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October 29, 2010

Ms. Tara Diaz
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A, 11th Floor
625 Broadway
Albany, New York 12233-7015

Subject: **Site Characterization Report - FINAL**
Cutchogue Freon Plume, Site No. 1-52-227
Work Assignment #D004434-30
MACTEC Engineering and Consulting, P.C., Project No. 3612092126

Dear Ms. Diaz:

MACTEC Engineering and Consulting, P.C. (MACTEC) is pleased to transmit the Final Site Characterization Report (SC Report) for the Cutchogue Freon Plume Site in New Hyde Park, Nassau County, New York. This SC Report documents the activities and results of sampling performed at the site in March, 2010.

As requested, we are providing four paper copies and an electronic version. Please note that we will also transmit the project data as an electronic data deliverable (EDD). Mactec is preparing the EDD in the EQUIS format requested by NYSDEC and will forward within two weeks.

Thank you for the opportunity to assist the New York State Department of Environmental Conservation on this project.

Sincerely,

MACTEC Engineering and Consulting, P.C.

Eric C. Sandin
Project Manager

FILE COPY

FINAL
FIELD ACTIVITIES PLAN
CUTCHOGUE FREON PLUME
SITE # 152227

WORK ASSIGNMENT NO. D004434-30

Prepared for:

New York State Department of Environmental Conservation
Albany, New York

Prepared by:

MACTEC Engineering and Consulting, P.C.
Portland, Maine

MACTEC: 3612092126

MARCH 2010

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MARCH 2010

Submitted by:

Eric C. Sandin
Project Manager

Approved by:

Bryanna Stiles w/permission by J.W.P.
John W. Peterson
Principal Professional

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CFC	chlorofluorocarbon
EAR	Environmental Assessment & Remediation, Inc.
FAP	Field Activities Plan
HASP	Health and Safety Plan
IDW	Investigation derived waste
MACTEC	MACTEC Engineering and Consulting, P.C.
NYSDEC	New York State Department of Environmental Conservation
PID	photoionization detector
ppm	parts per million
QAPP	Quality Assurance Program Plan
RI	remedial investigation
SCSDH	Suffolk County Department of Health Services
Site	Cutchogue Freon Plume site
µg/L	microgram(s) per liter
USDOT	United States Department of Transportation
VOC	volatile organic compound
WA	work assignment

1.0 INTRODUCTION

MACTEC Engineering and Consulting, P.C. (MACTEC), under contract to the New York State Department of Environmental Conservation (NYSDEC), is submitting this Draft Field Activities Plan (FAP) for the Cutchogue Freon Plume site (Site) in Town of Southhold, Suffolk County, New York (Figure 1.1). This FAP has been prepared in accordance with the NYSDEC requirements in work assignment (WA) No. D004434-30, dated, July 1, 2009, and with the July 2005 Superfund Standby Contract between MACTEC and the NYSDEC.

The objective of the WA is to identify the source of chlorofluorocarbons (CFCs), specifically chlorodifluoromethane and dichlorodifluoromethane, which were detected in tap water from several private residential wells located in the area of Harbor Lane in the Hamlet of Cutchogue. These CFCs are part of a group of volatile organic compounds (VOCs) that are often used as refrigerants, aerosol propellants, and solvents. CFCs are sometimes referred to as Freons. Freon is one manufacturer's (duPont) brand name. The NYSDEC has named this investigation the "Cutchogue Freon Spill" and therefore, MACTEC will use the term Freon-type contaminant to refer to CFCs in this field plan.

In 2005 and 2006, the Suffolk County Department of Health Services (SCDHS) conducted a drinking water survey (Survey #SV1405) of more than 50 homes that lie between Route 25 (Main Street) and the East Inlet to Cutchogue Harbor. Sampled homes were located principally on: Harbor Lane; Oak Street; Pierce Drive, and Briarwood Lane. The sampling was conducted in support of an investigation into NYSDEC Spill #05-51408, an area of fuel-related groundwater impact (principally, the gasoline additive Methyl Tertiary Butyl Ether and volatile fuel compounds such as benzene, toluene, ethylbenzene, xylenes [BTEX]) that was discovered in water from a well located at 710 Harbor Lane. SCDHS sampling surveys and NYSDEC investigations identified a groundwater plume with petroleum impacts that is believed to extend from a gas station on Main Street eastward through 710 Harbor Lane and adjacent properties to the east.

Chlorodifluoromethane and/or dichlorodifluoromethane were reported in residential wells and groundwater explorations in two apparent clusters within the sampled residences between Maine Street and East Creek. Several direct-push (earthprobe-type) borings that were drilled to look for petroleum impact along a private lane (between 1005 Harbor Lane and 1155 harbor Lane) encountered

chlorodifluoromethane at depths of between 30 and 35 feet below ground surface (bgs) at reported concentrations above 100 micrograms per liter (ug/L). Several residential wells in this area also exhibited this Freon-type compound at levels just above the drinking water standard of 5 ug/L. The westernmost detection, in a well on the west side of Harbor Lane (1120 Harbor Lane), suggests that a plume may be migrating into the residential neighborhood from an upgradient source. The plume appears to parallel the path of the petroleum plume.

Tap water from several homes in a southern portion of the Harbor Lane neighborhood also contained dichlorofluoromethane and/or chlorodifluoromethane at low concentrations (e.g. generally less than the drinking water standard of 5 ug/L). These properties appear to indicate the presence of a second flowpath that contains Freon-type contaminants.

Since these compounds would not typically be expected from a gasoline-type release and since several of the commercial properties to the west of the gas station have visible cooling equipment, the NYSDEC has determined that additional groundwater investigations are needed to investigate the occurrence of Freon-type contamination and to determine the source(s).

2.0 SITE PHYSICAL SETTING

The Harbor Lane area of Cutchogue is located on the North Fork near the eastern end of Long Island. This residential area is bounded on the east and south by East Creek, a tidal inlet that opens into Cutchogue Harbor to the south. Ground elevation varies from sea level at the shore to about 20 feet above mean sea level along Route 25. Topography is fairly level with a general slope to the southeast form the morainal ridge that forms the north coastline of the North Fork. Land use is mixed with residential lots distributed around Harbor Lane, agricultural fields and vineyards to the west, and light commercial/industrial development along the Route 25 corridor.

Local surface geology is the Roanoke Point outwash, a glacial unit typified by medium to coarse sand and gravel. Finer layers of sand, silt and clay may be present. Some areas along the south shore have a glacial clay unit that starts at depths of 30 to 40 feet below grade by but this may be absent in this area of Cutchogue (USGS, 2004).

Prior investigations reported depth to groundwater varying from about 9 to 16 feet bgs (Environmental Assessment & Remediation, Inc. [EAR], 2008). Shallow groundwater migrates generally towards the southeast however locally flow direction is influenced by the proximity of inlets such as East Creek. EAR reported that water level showed tidal influence. The sandy surface soils promote infiltration and no streams are present in the immediate study area.

3.0 SCOPE OF WORK

This FAP has been developed to characterize groundwater to provide data on the extent and concentration of VOCs. The components of the scope of work include:

- Geoprobe Groundwater Profiling – An initial nine groundwater profile borings are planned using direct-push technology with sequential groundwater sampling. Groundwater samples will be collected at 10-foot intervals starting at the water and ending at depths between 30 and 60 feet into the water table depending on projected depth of groundwater impact
- Supplemental Geoprobe Groundwater Profiling – Up to seven additional profiles may be completed to advance the site understanding of the vertical and lateral extent of contamination. Quick turnaround results from the initial profiles will be used to determine data gaps and the location of addition profiles, as necessary.
- Monitoring Well Sampling – Six existing groundwater monitoring wells will be sampled to provide contemporaneous characterization data to supplement the groundwater profiling.

Figure 3.1 is an aerial photograph of the Site area that identifies the proposed sampling locations. A summary field tasks and methodologies are described in more detail in Table 3.1, as well as in the following subsections. The sample IDs and analytical program is provided in Table 3.2.

3.1 FIELD OPERATIONS

Companion documents to this FAP that will govern the execution of the field exploration activities include MACTEC's Program Quality Assurance Program Plan (QAPP) (MACTEC, 2007) and Health and Safety Plan (HASP) (MACTEC, 2005). In addition to these program documents, Appendix A provides details related to health and safety for on-Site activities as presented in the Site-specific HASP.

Subcontractors chosen to support the field activities include:

- Con-Test Laboratory – NYSDEC Environmental Laboratory Approval Program certified laboratory for the analysis of groundwater samples; and
- GeoLogic NY, Inc. - direct push services for collecting groundwater samples.

3.1.1 Health and Safety

The Site-specific HASP is provided as Appendix A to this document. Based on available Site information, MACTEC anticipates that all fieldwork will be conducted in Level D personal protection. Specific investigation activities and required level of personal protection are set forth in the Site-specific HASP. Criteria for upgrading or downgrading the specified level of protection are also provided in the Site-specific HASP. Additional health and safety requirements are set forth in the Program HASP (MACTEC, 2005). Should Site conditions pose a threat to those present on-Site, and/or should Site conditions warrant an upgrade from Level D, as defined by tbe HASP, work will stop and the situation will be reevaluated by the NYSDEC and MACTEC. The New York State Department of Health Community Air Monitoring Plan will also be followed and is included in Appendix A.

3.1.2 Mobilization

MACTEC has initiated field planning activities that include identifying property owners, contacting municipal public works departments to obtain access to drill within road right-of-ways, etc. Upon approval of this FAP, MACTEC work with the drilling subcontractor to obtain utility clearances for all proposed locations and establish a field start date. MACTEC will apprise the NYSDEC of actions that may be needed to obtain access permission to sample on private or munieipal property. The NYSDEC is ultimately responsible for obtaining access.

MACTEC and its subcontractors will mobilize to the Site and begin the characterization sampling in accordance with the project schedule. Mobilization will include acquisition of the following:

- transportation to and from the study area;
- drilling equipment and field supplies;
- health and safety equipment;
- decontamination supplies and equipment, and;
- sampling containers and equipment.

Prior to the commencement of any drilling activities, MACTEC will hold an on-Site kick-off meeting with the subcontractor the familiarize workers with the Site history, health and safety requirements, sampling procedures, decontamination efforts, and handling of investigation-derived waste (IDW).

3.1.3 Groundwater Profile Sampling by Geoprobe

To characterize groundwater conditions and to provide data to assess the presence and distribution of Freon-type contaminants, groundwater profile borings are initially planned for three separate sub-areas of the study area (see Figure 3.1).

Route 25 Corridor. A transect consisting of four initial borings (GW-01 to GW-04) will be completed along Route 25 (Maine Street). These borings will provide information on the presence/absence of Freon-type contaminants in groundwater along this transect which is downgradient from several commercial/industrial properties that lie to the west of Route 25. Samples will be collected at four successive ten-foot intervals starting at the water table. Samples will be submitted for quick analysis (e.g. 48-hour turnaround) and the results will be used to determine if additional profiles are needed to characterize the extent of impact and identify potential release source(s). Potential additional profile locations are included on Figure 3.1.

Harbor Lane – Southern Area of Impact. Two initial borings (GW-05 and GW-06) are planned for a southern portion of Harbor Lane to characterize groundwater conditions in this portion of the neighborhood. Previous residential well sampling identified Freon-type contaminants in several properties at the locations depicted on Figure 3.1; however, the vertical and lateral extent of impact has not been determined. The prior detections in tap water appear to be oriented along a groundwater flowpath and the planned vertical profiling will determine current concentration and depth of impact. Samples will be collected at six successive ten-foot intervals starting at the water table. Samples will be submitted for quick analysis (e.g. 48-hour turnaround) and the results will be used to determine if additional profiles are needed to characterize the lateral and vertical extent of impact to groundwater. Potential additional profile locations to the north on Harbor Lane are shown on Figure 3.1.

Harbor Lane – Northern Area of Impact. Three borings will be completed along a transect that starts to the southeast of monitoring well MW-6 and will be used to profile groundwater quality as it flows towards Harbor Lane. Prior investigations detected Freon-type contamination in the wells and earthprobe borings to the east as shown on Figure 3.1. If Freon-type contaminants are detected it may rule out a residential release from the Harbor Lane neighborhood as a source of the contamination.

Samples will be collected at four successive ten-foot intervals starting at the water table. The earthprobe borings reported the highest levels of Freon-type contaminants at depths between 30 and 35 feet bgs.

Groundwater samples will be collected by using direct push technology to advance a discrete mill-slot sampling device to a desired depth. Groundwater will be purged using a peristaltic pump. One volume of water approximately equal to the volume in the rods will be purged and one set of groundwater parameters including temperature, conductivity, pH, and turbidity will be measured prior to sampling, if possible. Purge water will be examined for evidence of visual contamination and will be screened with a photonization detector (PID). If no VOCs are detected and no visual contamination is observed, the water will be discharged near the boring and allowed to infiltrate into unpaved ground. If evidence of contamination is noted, the water will be containerized and stored at a designated area for waste characterization and disposal. To minimize mixing within the water column, groundwater samples will be collected in order from the top of the water table to each borings target completion depth. Groundwater samples will be collected at ten foot intervals from within the water table.

Groundwater samples will be collected for VOC analysis at a low purge rate (approximately 100 milliliters per minute) at each location to profile off-site groundwater. Direct push sampling techniques are described in Section 4.5.1 of the QAPP (MACTEC, 2007). Groundwater measurements and sampling activities will be documented using a Groundwater Grab Field Data Record (QAPP Figure 4-10; MACTEC, 2007). Laboratory analysis is described in Table 3.2 and Appendix B, Table B-1.

3.1.4 Monitoring Well Sampling

Groundwater samples will be collected from the six existing monitoring wells (MW-1 to MW-6) shown on Figure 3.1 to provide additional data on the presence/absence of Freon-type contamination a that is contemporaneous with the profile sampling.

Prior to well sampling, each well will be examined for integrity, depth sounded and static water level measured. Monitoring wells will then be sampled using low-flow sampling procedures as described in the Section 4.5.4.3.2 of the QAPP (MACTEC, 2007).

Field measurements for pH, temperature, specific conductivity, oxidation reduction potential, dissolved oxygen, and turbidity will be collected through a flow through cell (with the exception of turbidity) from each monitoring well during pre-sample purging. Field measurements and monitoring well sampling activities will be documented using a Low Flow Groundwater Data Record (QAPP Figure 4-16; MACTEC, 2007).

Purge water will be screened with a PID and observed for sheens and odors. If no evidence of contamination is detected then the water will be allowed to infiltrate into the ground surface at the well location. If contamination is observed, purge water will be containerized and stored on-Site for future disposal. Groundwater samples from monitoring wells will be analyzed for VOCs by United States Environmental Protection Agency Method 8260, as described in the NYSDEC Analytical Services Protocol of June 2005 (NYSDEC, 2005). The laboratory will provide NYSDEC Category B deliverables.

3.2 DECONTAMINATION AND MANAGEMENT OF INVESTIGATION DERIVED WASTE

3.2.1 Decontamination

Sampling methods and equipment for this field program have been chosen to minimize decontamination requirements mitigating potential for cross contamination. Disposable sampling equipment will be used as much as practical to minimize decontamination time and water disposal. Non-disposable sampling equipment will be decontaminated before and after the collection of each sample. Decontamination methods and materials are described in detail in Subsection 4.3 of the QAPP.

Non-disposable sampling equipment will be decontaminated by 1) washing the sample collection equipment with potable water and Liquinox, rinsing with potable water, rinsing with deionized water, and then allowing the equipment to air dry, or 2) steam cleaning the equipment and then allowing the equipment to air dry. Drilling equipment (i.e. drill rods and casing) will be decontaminated by pressure washing prior to each boring, and before leaving the Site. Decontamination fluids will be released on-Site to the ground surface in the area of decontamination. In the event that

decontamination fluids exhibit visual or olfactory evidence of contamination, or PID readings are above background, fluids will be containerized for characterization testing and off-Site disposal.

3.2.2 Investigation Derived Wastes

The method of disposing investigation derived wastes (IDW) generated during this RI will be based upon whether the wastes are considered hazardous or non-hazardous. The approach to field screening and handling of the IDW are described in the following paragraphs.

United States Department of Transportation (USDOT) -approved 55-gallon containers filled during the field investigation will be staged near the work area at an area to be designated by the NYSDEC, and approved by property owner. Transport and disposal of these containers will be arranged by MACTEC on behalf of NYSDEC. Containers will be labeled with the following information: drum contents; Site name and the NYSDEC Site Number; and date drum filling began and date drum was sealed.

Disposable Sampling Equipment. Used disposable equipment will be bagged in polyethylene trash bags and sealed with twist ties. MACTEC personnel will measure the headspace in the closed bags with a PID at least one hour after sealing the bags. If the headspace reading is greater than 5 parts per million (ppm), the tubing will be decontaminated by flushing with potable water and re-bagged. This process will be repeated until PID readings are below 5 ppm, or for a maximum of three times. If the headspace is below 5 ppm, the disposable equipment will be disposed of as non-hazardous municipal solid waste. If the headspace readings do not drop below 5 ppm, the disposable equipment will be placed in USDOT approved 55-gallon containers for off-Site disposal.

Personal Protective Equipment. Used protective clothing will be double bagged in polyethylene trash bags and sealed with twist ties. A PID will be used to document the absence of VOCs. If no VOCs are detected, the bags will be disposed of as municipal solid waste. If VOCs are detected due to contaminants deposited on PPE, the waste will be containerized and disposed of by a waste contractor in the appropriate manner.

Well Purge Water. Purge water will be released on-Site to the ground surface in the area of well or groundwater profile boring. The purge water will be allowed to infiltrate into unpaved ground and not

disposed of on impervious surfaces. Purge water that exhibits visual or olfactory evidence of contamination, or PID readings above background, will be containerized in USDOT approved 55-gallon containers for later disposal in the on-Site system or off-Site disposal.

Drill Cuttings. Direct push and drilling soil cuttings will be screened for VOCs with a PID. Soils with visual evidence of contamination, or with sustained PID readings greater than background will be containerized for off-Site disposal in USDOT-approved 55-gallon drums. Soils with sustained PID readings of less than or equal to background will be considered non-contaminated and will be used as backfill for the borings from which they were extracted. Remaining uncontaminated soils will be spread evenly on the ground surface in unpaved areas of the Site, if acceptable to the property owner. If no on-Site space is available, remaining soil will be containerized in USDOT 55-gallon drums for off-Site disposal.

3.3 SITE SURVEY

Locations of the Geoprobe profile borings will be surveyed using a Trimble Global Positioning System or equivalent.

4.0 REFERENCES

EAR, 2008. Letter report to Joseph E. Hass II (NYSDEC) from Karyn Waryas (EAR) dated April 4, 2008. Subject: Alternative Water Supply Recommendation; 710 Harbor Lane, Cutchogue, NY; NYSDEC Spill #05-51408, PIN #SP-03791

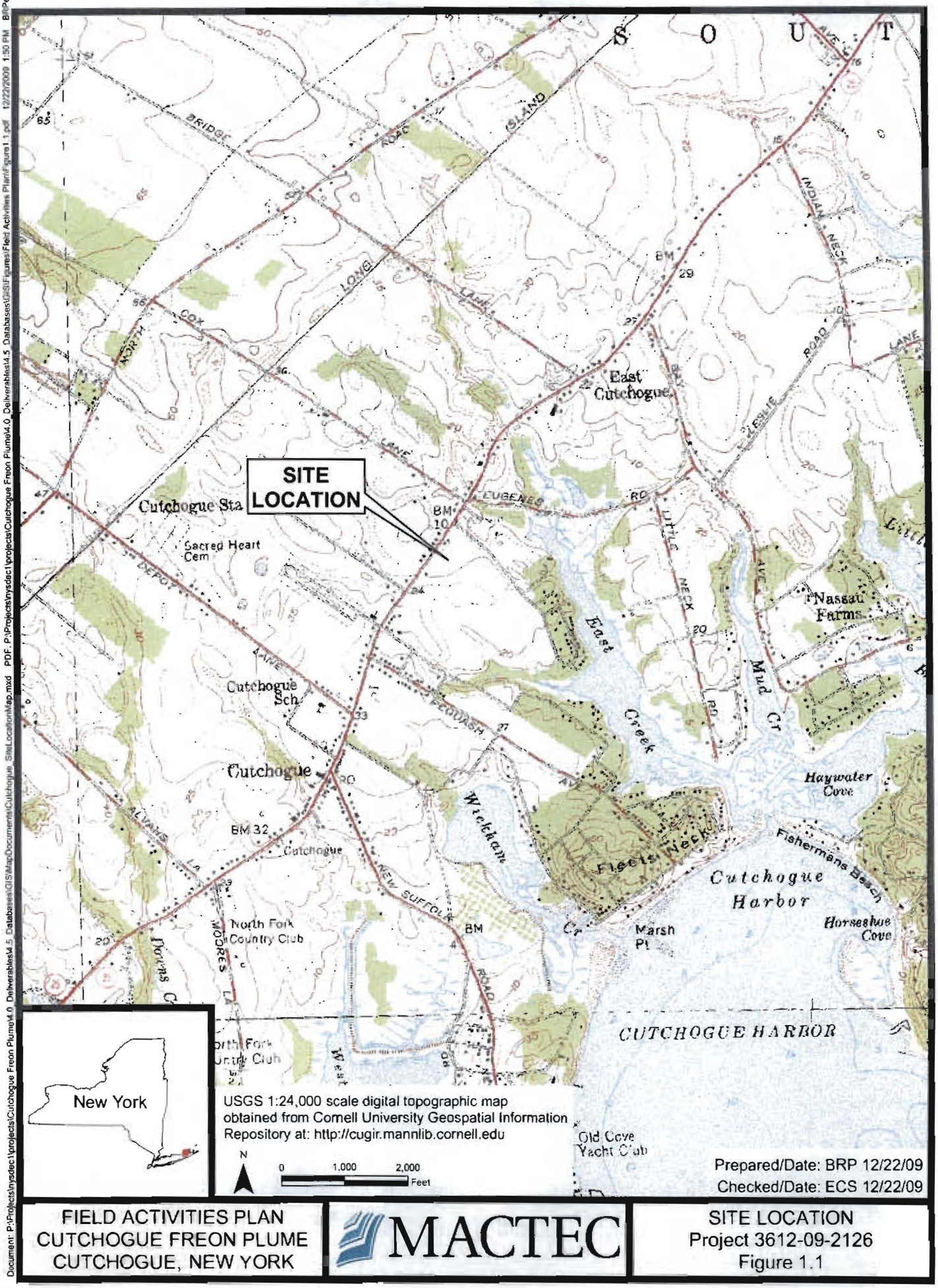
MACTEC Engineering and Consulting, P.C. (MACTEC), 2007. Program Quality Assurance Program Plan. Prepared for the New York State Department of Environmental Conservation, Albany, New York. October 2007.

MACTEC Engineering and Consulting, P.C. (MACTEC), 2005. Program Health and Safety Plan. Prepared for New York State Department of Environmental Conservation, Albany, New York. 2005.

New York State Department of Environmental Conservation (NYSDEC), 2005. "Analytical Services Protocols"; 6/05 Edition; June 2005.

USGS, 2004. Hydrogeologic Framework of the North Fork and Surrounding Areas, Long Island, New York. Water Resources Investigations Report 02-4284. Schubert, Christopher E. et al., Coram, New York 2004.

FIGURES



FIELD ACTIVITIES PLAN
CUTCHOGUE FREON PLUME
CUTCHOGUE, NEW YORK

MACTEC

SITE LOCATION
Project 3612-09-2126
Figure 1.1

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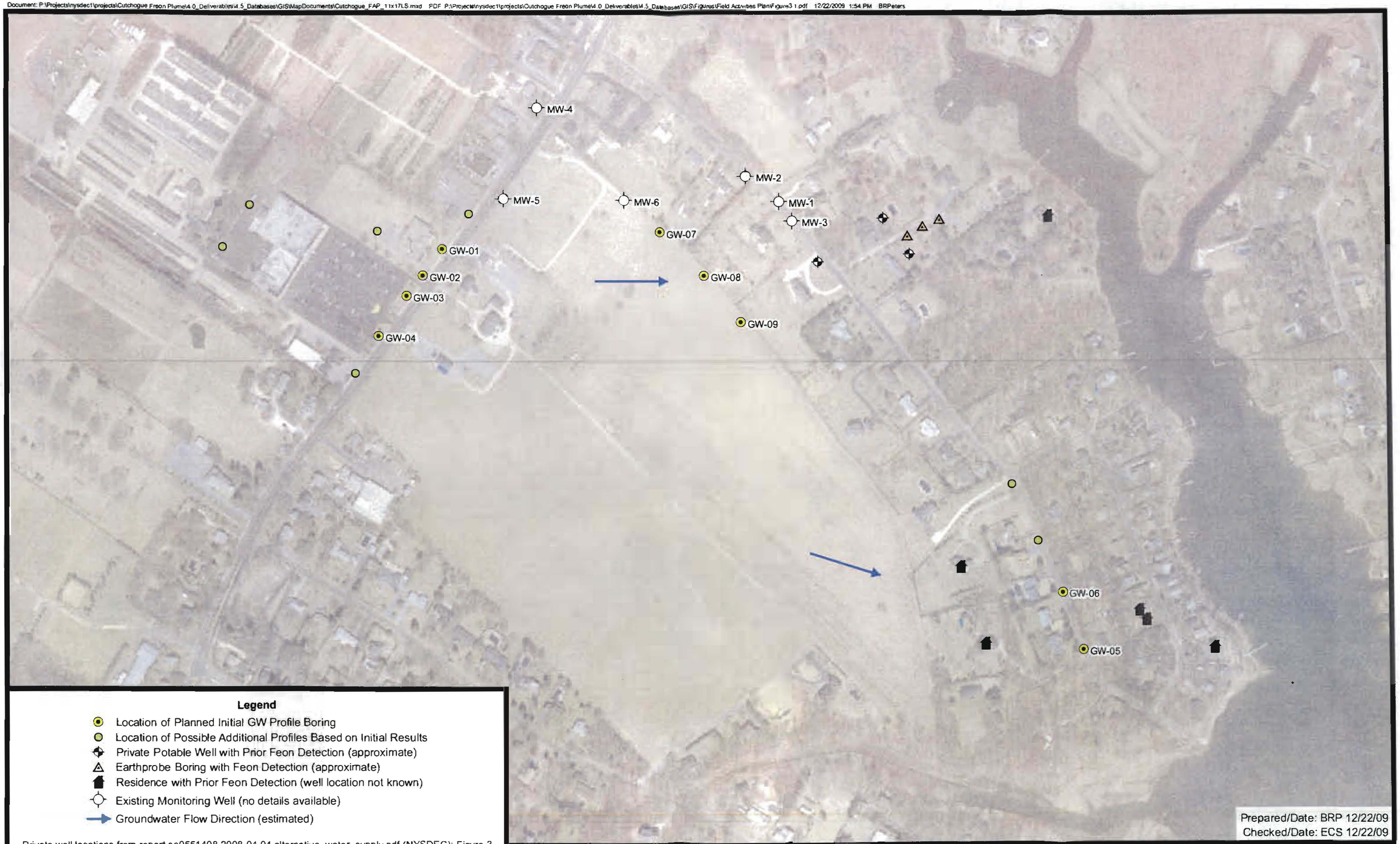


Legend

- Location of Planned Initial GW Profile Boring
- Location of Possible Additional Profiles Based on Initial Results
- Private Potable Well with Prior Feon Detection (approximate)
- Earthprobe Boring with Feon Detection (approximate)
- Residence with Prior Feon Detection (well location not known)
- Existing Monitoring Well (no details available)
- Groundwater Flow Direction (estimated)

Private well locations from report.sp0551408.2008-04-04.alternative_water_supply.pdf (NYSDEC); Figure 3

N

0 150 300 Feet

Suffolk County color digital orthoimagery (2007) obtained from New York State GIS Clearinghouse at: http://www.nysgis.state.ny.us

Prepared/Date: BRP 12/22/09
Checked/Date: ECS 12/22/09

FIELD ACTIVITIES PLAN
CUTCHOGUE FREON PLUME
CUTCHOGUE, NEW YORK

MACTEC

PROPOSED EXPLORATION LOCATIONS
Project 3612-09-2126
Figure 3.1

TABLES

Table 3.1: Proposed Field Tasks and Methodology

LOCATION TYPE	LOCATION ID	DESCRIPTION AND METHODOLOGY	RATIONALE	ANALYTICAL
Groundwater Profile Sampling	GW-01 to GW-04	Geoprobe borings with a planned total of 16 groundwater samples collected at 10-foot intervals from water table to 40 feet below the water table	This initial transect of four boings along Maine Street will characterize groundwater conditions downgradient from several commercial properties to confirm or disprove the presence of freon-type contaminants	TCL VOCs
Groundwater Profile Sampling	GW-05 and GW-06	Geoprobe borings with a planned total of 12 groundwater samples collected at 10-foot intervals from water table to 60 feet below the water table	These profiles, completed along the sourthern portion of Harbor Lane will provide data to assess the distributiou of Freon-type compounds that were previously detected in several residential wells in this portion of the neighborhood	TCL VOCs
Groundwater Profile Sampling	GW-07 and GW-09	Geoprobe borings with a planned total of 15 groundwater samples collected at 10-foot intervals from water table to 50 feet below the water table	This transect, to be completed immediately upgradient of Harbor Lane residences, will provide data to evaluate the distribution and current levels of freon-type contaminautes that were detected in 710 Harbor Lane and nearby properties	TCL VOCs
Groundwater Profiles Sampling (Optional)	GW-10 to GW-16	Geoprobe borings with interval groundwater samples collected from the water table to 40 ft below the water table	Additional groundwater profile borings that may be needed to aid in the delineation of impact. Possible locations (not numbered) are shown on Figure 3.1. Locations may be moved based on initial laboraotry results from GW-01 to GW-04.	TCL VOCs
Monitoring Well	MW-1 to MW-6	Sample six exisiting monitoring wells using low-flow sampling methods	These six water table monitoring wells were installed in the northern portion of the Harbor Lane area as part of the petroleum spill investigation. Sampling will provide additional characterization data to assess the distribution of freon-type VOCs	TCL VOCs

Prepared by:ECS 12/22/09
Checked by:JWP 01/05/09

NOTES:

TCL	Target Compound List
VOCs	Volatile Organic Compoand analyzed by USEPA Method 8260

Table 3.2: Proposed Sample Identification and Analyses

						Groundwater Samples	
Site Type	Media	Location ID	Projected Depth to Water (feet bgs)	Sampling Depth (bottom of interval)[1]	Sample ID	VOCs 8260B	DUP
Geoprobe Groundwater Profiling							
Geoprobe	Groundwater	GW-01	12	22	152227GW0122X	1	
Geoprobe	Groundwater	GW-01	12	32	152227GW0122X	1	
Geoprobe	Groundwater	GW-01	12	42	152227GW0122X	1	
Geoprobe	Groundwater	GW-01	12	52	152227GW0122X	1	
Geoprobe	Groundwater	GW-02	12	22	152227GW0222X	1	
Geoprobe	Groundwater	GW-02	12	32	152227GW0232X	1	
Geoprobe	Groundwater	GW-02	12	42	152227GW0242X	1	
Geoprobe	Groundwater	GW-02	12	52	152227GW0252X	1	
Geoprobe	Groundwater	GW-03	12	22	152227GW0322X	1	
Geoprobe	Groundwater	GW-03	12	32	152227GW0332X	1	
Geoprobe	Groundwater	GW-03	12	42	152227GW0342X	1	1
Geoprobe	Groundwater	GW-03	12	52	152227GW0352X	1	
Geoprobe	Groundwater	GW-04	12	22	152227GW0422X	1	
Geoprobe	Groundwater	GW-04	12	32	152227GW0432X	1	
Geoprobe	Groundwater	GW-04	12	42	152227GW0442X	1	
Geoprobe	Groundwater	GW-04	12	52	152227GW0452X	1	
Geoprobe	Groundwater	GW-05	10	20	152227GW0520X	1	
Geoprobe	Groundwater	GW-05	10	30	152227GW0530X	1	
Geoprobe	Groundwater	GW-05	10	40	152227GW0540X	1	
Geoprobe	Groundwater	GW-05	10	50	152227GW0550X	1	
Geoprobe	Groundwater	GW-05	10	60	152227GW0560X	1	
Geoprobe	Groundwater	GW-05	10	70	152227GW0570X	1	
Geoprobe	Groundwater	GW-06	10	20	152227GW0620X	1	
Geoprobe	Groundwater	GW-06	10	30	152227GW0630X	1	
Geoprobe	Groundwater	GW-06	10	40	152227GW0640X	1	
Geoprobe	Groundwater	GW-06	10	50	152227GW0650X	1	1
Geoprobe	Groundwater	GW-06	10	60	152227GW0660X	1	
Geoprobe	Groundwater	GW-06	10	70	152227GW0670X	1	
Geoprobe	Groundwater	GW-07	13	23	152227GW0723X	1	
Geoprobe	Groundwater	GW-07	13	33	152227GW0733X	1	
Geoprobe	Groundwater	GW-07	13	43	152227GW0743X	1	
Geoprobe	Groundwater	GW-07	13	53	152227GW0753X	1	
Geoprobe	Groundwater	GW-07	13	63	152227GW0763X	1	
Geoprobe	Groundwater	GW-08	13	23	152227GW0823X	1	
Geoprobe	Groundwater	GW-08	13	33	152227GW0833X	1	
Geoprobe	Groundwater	GW-08	13	43	152227GW0843X	1	1
Geoprobe	Groundwater	GW-08	13	53	152227GW0853X	1	
Geoprobe	Groundwater	GW-08	13	63	152227GW0863X	1	
Geoprobe	Groundwater	GW-09	13	23	152227GW0923X	1	
Geoprobe	Groundwater	GW-09	13	33	152227GW0933X	1	
Geoprobe	Groundwater	GW-09	13	43	152227GW0943X	1	
Geoprobe	Groundwater	GW-09	13	53	152227GW0953X	1	
Geoprobe	Groundwater	GW-09	13	63	152227GW0963X	1	
Additional Groundwater Profiles (Optional based on initial sampling results)							
Geoprobe	Groundwater	GW-10	TBD	TBD	152227GW10xxX	4	
Geoprobe	Groundwater	GW-11	TBD	TBD	152227GW11xxX	4	
Geoprobe	Groundwater	GW-12	TBD	TBD	152227GW12xxX	4	
Geoprobe	Groundwater	GW-13	TBD	TBD	152227GW13xxX	4	
Geoprobe	Groundwater	GW-14	TBD	TBD	152227GW14xxX	4	
Geoprobe	Groundwater	GW-15	TBD	TBD	152227GW15xxX	4	
Geoprobe	Groundwater	GW-16	TBD	TBD	152227GW16xxX	4	
Monitoring Well Sampling							
Monitoring Well	Groundwater	MW-1	14	24	152227MW01X	1	
Monitoring Well	Groundwater	MW-2	12	24	152227MW02X	1	
Monitoring Well	Groundwater	MW-3	15	24	152227MW03X	1	
Monitoring Well	Groundwater	MW-4	9	24	152227MW04X	1	
Monitoring Well	Groundwater	MW-5	11	24	152227MW05X	1	
Monitoring Well	Groundwater	MW-6	13	25	152227MW06X	1	
TOTAL SAMPLES						77	3

NOTES:

Sample ID: 152227 = NYSDEC Site No.; X = QAQC code (X = primesample; D = Duplicate

8260B VOCs = Target Compound List Volatile Organic Compounds

1. Geoprobe sample intervals are based on projected depth to water and may be modified in the field based on observed conditions
   Monitoring well sampling interval is bottom depth as shown on well logs

TBD = To Be Determined

bgs = below ground surface

NA = not applicable

Prepared By ECS 12/23/09
Checked by. JWP 12/28/09

MACTEC, Inc.

MACTEC Short Form HASP

Site: Cutchogue Freon Plume in Suffolk County, New York (Site 1-52-227) Job Number: 3612092126
Street Address: Various Locations in Cutchogue, Long Island, New York
Proposed Date(s) of Investigation: March 8 – April 15 (TBD)
Prepared by: Michael J. Washburn Date: 2/22/2010
*Approved by: Kendra C. Bavor, CSP Date: 2/26/2010
Site Description: Densely populated area, working along busy road ways and in right-of-ways.
(attach map)
Proposed Activity(s): Oversight supervision of Direct Push ground water sampling (0-70'bgs)

*Approval also serves as certification of a Hazard Assessment as required by 29 CFR 1910.132

Dates of Required Training and Medical Surveillance:

		Names of Field Team			
		TDB			
	Req?	Dates	Dates	Dates	Dates
Medical Surveillance	x				
Site Specific Medical Testing:_____					
40-Hour Initial	x				
8-Hour Supervisor [1,3]					
8-Hour Refresher	x				
First Aid/CPR [1,2]					
Respirator Fit Test [1]					
Respirator Brand [1]					
Hazard Communication [1]	x				
Fall Protection [1]					
Confined Space Entry [1]					

[1] If Applicable
[2] At least one worker must be trained in First Aid/CPR and should received Bloodborne Pathogen Training
[3] Required for Field Lead and Site Health and Safety Officer

Known or Suspected Contaminants (include PELs/TLVs):

Contaminants of Concern	Historical Highest Sample Data	PEL/TLV	Fact Sheet Included
Dichlorofluoromethane	0.450 mg/L (PPM)	10 ppm	x
Chlorodifluoromethane	0.260 mg/L (PPM)	1000 ppm	x

JHAs: Check and attach all that apply (add applicable JHAs not already listed):

Activity Specific JHAs:

☒	Mobilization/Demobilization and Site Preparation
☒	Field Work - General
☒	Decontamination
☒	Groundwater Sampling
☐	Soil Sampling
☐	Drilling Operation (MACTEC Driller)
☐	Geoprobe (MACTEC Geoprobe Operator)
☐	Excavations and Backfilling
☒	Soil Vapor Survey

Hazard Specific JHAs:

☐	Insect Stings and Bites
☐	Gasoline
☐	Working with Preservatives (Acids)
☐	
☐	
☐	
☐	
☐	
☐	

Chemicals Brought to the Site:
List all chemicals brought to the site (e.g., preservatives, decontamination solutions, gasoline, etc.). Attach MSDS

Chemicals	MSDS Attached?
HCL – VOC PRESERVATIVE	☒
	☐
	☐
	☐

Chemicals will be kept in their original containers. If transferred to another container, aside from days use by one individual, the new container will be labeled with the name of the chemical and the hazard warnings.

HAZARD IDENTIFICATION SUMMARY

Complete the checklist for summarizing the hazards identified in the JHAs

Standard Hazards			
☐ Falling Objects	☒ Slips and trips	☒ Pinch points	☐ Rotating equipment
☐ Falls	☒ Power equipment/tools	☐ Elevated work surfaces	☐ _____
Eye Hazards			
☐ Particulates	☐ Liquid splashes	☐ Welding Arc	☐ _____
Hearing Hazards			
☐ None	☒ Impact noise	☐ High frequency noise	☐ High ambient noise

Respiratory Hazards						
☐ None	☐ Dust/aerosols/particulates	☐ Organic Vapors	☐ Acid Gases	☐ O_2 deficient	☐ Metals	☐ Asbestos

Chemical Hazards			
☐ None	☐ Organic solvents	☐ Reactive metals	☐ PCBs
☐ Acids / bases	☐ Oxidizers	☐ Volatiles/Semi-volatiles	☒ CFC _____

Environmental Hazards			
☐ None	☒ Temperature extremes: ☒ Cold ☐ Heat	☐ Wet location	☐ Bio hazards (snakes, insects, spiders, poisonous plants, etc.)
☐ Explosive vapors	☐ Confined space	☐ Engulfment Hazard	☐ _____

Electrical Hazards				
☐ None	☐ Energized equipment or circuits	☒ Overhead utilities	☒ Underground utilities	☐ Wet location

Fire Hazards			
☒ None	☐ Cutting, welding, or grinding generated sparks or heat sources	☐ Flammable materials present	☐ Oxygen enriched location

Ergonomic Hazards					
☒ Lifting	☐ Bending	☐ Twisting	☐ Pulling/tugging	☐ Repetitive motion	☐ Carrying
Computer Use in the: ☐ Office ☐ Field				☐ _____	

Radiological Hazards						
☒ None	☐ Alpha	☐ Beta	☐ Gamma/X-rays	☐ Neutron	☐ Radon	☐ Non-Ionizing

Other Hazards
☒ Traffic

PPE and Monitoring Instruments

Initial Level of PPE *			
☐ Level D	☒ Modified Level D	☐ Level C	* Cannot use Short Form HASP for Level B or A work

Standard PPE					
☒ Hard Hat	☐ Safety boots	☒ Safety glasses	☐ Chem. Resistant Boots	☒ High visibility vest	☐ Other:_____

Eye and Face Protection			
☐ Face shield	☐ Vented goggles	☐ Unvented goggles	☐ Indirect vented goggles

Hearing Protection			
☒ Ear plugs	☐ Ear Muffs	☐ Ear plugs and muffs	☐ Other _____

Respiratory Protection					
☒ None	☐ Dust mask	☐ Full Face APR	☐ Half Face APR	Cartridge Type: _____	Change Cartridges: _____

Protective Clothing			
☒ Work uniform	☐ White uncoated Tyvek®	☐ Poly-coated Tyvek®	☐ Saranex®
☐ Boot covers	☐ Reflective vest	☐ Chaps or Snake Legs	☐ Other _____

Hand Protection					
☐ None	☐ Cotton gloves	☐ Leather gloves	☐ Glove liners	☒ Cut-resistant gloves (optional)	☐ Other _____
☐ Outer Gloves: List Type Nitrile			☐ Inner Gloves: List Type_____		

Monitoring Instruments Required*

Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen over permissible exposure limits or published exposure levels since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are as follows:

- When work begins on a different portion of the site.
- When contaminants other than those previously identified are being handled.
- When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling.)
- When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon.)

☐ LEL/O2 Meter	☒ PID:	☒ 10.0-10.6 eV Lamp ☐ 11.7 eV Lamp	☐ FID	☐ Hydrogen Sulfide/Carbon Monoxide
☐ Dräger Pump (or equivalent) List Tubes_____	☐ Dust Meter:	☐ Respirable dust ☐ Total dust	☐ Other _____	

*Monitoring instruments will be calibrated daily in accordance with manufacturer's instructions.

Air Monitoring Action Levels:

PID/FID Reading [1]	Detector Tube [1]	Dust Meter [1]	LEL[2]/O_2 [1]	Action	Level of PPE
Any above background				Stop work. Evacuate area. Reevaluate. If action levels continue to be exceeded, contact HSO	D
			>10% LEL	Stop work. Evacuate area. If action levels continue to be exeeeded, contact HS●, consider return with ventilation system and spark proof/intrinsically safe equipment.	
			<19.5% O_2	Stop work and evacuate area.	

[1] Sustained readings measured in the breathing zone
[2] Readings at measured at the source (borehole, well, etc.)

PPE Selection Guidelines

When selecting the appropriate PPE for the job, consider the following:

- **Safety glasses** – general eye protection – source of hazard, typically coming from straight on, required at most sites
- **Tinted Safety Glasses** – same as above, but when working in direct sunlight. May need two both tinted and untinted if working in both sunlight and shade/overcast skys.
- **Safety goggles** – needed for splash hazard, more severe eye exposures coming from all directions. Non-vented or indirect venting for chemical splash, non-vented for hazardous gases or very fine dust, vented for larger particulates coming from all directions.
- **Face shield** – needed to protect face from cuts, burns, chemicals (corrosives or chemicals with skin notation), etc.
- **Safety boots** – needed if danger of items being dropped on foot that could injure foot
- **Hard hat** – danger from items falling on head – any overhead work, tools, equipment, etc that is above the head and could fall on head of item fails, or falls off work platform. Typically required at most sites as a general PPE
- **Thin, chemical protective inner gloves** (e.g., thin Nitrile, PVC – do not use latex – many people are allergic to latex) –needed to protect hands from incidental contact with low risk contamination at very low concentrations (ppb or low ppm concentrations in groundwater or soil) or used in combination with outer gloves as a last defense against contamination. Need to specify type
- **Outer gloves** – thicker gloves (e.g., Nitrile, Butyl, Viton, etc.) – used when potential for high concentrations of contaminants (e.g., floating product, percent ranges of contaminant, opening drums, handling pure undiluted chemicals, etc.). Need to specify type.
- **Leather gloves, leather palm, cotton** – good in protecting hands against cuts – no protection from chemicals. May be used in combination with chemical protective gloves.
- **Boot Covers** – when there is contamination in surface soils or waking surface in general. When safety boots need protection from contact with contaminants.
- **White (uncoated) Tyveks** – protect clothing from getting dirty, good for protection against solid, non-volatile chemicals (e.g., asbestos, metals) – no chemical protection.
- **Polycoated Tyveks** – least protective of chemical protective clothing. Used when some risk of contamination getting on skin or clothing. Usually, lower ppm ranges of contaminants.
- **Saranex** – Greater protection against contamination than Polycoated Tyveks. Used to protect against PCBs or higher concentrations of contaminants in the soil or groundwater.
- **Other Chemical protective clothing** – if significant risk of dermal exposure, contact H&S to determine best kind.
- **Long sleeved shirts, long pants** – if working in areas with poison ivy/oak/sumac, poisonous insects, etc. and no chemicals exposure. May want to use uncoated Tyveks for work in areas where poisonous plants are know to be to protect clothing.
- **Cartridge Respirator (Level C PPE)** – Need to calculate change schedule (contact Division EH&S Manager for this) to determine length of use. To be able to use cartridge respirators, need to know contaminants, estimate levels to be encountered in the breathing zone, need to ensure that cartridge will be effective against COCs, and need to be able to monitor for COCs using PID, FID, Dräger tubes, etc.. If can't do any of these, then Level B PPE is probably going to be needed.
- **High Visibility Vest** – needed for any road work (with in 15 feet of a road) or when working on a site with vehicular traffic or working around heavy equipment. Needed if work tasks would take employee concentration away from movement of vehicles and workers would have to rely on the other driver's ability to see the employee in order not to hit them. This includes heavy equipment as well as cars and trucks, on public roads or the jobsite. Not needed if wearing Polycoated Tyveks – as they are already high visibility.
- **Reflective Vest** – see above, but for use at night.
- **Hearing Protection** – needed if working at noise levels above 85 dBA on a time weighted average. If noise measurements are not available, use around noisy equipment, or in general, if you have to raise your voice to be heard when talking to someone standing two feet away.
- **Protective Chaps** – required when using a machete or chain saw or any other cut hazard to legs.

Work Zones:
The work zones will be defined relative to the location of the work activity. The Exclusion Zone is considered the area within a 10-foot diameter of the sampling location. The Contamination Reduction Zone is considered to be the area with in a 20-foot diameter of the sampling location. The decontamination zone being located upwind of the work area. Work zones will be maintained through the use of:

- ☐ Warning Tape
- ☒ Visual Observations
- ☒ Barricades, signs and cones along roadway and right-of-ways

Decontamination Procedures and Equipment:
Note: See Decontamination JHA for further information

Level D Decontamination Procedures

Decontamination Solution:	Detergent and Water
Station 1: Equipment Drop	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, etc. on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.
Station 2: Outer Boots, and Gloves Wash and Rinse (if worn)	Scrub outer boots, and outer gloves decon solution or detergent water. Rinse off using copious amounts of water.
Station 3: Outer Boot and Glove Removal (if worn)	Remove outer boots and gloves. Deposit in plastic bag.
Station 4: Inner glove removal	Remove inner gloves and place in plastic bag.
Station 5: Field Wash	Hands and face are thoroughly washed. Shower as soon as possible.

Modified Level D and Level C PPE Decontamination Procedures

Decontamination Solution:	Detergent and Water
Station 1: Equipment Drop	Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, etc. on plastic drop cloths. Segregation at the drop reduces the probability of cross contamination. During hot weather operations, a cool-down station may be set up within this area.
Station 2: Outer Garment, Boots, and Gloves Wash and Rinse	Scrub outer boots, outer gloves, and splash suit with decon solution or detergent water. Rinse off using copious amounts of water.
Station 3: Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4: Canister or Mask (Level C only) Change	If worker leaves exclusion zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers are donned, joints are taped, and worker returns to duty.
Station 5: Boot, Gloves and Outer Garment Removal	Boots, chemical resistant splash suit, and inner gloves are removed and deposited in separate containers lined with plastic.
Station 6: Face Piece Removal (Level C only)	Facepiece is removed. Avoid touching face with fingers. Facepiece is deposited on plastic sheet.
Station 7: Field Wash	Hands and face are thoroughly washed. Shower as soon as possible.

Site Communication:

- ☒ Verbal
- ☐ Two-way radio
- ☒ Cellular telephone
- ☒ Hand signals
  - Hand gripping throat ---------- Out of air, can't breathe
  - Grip partner's wrist or both hands around waist ---------- Leave area immediately
  - Hands on top of head ---------- Need assistance
  - Thumbs up ---------- OK, I am all right, I understand
  - Thumbs down ---------- No, negative
- ☐ Horn
- ☐ Siren
- ☐ Other:

EMERGENCY CONTACTS

NAME	TELEPHONE NUMBERS		DATE OF PRE-EMERGENCY NOTIFICATION (if applicable)
Fire Department:	911		
Hospital:			
Police Department:	911		
Site Health And Safety Officer: TBD	Office:	Home:	
Client Contact: Brian Jankauskas	Office: 518-402-9620	Pager:	
Project Manager: Eric Sandin	Office: 207-828-3556	Home: 207-807-1152	
Division EH&S Manager: Cindy Sundquist	Office: 207-828-3309 (w) 207-650-7593(c)	Home: 207-892-4402	
EPA/DEP (if applicable):			
OTHER: Ambulance	911		

Emergency Equipment:
The following emergency response equipment is required for this project and shall be readily available:

- ☒ Field First Aid Kit
- ☐ Fire Extinguisher (ABC type)
- ☐ Eyewash (Note: 15 minutes of free-flowing fresh water)
- ☐ Other: _____

EMERGENCY PROCEDURES

- The HSO (or alternate) should be immediately notified via the on-site communication system. The HSO assumes control of the emergency response.
- The HSO notifies the Project Manager and client contact of the emergency. The HSO shall then contact the Division ES&H Manager who will then contact the Corporate EH&S Manager.
- If applicable, the HSO shall notify off-site emergency responders (e.g. fire department, hospital, police department, etc.) and shall inform the response team as to the nature and location of the emergency on-site.
- If applicable, the HSO evacuates the site. Site workers should move to the predetermined evacuation point (See Site Map).
- For small fires, flames should be extinguished using the fire extinguisher. Large fires should be handled by the local fire department.
- In an unknown situation or if responding to toxic gas emergencies, appropriate PPE, including SCBAs (if available), should be donned. If appropriate PPE is unavailable, site workers should evacuate and call in emergency personnel.
- For chemical spills, follow the job specific JHA for spill containment
- If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and wash affected area. Site worker should shower as soon as possible after incident.
- If a worker is injured, first aid shall be administered by certified first aid provider.
- If the emergency involves toxic gases, workers will back off and reassess. Prior to re-entering the work zone, the area must be determined to be safe. Entry will be using Level B PPE and utilize appropriate monitoring equipment to verify that the site is safe.
- An injured worker shall be decontaminated appropriately.
- After the response, the SHSO shall follow-up with the required company reporting procedures, including the completing the MACTEC Incident Analysis Report.

Site Specific Emergency Procedures are as follows: _____

Additional Health and Safety Procedures: Underground utility clearance will be provided by the subcontractor. Use caution when working in an area of known utilities. Establish a work zone and provide warning for the general Public in high traffic areas. Consider using flashing lights.

FIELD TEAM REVIEW: I acknowledge that I understand the requirements of this HASP, and agree to abide by the procedures and limitations specified herein. I also acknowledge that I have been given an opportunity to have my questions regarding the HASP and its requirements answered prior to performing field activities. Health and safety training and medical surveillance requirements applicable to my field activities at this site are current and will not expire during on-site activities.

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Name: _____ Date: _____

Routes to Emergency Medical Facilities

Confirm routes to hospitals from specific sites prior to commencing field work.

PRIMARY HOSPITAL:

Facility Name: Cutchogue Walk in Medical Center
Address: Unit 4, 32645 Main Road, Cutchogue, NY
Telephone Number: (631) 734-8363

DIRECTIONS TO PRIMARY HOSPITAL (attach map):

Directions to Cutchogue Walk in Medical Center
0.2 mi – about 1 min

1. Head northwest on Harbor Ln toward Main Rd - 0.2 mi
2. Turn right at Main Rd
   Destination will be on the left - 36 ft

Cutchogue Walk in Medical Center Unit 4

ALTERNATE HOSPITAL:

Facility Name: Southampton Hospital
Address: 13105 Main Road, Mattituck, NY
Telephone Number: (631) 298-4105

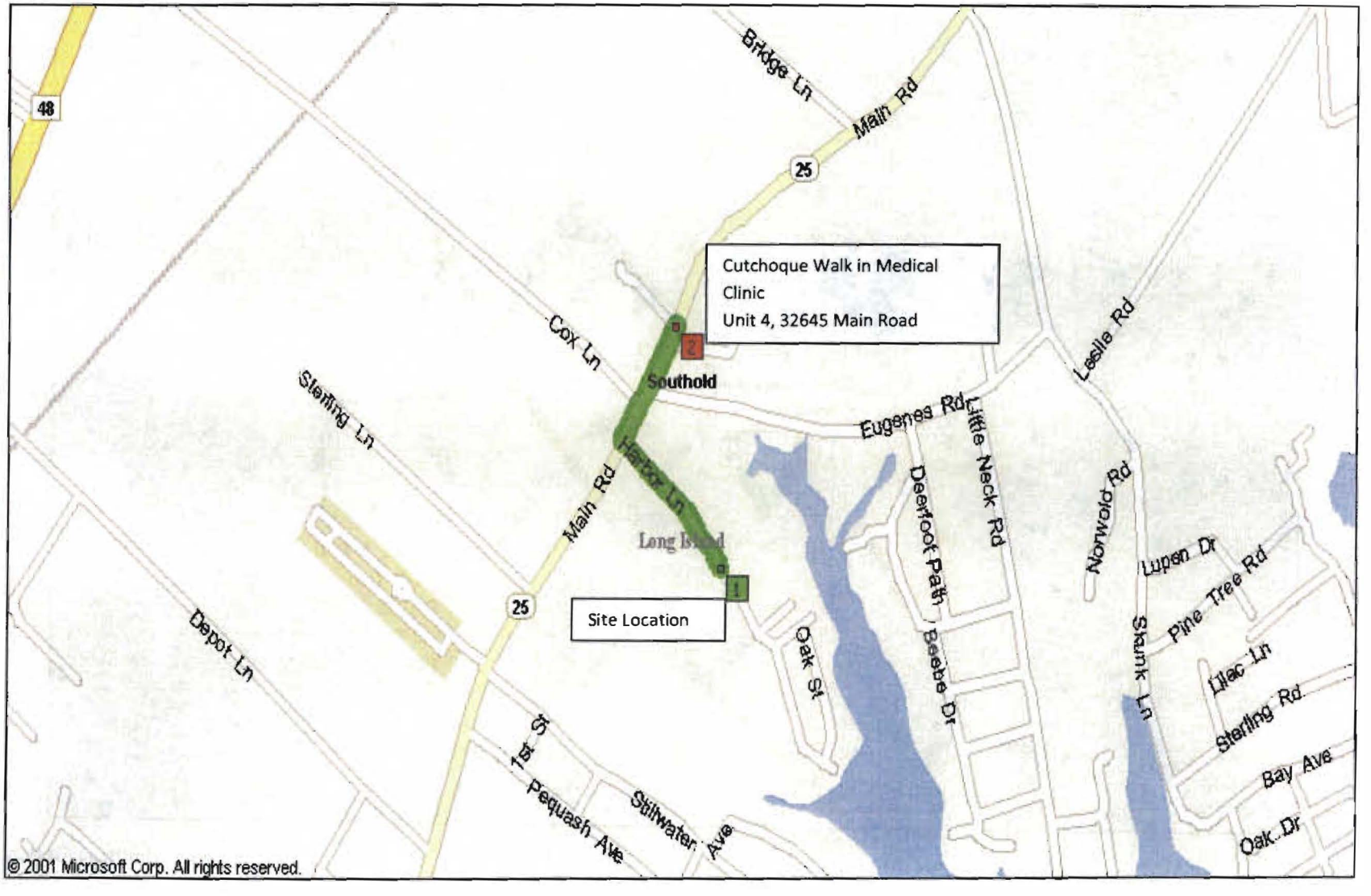
DIRECTIONS TO ALTERNATE HOSPITAL (attach map):

Directions to Southampton Hospital
4.1 mi – about 7 mins

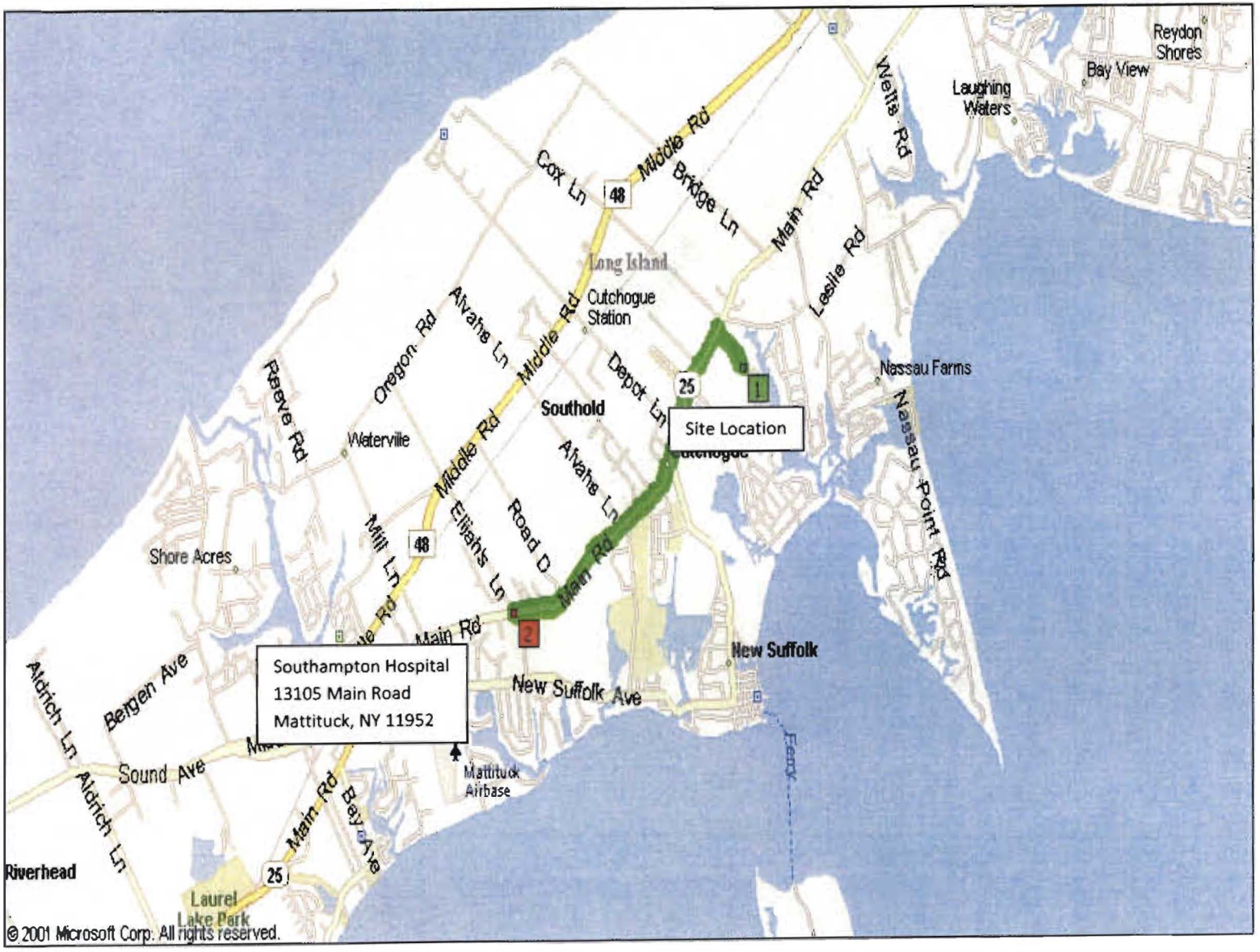
1. Head northwest on Harbor Ln toward Main Rd - 0.3 mi
2. Turn left at Main Rd/NY-25 W
   Destination will be on the right - 3.8 mi

Southampton Hospital
13105 Main Road
Mattituck, NY 11952-3214

Primary Hospital Map



Secondary Hospital Route



Check one
Initial Report: ☐
Update: ☐
Final Report: ☐

Category C: ☐
Category B: ☐
Category A: ☐

ATTACHMENT 1
INCIDENT ANALYSIS REPORT
Attorney-Client Work Product Prepared in Anticipation of Litigation

(Review instructions on page 9 prior to completing this form)

Local Office ID Number: _____

To: Office of the General Counsel
This information has been prepared at your request and under your direction in anticipation of litigation so that you may prove appropriate legal advice to the undersigned and the management of the Company.

Section 1 – General Information

Report Date: _____ Incident Date: _____ Time of incident: _____

Employee Name: _____ Sex: ☐ M ☐ F

Job Title: _____ Hire Date: _____ Time employee began work: _____

Department: _____ Project Manager: _____ Client: _____

Office where employee works from: _____ Immediate Supervisor: _____ Hours employee worked during last 7 days: ____ hr

Location where incident occurred: _____ Is this a Company controlled work site: ☐ Yes ☐ No

Section 2 – Incident Type (mark all that apply)

A. Type of incident being reported:

☐ Near Miss ☐ First-aid Case ☐ Medical Treatment ☐ Hospitalization ☐ Day Away Case ☐ Restricted/Transfer Case
☐ Fatality ☐ Vehicle Incident ☐ Notice of Violation ☐ Regulatory Inspection ☐ Environmental Release
☐ Other (please describe): _____

B. If an **injury or illness** - describe the part of the body that was affected and how it was affected:

C. If an **environmental release** - describe the quantity and name and CAS# of material released into the environment:

D. If an **inspection by a regulatory agency** - what agency, who were the inspectors, and supply inspector contact information:

Section 3 – Incident Description (Attach and number additional pages, as needed, to ensure **all details related to the incident are captured.**)

A. List the names of all persons involved in the incident. and employer information:

B. List the names of any witnesses, their employer, and a local/company telephone number or address:

C. What was the employee(s) doing just prior to the incident?

D. Explain in **detail** what happened?

E. Explain in **detail** what object or substance directly harmed the employee?

F. List any damaged equipment or property (other than motor vehicles) model and serial number **and** estimated costs to repair/replace damaged equipment or property, if applicable:

Section 4 - Incident Analysis

A. Was a Job Hazard Analysis (JHA) completed for the work being performed? YES ☐ NO ☐ Who prepared the JHA?

B. When and who was the last safety officer (i.e. LHSR, supervisor, Division ES&H Manager, etc.) at your work site?

C. When and what safety training **directly related** to the incident has the person(s) involved had?

Section 5 - Incident Investigation Results

#	Causal Factors (Attach and number any additional pages as needed to completely address this section)
1	
2	
3	
4	
5	

Root Cause(s) Analysis (The below items represent major root cause categories which have been determined to be Less Than Adequate (LTA). A more detailed determination of the root cause will be facilitated, if needed, by your Division's ES&H Manager.)

1. Equipment Reliability Program Implementation
2. Administrative / Management Systems
3. Procedures
4. Human Factors Engineering
5. Training
6. Immediate Supervision
7. Communications
8. Personal Performance

Root Cause #	Corrective Actions to be taken (Attach additional pages as needed to completely address this section)	Responsible Person	Proposed Completion Date	Closed on Date	Verified by and Date Verified

Section 6 – Notifications, Certification & Approvals

Check the appropriate boxes indicating the applicable reports have been made to the following organizations:

Auto Lessor ☐ **Insurer** ☐ **Workers' Compensation Administrator** ☐

Post-incident Substance Abuse Testing Has Been Performed ☐

Incident investigated by (signatures):			
Employee(s):	**Date:**	Employee's Supervisor:	Date:
LHSR/Project/Office Manager:	Date:	Division ES&H Manager:	Date:

Check one
Initial Report: ☐
Update: ☐
Final Report: ☐

ATTACHMENT 2
VEHICLE INCIDENT REPORT
Attorney-Client Work Product Prepared in Anticipation of Litigation
(Review instructions on page 12 prior to completing this form)

Section 1 - General Information

Date of incident: _____

Time incident occurred: _____ ☐ AM ☐ PM Illumination: ☐ Dark ☐ Light Road Condition: ☐ Dry ☐ Wet ☐ Icy/snow

Were police summoned to scene? ☐ Yes ☐ No Police Department and Location: _____

Report #: _____ Officer's Name and Badge Number: _____

Section 2 - Company Driver and Vehicle

Driver's name: _____ D/L # _____ State: _____

Driver's home office address: _____ Driver's Phone # _____

Company Vehicle # _____ Year _____ Model _____ License # _____ State _____

Company car? ☐ Yes ☐ No Owned by employee? ☐ Yes ☐ No

Leased/rented from _____

Passenger/Witness Name(s) _____ Address: _____ Phone: _____

Passenger/Witness Name(s) _____ Address: _____ Phone: _____

Passenger/Witness Name(s) _____ Address: _____ Phone: _____

Damage to vehicle: _____

Injuries to employee(s): _____

Injuries to others: _____

Vehicle was being used for: Company business ☐ Yes ☐ No Personal business ☐ Yes ☐ No

Towed: ☐ Yes ☐ No By Whom: _____ To Where: _____

Section 3 - Other Driver and Vehicle Information

Driver's Name: _____ D/L # _____ State _____

Current Address _____ City _____ State _____

Telephone Home: _____ Work: _____ Cell: _____

Reg. Owner's Name: _____ Address: _____ City: _____ State: _____
(verify registration document)

The Other Vehicle: Make _____ Model _____ Year _____ License # _____ State ____

Insurance company name: _____ Address: _____ Phone # _____

Policy No. _____ Contact Person _____ Phone # _____

Passenger/Witness Name(s) _____ Address: _____ Phone: _____

Passenger/Witness Name(s) _____ Address: _____ Phone: _____

Damage: (*Make note of pre-existing damage and take pictures if possible.* ***Attach additional pages as needed)***

Injuries to other driver/passengers:

Section 4 – Approvals (signatures required)

Form completed by: _____ Signature: _____ Date: _____

Things to Do First In The Event Of a Motor Vehicle Incident

1. Most important: **STOP.**
2. **Call 911 if there are injuries.**
3. Call for an officer if the incident occurred on public property (streets, highways or roads). Disputes often arise between the parties involved as to who was at fault; therefore, a police report is important. If an officer is unable to attend the scene of the accident, a counter police report may be filed at most stations. Insurance companies rely on police reports to determine liability.
4. Complete the Incident Investigation Report and the Vehicle Incident Report forms. It is important that both these forms are completed in detail. Include a diagram of the incident on the back of the report. Incomplete information may lead to delays in processing associated claims and in helping to prevent this type of incident from occurring again.
5. Express no opinion as to who was at fault. This is for the insurance companies to determine.
6. Give only information that is required by the authorities or as directed by MACTEC contractual requirements.
7. Sign only those statements required by the authorities or as directed by MACTEC contractual requirements. Do not sign away your rights or the company's rights.
8. If you are injured or think you were injured, tell your supervisor and see a physician. Your supervisor will notify MACTEC's Worker's Compensation insurance carrier, your Division's ES&H Manager and the Corporate Director of ES&H by phone, email or fax. For additional instructions on what to do, go to MACTEC's ES&H website on the intranet at:

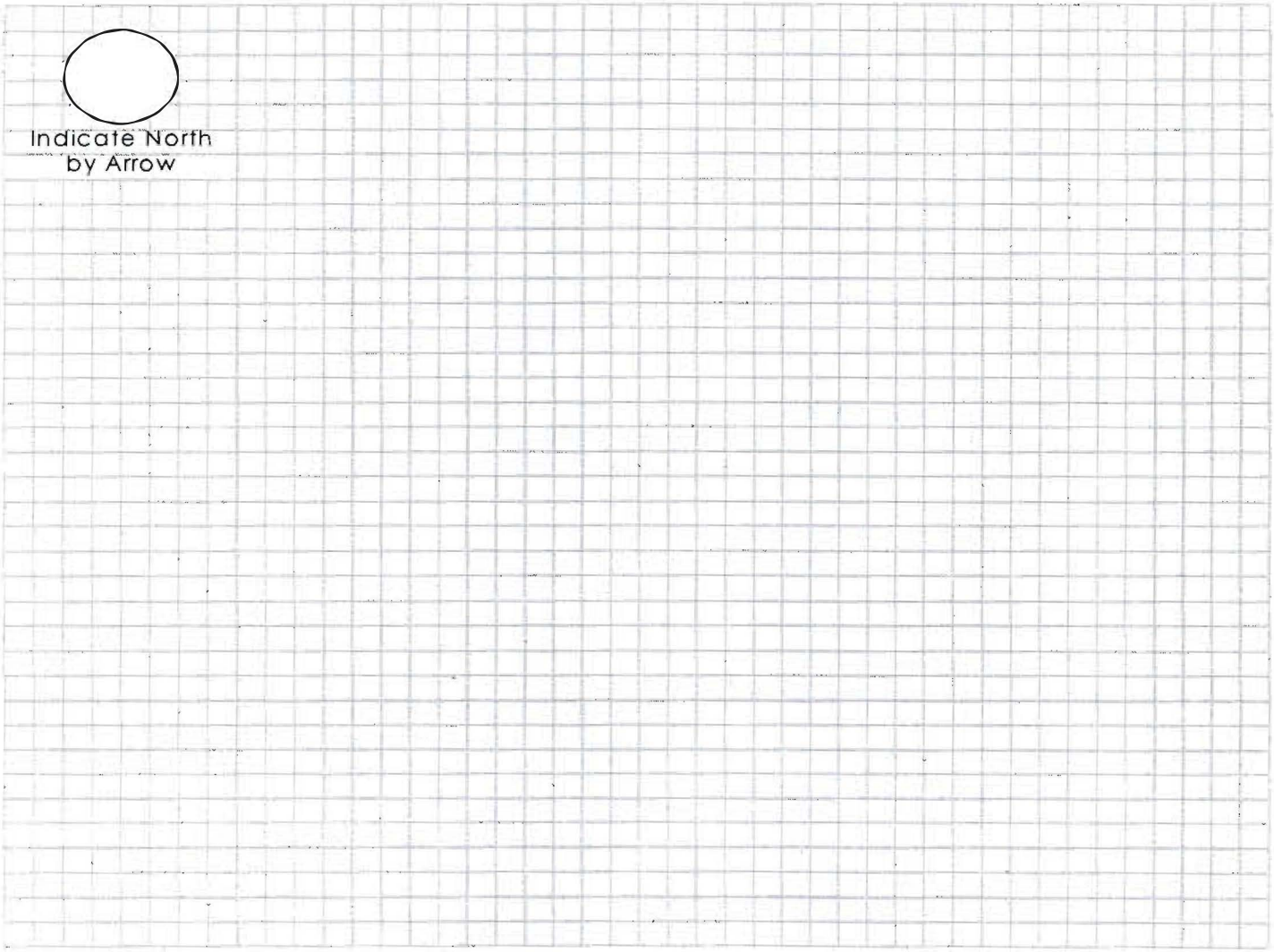
   http://intranet.mactec.com/EnvSafetyHealth/HealthSafety_Claims_Reporting.htm
9. Your supervisor will forward both completed incident reports immediately to your Division's ES&H Manager.

Instructions:

1. Number each vehicle and show directions → [1] [2] ←
2. Use a solid line to show path before incident and use a dotted line to show path after incident

→ [1] (before) - - - → [1] (after)

3. Show pedestrian/non-motorist by: ——→○
4. Show railroad by: ⊣⊣⊣⊣⊣⊣⊣⊣⊣⊣
5. Indicate north by arrow as: ⊘
6. Show street or highway names or numbers
7. Show signs, signals, warning and traffic controls.



Prepared by: _____ Date: _____

ATTACHMENT A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
Dichlorofluoromethane
CAS Number: 75-43-4
Synonyms:
Freon© 21, CRC21, HCFC-21
Halon© 112, Genetron©21
Fluorodichloromethane

HEALTH HAZARD DATA

Color: colorless

Physical State: Solid ___ Liquid ___ Gas X
Liquified gas

Odor: faint sweet

Odor Threshold: not available

Vapor Density: 3.8 g/L

Ionization Potential (IP): 12.39

IDLH: 5000 ppm

Carcinogen: OSHA ___ IARC ___ NTP ___ ACGIH ___ NIOSH ___

Skin absorbable: yes __ no X

Skin corrosive: yes __ no X

Signs/Symptoms of Acute Exposure:
Ringing ears, irregular heartbeat, drowsy with liquified gas can cause frostbite blurred vission, symptoms of drunkeness causing coughing or wheezing, can cause headache, dizziness, nausea causes cetnral nervous system depression liver damage

Source	TWA (units)	STEL (units)	C (units)
OSHA PEL	1000 ppm		
ACGIH TLVs	10 ppm		
NIOSH RELs	10 ppm		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level
FID			0.15	0.8
PID	any	Isobutylene	NA	NA
Detecor Tube	Drager		NA	NA

Checked by: Cindy Sundquist Date: 3/1/10

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits: gas- none required; liquid gas- thermal insulated

Gloves: insulated glvoes

Eyes: safety goggles & faceshield

Boots: No specific required - work boots

Service Limit Concentration (ppm): 1000

MUC 1/2 Mask APR=TWA x 10= 15 ppm
MUC Full-Face APR=TWA x 10= 15 ppm

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA / NA

Fire Extinguishing Media:
Dry Chemical X Foam ___
Water Spray ___ CO_2 X

Cool containers with water sparay.

Incompatibilities:

Note: The recommended protective clothing materials assumes that potential for direct contact (by splashing, dust inhalation, or other means) with the contaminants exists. Professional judgment and knowledge of on-site hazards should be used in selecting PPE appropriate to the concentration of the contaminant (trace vs percentage) to which the individual is likely to be exposed.

ATTACHMENT A

CONTAMINANT FACT SHEET

CONTAMINANT FACT SHEET

Chemical Name:
chlorodifluoromethane
CAS Number: 75-45-6
Synonyms:
CHCIF2
HALOCARBON 22

HEALTH HAZARD DATA

Color: colorless

Physical State: Solid ___ Liquid ___ Gas X LIQUIFIED GAS

Odor: ether-like

Odor Threshold: not available

Vapor Density: 3.74 g/L

Ionization Potential (IP): NA

IDLH: 50,000 ppm

Specific gravity 3.110 (air =1)

Carcinogen: OSHA ___ IARC ___ NTP ___ ACGIH ___ NIOSH ___

Skin absorbable: yes __ no X

Skin corrosive: yes __ no X

Signs/Symptoms of Acute Exposure:
drowsiness, fatigue, and weakness
light-headed, giddiness, shortness of breath, irregular heartbeat, cardiac arrest
ringing ears, nausea, death
with liquified gas can cause frostbite
central nervous system depression
an asphyxiant, by displacing oxygen

Source	TWA (units)	STEL (units)	C (units)
OSHA PEL	1000 ppm		
ACGIH TLVs	1000 ppm		
NIOSH RELs	ppm		

AIR MONITORING

Type	Brand/Model No.	Calibrations Method/Media	Relative Response or Conversion Factor	Meter Specific Action Level
FID			NA	NA
PID	HNu	Isobutylene	NA	NA
Detecor Tube	Drager		NA	NA

Checked by: Kendra Bavor Date: 2/26/10

PERSONAL PROTECTIVE EQUIPMENT

Recommended Protective Clothing Materials:

Suits: Liquifled: Thermal protective

Gloves: liquified gas: thermal protective

Boots: work boots

Service Limit Concentration (ppm): 1000

MUC 1/2 Mask APR=TWA x 10= 15 ppm

MUC Full-Face APR=TWA x 10= 15 ppm

FIRE/REACTIVITY DATA

Flash Point: NA

LEL/UEL: NA / NA

Fire Extinguishing Media:

Dry Chemical X Foam X

Water Spray X CO_2 X

Incompatibilities:
None - store away from heat and direct sunlight.

May decompose into Phosgene, hydrogen fluoride, hydrogen chloride and carbonyl fluoride)

Note: The recommended protective clothing materials assumes thet potential for direct contact (by splashing, dust inhalation, or other means) with the contaminants exists. Professional judgment and knowledge of on-site hazards should be used in selecting PPE appropriate to the concentration of the contaminant (trace vs percentage) to which the individual is likely to be exposed.

MACTEC

Job Hazard Analysis – HASP Format

Job Title: Mobilization/Demobilization and Site Preparation **Date of Analysis:** 8/15/06

Minimum Recommended PPE*: High visibility vest, hard hat, steel-toed boots, safety glasses, hearing protection
*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Prepare for Site Visit	1A) N/A	1A) Prior to leaving for site ▪ Obtain and review HASP prior to site visit, if possible ▪ Determine PPE needs – bring required PPE to the site, if not otherwise being provided at the site (e.g., steel toed boots) ▪ Determine training and medical monitoring needs and ensure all required Health and Safety training and medical monitoring has been received and is current ▪ Ensure all workers are fit for duty (alert, well rested, and mentally and physically fit to perform work assignment) ▪ If respiratory protection is required/potentially required, ensure that training and fit-testing has occurred within the past year. ▪ Familiarize yourself with route to the site
	1B) Vehicle defects	1B) Inspect company owned/leased vehicle for defects such as: ▪ Flat tires ▪ Windshield wipers worn or torn ▪ Oil puddles under vehicle ▪ Headlights, brake lights, turn signals not working
	1C) Insufficient emergency equipment, unsecured loads	1C) Insufficient emergency equipment, unsecured loads ▪ Ensure vehicle has first aid kit and that all medications are current (if first aid kits are not provided at the site) ▪ Ensure vehicle is equpped with warning flashers and/or flares and that the warning flashers work ▪ Cell phones are recommended to call for help in the event of an emergency ▪ Vehicles carrying tools must have a safety cage in place. All tools must be properly secured ▪ Vehicles must be equipped with chocks if the vehicle is to be left running, unattended. ▪ Ensure sufficient gasoline is in the tank
2. Operating vehicles – general	2A) Collisions, unsafe driving conditions	2A) Drive Defensively! ▪ Seat belts must be used at all times when operating any vehicle on company business. ▪ Drive at safe speed for road conditions ▪ Maintain adequate following distance ▪ Pull over and stop if you have to look at a map ▪ Try to park so that you don't have to back up to leave. ▪ If backing in required, walk around vehicle to identify any hazards (especially low level hazards that may be difficult to see when in the vehicle) that might be present. Use a spotter if necessary
3. Driving to the jobsite	3A) Dusty, winding, narrow roads	3A) Dusty, winding, narrow roads ▪ Drive confidently and defensively at all times. ▪ Go slow around corners, occasionally clearing the windshield.
	3B) Rocky or one-lane roads	3B) Rocky or one-lane roads ▪ Stay clear of gullies and trenches, drive slowly over rocks. ▪ Yield right-of-way to oncoming vehicles---find a safe place to pull over.
	3C) Stormy weather, near confused tourists	3C) Stormy weather, near confused tourists ▪ Inquire about conditions before leaving the office. ▪ Be aware of oncoming storms. ▪ Drive to avoid accident situations created by the mistakes of others.

MACTEC

Job Hazard Analysis – HASP Format

Job Title: Mobilization/Demobilization and Site Preparation **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3D) When angry or irritated	3D) When angry or irritated ▪ Attitude adjustment; change the subject or work out the problem before driving the vehicle. Let someone else drive.
	3E) Turning around on narrow roads	3E) Turning around on narrow roads ▪ Safely turn out with as much room as possible. ▪ Know what is ahead and behind the vehicle. ▪ Use a backer if available.
	3F) Sick or medicated	3F) Sick or medicated ▪ Let others on the crew know you do not feel well. ▪ Let someone else drive.
	3G) On wet or slimy roads	3G) On wet or slimy roads ▪ Drive slow and safe, wear seatbelts.
	3H) Animals on road	3H) Animals on road ▪ Drive slowly, watch for other animals nearby. ▪ Be alert for animals darting out of wooded areas
4. Gain permission to enter site	4A) Hostile landowner, livestock, pets	4A) Hostile landowner, livestock, pets ▪ Talk to land owner, be courteous and diplomatic ▪ Ensure all animals have been secured away from work area
5. Mobilization/ Demobilization of Equipment and Supplies	5A) Struck by Heavy Equipment/Vehicles	5A) Struck by heavy equipment ▪ Be aware of heavy equipment operations. ▪ Keep out of the swing radius of heavy equipment. ▪ Ground personnel in the vicinity of heavy equipment operations will be within the view of the operator at all times ▪ Employees shall wear a high visibility vest or T-shirt (reflective vest required if working at night). ▪ Ground personnel will be aware of the counterweight swing and maintain an adequate buffer zone. ▪ Ground personnel will not stand directly behind heavy equipment when it is in operation.
	5B) Struck by Equipment/Supplies	5B) Struck by Equipment/Supplies ▪ Workers will maintain proper space around their work area, if someone enters it, stop work. ▪ When entering another worker's work space, give a verbal warning so they know you are there.
	5C) Overexertion Unloading/Loading Supplies	5C) Overexertion Unloading/Loading Supplies ▪ Train workers on proper body mechanics, do not bend or twist at the waist while exerting force or lifting. ▪ Tightly secure all loads to the truck bed to avoid load shifting while in transit.
	5D) Caught in/on/between	5D) Caught in/on/between ▪ Do not place yourself between two vehicles or between a vehicle and a fixed object.
	5E) Slip/Trip/Fall	5E) 1E). Slip/Trip/Fall ▪ Mark all holes and low spots in area with banner tape. Instruct personnel to avoid these areas. ▪ Drivers will maintain 3 point contact when mounting/dismounting vehicles/equipment. ▪ Drivers will check surface before stepping, not jumping down.

MACTEC

Job Hazard Analysis – HASP Format

Job Title: Mobilization/Demobilization and Site Preparation **Date of Analysis:** 8/15/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	5F) Vehicle accident	5F) Vehicle accident ▪ Employees should follow MACTEC vehicle operation policy and be aware of all stationary and mobile vehicles.
6. Site Preparation	6A) Slip/Trip/Fall	6A) Slip/Trip/Fall ▪ Mark all holes and low spots in area with banner tape. Instruct personnel to avoid these areas
7. Installation of soil erosion and sediment controls	7A) Overexertion	7A) Overexertion ▪ Workers will be trained in the proper method of placing erosion controls. ▪ Do not bend and twist at the waist while lifting or exerting force.
	7B) Struck by Equipment/Supplies	7C) Struck by Equipment/Supplies ▪ Workers will maintain proper space around their work area, if someone enters it, stop work. ▪ When entering another worker's work space, give a verbal warning so they know you are there.
8. Driving back from the jobsite	8A) See hazards listed under item #3	8A) See safe work practices under item #3

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

Minimum Recommended PPE*: Safety Shoes, Safety glasses with side shields, High visibility vest, ear plugs (Hearing protection), Nitrile gloves

*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Prepare for site visit	1A) N/A	▪ Obtain and review HASP prior to site visit, if possible ▪ Determine PPE needs – bring required PPE to the site, if not otherwise being provided at the site (e.g., steel toed boots) ▪ Determine training and medical monitoring needs and ensure all required Health and Safety training and medical monitoring has been received and is current ▪ Complete site specific/ client required training ▪ Ensure all workers are fit for duty (alert, well rested, and mentally and physically fit to perform work assignment) ▪ First aid kits shall be available at the work site and on each transport vehicle. ▪ Familiarize yourself with route to the site ▪ Check weather forecast. Pack appropriate clothing and other items (e.g., sunscreen) for anticipated weather conditions ▪ Verify that subsurface utilities have been identified.
2. Traveling to the site by vehicle	2A) See JHA for Mobilization, Demobilization and Site Preparation	▪ See JHA for Mobilization, Demobilization and Site Preparation
3. Initial Arrival - Assess Site Conditions	3A) Communication with subcontractor and other site personnel	▪ Develop communication methods (agree on hand signals, warning alarms) ▪ Log all workers and visitor on and off the site. ▪ Let other crewmembers know when you see a hazard. ▪ Avoid working near known hazards. ▪ Always know the whereabouts of fellow crewmembers. ▪ Carry a radio and spare batteries or cell phone ▪ Hold and document Safety tailgate meetings ▪ Establish work zones, evacuation routes and rally locations.
	3B) Insect Bites and Stings	▪ Discuss the types of insects expected at the Site and be able to identify them. ▪ Look for signs of insects. ▪ Inform crew members if allergic to insects and what to do if you need assistance. ▪ Avoid wearing heavy fragrances. ▪ Carry first-aid and sting relief kits. ▪ Carry identification of known allergies and necessary emergency medication. ▪ Spray clothing with insect repellant as a barrier. ▪ Wear light colored clothing that fits tightly at the wrists, ankles, and waist. ▪ Cover trouser legs with high socks or boots. ▪ Tuck in shirt tails.

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3C) Poisonous plants	▪ Wear long sleeves, long pants and boots ▪ Ensure all field workers can identify the plants. Mark identified poisonous plants with high visibility spray paint if working at a fixed location. ▪ Look for signs of poisonous plants and demark area to aid in avoiding plant. ▪ Do not touch any plant part to any part of your body/clothing. ▪ Use commercially available products such as Ivy Block or Ivy Wash as appropriate.
	3D) Vermin, leaches, animal borne disease	▪ Survey the area for dens, nests, etc. ▪ Identify areas where biological hazards may be present. ▪ Wear long sleeve shirt and full length pants ▪ Be aware of your surroundings. ▪ Wear appropriate footwear (snake boots, etc.) ▪ Avoid high grass areas if possible ▪ Do not put hand/arm into/under an area that you cannot see into/under clearly ▪ Perform routine inspections for ticks, leaches, etc. of yourself and co-workers.
	3E) Chemical Hazards	▪ Wear chemical resistant PPE as identified in the HASP ▪ Use monitoring equipment, as outlined in HASP, to monitor breathing zone ▪ Read MSDSs for all chemicals brought to the site ▪ Be familiar with hazards associated with site contaminants. ▪ Ensure that all containers are properly labeled
	3F) Overhead Power Lines	▪ Identify the location of all overhead power lines at the site. ▪ Maintain clearances depending on voltage - All equipment will stay a minimum of 10 feet from overhead energized electrical lines (50 kV or less). This distance will increase by 4 inches for each 10 kV above 50 kV. Rule of Thumb: Stay 10 feet away from all overhead power lines known to be 50 kV or less and 35 feet from all others.) ▪ Re-locate work so it is not close to power lines ▪ Avoid storing materials under overhead power lines
	3G) Underground Utilities	▪ All utilities will be marked prior to excavation activities ▪ For areas where utility locations cannot be verified, workers must hand dig for the first 3 feet ▪ Use lineman's gloves when locating underground power lines ▪ Work at adequate offsets from utility locations ▪ Immediately cease work if unknown utility markings are discovered.

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3H) Cold Stress	▪ Dress in layers with wicking garments (those that carry moisture away from the body – e.g., cotton) and a weatherproof slicker. A wool outer garment is recommended. ▪ Take layers off as you heat up; put them on as you cool down. ▪ Wear head protection that provides adequate insulation and protects the ears. ▪ Maintain your energy level. Avoid exhaustion and over-exertion which causes sweating, dampens clothing, and accelerates loss of body heat and increases the potential for hypothermia. ▪ Acclimate to the cold climate to minimize discomfort. ▪ Maintain adequate water/fluid intake to avoid dehydration. ▪ Be aware of signs of hypothermia, its prevention, detection and treatment. ▪ Have extra protection available, in case of an emergency such as blankets and heating devices. ▪ Don't work under extremely adverse weather conditions ▪ Stay in tune to current weather and extended forecasts.
	3I) Heat Stress	▪ Remain constantly aware of the four basic factors that determine the degree of heat stress (air temperature, humidity, air movement, and heat radiation) relative to the surrounding work environmental heat load. ▪ Know the signs and symptoms of heat exhaustion, heat cramps, and heat stroke. Heat stroke is a true medical emergency requiring immediate emergency response action. ▪ Maintain adequate water intake by drinking water periodically in small amounts throughout the day (flavoring water with citrus flavors or extracts enhances palatability). ▪ Lessen work load and/or duration of physical exertion the first days of heat exposure to allow gradual acclimatization. ▪ Alternate work and rest periods. More severe conditions may require longer rest periods and electrolyte fluid replacement.
	3J) Lightning and Thunder	▪ Monitor weather channels to determine if electrical storms are forecasted. ▪ Plan ahead and identify safe locations to be in the event of a storm. (e.g., sturdy building, vehicle, etc.) ▪ Suspend all field work at the first sound of thunder. You should be in a safe place when the time between the lightning and thunder is less than 30 seconds.
	3K) Severe Weather	▪ Watch for clouds and incoming weather. ▪ Monitor weather forecasts. ▪ Train workers about weather and appropriate precautions. ▪ Identify a shelter and a safe place in event of tornado etc
	3L) Sun	▪ Keep body protected ▪ Wear sunscreen, wide brimmed hat or hardhat. ▪ Schedule work for cool part of day. ▪ Take breaks in the shade.

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3M) High Crime Areas	▪ Do not enter areas where threats are present. ▪ Contract security where applicable. Use the buddy system. ▪ Maintain contact with support such as radio or cell phone ▪ Do not work after dark.
	3N) Operations conducted at an active facility	▪ Stay well clear of operations being conducted at the facility ▪ Keep alert for moving materials, equipment or vehicles ▪ Determine client specific PPE needs prior to arriving at the site ▪ Determine client specific emergency response procedures and follow as appropriate ▪ Participate in client required safety training ▪ Get copies of Clients MSDSs for any client chemicals that workers may be exposed to. ▪ Provide MSDSs to client for all chemicals brought to the site.
	3O) Remote Locations	▪ Carry a two-way radio and know how to use it. ▪ Work in teams. Account for all at the end of the work day. ▪ Make sure someone on crew is certified in first aid. ▪ Carry a first aid kit.
	3P) Set up Decon Station	▪ Refer to MSDS for specific hazards associated with decon solutions ▪ Monitor breathing zone for decon solutions (e.g., methanol, hexane, etc.), if appropriate (see HASP) ▪ Removal of PPE will be performed by the following tasks in the listed order: o Gross boot wash and rinse and removal o Outer glove removal o Suit removal o Respirator removal (if worn). o Inner glove removal ▪ Contaminated PPE is to be placed in the appropriate, provided receptacles. ▪ Employees will wash hands, face, and any other exposed areas with soap and water. ▪ Portable eyewash stations and showers will be available should employees come into direct contact with contaminated materials. ▪ Decon solutions will be disposed of according to the work plan.
4. Walk around the Site	4A) Poisonous plants	▪ See section 3C above
	4B) Vermin, leaches, animal borne disease	▪ See Section 3 D above ▪
	4C) Chemical Hazards	▪ See Section 3 E above

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	4D) Slips/Trips/Falls	▪ Wear slip resistant footwear preferably laced boots with a minimum 8" high upper and non-skid soles for ankle support and traction. ▪ Pay attention to where you place your feet ▪ Slow down and use extra caution around logs, rocks, and animal holes. ▪ Extremely steep slopes (>50%) can be hazardous under wet or dry conditions; consider an alternate route. ▪ Site SHSO will inspect the entire work area to identify and mark hazards. ▪ Clear area of trip hazards; mark or barricade those that cannot be moved; ▪ Use caution when walking around excavated areas ▪ Stay back at least 5 feet from excavated areas ▪ Use caution when walking on or around loose soil. ▪ Be aware of surroundings. Avoid muddy areas if possible.
5. Oversight during drilling, or construction operations	5A) Heavy Equipment/ Vehicles	▪ Spotters will be used when backing up trucks and heavy equipment and when moving equipment. ▪ Ground personnel in the vicinity of vehicles or heavy equipment operations will be within the view of the operator at all times. ▪ Ground personnel will be aware of the swing radius and maintain an adequate buffer zone. ▪ Ground personnel will not stand directly behind heavy equipment when it is in operation. ▪ Personnel are prohibited from riding on the buckets, or elsewhere on the equipment except for designated seats with proper seat belts or lifts specifically designed to carry workers. Ground personnel will stay clear of all suspended loads. ▪ Ground personnel will wear high visibility vests ▪ Eye contact with operators will be made before approaching equipment.
	5B) Eye Injury	▪ Wear appropriate safety glasses (tinted for sun). ▪ Watch where you walk, especially around trees and brush with protruding limbs.
	5C) Foot Injury	▪ Wear steel toed boots ▪ Wear insulated steel toed boots during winter ▪ Ensure shoes/boots have good traction ▪ Pay attention to where you place your feet, especially when walking on uneven terrain
	5D) Head Injury	▪ Wear hardhat ▪ Do not walk or work under scaffolding or other elevated work unless there are guardrails and toeboards in place ▪ Flag or mark protruding objects at head level
	5E) Chemical Hazards	▪ See Section 3E above ▪ Wash hands and face prior to consumption of food, beverage or tobacco.
	5F) Dust - particulates (respiratory)	▪ Use dust suppression methods ▪ Stand upwind of point of dust generation
	5G) Overhead Power Lines	▪ See Section 3F above.
	5H) Underground Utilities	▪ See Section 3G above

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	5I) Standing/Static Posture	▪ Change posture on a frequent basis ▪ Stretch prior to any physical activity
	5J) Slips/Trips/Falls	▪ See Section 4D above
6. Sampling Oversight	6A) Chemical Hazards	▪ See Section 3E above ▪ Wash hands and face prior to consumption of food, beverage or tobacco. ▪ Calibrate meters in a clean, well ventilated area ▪ Store calibration gases in well vented area. Ensure chemical labels and warnings are legible.
	6B) Personnel Decontamination	▪ Refer to MSDS for specific hazards associated with decon solutions ▪ Monitor breathing zone for decon solutions (e.g., methanol, hexane, etc.), if appropriate (see HASP) ▪ Removal of PPE will be performed by the following tasks in the listed order: o Gross boot wash and rinse and removal o Outer glove removal o Suit removal o Respirator removal (if worn). o Inner glove removal ▪ Contaminated PPE is to be placed in the appropriate, provided receptacles. ▪ Employees will wash hands, face, and any other exposed areas with soap and water. ▪ Portable eyewash stations and showers will be available should employees come into direct contact with contaminated materials. ▪ Decon solutions will be disposed of according to the work plan.
	6C) Lifting	▪ Good lifting techniques (lift with legs not back) ▪ Mechanical devices (e.g., hand truck, cart, forklift, etc.) should be used to reduce manual handling of materials and drums. ▪ Team lifting should be utilized if mechanical devices are not available. (mandatory for items over 50 lbs) ▪ Split heavy loads in to smaller loads ▪ Make sure that path is clear prior to lift. ▪ Redesign work area to avoid low lifts ▪ Stretch prior to lifting ▪ Maintain a healthy life style and level of physical fitness.

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	6D) Hand Tools	▪ Cut resistant work gloves will be worn when dealing with sharp objects. ▪ All hand and power tools will be maintained in safe condition. ▪ Do not drop or throw tools. Tools shall be placed on the ground or work surface or handed to another employee in a safe manner. ▪ Guards will be kept in place while using hand and power tools. ▪ Daily inspections will be performed. ▪ Remove broken or damaged tools from service and tag out as defective ▪ No tampering with electrical equipment is allowed (e.g., splicing cords, cutting the grounding prong off plug, etc.) ▪ Do not use excessive force or impact ▪ Do not use tool improperly. Ensure all workers are trained
	6E) Slips/Trips/Falls	▪ See Section 4D above.
	6F) Struck by Vehicle	▪ Ground personnel in the vicinity of vehicles operations will be within the view of the operator at all times. ▪ Ground personnel will not stand directly behind vehicles when it is in operation ▪ Drivers will keep workers on foot in their vision at all times, if you lose sight of someone, Stop! ▪ High visibility vests will be worn when workers are exposed to vehicular traffic at the site or on public roads. ▪ Try to park so that you don't have to back up to leave. ▪ If backing in required, walk around vehicle to identify any hazards (especially low level hazards that may be difficult to see when in the vehicle) that might be present. Use a spotter if necessary ▪ Place cones in the font and rear of the vehicle ▪ Prior to driving off, walk around vehicle to collect cones and identify any hazards - especially low level hazards that may be difficult to see when in the vehicle. ▪ Set up "Workers in the Road" or similar warning signs and cones to alert traffic. ▪ Use emergency flashers and roof top flashing light (recommended) to alert oncoming vehicular traffic. ▪ Remain alert at all times as to the traffic outside the vehicle. Step to the side of the road when distracted by by-standers. Keep unofficial personnel out of the work area. ▪ Exit vehicle with caution. ▪ Wear High Visibility Vest when outside the vehicle. ▪ Utilize vehicle as a shield from oncoming traffic, as practical
7. IDW pickup oversight	7A) Foot Injury	▪ See Section 5C above.
	7B) Chemical Hazards	▪ See Section 3E above.
	7C) Lifting	▪ See Section 6C above.
	7D) Slips/Trips/Falls	▪ See Section 4D above
8. Return to office/home	8A) See Mobilization/ Demobilization and Site Preparation JHA	▪ See Mobilization/ Demobilization and Site Preparation JHA

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Field Work - Oversight **Date of Analysis:** 7-14-2009

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Decontamination **Date of Analysis:** 5/30/06

Minimum Recommended PPE*: High visibility vest, hard hat, steel-toed boots, safety glasses, hearing protection
*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Establish Decontamination Station	1A) Materials Handling	1A) Materials Handling ▪ Use proper lifting techniques ▪ Use mechanical aids, if available, to move heavy items.
2. Decontamination / Steam cleaning.	2A) Struck by steam/hot water/pressure washing	2A) Struck by steam/hot water ▪ Workers not directly engaged in steam cleaning operations must stay clear. ▪ Workers using steam cleaning equipment must be trained on operation and safety devices/procedures using the owners/operators manual. ▪ Use face shield **and** safety glasses or goggles, if steam cleaning. ▪ Stay out of the splash/steam radius. ▪ Pressure washer must have dead man switch. ▪ Do not direct steam at anyone. ▪ Do not hold objects with your feet or hands. ▪ Ensure that direction of spray minimizes spread of contaminants of concern. ▪ Use shielding as necessary.
	2B) Exposure to contaminants	2B) Exposure to contaminants ▪ Conduct air monitoring (see HASP). ▪ Wear proper PPE (see HASP). ▪ See MSDSs for hazards associated with the decon solutions used (if other than water alone us used).
	2C) Slips/Trips/Falls	2C) Slips/Trips/Falls ▪ Be cautious as ground/plastic can become slippery ▪ Use boots or boot covers with good traction
3. Vehicle Decontamination	3A) Vehicle traffic in and out of the CRZ	3A) Large Vehicle Traffic ▪ Always wear a hard hat, steel toe boots, and a high visibility vest (unless Tyveks are used and are high visibility). ▪ Vehicle drivers are not to exit the vehicle in the CRZ. ▪ Identify an individual to communicate with vehicle drivers and maintain order ▪ Trucks will be lined with plastic and kept out of direct contact with any contaminated materials during loading. Wear PPE when removing plastic lining from truck beds. ▪ If not in the vehicle, obtain eye contact with the driver, so he is aware of your presence and location in the CRZ. ▪ If you are driving the vehicle, be aware of personnel in the CRZ and maintain communication with the identified personnel.
	3B) Exposure to contaminants	3B) Exposure to contaminants ▪ Use safety glasses or goggles, Polycoated Tyvek (if level of contamination poses dermal hazard or to keep work clothes dry), high visibility vest (if high visibility Tyveks are not used) hard hats, steel toe boots, and gloves while cleaning contaminated materials. ▪ Do not doff PPE until decontamination of the vehicle is complete and a decontamination certificate has been issued by the HSO. ▪ Conduct air monitoring (see HASP). ▪ See MSDSs for hazards associated with the decon solutions (if other than water alone is used).

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Decontamination **Date of Analysis:** 5/30/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	3C) Slips/Trips/Falls	3C) Slips/Trips/Falls ▪ Be cautious as ground/plastic can become slippery ▪ Use boots or boot covers with good traction
4. Equipment and Sample Decontamination	4A) Chemical exposure when handling contaminated sample jars and equipment	4A) Chemical exposure ▪ Wear PPE as outlined in the HASP. ▪ Refer to MSDS for specific hazards associated with decon solutions ▪ Monitor breathing zone for contaminants ▪ Monitor breathing zone for decon solutions (e.g., methanol, hexane, etc.) if appropriate (see HASP)
	4B) Materials Handling related injuries	4B) Materials Handling related injuries ▪ Use proper lifting techniques when lifting heavy equipment ▪ Use two person lift for heavy coolers
5. Personal Decontamination	4C) Exposure to contaminants	4C) Exposure to contaminants ▪ Avoid bringing contaminated materials via shoes and clothing into the CRZ by examining such prior to exiting the EZ. ▪ Removal of PPE will be performed by the following tasks in the listed order: ▪ Gross boot wash and rinse and removal ▪ Outer glove removal ▪ Suit removal ▪ Respirator removal (if worn). ▪ Inner glove removal ▪ Contaminated PPE is to be placed in the appropriate, provided receptacles. ▪ Respirators will be removed and decontaminated at a specified location within the CRZ by a designated technician, then placed in storage bag. ▪ Employees will wash hands, face, and any other exposed areas with soap and water. ▪ Portable eyewash stations and showers will be available should employees come into direct contact with contaminated materials. ▪ See MSDSs for hazards associated with the decontamination solutions used. ▪ Decon solutions will be disposed of according to the work plan.

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Groundwater Sampling **Date of Analysis:** 9/21/06

Minimum Recommended PPE*: steel-toed boots, safety glasses, chemical resistant gloves
*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Mobilization	3A) See JHA Mobilization/Demobilization/Site Preparation	1A) See JHA Mobilization/Demobilization/Site Preparation
2. General Site Hazards	2A) See JHA Field Work - General	2A) See JHA Field Work - General
	2B) Chemical exposure	2B) Chemical Exposure ▪ Read HASP and determine air monitoring and PPE needs.
3. Calibrate monitoring equipment	4A) Exposure to calibration gases	4A) Exposure to calibration gases ▪ Review equipment manuals ▪ Calibrate in a clean, well ventilated area
4. Opening the well cap, taking water level readings	5A) Contact with poisonous plants or the oil from poisonous plants	5A) Contact with poisonous plants or the oil from those plants: ▪ Look for signs of poisonous plants and avoid. ▪ Ensure all field workers can identify the plants. Mark identified poisonous plants with spray paint if working at a fixed location. ▪ Wear PPE as described in the HASP. ▪ Do not touch any part of your body/clothing. ▪ Always wash gloves before removing them. ▪ Discard PPE in accordance with the HASP. ▪ Use commercially available products such as Ivy Block or Ivy Wash as appropriate.
	5B) Contact with biting insects (i.e., spiders, bees, etc.) which may have constructed a nest in the well cap/well.	5B) Contact with stinging/biting insects ▪ Discuss the types of insects expected at the Site and be able to identify them. ▪ Look for signs of insects in and around the well. ▪ Wear Level of PPE as described in the HASP. At a minimum, follow guidelines in the JHA "Insects Stings and Bites." ▪ If necessary, wear protective netting over your head/face. ▪ Avoid contact with the insects if possible. ▪ Inform your supervisor and the Site Health and Safety Supervisor if you have any allergies to insects and insect bites. Make sure you have identification of your allergies with you at all times and appropriate response kits if applicable. ▪ Get medical help immediately if you are bitten by a black widow or brown recluse, or if you have a severe reaction to any spider bite or bee sting.
	5C) Exposure to hazardous Inhalation and contact with hazardous substances (VOC contaminated groundwater/ soil); liquid splash; flammable atmospheres.	5C) Exposure to hazardous substances ▪ Wear PPE as identified in HASP. ▪ Review hazardous properties of site contaminants with workers before sampling operations begin ▪ Immediately monitor breathing zone after opening well to determine exposure and verify that level of PPE is adequate – see Action Levels in HASP ▪ Monitor headspace in well. After the initial headspace reading (if required by the Work Plan), allow the well to vent for several minutes before obtaining water level and before sampling. ▪ When decontaminating equipment wear additional eye/face protection over the safety glasses such as a face shield.
	5D) Back strain due to lifting bailers or pumps and from moving equipment to well locations	5D) Back strain ▪ Use mechanical aids when possible, if mechanical aids are not available, use two person lifts for heavy items. ▪ Use proper lifting techniques

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Groundwater Sampling **Date of Analysis:** 9/21/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	5E) Foot injuries from dropped equipment	5E) Fool Injuries ▪ Be aware when moving objects, ensure you have a good grip when lifting and carrying objects. ▪ Do not carry more than you can handle safely ▪ Wear Steel toed boots
5. Collecting water samples	6A) Fire/Explosion/Contamination hazard from refueling generators	6A) Fire/Explosion/Contamination hazard from refueling generators ▪ Turn the generator off and let it cool down before refueling ▪ Segregate fuel and other hydrocarbons from samples to minimize contamination potential ▪ Transport fuels in approved safety containers. The use of containers other than those specifically designed to carry fuel is prohibited ▪ See JHA for Gasoline use
	6B) Electrocution	6B) Electrocution ▪ A ground fault circuit interrupter (GFCI) device must protect all AC electrical circuits. ▪ Use only correctly grounded equipment. Never use three-pronged cords which have had the third prong broken off. ▪ Make sure that the electrical cords from generators and power tools are not allowed to be in contact with water ▪ Do not stand in wet areas while operating power equipment ▪ Always make sure all electrically-powered sampling equipment is in good repair. Report any problems so the equipment can be repaired or replaced. ▪ When unplugging a cord, pull on the plug rather than the cord. ▪ Never do repairs on electrical equipment unless you are both authorized and qualified to do so.
	6C) Exposure to contaminants	6C) Exposure to Contaminants ▪ Stand up wind when sampling ▪ Monitor breathing zone with appropriate monitoring equipment (see HASP) ▪ Wear chemical resistant PPE as identified in HASP ▪ See section 4C) under Safe Practices above
	6D) Infectious water born diseases	6D) Infectious water born diseases ▪ Wear chemical resistant gloves and other PPE – as identified in HASP ▪ Prevent water from contacting skin ▪ Wash exposed skin with soap and water ASAP after sampling event ▪ Ensure that all equipment is adequately decontaminated using a 10% bleach solution
	6E) Exposure to water preservatives	6E) Exposure to water preservatives ▪ Work in a well ventilated area, upwind of samples ▪ Wear chemical resistant PPE as identified in HASP ▪ When preserving samples always add acid to water, avoid the opposite. ▪ See JHA Acids - Sampling
	6F) Slips/trips/falls	6F) Slips/trips/falls ▪ Ground can become wet/muddy, created by spilled water ▪ Place all purged water in drums for removal ▪ Wear good slip resistant footwear
	6G) Repetitive Motion and other Ergonomic Issues	6G) Ergonomic Issues ▪ Use mechanical means where possible to raise and lower equipment into well. ▪ Alternate raising and lowering equipment between field sampling team members, and alternate bailing the well. ▪ Use safe lifting techniques.

MACTEC

Job Hazard Analysis - HASP Format

Job Title: Groundwater Sampling **Date of Analysis:** 9/21/06

Key Work Steps	Hazards/Potential Hazards	Safe Practices
6. Sample Processing	7A) Contaminated water	7A) Contaminated water ▪ Wear appropriate PPE as identified in HASP ▪ Decontaminate outside of bottles ▪ Prevent water from contacting skin ▪ Work in well ventilated area – upwind of samples ▪ Waste will be returned to the operation office for storage and disposal
7. Shipping Samples	8A) Freeze burns, back strain, hazardous chemical exposure, sample leakage	8A) Freeze burns, back strain, hazardous chemical exposure, sample leakage ▪ Wear appropriate chemical resistant gloves as identified in HASP. ▪ Wear leather or insulated gloves when handling dry ice. ▪ Follow safe lifting techniques – get help lifting heavy coolers. ▪ Samples that contain hazardous materials under the DOT definition, must be packaged, manifested and shipped by personnel that have the appropriate DOT HAZMAT training.

MACTEC

Job Hazard Analysis - Short Form HASP

Job Title: Soil Vapor Sampling **Date of Analysis:** 01/20/2010

Minimum Recommended PPE*:
steel-toed boots, safety glasses with side shields, chemical resistant gloves-nitrile, hearing protection, flashlight/work gloves

*See HASP for all required PPE

Key Work Steps	Hazards/Potential Hazards	Safe Practices
1. Begin Site Work	1A) SEE SITE-SPECIFIC HASP	1A) See Site-Specific HASP and don appropriate PPE.
2. Utility Clearance	2A) Underground utilities: electrical, flammable, and explosive hazards.	2A) Notify Dig Safe and Local Utility Companies to Identify and mark Utilities coming into the building from the outside (e.g., gas, water, sewer, refrigerant, and electrical lines). • Review facility drawings to determine and mark indoor locations of subsurface utility lines. • Mark and maintain utility markings for the duration of the site work.
3. General Site Hazards	3A) See JHA Field Work – General/ or Oversight	3A) See JHA Field Work – General./ or Oversight
	3B) Chemical exposure	3B) Chemical Exposure ▪ Read HASP and determine air monitoring and PPE needs.
4. Calibrate monitoring equipment	4A) Exposure to calibration gases	4A) Exposure to calibration gases ▪ Review equipment manuals. • Calibrate in a clean, well ventilated area.
5. Access location	5A) Slips, Trips, Falls	5A) Observe walking surfaces for potential tripping hazards, icy or wet surfaces. Avoid puddles. Salt or sand areas of ice.
	5B) Lifting Injuries	5B) See JHA Field Work – General/ or Oversight • Follow safe lifting techniques.
6. Drill Hole in surface (floor/ground/road way)	6A) Electrocution	6A) Electrocution ▪ A ground fault circuit interrupter (GFCI) device must protect all AC electrical circuits. ▪ Use only correctly grounded equipment. Never use three-pronged cords which have had the third prong broken off. ▪ Make sure that the electrical cords from generators and power tools are not allowed to be in contact with water. ▪ Do not stand in wet areas while operating power equipment. ▪ Always make sure all electrically-powered sampling equipment is in good repair. Report any problems so the equipment can be repaired or replaced. ▪ When unplugging a cord, pull on the plug rather than the cord. ▪ Never do repairs on electrical equipment unless you are both authorized and qualified to do so.
	6B) Exposure to hazardous Inhalation and contact with hazardous substances (VOC contaminated Soil Vapor).	6B) Exposure to hazardous substances ▪ Wear PPE as identified in HASP (steel-toed boots, safety glasses, nitrile gloves and a flashlight or lamp). ▪ Review hazardous properties of site contaminants with workers before sampling operations begin. ▪ Immediately monitor breathing zone using a PID after drilling hole to determine exposure and verify that level of PPE is adequate – see Action Levels in HASP.

MACTEC

Job Hazard Analysis - Short Form HASP

Job Title: Soil Vapor Sampling **Date of Analysis:** 01/20/2010

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	6C) Back strain due to lifting and from moving equipment	6C) Back strain ▪ Use mechanical aids when possible, if mechanical aids are not available, use two person lifts for heavy items. ▪ DO NOT LIFT MORE THAN THE MACTEC LIMIT OF 50 POUNDS. ▪ Use proper lifting techniques.
	6D) Foot injuries from dropped equipment/drill bit	6D) Foot Injuries ▪ Be aware when moving objects, ensure you have a good grip when lifting and carrying objects. ▪ Do not carry more than you can handle safely. ▪ Watch feet when drilling and hold drill firmly. ▪ Wear Steel toed boots.
7. Installing Probes Using Rotary Hammer	7A) Electrocution	7A) Electrocution • See 6A above.
	7B) Lifting Injuries	7B) See JHA Field Work – General/ or Oversight • Follow safe lifting techniques.
	7C) Injuries from Impact/Vibration/Entanglement	7C) Impact Injuries • Loss of control of the hammer drill during operation can cause serious injury. • Read and follow the manufacturer's instructions for proper operation of the rotary hammer drill. • Always hold the body handle and side handle firmly during operation (use two hands) to prevent loosing control of the drill. • Ensure that the rotary hammer drill is in the OFF position before plugging it into power. • Ensure that the extension cord is sufficiently rated for the hammer drill. Check the manufacturer's instruction manual. • Make sure that long hair, loose clothing, etc., are tied back so that they cannot get caught in the drill bit. • Watch the placement of the extension cord to ensure that it will not become tangled in the drill bit. • Follow the manufacturer's instructions for operation of the rotary hammer drill. • Ensure that the soil vapor probe is seated properly and locked into the housing in the rotary hammer drill prior to turning on the drill. • Do not lean on the rotary hammer, this reduces the effectiveness of the rotary drill and cause the drill bit to get stuck. • Maintain proper balance when operating the hammer and always work on a level surface. • Stop drilling if the drill bit becomes bound in the subsurface. This can cause the hammer to buck/turn and can cause injury. • Always turn off the hammer drill before moving to a new location or changing probes.

MACTEC

Job Hazard Analysis - Short Form HASP

Job Title: Soil Vapor Sampling **Date of Analysis:** 01/20/2010

Key Work Steps	Hazards/Potential Hazards	Safe Practices
	7D) Noise	7D) Noise • Wear hearing protection at all times when operating the hammer drill.
	7E) Burns	7E) Burns • Do not touch the drill bit during and immediately after use as it may be hot. Allow a few minutes for the bit to cool.
8. Installing Probes Using Slide Hammer	8A) Lifting Injuries	8A) See JHA Field Work – General/ or Oversight
	8B) Noise	8B) Noise • Wear hearing protection at all times when using the slide hammer.
	8C) Cuts from Burs on Slide Hammer	8C) Cuts from Burs on Slide Hammer • Inspect the slide hammer. • Wear sturdy work gloves when operating and handling the slide hammer.
	8C) Pinching Hazard	8C) Pinching Hazards • Wear sturdy work gloves. • Keep your hands on the handles at all times while operating the slide hammer.
	8D) Foot Injuries from Dropping Slide Hammer on Feet	8D) Foot Injuries from Dropping Slide Hammer on Feet • See #6D above.
9. Collecting Sub-Slab/ sub pavement sample	9A) Cutting Hazard	9A) Cutting Hazard • Use MACTEC approved Maxisafe knife to cut the tubing. • Always cut the tubing away from you. ▪ Keep hands and body parts away from the path of the knife.
	9B) Exposure to contaminants	9B) See #6B above.
	9C) Pinching Hazard	9C) Pinching Hazard from attaching regulators/tubing • Use appropriate size wrenches for the fittings. • Take care when using wrenches to attach regulator and or tubing to cans to not pinch fingers.
10. Mixing Mortar to Fill Drill Holes	10A) Inhalation of Dust	10A) Inhalation of Dust ▪ Empty the bag of mortar slowly into appropriately sized container. ▪ Have water available to immediately add to mortar to suppress the creation of airborne dust.

Prepared by: Kendra Bavor, CSP 1/20/2010

MACTEC, Inc.

Site Health and Safety Checklist

Site: _____

Project Number: _____ **Project Manager:** _____

Prepared by: _____

Names of MACTEC employees onsite: _____

_____

Y	N	N/A			Comments
☐	☐	☐	1.	Are emergency phone numbers posted?	
☐	☐	☐	2.	Are directions to the nearest emergency medical care posted?	
☐	☐	☐	3.	Is there a Site Health And Safety Officer (HSO) at the site?	
☐	☐	☐		a. Is it current?	
☐	☐	☐		b. Does it address know/suspected hazards?	
☐	☐	☐		c. Is it approved?	
☐	☐	☐	4.	Have applicable workers received 40-hour initial training? (24-hours training for contractors is acceptable)	
☐	☐	☐	5.	Do visitors sign the visitor's log acknowledging that they understand:	
☐	☐	☐		a. General site information?	
☐	☐	☐		b. Operations?	
☐	☐	☐		c. Specific hazards?	
☐	☐	☐		d. Required safety procedures and requirements?	
☐	☐	☐	6.	Are Tailgate Safety Meetings taking place?	
☐	☐	☐		a. Are names of attendees and subject matter documented?	
☐	☐	☐		b. Are they being held on a weekly basis? More often if needed?	
☐	☐	☐	7.	Is there a charged fire extinguisher on-site?	
☐	☐	☐	8.	Is there an eyewash on-site?	
☐	☐	☐	9.	Is there a first aid kit on-site?	
☐	☐	☐	10.	Are PPE identified in the HASP being worn by site workers?	
☐	☐	☐		a. Are hard hats worn?	
☐	☐	☐		b. Are steel toed boots/shoes being worn?	
☐	☐	☐	11.	Are safety goggles or safety glasses worn?	

Prepared by: _____
Checked by: _____

Y	N	N/A		Comments
☐	☐	☐	12. Are approved respirators worn when needed?	
☐	☐	☐	a. Are the cartridges appropriate for the hazards at the site?	
☐	☐	☐	b. Are cartridges changed daily, unless specified otherwise in the HSO?	
☐	☐	☐	13. Is there an assigned safety standby outside the exclusion zone for Level B and A work?	
☐	☐	☐	14. Are ear plugs/muffs worn when noise makes conversation difficult at a distance of 2 feet?	
☐	☐	☐	15. Are gloves and protective clothing worn when there is a danger of chemical exposure?	
☐	☐	☐	16. Are there confined spaces at the site?(if no go to 19.)	
☐	☐	☐	a. If yes, will Harding ESE employees be entering the space?	
☐	☐	☐	b. Is a permit being used?	
☐	☐	☐	c. Is the permit completely filled out and approved prior to entry?	
☐	☐	☐	d. Are confined spaces thoroughly emptied of the hazardous substances prior to entry?	
☐	☐	☐	e. Is ventilation provided prior to entry?	
☐	☐	☐	f. Is air within the confined space tested for oxygen deficiency, explosive concentrations, and toxic substances in that order?	
☐	☐	☐	g. Is the air in the space tested frequently?	
☐	☐	☐	h. Is approved respiratory equipment required in the confined space if the air cannot be made acceptable?	
☐	☐	☐	i. Is there an assigned safety standby outside the confined space?	
☐	☐	☐	j. Is the safety standby trained and equipped to handle emergencies?	
☐	☐	☐	17. Are the caps kept on the cylinder when not in use?	
☐	☐	☐	a. Is the entry being done in compliance with the MACTEC Permit Required Confined Space Program?	
☐	☐	☐	18. Is there at least one person on site current in their first aid/CPR training?	
☐	☐	☐	19. Are work areas properly illuminated?	
☐	☐	☐	20. Do employees who drive on company business have current operators licenses?	
☐	☐	☐	21. Do employees wear their seat belts?	

Y	N	N/A			Comments
☐	☐	☐	22.	Are trucks and trailers secured from movement during loading and unloading operations?	
☐	☐	☐	23.	Is the location of electrical power lines and other utilities determined before digging or drilling?	
☐	☐	☐	24.	Are MACTEC vehicles parked in a safe manner?	
☐	☐	☐	25.	Is the drill rig parked in a safe manner?	
☐	☐	☐		a. Is there a minimum of 10 feet between power lines and the mast?	
☐	☐	☐	26.	Are traffic cones set up if needed?	
☐	☐	☐	27.	Is there a wind indicator showing wind direction on-site?	
☐	☐	☐	28.	Are exits in building/trailers kept free of obstruction?	
☐	☐	☐	29.	Are appropriate air monitoring instruments being used?	
☐	☐	☐		a. Are air monitoring instruments properly calibrated?	
☐	☐	☐	30.	Are tools and equipment used by employees in good condition?	
☐	☐	☐	31.	Are ladders in good condition and secured when in use?	
☐	☐	☐	32.	Are electrically operated tools grounded?	
☐	☐	☐	33.	Are exposed wiring and cords not frayed or deteriorated?	
☐	☐	☐	34.	Do extension cords have a grounding conductor?	
☐	☐	☐	35.	Are compressed gas cylinders stored and transported in such a manner as to prevent it from being damaged?	
☐	☐	☐		a. Are the caps kept on the cylinder when not in use?	
☐	☐	☐	36.	Is there a means to minimize heat or cold stress on-site?	
☐	☐	☐	37.	Are breaks taken as required?	
☐	☐	☐	38.	Are meals eaten only in areas free from toxic materials?	
☐	☐	☐		Other: Describe_____	
☐	☐	☐		_____	
☐	☐	☐		_____	

File: Project files folder 4.7
Rev. Date: 3-17-09

DAILY TAILGATE SAFETY MEETING CHECKLIST

Project: _____ Site: _____

Date: _____ Location: _____

To be reviewed on the first day of site activities and when new workers arrive on site:

Alternate for Health & Safety: _____

Location of on-site HASP: _____

Site training requirements: See HASP

Specific medical surveillance requirements: See HASP

Agenda:

During the project, one or more of the agenda items could be selected for the required daily site training.

		Check-off: Date				
		___	___	___	___	___
1.	Planned work for this day (discuss)	☐	☐	☐	☐	☐
2.	Physical hazards and controls (discuss/review)	☐	☐	☐	☐	☐
3.	Chemical hazards and controls (discuss/review)	☐	☐	☐	☐	☐
4.	Biological hazards and controls (discuss/review)	☐	☐	☐	☐	☐
5.	Personal protective equipment Modified D	☐	☐	☐	☐	☐
6.	Personal protective equipment required per the hazard assessment:	☐	☐	☐	☐	☐
	SPECIFY TYPE					
	Protective coveralls					
	Safety glasses/goggles — ANSI approved					
	Hard hat — ANSI approved					
	Foot protection — Safety toe boots & overboots					
	Work gloves					
	Chemical gloves					
	Hearing protection					
	Other					
7.	Review inspection, decontamination, and maintenance procedures and the limitations of the above stated PPE.	☐	☐	☐	☐	☐
8.	Decontamination procedure (discuss/review)	☐	☐	☐	☐	☐
9.	Exclusion zone maintained/ Identified	☐	☐	☐	☐	☐
10.	Site emergency response plan (discuss/review)	☐	☐	☐	☐	☐
11.	Signs and symptoms of overexposure to chemicals anticipated on site	☐	☐	☐	☐	☐
12.	General health and safety rules	☐	☐	☐	☐	☐
13.	Specific health and safety requirements relating to site activities including: (discuss/review)	☐	☐	☐	☐	☐
14.	Working in temperature extremes	☐	☐	☐	☐	☐
15.	Rain or other weather advisories	☐	☐	☐	☐	☐
16.	Drilling/boring	☐	☐	☐	☐	☐
17.	UST	☐	☐	☐	☐	☐
18.	Excavations	☐	☐	☐	☐	☐
19.	Heavy equipment	☐	☐	☐	☐	☐
20.	Drilling/ Boring	☐	☐	☐	☐	☐
21.	Lockout/tagout	☐	☐	☐	☐	☐

Prepared by: _____

Checked by: _____

I have participated in the daily safety meeting discussing the topics indicated on the reverse and fully understand my responsibility for complying with all health and safety requirements. I have had the opportunity to have my questions on site health and safety issues and procedures answered.

Employee Name	Employee Signature	Date

Name and Signature of person conducting training

Date

Prepared by: _____
Checked by: _____

1.1 MEDICAL DATA SHEET

This Medical Data Sheet will be completed by all on-site personnel and kept in the Support Zone during site operations. It is not a substitute for the Medical Surveillance Program requirements consistent with the MACTEC E&C Corporate Health and Safety Program for Hazardous Waste Sites. This data sheet will accompany any personnel when medical assistance or transport to hospital facilities is required. If more space is required, use the back of this sheet.

Project: _____

Name: _____

Address: _____

Home Telephone: Area Code (__)

Age: _____ Height: _____ Weight: _____

In case of emergency, contact: _____

Address: _____

Telephone: Area Code (__)

Do you wear contact lenses? Yes ( ) No ( )

Allergies: _____

List medication(s) taken regularly: _____

Particular sensitivities: _____

Previous/current medical conditions or exposures to hazardous chemicals: _____

_____

Name of Personal Physician: _____

Telephone: Area Code (__)

Material Safety Data Sheet
Hydrochloric Acid, Reagent ACS

ACC# 95547

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrochloric Acid, Reagent ACS
Catalog Numbers: AC423790025, AC423790250, AC423795000, NC9619320
Synonyms: Muriatic acid; Chlorohydric acid; Hydrogen chloride; Spirits of salt
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7647-01-0	Hydrochloric acid	36.5	231-595-7
7732-18-5	Water	Balance	231-791-2

Hazard Symbols: C
Risk Phrases: 34 37

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to slight yellow clear liquid. **Danger!** Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. May be harmful if swallowed.
Target Organs: Respiratory system, teeth, eyes, skin, circulatory system.

Potential Health Effects
Eye: May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Contact with liquid is corrosive to the eyes and causes severe burns. May cause painful sensitization to light.
Skin: May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with liquid is corrosive and causes severe burns and ulceration.
Ingestion: May cause circulatory system failure. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract. May be harmful if swallowed.
Inhalation: May cause severe irritation of the respiratory tract with sore throat, coughing,

shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract. Exposure to the mist and vapor may erode exposed teeth. Causes corrosive action on the mucous membranes.
Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth. May cause fetal effects. Laboratory experiments have resulted in mutagenic effects. Prolonged exposure may cause conjunctivitis, photosensitization, and possible blindness.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes). SPEEDY ACTION IS CRITICAL!
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Give milk of magnesia.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician: Do NOT use sodium bicarbonate in an attempt to neutralize the acid.
Antidote: Do NOT use oils or ointments in eye.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Not flammable, but reacts with most metals to form flammable hydrogen gas. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Reaction with water may generate much heat which will increase the concentration of fumes in the air. Containers may explode when heated.
Extinguishing Media: For large fires, use water spray, fog, or alcohol-resistant foam. Substance is nonflammable; use agent most appropriate to extinguish surrounding fire. Do NOT get water inside containers. Do NOT use straight streams of water. Most foams will react with the material and release corrosive/toxic gases. Cool containers with flooding quantities of water until well after fire is out. For small fires, use carbon dioxide (except for cyanides), dry chemical, dry sand, and alcohol-resistant foam.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Large spills may be neutralized with dilute alkaline solutions of soda ash (sodium carbonate, Na2CO3), or lime (calcium oxide, CaO). Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation. Do not get water inside containers. A vapor suppressing foam may be used to reduce vapors. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Contents may develop pressure upon prolonged storage. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Discard contaminated shoes. Use caution when opening. Keep from contact with moist air and steam.
Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Do not store in metal containers. Store protected from moisture. Do not store near flammable or oxidizing substances (especially nitric acid or chlorates).

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hydrochloric acid	2 ppm Ceiling	50 ppm IDLH	5 ppm Ceiling; 7 mg/m3 Ceiling
Water	none listed	none listed	none listed

OSHA Vacated PELs: Hydrochloric acid: No OSHA Vacated PELs are listed for this chemical.
Water: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear neoprene or polyvinyl chloride gloves to prevent exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid
Appearance: colorless to slight yellow

Odor: strong, pungent
pH: 0.01
Vapor Pressure: 5.7 mm Hg @ 0 deg C
Vapor Density: 1.26
Evaporation Rate:> 1.00 (N-butyl acetate)
Viscosity: Not available.
Boiling Point: 81.5-110 deg C @ 760 mmHg
Freezing/Melting Point:-74 deg C
Decomposition Temperature: Not available.
Solubility: Miscible.
Specific Gravity/Density:1.0-1.2
Molecular Formula:HCl.H2O
Molecular Weight:36.46

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Mechanical shock, incompatible materials, metals, excess heat, exposure to moist air or water, bases.
Incompatibilities with Other Materials: Acetates, acetic anhydride, alcohols + hydrogen cyanide, 2-aminoethanol, ammonium hydroxide, calcium carbide, calcium phosphide, cesium acetylene carbide, cesium carbide, chlorosulfonic acid, 1,1-difluoroethylene, ethylene diamine, ethyleneimine, fluorine, lithium silicides, magnesium boride, mercuric sulfate, oleum, perchloric acid, potassium permanganate, beta-propiolactone, propylene oxide, rubidium acetylene carbide, rubidium carbide, silver perchlorate + carbon tetrachloride, sodium, sodium hydroxide, sulfuric acid, uranium phosphide, vinyl acetate, zinc, metal oxides, aluminum, amines, carbonates, iron, steel, copper alloys, copper, alkali metals, bases, moisture.
Hazardous Decomposition Products: Hydrogen chloride, chlorine, carbon monoxide, carbon dioxide, hydrogen gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 7647-01-0: MW4025000; MW4031000
CAS# 7732-18-5: ZC0110000
LD50/LC50:
CAS# 7647-01-0:
Inhalation, mouse: LC50 = 1108 ppm/1H;
Inhalation, mouse: LC50 = 8300 mg/m3/30M;
Inhalation, rat: LC50 = 3124 ppm/1H;
Inhalation, rat: LC50 = 45000 mg/m3/5M;
Inhalation, rat: LC50 = 8300 mg/m3/30M;
Oral, rabbit: LD50 = 900 mg/kg;
CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;
Carcinogenicity:
CAS# 7647-01-0:
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: IARC Group 3 - not classifiable CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP,

or OSHA.
Epidemiology: Experimental reproductive effects have been reported.
Teratogenicity: Embryo or Fetus: Stunted fetus, Inhalation, rat TCL0=450 mg/m3/1H Specific Developmental Abnormalities: homeostatis, Inhalation, rat TCL0=450 mg/m3/1H (female 1 days pre-mating).
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: Cytogenetic analysis: Hamster, lung = 30 mmol/L.; Cytogenetic analysis: Hamster, ovary = 8 mmol/L.
Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: 3.6 mg/L; 48Hr; Lethal (unspecified) Bluegill/Sunfish: LC50; 96 Hr; pH 3.0-3.5 No data available.
Environmental: Rapidly hydrolyzes when exposed to water. Will exhibit extensive evaporation from soil surfaces. Upon transport through the soil, hydrochloric acid will dissolve some of the soil materials (especially those with carbonate bases) and the acid will neutralize to some degree.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	HYDROCHLORIC ACID				No information available.
Hazard Class:	8				
UN Number:	UN1789				
Packing Group:	II				

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 7647-01-0 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 7647-01-0: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7647-01-0: 500 lb TPQ

SARA Codes

CAS # 7647-01-0: acute.

Section 313

This material contains Hydrochloric acid (CAS# 7647-01-0, 36 5%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 7647-01-0 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 7647-01-0 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7647-01-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 34 Causes burns.

R 37 Irritating to respiratory system.

Safety Phrases:

S 1/2 Keep locked up and out of reach of children.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 7647-01-0: 1
CAS# 7732-18-5: No information available.

Canada - DSL/NDSL

CAS# 7647-01-0 is listed on Canada's DSL List.
CAS# 7732-18-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1A, E.

Canadian Ingredient Disclosure List

CAS# 7647-01-0 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 7647-01-0: OEL-AUSTRALIA:TWA 5 ppm (7 mg/m3) OEL-AUSTRIA:TWA 5 ppm (7 mg/m3) OEL-BELGIUM:STEL 5 ppm (7.7 mg/m3) OEL-DENMARK:STEL 5 ppm (7 mg/m3) OEL-FINLAND:STEL 5 ppm (7 mg/m3);Skin OEL-FRANCE:STEL 5 ppm (7.5 mg/m3) OEL-GERMANY:TWA 5 ppm (7 mg/m3) OEL-HUNGARY:STEL 5 mg/m3 OEL-JAPAN:STEL 5 ppm (7.5 mg/m3) OEL-THE NETHERLANDS:TWA 5 p pm (7 mg/m3) OEL-THE PHILIPPINES:TWA 5 ppm (7 mg/m3) OEL-POLAND:TWA 5 mg/m3 OEL-RUSSIA:STEL 5 ppm (5 mg/m3) OEL-SWEDEN:STEL 5 ppm (8 mg/ m3) OEL-SWITZERLAND:TWA 5 ppm (7.5 mg/m3);STEL 10 ppm (15 mg/m3) OEL -THAILAND:TWA 5 ppm (7 mg/m3) OEL-TURKEY:TWA 5 ppm (7 mg/m3) OEL-UNI TED KINGDOM:TWA 5 ppm (7 mg/m3);STEL 5 ppm (7 mg/m3) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPOR E, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 7/06/1999
Revision #4 Date: 8/14/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

APPENDIX B

QUALITY ASSURANCE PROJECT PLAN

APPENDIX B
QUALITY ASSURANCE PROJECT PLAN
CUTCHOGUE FREON PLUME SITE

This Site-specific Quality Assurance Project Plan (QAPjP) identifies sections of MACTEC's NYSDEC Program Quality Assurance Program Plan (QAPP) (MACTEC, 2007) that apply to the activities described in this Field Activities Plan (FAP), describes variances to those procedures, and specifies the analytical methods to be used for laboratory analysis of environmental samples.

General Procedures. The general procedures used to conduct the remedial investigation FAP at the Cutchogue Freon Plume Site will be taken from the following sections of the QAPP:

Section 2.0	Program Organization and Responsibilities
Section 6.0	Calibration Procedures
Section 7.0	Analytical Program
Section 8.0	Data Reduction, Validation, and Reporting
Section 9.0	Internal Quality Control
Section 10.0	Audits
Section 11.0	Preventive Maintenance
Section 12.0	Data Assessment
Section 13.0	Corrective Action
Section 14.0	Reports to Management

Sampling Procedures. The following sampling techniques and procedures set forth in the QAPP will be used at the site (with variances to QAPP noted):

Section 3.0	Quality Assurance Objectives
Section 4.0	Sampling Procedures with variations noted below:
4.1	Sample Labels and Records. Sampling IDs are shown in Table 3.2 of the FAP and include the Site number instead of abbreviated name.

4.9 Investigation-Derived Waste. The approach to screening and handling IDW is described in Section 3.2.2 of the FAP.

Data Quality Objectives. Analytical DQOs for the Gent Uniform site RI sampling activities are summarized in Table B-1. NYSDEC Analytical Services Protocols (ASP) (NYSDEC, 2005) methods will be used. Results will be evaluated by preparing a Data Usability Summary Report (DUSR) (NYSDEC, 2002).

Table B-1:

Analytical DQO Levels

Parameter	Use	Data Quality Level
PH, Dissolved Oxygen, Temperature, Specific Conductance, Turbidity	Provides physical and chemical data on groundwater samples for use during sampling collection.	Level I
PID screening	Provides qualitative real-time information on air quality in the breathing zone for health and safety decisions, and to identify potentially contaminated groundwater, soil, and soil gas.	Level I
TCL VOCs	Provides analytical information to compare to standards and guidance values.	Level III 8260B (water)
TCLP/Waste Characterization – as needed	Provides analytical information to compare to standards and guidance values.	Level III 1311, 8260B, 8270C, 6010B/7470A, Characteristics – as needed

Notes:
TCL = target compound list
VOCs = volatile organic compounds
TCLP = toxicity characteristics leaching procedure

REFERENCES

MACTEC Engineering and Consulting, Inc., 2007. Program Quality Assurance Program Plan. Prepared for the New York State Department of Environmental Conservation, Albany, New York. October 2007.

New York State Department of Environmental Conservation (NYSDEC), 2005. *"Analytical Services Protocols"*; 6/05 Edition; June 2005.

New York State Department of Environmental Conservation (NYSDEC), 2002. Draft DER-10, Technical Guidance for Site Investigation and Remediation. December 2002.

U.S. Environmental Protection Agency (USEPA), 1987. "Data Quality Objectives for Remedial Response Activities"; Office of Emergency and Remedial Response and Office of Waste Programs Enforcement; Washington DC; EPA/540/G-87/003; March 1987.