEC and New York State Department of Health (NYSDOH). The following will be recorded:

- Air monitoring results, location, date and time of day
- Daily equipment check and calibration.
- Weather conditions
- Actions taken

Work Zone Monitoring

Routine, real-time monitoring will be conducted on the downwind side of the work zone during exterior intrusive activities. Air monitoring will be conducted in accordance with the schedule set forth in Table 10-1, "Summary of Air Monitoring Plan with Action Levels - Photo-ionization Detector (PID) & Particulate Monitor (PM)." If measured concentrations exceed the limits established in Table 10-1, appropriate response actions will be taken to include additional monitoring at the downwind perimeter of the site for exterior intrusive work. Additional monitoring and/or monitoring instruments may be added if site conditions change.

Vapor Emission Response Plan

If the downwind perimeter air concentrations of organic vapors exceed the upwind work area perimeter concentration by 5 ppm but less than 25 ppm for exterior intrusive activities, the following actions will be taken:

- Every 30 minutes monitor the perimeter work area location.
- Every 30 minutes monitor the organic vapor concentration 200 feet downwind of the work area perimeter or half the distance to the nearest receptor, whichever is less. If this reading exceeds the perimeter work area upwind organic vapor concentration by 5 ppm, all work must halt and monitoring increased to every 15 minutes. If, at any time, this reading exceeds the perimeter work area upwind

concentration by 10 ppm, the Major Vapor Emissions Response Plan will be initiated.

- If organic vapor levels 200 feet downwind of the perimeter work area or half the distance to the nearest downwind receptor, whichever is less, exceeds by 5 ppm the work area perimeter upwind concentration persistently, then air quality monitoring must be performed within 20 feet of the nearest downwind receptor (20-foot zone). If the readings in the 20-foot zone exceed the perimeter work area upwind concentration by 5 ppm for more than 30 minutes, then the Major Vapor Emissions Response Plan will be implemented.
- Work activities can resume only after the downwind 200 foot reading and the 20-foot zone reading are less than 5 ppm above the perimeter work area upwind concentration. In addition, the downwind perimeter work area concentration must be less than 25 ppm above the perimeter work area upwind concentration.

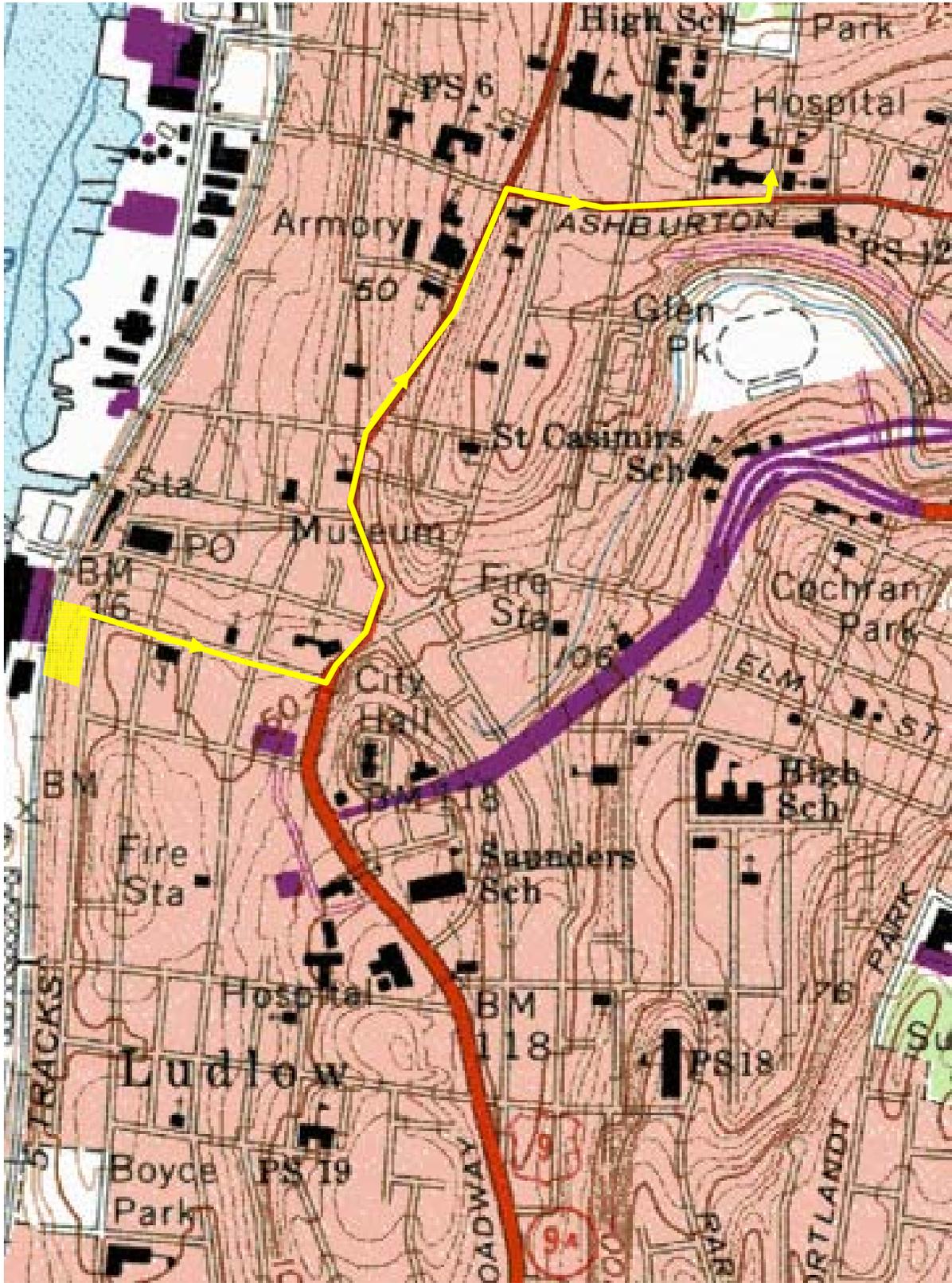
Major Vapor Emission Response Plan

If the downwind perimeter air concentrations of organic vapors exceed the upwind work area perimeter concentration by more than 25 ppm for exterior intrusive activities, then the Major Vapor Emission Response Plan will be activated. Upon activation, the following activities will be undertaken:

- All work will halt.
- All Emergency Response Contacts as listed in Section 17 will be contacted.
- The NYSDEC or NYSDOH will notify the County Health Department and advise them of the situation.
- The local police and fire department authorities will be immediately contacted by the SSO and advised of the situation.
- Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the SSO and work may resume.

Personal Monitoring

Real-time personal monitoring will be conducted in conjunction with the work zone monitoring. Since occupational worker exposures are higher than the work zone or community action levels, it is assumed that as long as work zone levels are monitored and appropriate actions are taken that worker exposures will be below the OSHA allowable limits.



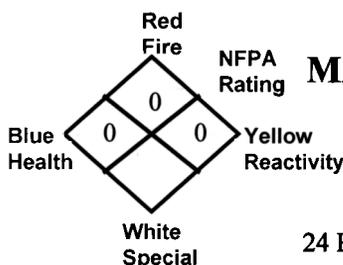
**MALCOLM
PIRNIE**

NYS BROWNFIELD CLEANUP PROGRAM
Former Teutonia Hall SITE
CITY OF YONKERS, NY
HEALTH AND SAFETY PLAN

HOSPITAL ROUTE

MAY 2007

5633-002

Alconox ®**MATERIAL SAFETY DATA SHEET**

Alconox, Inc.
30 Glenn Street
White Plains, NY 10603

24 Hour Emergency Number – Chem-Tel (800) 255-3924

I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 2001
Chemical Family:	Anionic Powdered Detergent
Manufacturer Catalog Numbers for sizes	1104, 1125, 1150, 1101, 1103 and 1112

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in ALCONOX as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.
pH:	9.5 (1%)

IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO ₂ , foam
Special Fire fighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition or Byproducts:	May release CO ₂ on burning

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED.

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

**Containing One or More of the Following Components in a Nitrogen Balance Gas:
Oxygen 0-23.5%; Isobutylene, 0.0005-0.9%**

SYNONYMS: Not Applicable
CHEMICAL FAMILY NAME: Not Applicable
FORMULA: Not Applicable
Document Number: 50054

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:	Calibration of Monitoring and Research Equipment
SUPPLIER/MANUFACTURER'S NAME:	AIR LIQUIDE AMERICA CORPORATION
ADDRESS:	821 Chesapeake Drive Cambridge, MD 21613
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	1-410-228-6400
General MSDS Information	1-713/868-0440
Fax on Demand:	1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Oxygen	7782-44-7	0 - 23.5%	There are no specific exposure limits for Oxygen.					
Isobutylene	115-11-7	0.0005 - 0.9%	There are no specific exposure limits for Isobutylene.					
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established.

C = Ceiling Limit.

See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, odorless gas. Releases of this product may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated. Isobutylene, a component of this gas mixture, may cause drowsiness and other central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. The chief health hazard associated with this gas mixture is when this product contains less than 19.5% Oxygen and is released in a small, poorly-ventilated area (i.e. an enclosed or confined space). Under this circumstance, an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN	OBSERVED EFFECT
12-16% Oxygen:	Breathing and pulse rate increase, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea, vomiting, collapse, or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. The most significant hazard associated with this gas mixture when it contains less than 19.5% oxygen is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color. Additionally, Isobutylene, a component of this gas mixture, may cause drowsiness or central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to this gas mixture.

TARGET ORGANS: Respiratory system.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH	(BLUE)	1	
FLAMMABILITY	(RED)	0	
REACTIVITY	(YELLOW)	0	
PROTECTIVE EQUIPMENT		B	
EYES	RESPIRATORY	HANDS	BODY
See Section 8			
For Routine Industrial Applications			

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

FLASH POINT, (method): Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

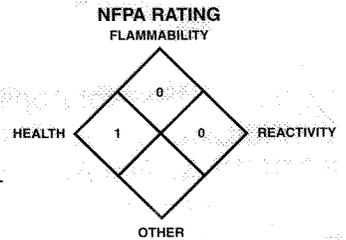
FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.



6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen. Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly-ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C; 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of oxygen.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if oxygen levels are below 19.5% or unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: No special protection is needed under normal circumstances of use.

BODY PROTECTION: No special protection is needed under normal circumstances of use.

9. PHYSICAL and CHEMICAL PROPERTIES

Unless otherwise specified, the following information is for Nitrogen, the main component of this gas mixture.

GAS DENSITY @ 32°F (0°C) and 1 atm: 0.072 lbs/ft³ (1.153 kg/m³)

BOILING POINT: -195.8°C (-320.4 °F)

FREEZING/MELTING POINT @ 10 psig: -210°C (-345.8°F)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

pH: Not applicable.

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

MOLECULAR WEIGHT: 28.01

EVAPORATION RATE (nBuAc = 1): Not applicable.

EXPANSION RATIO: Not applicable.

ODOR THRESHOLD: Not applicable.

SPECIFIC VOLUME (ft³/lb): 13.8

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is for this gas mixture.

APPEARANCE AND COLOR: This product is a colorless, odorless gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of this product.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state.

DECOMPOSITION PRODUCTS: The thermal decomposition products of Isobutylene include carbon oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. A component of this product (Isobutylene) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

NITROGEN: There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

ISOBUTYLENE:

LC₅₀ (inhalation, rat) = 620,000 mg/kg/4 hours

LC₅₀ (inhalation, mouse) = 415,000 mg/kg

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Not applicable.

SENSITIZATION TO THE PRODUCT: This gas mixture is not known to cause sensitization in humans.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for this gas mixture.

Embryotoxicity: No embryotoxic effects have been described for this gas mixture.

Teratogenicity: No teratogenicity effects have been described for this gas mixture.

Reproductive Toxicity: No reproductive toxicity effects have been described for gas mixture.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by over-exposure to the components of this product.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary; treat symptoms; eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for the components of this gas mixture.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product.

OXYGEN: Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log K_{ow} = -0.65

NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C. 1.6 volumes Nitrogen/100 volumes water at 20°C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plant and animal life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:	Compressed gases, n.o.s. (Nitrogen, Oxygen)
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1956
PACKING GROUP:	Not applicable.
DOT LABEL(S) REQUIRED:	Non-Flammable Gas
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996):	126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: This product is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 313
Oxygen	NO	NO	NO
Nitrogen	NO	NO	NO
Isobutylene	NO	NO	NO

SARA THRESHOLD PLANNING QUANTITY: Not applicable.

TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER U.S. FEDERAL REGULATIONS:

- No component of this product is subject to the requirements of CFR 29 1910.1000 (under the 1989 PELs).
- Isobutylene is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 pounds.
- The regulations of the Process Safety Management of Highly Hazardous Chemicals are not applicable (29 CFR 1910.119).
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82).
- Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Isobutylene is listed under this regulation in Table 3 as Regulated Substances (Flammable Substances), in quantities of 10,000 lbs (4,553 kg) or greater.

OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: No. California - Permissible Exposure Limits for Chemical Contaminants: Nitrogen. Florida - Substance List: Oxygen, Isobutylene. Illinois - Toxic Substance List: No. Kansas - Section 302/313 List: No. Massachusetts - Substance List: Oxygen, Isobutylene.	Michigan - Critical Materials Register: No. Minnesota - List of Hazardous Substances: No. Missouri - Employer Information/Toxic Substance List: No. New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen, Isobutylene. North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.	Pennsylvania - Hazardous Substance List: Oxygen, Nitrogen, Isobutylene. Rhode Island - Hazardous Substance List: Oxygen, Nitrogen. Texas - Hazardous Substance List: No. West Virginia - Hazardous Substance List: No. Wisconsin - Toxic and Hazardous Substances: : No.
--	--	--

CALIFORNIA PROPOSITION 65: No component of this product is on the California Proposition 65 lists.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 "Safe Handling of Compressed Gases in Containers"
 AV-1 "Safe Handling and Storage of Compressed Gases"
 "Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
 9163 Chesapeake Drive, San Diego, CA 92123-1002
 619/565-0302

Fax on Demand: 1-800/231-1366

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

BIN#265

MATERIAL SAFETY DATA SHEET

81425

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas:
Oxygen, 0.0015-23.5%; Methane, 0.0005-2.5%; Carbon Monoxide, 0.0005-1.0%;
Hydrogen Sulfide, 0.001-0.025%

SYNONYMS: Not Applicable

CHEMICAL FAMILY NAME: Not Applicable

FORMULA: Not Applicable

Document Number: 50018

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:	Calibration of Monitoring and Research Equipment
SUPPLIER/MANUFACTURER'S NAME:	AIR LIQUIDE AMERICA CORPORATION
ADDRESS:	821 Chesapeake Drive Cambridge, MD 21613
EMERGENCY PHONE:	CHEMTREC: 1-800-424-9300
BUSINESS PHONE:	1-410-228-6400
	General MSDS Information 1-713/868-0440
	Fax on Demand: 1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR	
			ACGIH	OSHA

MAR-02-00 03:19PM FROM-LUMIDOR SAFETY PRODUCTS 954-433-7730 T-041 P 02/09 F-654

		23.5%	above 19.5%.					
Methane	74-82-8	0.0005 - 2.5%	There are no specific exposure limits for Methane. Methane is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Hydrogen Sulfide	7783-06-4	0.001 - 0.025%	10	15	20C 10 (Vacated 1989 PEL)	50 ppm (10 minute maximum peak) 15 (Vacated 1989 PEL)	100	NIOSH REL: 10 ppm C (10 minutes) DFG-MAK: 15 ppm
Carbon Monoxide	630-08-0	0.0005 - 1.0%	25	NE	50 35 (Vacated 1989 PEL)	200C (Vacated 1989 PEL)	1200	NIOSH REL: 35 (TWA); 200C DFG MAK: 30
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established C = Ceiling Limit. See Section 16 for Definitions of Terms Used.
 NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless gas which has a rotten-egg odor (due to the presence of Hydrogen Sulfide). The odor cannot be relied on as an adequate warning of the presence of this product, because olfactory fatigue occurs after over-exposure to Hydrogen Sulfide. Hydrogen Sulfide and Carbon Monoxide (another component of this gas mixture) are toxic to humans in relatively low concentrations. Over-exposure to this gas mixture can cause skin or eye irritation, nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. Additionally, releases of this product may produce oxygen-deficient atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. A potential health hazard associated with this product is the potential of inhalation of Hydrogen Sulfide, a component of this gas mixture. Such over-exposures may occur if this product is used in a confined space or other poorly-ventilated area. Over-exposures to Hydrogen Sulfide can cause dizziness, headache, and nausea. Over-exposure to this gas could result in respiratory arrest, coma, or unconsciousness, due to the presence of Hydrogen Sulfide. Continuous inhalation of low concentrations of Hydrogen Sulfide may cause olfactory fatigue, so that the odor is no longer an effective warning of the presence of this gas. A summary of exposure concentrations and observed effects are as follows:

CONCENTRATION OF HYDROGEN SULFIDE	OBSERVED EFFECT
3-20 ppm	Odor is unpleasant.
50 ppm	Eye irritation. Dryness and irritation of nose, throat.
Slightly higher than 50 ppm	Irritation of the respiratory system.
100-150 ppm	Temporary loss of smell.
200-250 ppm	Headache, vomiting, nausea. Prolonged exposure may lead to lung damage.
300-500 ppm	Exposures of 4-8 hours can be fatal.
500 ppm	Swifter onset of symptoms. Death occurs in 1-4 hours.
600 ppm	Headache, excitement, staggering, and stomach ache after brief exposure.
700 ppm	Death occurs within 0.5 - 1 hour of exposure.
800 ppm	Rapid onset of unconsciousness, coma, death.
900 ppm	Immediate respiratory arrest.
NOTE:	This product contains a maximum of 250 ppm Hydrogen Sulfide. The higher concentration values here are presented to delineate the complete health effects which have been observed for humans after exposure to Hydrogen Sulfide.

Inhalation over-exposures to atmospheres containing more than the Threshold Limit Value of Carbon Monoxide (25 ppm) and another component of this gas mixture, can result in serious health consequences. Carbon Monoxide is classified as a chemical asphyxiant, producing a toxic action by combining with the hemoglobin of the blood and replacing the available oxygen. Through this replacement, the body is deprived of the required oxygen, and asphyxiation occurs.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH	(BLUE)		3
FLAMMABILITY	(RED)		0
REACTIVITY	(YELLOW)		0
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
See Section 8			
For Routine Industrial Applications			

3. HAZARD IDENTIFICATION (Continued)

Since the affinity of Carbon Monoxide for hemoglobin is about 200-300 times that of oxygen, only a small amount of Carbon Monoxide will cause a toxic reaction to occur. Carbon Monoxide exposures in excess of 50 ppm will produce symptoms of poisoning if breathed for a sufficiently long time. If this product is released in a small, poorly ventilated area (i.e. an enclosed or confined space), symptoms which may develop include the following:

CONCENTRATION OF CARBON MONOXIDE

- All exposure levels:
- 200 ppm
- 400 ppm
- 1,000-2,000 ppm
- 2,000-25,000 ppm
- >25,000 ppm

OBSERVED EFFECT

Over-exposure to Carbon Monoxide can be indicated by the lips and fingernails turning bright red. Slight symptoms (i.e. headache) after several hours of exposure. Headache and discomfort experienced within 2-3 hours of exposure. Within 30 minutes, slight palpitations of the heart occurs. Within 1.5 hours, there is a tendency to stagger. Within 2 hours, there is mental confusion, headaches, and nausea. Unconsciousness within 30 minutes. Potential for collapse and death before warning symptoms.

Additionally, if mixtures of this product contain less than 19.5% Oxygen and are released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with various levels of oxygen are as follows:

CONCENTRATION OF OXYGEN

- 12-16% Oxygen:
- 10-14% Oxygen:
- 6-10% Oxygen:
- Below 6%

OBSERVED EFFECT

Breathing and pulse rate increased, muscular coordination slightly disturbed. Emotional upset, abnormal fatigue, disturbed respiration. Nausea, vomiting, collapse, or loss of consciousness. Convulsive movements, possible respiratory collapse, and death.

SKIN and EYE CONTACT: Hydrogen Sulfide, a component of this gas mixture, may be irritating to the skin. Inflammation and irritation of the eyes can occur at very low airborne concentration of Hydrogen Sulfide (less than 10 ppm). Exposure over several hours may result in "gas eyes" or "sore eyes" with symptoms of scratchiness, irritation, tearing and burning. Above 50 ppm of Hydrogen Sulfide, there is an intense tearing, blurring of vision, and pain when looking at light. Over-exposed individuals may see rings around bright lights. Most symptoms disappear when exposure ceases. However, in serious cases, the eye can be permanently damaged.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. However, Hydrogen Sulfide and Carbon Monoxide (components of this gas mixture) are toxic to humans. Over-exposure to this gas mixture can cause nausea, dizziness, headaches, collapse, unconsciousness, coma, and death. Due to the presence of Hydrogen Sulfide, over-exposures to this gas mixture can also irritate the skin and eyes; severe eye contamination can result in blindness.

CHRONIC Severe over-exposures to Hydrogen Sulfide, a component of this gas mixture, which do not result in death, may cause long-term symptoms such as memory loss, paralysis of facial muscles, or nerve tissue damage. In serious cases of over-exposure, the eyes can be permanently damaged. Skin disorders and respiratory conditions may be aggravated by repeated over-exposures to this gas product. Refer to Section 11 (Toxicology Information) for additional information on the components of this product.

TARGET ORGANS: Respiratory system, blood system, central nervous system effects, cardiovascular system, reproductive system, skin, eyes.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

SKIN EXPOSURE: If irritation of the skin develops after exposure to this gas mixture, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention.

EYE EXPOSURE: If irritation of the eye develops after exposure to this gas mixture, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim roll eyes. Minimum flushing is for 15 minutes. Seek medical assistance immediately, preferably an ophthalmologist.

Victims who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take victim(s) to hospital and the MSDS to physician or other health professional with victim(s).

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

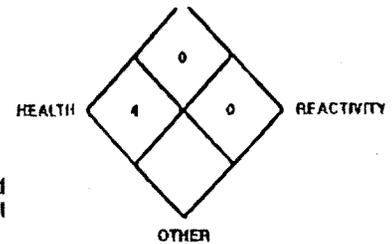
Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture contains toxic gases, Hydrogen Sulfide and Carbon Monoxide, and presents an health hazard to firefighters. This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.
Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.



6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of over-exposure to Hydrogen Sulfide and Carbon Monoxide, the toxic components of this product, and other safety hazards related to the remaining components of this product, than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated area or outdoors. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for Hydrogen Sulfide, Carbon Monoxide, and Oxygen. Hydrogen Sulfide and Carbon Monoxide level must be below exposure level listed in Section 2 (Composition and Information on Ingredients) and Oxygen levels must be above 19.5% before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify cylinders containing a gas mixture with Hydrogen Sulfide or Carbon Monoxide. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Eye wash stations/safety showers should be near areas where this product is used or stored. All work operations should be monitored in such a way that emergency personnel can be immediately contacted in the event of a release. All work practices should minimize releases of Hydrogen Sulfide and Carbon Monoxide-containing gas mixtures.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C, 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING!** Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: **WARNING!** Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Oxygen, Hydrogen Sulfide, and Carbon Monoxide.

RESPIRATORY PROTECTION. No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if Carbon Monoxide levels exceed the exposure levels given in Section 2 (Composition and Information on Ingredients) or if oxygen levels are below 19.5%, or if either level is unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards. The following NIOSH respiratory protection recommendations for Hydrogen Sulfide and Carbon Monoxide are provided for further information.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

NIOSH/OSHA RECOMMENDATIONS FOR HYDROGEN SULFIDE CONCENTRATIONS IN AIR:

UP TO 100 ppm

Powered air-purifying respirator with cartridge(s) to protect against hydrogen sulfide; gas mask with canister to protect against hydrogen sulfide; or SAR; or full-facepiece SCBA.

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

Escape

Gas mask with canister to protect against hydrogen sulfide; or escape-type SCBA

NOTE:

The IDLH concentration for Hydrogen Sulfide is 100 ppm.

NIOSH/OSHA RECOMMENDATIONS FOR CARBON MONOXIDE CONCENTRATIONS IN AIR:

UP TO 350 ppm

Supplied Air Respirator (SAR)

UP TO 875 ppm

Supplied Air Respirator (SAR) operated in a continuous flow mode.

UP TO 1200 ppm

Gas mask with canister to protect against carbon monoxide; or full-facepiece SCBA; or full-facepiece Supplied Air Respirator (SAR).

Emergency or Planned Entry into Unknown Concentration or IDLH Conditions: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece Supplied Air Respirator (SAR) with an auxiliary positive pressure SCBA.

Escape

Gas mask with canister to protect against carbon monoxide; or escape-type SCBA.

NOTE:

NOTE: End of Service Life Indicator (ESLI) required for gas masks.
The IDLH concentration for Carbon Monoxide is 1200 ppm.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: No special protection is needed under normal circumstances of use.

BODY PROTECTION: No special protection is needed under normal circumstances of use.

9. PHYSICAL and CHEMICAL PROPERTIES

Unless otherwise specified, the following information is for Nitrogen, the main component of this gas mixture.

GAS DENSITY @ 32°F (0°C) and 1 atm: .072 lbs/ft³ (1.153 kg/m³)

BOILING POINT: -320.4°F (-195.8°C)

FREEZING/MELTING POINT @ 10 psig: -345.8°F (-210°C)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

EVAPORATION RATE (nBuAc = 1): Not applicable.

ODOR THRESHOLD: 0.13 ppm (Hydrogen Sulfide)

VAPOR PRESSURE @ 70°F (21.1°C) (psig): Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

APPEARANCE AND COLOR: This product is a colorless gas which has an rotten egg-like odor, due to the presence of Hydrogen Sulfide.

HOW TO DETECT THIS SUBSTANCE (warning properties): Continuous inhalation of low concentrations of Hydrogen Sulfide (a component of this gas mixture) may cause olfactory fatigue, so that there are no distinct warning properties. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation. Wet lead acetate paper can be used for leak detection. The paper turns black in the presence of Hydrogen Sulfide. Cadmium chloride solutions can also be used. Cadmium solutions will turn yellow upon contact with Hydrogen Sulfide.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state.

DECOMPOSITION PRODUCTS: The thermal decomposition products of Methane include carbon oxides. The decomposition products of Hydrogen Sulfide include water and sulfur oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. Components of this product (Hydrogen Sulfide, Methane) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride). Carbon Monoxide is mildly corrosive to nickel and iron (especially at high temperatures and pressures). Hydrogen Sulfide is corrosive to most metals, because it reacts with these substances to form metal sulfides.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

METHANE: There are no specific toxicology data for Methane. Methane is a simple asphyxiant, which acts to displace oxygen in the environment.

HYDROGEN SULFIDE:

- LC₅₀ (inhalation, human) = 600 ppm/30 minutes
- LC₅₀ (inhalation, man) = 5.7 mg/kg; central nervous system, pulmonary effects
- LC₅₀ (inhalation, human) = 800 ppm/5 minutes
- LC₅₀ (inhalation, rat) = 444 ppm
- LC₅₀ (inhalation, mouse) = 673 ppm/1 hour
- LC₅₀ (inhalation, mammal) = 800 ppm/5 minutes

- LC₅₀ (inhalation, mouse) = 6 (ppm) hour (primate H) post) un. concn
- LC₅₀ (inhalation, human) = 600 mg/m³/10 minutes
- LC₅₀ (inhalation, man) = 4000 ppm/30 minutes
- LC₅₀ (inhalation, man) = 650 ppm/45 minutes: central nervous system and blood system effects.
- LC₅₀ (inhalation, human) = 5000 ppm/5 minutes
- LC₅₀ (inhalation, dog) = 4000 ppm/45 minutes
- LC₅₀ (inhalation, rabbit) = 4000 ppm
- LC₅₀ (inhalation, rat) = 1811 ppm/4 hours
- LC₅₀ (inhalation, guinea pig) = 2450 ppm/4 hours
- LC₅₀ (inhalation, guinea pig) = 5718 ppm/4 hours
- LC₅₀ (inhalation, mammal) = 5000 ppm/5 minutes
- LC₅₀ (inhalation, wild bird) = 1334 ppm

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA 2 LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Hydrogen Sulfide, a component of this gas mixture, is irritating to the eyes, and may be irritating to the skin.

SENSITIZATION OF PRODUCT: The components of this gas mixture are not known to be skin or respiratory sensitizers.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this gas mixture on the human reproductive system.

Mutagenicity: This gas mixture is not expected to cause mutagenic effects in humans.

Embryotoxicity: This gas mixture contains components that may cause embryotoxic effects in humans; however, due to the small total amount of the components, embryotoxic effects are not expected to occur.

Teratogenicity: This gas mixture is not expected to cause teratogenic effects in humans due to the small cylinder size and small total amount of all components. Carbon Monoxide, a component of this gas mixture which exists up to 1%, can cause teratogenic effects in humans. Severe exposure to Carbon Monoxide during pregnancy has caused adverse effects and the death of the fetus. In general, maternal symptoms are an indicator of the potential risk to the fetus since Carbon Monoxide is toxic to the mother before it is toxic to the fetus.

Reproductive Toxicity: This gas mixture is not expected to cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by over-exposure to this product. Carbon Monoxide, a component of this gas mixture, can aggravate some diseases of the cardiovascular system, such as coronary artery disease and angina pectoris. Because of the presence of Hydrogen Sulfide, eye disorders or skin problems may be aggravated by over-exposure to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate over-exposure. Hyperbaric oxygen is the most efficient antidote to Carbon Monoxide poisoning, the optimum range being 2-2.5 atm. A special mask, or, preferably, a compression chamber to utilize oxygen at these pressures is required. Avoid administering stimulant drugs. Be observant for initial signs of pulmonary edema in the event of severe inhalation over-exposures.

BIOLOGICAL EXPOSURE INDICES (BEIs): Biological Exposure Indices (BEIs) are applicable for this product, as follows:

BIOLOGICAL EXPOSURE INDICES (BEIs) for components of this product are as follows:		
CHEMICAL DETERMINANT	SAMPLING TIME	BEI
CARBON MONOXIDE • Carboxyhemoglobin in blood • Carbon monoxide in end-exhaled air	• End of shift • End of shift	• 3.5% of Hemoglobin • 20 ppm

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product.

HYDROGEN SULFIDE: Water Solubility = 1 g/242 mL at 20°C.

CARBON MONOXIDE: Water solubility = 3.3 ml/100 cc at 0°C, 2.3 ml at 20°C.

NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C; 1.6 volumes Nitrogen/100 volumes water at 20°C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plant and animal life. Hydrogen Sulfide and Carbon Monoxide, components of this product, can be deadly to exposed animal life, producing symptoms similar to those experienced by humans. This gas mixture may also be harmful to plant life.

12. ECOLOGICAL INFORMATION (Continued)

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life. The presence of more than a trace of Carbon Monoxide (a component of this product) is a hazard to fish. The following aquatic toxicity data are available for Hydrogen Sulfide (another component of this gas mixture):

- | | |
|--|---|
| TLm (Asellus sp) = 0.111 mg/L/96 hour | TLm (Lepomis macrochirus, bluegill sunfish) = 0.0478 mg/L/96 hour |
| TLm (Cratogeomys sp) = 1.07 mg/L/96 hour | TLm (Lepomis macrochirus, bluegill sunfish) = 0.0448 mg/L/96 hour at 21-22 °C |
| TLm (Gammarus) = 0.84 mg/L/96 hour | TLm (Pimephales promelas, fathead minnow) = 0.0071-0.55 mg/L/96 hour |
| LC ₅₀ (fly inhalation) = 380 mg/m ³ /960 minutes | TLm (Salvelinus fontinalis, brook trout) = 0.0216-0.038 mg/L/96 hour at 8-12.5 °C |
| LC ₅₀ (fly inhalation) = 1500 mg/m ³ /7 minutes | |

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

- | | |
|---|---|
| PROPER SHIPPING NAME: | Compressed gases, n.o.s. (Nitrogen, Hydrogen Sulfide) |
| HAZARD CLASS NUMBER and DESCRIPTION: | 2.2 (Non-Flammable Gas) |
| UN IDENTIFICATION NUMBER: | UN 1956 |
| PACKING GROUP: | Not applicable. |
| DOT LABEL(S) REQUIRED: | Non-Flammable Gas |
| NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): | 126 |

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: This product is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 306	SARA 313
Oxygen	NO	NO		NO
Methane	NO	NO		NO
Carbon Monoxide	NO	NO		NO
Nitrogen	NO	NO		NO
Hydrogen Sulfide	YES	YES		YES

- SARA THRESHOLD PLANNING QUANTITY:** Hydrogen Sulfide = 500 lbs.
TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.
CERCLA REPORTABLE QUANTITY (RQ): Hydrogen Sulfide = 100 lbs.

- Hydrogen Sulfide and Methane are subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for each of these gases is 10,000 pounds and so this mixture will not be affected by the regulation.
- Depending on specific operations involving the use of this gas mixture, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Hydrogen Sulfide is listed in Appendix A of this regulation. The Threshold Quantity for Hydrogen Sulfide under this regulation is 1500 lbs (and so one cylinder of this product will not be affected by this regulation).
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
- Nitrogen and Oxygen are not listed Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Hydrogen Sulfide is listed under this regulation in Table 1 as a Regulated Substance (Toxic Substance), in quantities of 10,000 lbs (4,553 kg) or greater. Carbon Monoxide and Methane are listed under this regulation in Table 3, as Regulated Substances (Flammable), in quantities of 10,000 lbs (4,553 kg) or greater, and so this mixture will not be affected by the regulation.

OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2A, as per the Controlled Product Regulations.

STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances:
Carbon Monoxide, Hydrogen Sulfide, Methane.

California - Permissible Exposure Limits for Chemical Contaminants: Carbon Monoxide, Nitrogen, Hydrogen Sulfide, Methane.

Florida - Substance List: Oxygen, Carbon Monoxide, Hydrogen Sulfide

Illinois - Toxic Substance List: Carbon Monoxide, Methane, Hydrogen Sulfide.

Kansas - Section 302313 List: No.

Massachusetts - Substance List: Oxygen, Carbon Monoxide, Hydrogen Sulfide, Methane.

Minnesota - List of Hazardous Substances: Carbon Monoxide, Hydrogen Sulfide, Methane.

Missouri - Employer Information/Toxic Substance List I:
Hydrogen Sulfide, Methane.

New Jersey - Right to Know Hazardous Substance List:
Oxygen, Carbon Monoxide, Nitrogen, Methane.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: Hydrogen Sulfide.

Pennsylvania - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Hydrogen Sulfide, Methane.

Rhode Island - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Hydrogen Sulfide, Methane.

Texas - Hazardous Substance List: Hydrogen Sulfide.

West Virginia - Hazardous Substance List: Hydrogen Sulfide.

Wisconsin - Toxic and Hazardous Substances: Hydrogen Sulfide

CALIFORNIA PROPOSITION 65: Carbon Monoxide (a component of this product) is on the California Proposition 65 lists as a chemical known to the State of California to cause birth defects or other reproductive harm.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommend recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scraping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the final product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 "Safe Handling of Compressed Gases in Containers"
AV-1 "Safe Handling and Storage of Compressed Gases"
"Handbook of Compressed Gases"

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302

Fax on Demand: 1-800/231-1366

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.