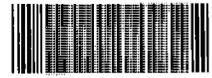


US EPA ARCHIVE DOCUMENT



**WORK PLAN
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA**

**Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island 02911**

Redacted

September 10, 2009

Prepared for

**Emhart Industries, Inc.
c/o Sullivan & Worcester LLP
1666 K Street, NW
Washington, DC 20006**

Prepared by

**LOUREIRO ENGINEERING ASSOCIATES, INC.
100 Northwest Drive
Plainville, Connecticut, 06062**

An Employee Owned Company

Comm. No. 15RP901



Loureiro Engineering Associates, Inc.

TRANSMITTAL

TO: USEPA – Region 1, New England One Congress Street, Suite 1100 (HBR) Boston, Massachusetts 02114-2023	DATE: September 21, 2009
ATTN: Mr. Ted Bazenas, On-Scene Coordinator	PROJECT: Centredale Manor LOCATION: N. Providence, RI COMM. NO.: 15RP9.01 PHONE # 617.918.1230

We are sending you Herewith Delivered by Hand Under Separate Cover via _____

The following items:

- Plans Prints Shop Drawings Specifications
 Reports Copy of Letter Work Plan

COPIES	DATE OR NO.	DESCRIPTION
5	September 10, 2009	Work Plan – Time-Critical Removal Action – Shallow Groundwater Remedy – Groundwater Action Area
1	September 10, 2009	CD-Rom - Time-Critical Removal Action – Shallow Groundwater Remedy – Groundwater Action Area

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REMARKS:

Ted –

I have attached to this Letter-of-Transmittal five hard copies and one CD-Rom of the Work Plan for the Time-Critical Removal Action being implanted in the Groundwater Action Area as a Shallow-Groundwater Remedy. Please let me know if you have any questions.

BY: David N. Scotti, P.G.

US EPA ARCHIVE DOCUMENT

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ACRONYMS

AMSL	Above Mean Sea Level
ARARs	Applicable or Relevant and Appropriate Requirements
BMP	Best Management Practices
CAMP	Community Air Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	Community Involvement Plan
CFR	Code of Federal Regulations
CQCP	Construction Quality Control Plan
CSM	Conceptual Site Model
CSTAG	Contaminated Sediments Technical Advisory Group
CWR	Completion of Work Report
DCP	Drum Contingency Plan
DVD	Digital Versatile Disc
FBG	Feet Below Grade
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	High-Density Polyethylene
HSM	Health and Safety Manager
HSO	Health and Safety Officer
HSS	Health and Safety Supervisor
JHA	Job Hazard Analysis
LEA	Loureiro Engineering Associates, Inc.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List



NTCRA	Non-Time Critical Removal Action
NTUs	Nephelometric Turbidity Units
OSC	On-Scene Coordinator
OSHA	Occupational, Safety, and Health Administration
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
PPE	Personal Protective Equipment
PRPs	Potentially Responsible Parties
PVC	Polyvinyl Chloride
RCRA	Resource Conservation and Recovery Act
RI	Rhode Island
RIDEM	Rhode Island Department of Environmental Management
SOW	Statement of Work
TCP	Traffic Control Plan
TCRA	Time-Critical Removal Action
T&DP	Transportation and Disposal Plan
TSA	Transportation and Safety Act
USDOT	United States Department of Transportation
UAO	Unilateral Administrative Order for Removal Action
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WP	Work Plan

UNITS

cm/s	centimeters per second
gpm	gallons per minute



1. INTRODUCTION

1.1 Background

On behalf of Emhart Industries, Inc. (Emhart), Loureiro Engineering Associates, Inc. (LEA) has prepared this Work Plan (WP) as required by Paragraph 40 of the Administrative Settlement Agreement and Order on Consent (Order), the effective date of which is August 11, 2009. The Order outlines a Time-Critical Removal Action (TCRA) at the Groundwater Action Area of the Centredale Manor Restoration Project Superfund Site located in North Providence, Rhode Island (hereinafter referred to as the “site”). This WP has been prepared in accordance with the Statement of Work (SOW) provided as Appendix A to the Order and describes all of the activities necessary to meet the requirements and objectives of the removal action as described in the SOW.

1.2 Site Description

As described by the United States Environmental Protection Agency (USEPA), the site includes two parcels, 2072 and 2074 Smith Street, encompassing approximately 9.7 acres, as well as certain sediments and floodplain areas of the Woonasquatucket River (River) from Route 44 (Smith Street) southerly to Allendale Dam and further to an area just below Lyman Mill Dam. The site consists of certain contaminated areas within this area as well as any other location to which contamination from that area has come to be located, or from which that contamination came.

The 2072 Smith Street parcel is occupied by Brook Village Apartments, an eleven-story apartment building that houses approximately 135 elderly residents. A series of four paved parking lots extend to the south of this building. The area of the parcel surrounding the building and parking lots includes landscaped areas and a paved driveway that provides access onto Smith Street. The parcel also includes a soil cap (Cap No. 2) located adjacent to the Woonasquatucket River. The parcel is bordered to the north by Smith Street, to the west by the Woonasquatucket River, to the east by a drainage ditch (former tailrace), and to the south by the 2074 Smith Street parcel.

Centredale Manor Apartments occupies the 2074 Smith Street parcel and consists of an eight-story apartment building that houses approximately 130 elderly residents. Two paved parking lots are located on this parcel to the north and west of the building. The apartment building, parking lots, and associated landscaped areas are located on the northern end of the parcel. The



parcel also includes two constructed caps: Cap No. 1 on the southern end of the parcel, which is bordered by Allendale Pond, the Woonasquatucket River and associated land to the south, and the Woonasquatucket River to the west; and Cap No. 3 along the eastern extent of the parcel that includes a drainage channel and occupies the area of the former tailrace. The property is bordered to the north by the Brooks Village Apartments property.

1.3 Previous Removal Actions

Following several preliminary studies and initial removal actions conducted by USEPA and its contractors, the site was placed on the National Priorities List (NPL) in March 2000. These initial removal actions included clearing and grubbing of approximately six acres of the site, the collection of over six hundred samples, the installation of over a mile of cedar and chain-link fence, and the installation of a soil cap over areas of contaminated soil and sediment. Beginning in April 2000, a TCRA was implemented by certain potentially responsible parties (PRPs) pursuant to a First Unilateral Administrative Order for Removal Action (UAO 1) for the Site. During this TCRA, the PRPs constructed a second soil cap. This second cap was installed on the Brook Village parcel adjacent to the Woonasquatucket River.

In 2001, a Non-Time Critical Removal Action (NTCRA) was implemented pursuant to a Second Administrative Order for Removal Action (UAO 2) for the Site. The NTCRA included the restoration of Allendale Dam, the delineation of dioxin-impacted soil and sediment in residential-use areas along the eastern embankments of Allendale Pond and Lyman Mill Pond, and the excavation and off-site disposal of certain dioxin-impacted soil and sediment.

Pursuant to a Third Administrative Order on Consent for Removal Action, a permeable protective cap was constructed over soils and sediments within the former tailrace located along the eastern boundary of the site in 2003 and 2004. This cap was constructed to satisfy the objectives of a TCRA and moderates the impact of flood conditions by managing surface water drainage that discharges into the former tailrace.

1.4 Rationale and Basis for Time Critical Removal Action

The Groundwater Action Area at the site has been identified by the USEPA as the area within the Brook Village parking lot that surrounds monitoring well MW-05S. This area is shown in Drawing 1-1. Based on the USEPA's Conceptual Site Model (CSM), shallow groundwater within this area is a likely on-going source or migration pathway of dioxins from contaminated soil below the water table to the River (USEPA, 2005).



The implementation of the TCRA will fulfill USEPA's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (USEPA, 2002) and the recommendations of the Contaminated Sediments Technical Advisory Group (CSTAG) that *all potential sources of contamination should be controlled early and in a logical and iterative manner* (USEPA, 2004). The shallow groundwater remedy described in this WP will control potential sources of contamination before the selection and implementation of the overall site remedy and will be a logical step in the overall remedy for the site. Moreover, this TCRA will reduce risk in the short-term and will provide a permanent remedy consistent with the long-term remedies under evaluation for the other areas of the site. Also, the TCRA described in this WP will permanently remove contaminant mass, consistent with USEPA's preferred remedy for impacted soil.

1.5 Time-Critical Removal Action Objective

The TCRA objective for the Groundwater Action Area is to provide overall, long-term protection of human health and the environment by preventing or reducing the potential for the migration of, and direct contact with, surface soils, sub-surface soils, and sediments that may be impacted with dioxins. This objective is to be achieved by excavating potentially impacted soils and sediments to specified lines and grades, backfilling, and constructing an impermeable cap over this area. The impermeable cap will eliminate any potential for the migration of and direct contact with impacted soils and sediments that remain in the Groundwater Action Area following excavation. In meeting the objective for the Groundwater Action Area, the TCRA will address USEPA's concern regarding mobilization of dioxin to the River.

1.6 Scope of Work

This WP describes the activities to be performed, as outlined in the SOW provided as Appendix A to the Order. In summary, the SOW includes: (i) focused excavation limited to specified lines and grades and off-site disposal of potentially impacted soils and sediments; (ii) installing steel sheeting to control surface water during the construction activities; (iii) backfilling and re-grading the area of excavation; (iv) constructing an impermeable cap over the Groundwater Action Area; (v) installing groundwater monitoring points; and, (vi) conducting one round of groundwater monitoring. The activities to be performed in accordance with this WP are consistent with the 1990 National Oil and Hazardous Substances Pollution Contingency Plan (NCP) found in Title 40, Part 300 of the Code of Federal Regulations (40 CFR Part 300). Further, the implementation of the TCRA will fulfill USEPA's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (USEPA, 2002) and the



recommendations of the CSTAG that *all potential sources of contamination should be controlled early and in a logical and iterative manner* (USEPA, 2004).

1.7 **Organization of this Work Plan**

This WP identifies the administrative and site management controls that will be established in facilitating the implementation of the TCRA for the Groundwater Action Area. Also, this WP identifies the reporting requirements of the TCRA. The engineered design and construction specifications needed to implement the TCRA are included in this WP.

The remainder of this WP is presented as follows:

- A description of the general approach to fulfilling the requirements of the SOW is provided in Section 2.
- A Community Involvement Plan (CIP) is provided in Section 3.
- A description of the site-specific Health and Safety Plan (HASP) to be followed in implementing the TCRA is presented in Section 4.
- Monitoring well abandonment procedures are described in Section 5.
- A Drum Contingency Plan (DCP) is provided in Section 6.
- A description of the site management controls to be established in implementing the TCRA is provided in Section 7.
- The sequence of construction activities is provided in Section 8.
- A Construction Quality Control Plan (CQCP) is provided as Section 9.
- A description of the Completion of Work Report (CWR) to be provided upon the completion of construction activities is provided in Section 10.
- A schedule for the implementation of the TCRA is provided in Section 11.
- The USEPA required Disclaimer and Certification Statement is provided in Section 12.

References are provided following the text of this WP. Tables, figures, drawings, and appendices are provided in support of this document and are attached as referenced in the appropriate sections of the text.



2. GENERAL APPROACH

2.1 Approach to the Time-Critical Removal Action

The general approach to meeting the objective of this TCRA includes limited excavation and capping. The area to be capped is shown in Drawing 2-1. As shown, this area encompasses a portion of the Brook Village parking lot and an adjacent area to the west that extends to the eastern bank of the River. The area of the cap has been established based on the area of shallow groundwater flow that has the potential to discharge to the River, shown in the Site Plan of Drawing 2-1. Shallow groundwater within this area may discharge to the River due to a hydraulic “mound” surrounding monitoring well MW-05S. The presence of the hydraulic mound in the vicinity of monitoring well MW-05S results in a hydraulic gradient for groundwater flow toward the River. The cap to be constructed in accordance with this TCRA encompasses this area.

2.2 Soil and Sediment Excavation

Within the limits of the area to be capped, the asphalt will be removed and transported off-site to a recycling facility. The underlying soil and sediment within this area will be excavated to varying depths as illustrated in Drawings 2-1, 2-2, and 2-3. In general, concrete and soils that are excavated to a depth of approximately four feet below grade will be temporarily stockpiled on site. These stockpiled materials will be used to backfill areas of deeper excavation that result from the removal of impacted soils that will be transported off-site for thermal treatment at an approved facility.

The limits of excavation are as defined in Drawings 2-1, 2-2, and 2-3. The shallow groundwater remedy incorporates the excavation of soil and sediment using a *lines and grades* approach: Soil and sediment will be excavated only to the lines and grades shown in Drawings 2-1, 2-2, and 2-3. Although field monitoring equipment such as a photo-ionization detector (PID) will be used during the removal for health and safety monitoring purposes, such equipment will not be used to re-define the limits of excavation. Soil and sediment will be excavated only to the lines and grades shown in Drawings 2-1, 2-2, and 2-3. The one and only exception to the lines and grades approach is if an intact container(s), or impaired container(s) that could be an on-going source of contamination, is encountered along a boundary of the excavation, then the container(s), and any similar container(s) within the footprint of the excavation boundary, will be removed.



To facilitate the excavation of sediments below the River bed, steel sheeting will be driven to a depth of 22 feet below the River bed to an elevation of approximately 71 feet above mean sea level (amsl). The sheeting will extend 8 feet above the River bed to an elevation of approximately 101 feet amsl. The sheeting will serve as a coffer dam and will divert surface water away from the embankment and the work area. Upon completing the cap, the steel sheeting will be driven below the River bed to an elevation of approximately 92.8[±] feet amsl. During the construction activities, any surface water or groundwater that is pumped to maintain a dry work area will be treated using filter bags and activated carbon, as appropriate, and will be discharged into the River.

2.3 Cap

Once the excavation is complete, the area excavated below the bed of the River will be backfilled with imported, clean material. The remaining area of excavation will be backfilled with the stockpiled materials. The impermeable cap will be constructed on top of the backfilled soil. The proposed elevations of the final grade are illustrated in Drawings 2-1, 2-2, and 2-3.

From its base, the components of the cap will include:

- a non-woven geotextile filter fabric (as needed);
- a 60-mil thick, textured, high-density polyethylene (HDPE) liner;
- a geosynthetic drainage net;
- along the River embankment, a polyethylene cellular confinement system, having a height of six inches, placed upon a uniaxial geonet;
- two feet of clean backfill materials consisting of the following materials: ¾-inch stone/riprap, for the area of excavation beneath the River bed; ¾-inch stone placed within the polyethylene cellular confinement system/riprap, along the embankment; gravel/loam and seed, between the embankment and the parking lot; and gravel/process stone/asphalt, in the parking lot area; and
- run-on and run-off controls.

The components of the cap are illustrated in the cross sections provided in Drawing 2-2 and 2-4.

2.4 **Applicable or Relevant and Appropriate Requirements**

2.4.1 Overview

Section 121(d) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires that on-site remedial actions attain or waive Federal environmental Applicable or Relevant and Appropriate Requirements (ARARs), or more stringent State environmental ARARs, upon completing remedial actions. Also, the NCP requires compliance with ARARs during remedial actions and during removal actions to the extent practicable. Further, CERCLA section 121(e)(1) provides that no Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on-site, where such remedial action is selected and carried out in compliance with section 121.

Accordingly, all TCRA activities for the Groundwater Action Area will be completed to meet (or waive) the substantive provisions of permitting regulations that are ARARs. The ARARs include cleanup standards, standards of control, or other requirements promulgated under federal or state laws. *Applicable Requirements* are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. *Relevant and Appropriate Requirements* are standards or requirements that, while not “applicable” to a site, address situations sufficiently similar to those encountered at the site that their use is well suited to the site.

The TCRA will be performed in compliance with the following types of ARARs:

- Ambient or chemical-specific requirements - the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment;
- Location-specific requirements - restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in special locations; and,
- Performance, design, or other action-specific requirements - requirements or limitations on actions taken with respect to hazardous wastes.

A summary of ARARs is provided as Table 2-1 of this WP. A detailed discussion of how the more pertinent ARARs will be attained is provided in the sections that follow.

2.4.2 Protection of Wetlands and Freshwater Wetlands Act

The ARARs for the protection of wetlands include: 40 CFR 6.302(a); 40 CFR 6, Appendix A; and the Rhode Island Department of Environmental Management (RIDEM) *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act* (RIDEM, 1998). In summary, the regulations state that construction should be avoided in wetlands unless there is no practicable alternative. In addition, the proposed activities should minimize harm to the wetlands to the maximum extent practicable. Because the TCRA specifies the excavation of dioxin-impacted sediment and soil to pre-established lines and grades within the River and floodplain, there is no alternative to removing the impacted material and these ARARs need to be satisfied. As appropriate, soil erosion and sediment controls will be provided in accordance with engineered design of the TCRA and the Rhode Island (RI) Soil Erosion and Sediment Control Handbook to minimize harm to the wetlands to the maximum extent practicable. In addition, the least amount of area within the River and floodplain wetland will be disturbed in completing the removal activities, and restoration of the Groundwater Action Area will be performed.

2.4.3 Floodplain Management

The ARARs for floodplain management include 40 CFR 6.302(b) and 40 CFR 6, Appendix A. As stated in the preceding paragraph, dioxin-impacted soil and sediment exist in the floodplain and there is no alternative to removing the material. In addition, the least amount of area within the River and floodplain wetland will be disturbed in completing the removal activities, and restoration of the Groundwater Action Area will be performed as soon as practicable.

2.4.4 Clean Water Act

Section 404(b)(1) of the Clean Water Act provides guidelines for the placement of dredged or fill material into surface waters. Clean fill materials will be placed into the area of the excavated River bed. Any impacts to the surface water will be minimized by maintaining a dry work area during the sediment excavation and removal activities and maintaining a barrier between the excavation and the surface waters associated with the River during backfilling operations.

2.4.5 Waste Management

The ARARs for waste management identified in this paragraph apply to the storage, identification, labeling, and shipment of wastes that are generated during the implementation of the TCRA. The wastes that will be generated include debris from clearing operations, excavated



dioxin-impacted soil and sediment, water generated from construction dewatering activities, water generated from decontamination activities, and disposal of personal protective equipment (PPE).

Excavated dioxin-impacted soil and sediment is considered to be hazardous waste. The RIDEM *Rules and Regulations for Hazardous Waste Management (2007)* identifies the requirements and procedures for these wastes or materials and incorporates a number of federal regulations including those promulgated under the Resource Conservation and Recovery Act (RCRA) and the Transportation and Safety Act (TSA). The RCRA regulations are found in 40 Code of Federal Regulations (CFR) and the TSA regulations are found in 49 CFR. The generator requirements enforced by USEPA under the RCRA regulations are contained in 40 CFR Part 262. The generator requirements enforced by the United States Department of Transportation (USDOT) under the TSA regulations are contained in 49 CFR Part 173. Additionally, the ARARs include:

- 40 CFR 263.10 through 263.31 and 49 CFR 177.800 through 177.854 – Transportation and Carrier Requirements
- 40 CFR 265.170 through 265.178 – Subpart I – Use and Management of Containers;
- 40 CFR 265.1087 – Subpart CC – Air Emission Standards for Tanks, Surface Impoundments and Containers; and,
- 40 CFR 262 – Subpart E – Export of Hazardous Waste
- 40 CFR 264 and 265 – Disposal Facility Requirements

All handling, transportation, and disposal of the wastes generated during the TCRA will be conducted in compliance with these regulations. The methods and procedures for proper containerization, labeling, reporting, storage, inspection, transport, and disposal that will be implemented to comply with these regulations are presented in the Transportation and Disposal Plan (T&DP) provided as Appendix A.

2.4.6 Earth-Moving Activities

Regulations designed to control dust generated by earth-moving activities are provided in the RIDEM Office of Air Resources *Air Pollution Control Regulation No. 5 – Fugitive Dust (2007)*. Because the excavation activities will be conducted in and adjacent to wetlands, the excavated soil and sediment are expected to be moist enough to prevent dust from being generated during excavation operations. In accordance with the Community Air Monitoring Plan (CAMP)



provided in the Health and Safety Plan (HASP) as Appendix B, air monitoring will be conducted to identify the presence of any dust at the site that is above specified threshold limits. To ensure that these limits are not exceeded, all excavation activities will be conducted under the application of a dust suppressant such as water to keep the soil and sediment moist and to prevent the generation of dust. Moreover, site worker and vehicular traffic out of the areas of excavation will be controlled with a boot wash and tracking pad and decontamination stations. Section 7.11 of this Draft WP identifies the equipment decontamination procedures that will be followed for all equipment used at the site.

2.4.7 Rules and Regulations for Groundwater Quality

Pursuant to Appendix 1 of the *Rules and Regulations for Groundwater Quality* that have been promulgated by RIDEM (2005), piezometers and monitoring wells that are within the boundaries of excavation will be properly abandoned to minimize the potential for contaminant migration at depth.

2.4.8 Remediation Regulations

The *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* that have been promulgated by RIDEM (1996) require that impacted soil and groundwater be remediated to levels that have been established to be protective of human health and the environment. The removal action activities to be completed in accordance with this WP have been designed to satisfy this requirement.

3. COMMUNITY INVOLVEMENT PLAN

3.1 Overview

A Community Involvement Plan (CIP) has been prepared to support the community involvement efforts of USEPA during the implementation of the TCRA. This CIP identifies the measures that will be taken to support USEPA in disseminating information regarding the TCRA activities to community residents, town officials, local environmental groups, and other interested parties. These measures include the participation at public and technical meetings and the preparation of documents and drawings or other illustrative aids to facilitate the discussions at these meetings. Also, these measures include providing general project and technical information to USEPA, as requested, so that fact sheets, newsletters and other communication tools may be prepared by USEPA.

Because the TCRA activities involve construction activities within three of the four Brook Village parking lots, a majority of the residents of the Brook Village community will not be able to use the Brook Village parking lot spaces that have been allotted to them. These residents will have to park in either the Centerdale Manor north or south parking lots for the duration of the TCRA activities. The community involvement support measures will therefore include measures to provide these residents of the Brook Village community with a means of transportation to and from their vehicles parked in either the Centerdale Manor north or south parking lots. A brief description of the community involvement support activities to be provided during the TCRA for the Groundwater Action Area is provided in the following sections.

3.2 General Support Activities

General community involvement support activities are likely to include the preparation of documents that summarize the TCRA activities being conducted at the site. The information provided in these documents may be incorporated by USEPA into community updates, newsletters, fact sheets, or other communication tools. These informational summaries will be clearly and succinctly written, without an excess of scientific terminology, so that the community residents can easily understand the activities being conducted. If requested by USEPA, photographs may also be provided to identify the progress of the TCRA activities.

3.3 **Public Meetings**

As requested by USEPA, community involvement support activities will include participation at public meetings, including Dialogue Group meetings, and other informal meetings. If requested by USEPA, appropriate visual aids and documents will be prepared to clearly convey site information at these meetings. Either the LEA Project Coordinator or Project Manager will attend the public meetings to ensure that a representative who is knowledgeable about the TCRA activities and the site in general may address the concerns raised by members of the community.

3.4 **Brook Village Shuttle Service**

The TCRA activities will encompass Brook Village Parking Lots D, E, F, and G. The parking spaces within these lots, identified as D1 – D8, E1 – E8, F1 – F8, and G1 – G8, and the spaces allotted for visitor parking within these lots will not be available during the removal action. Alternative parking will be available in the north Centerdale Manor parking lot. The Centerdale Manor south parking lot will be used to provide parking spaces for overflow parking and parking for visitors.

To assist Brook Village residents that are affected by this action, a shuttle service will be provided seven days per week, Monday through Friday. This service will operate between the hours of 8:00 am and 8:00 pm with the exception that between the following times the shuttle service will not be available: 11:00 – 11:15 am; 1:00 – 1:30 pm; and 3:00 – 3:15 pm. The shuttle service will be provided to taxi residents to and from their vehicles parked in one of the Centerdale Manor parking lots.

During the designated shuttle hours, a taxi will be stationed along the east side of the Brook Village north parking lot at the end of the fire lane. Residents who are in need of the shuttle service to assist them to their vehicle located in one of the Centerdale Manor parking lots may go to this designated station to receive a taxi to their vehicle. Residents returning to the Brook Village property may alert the taxi driver upon their return that they need assistance. The taxi driver will follow them to an alternate parking location provided on the Centerdale Manor property and will taxi them back to the Brook Village apartment building. If the taxi driver is not parked in the designated shuttle location, the resident should wait several minutes for the taxi to return from assisting another resident.



4. HEALTH AND SAFETY

As required by the Order, a Site-Specific Health and Safety Plan (HASP) has been prepared for the on-site activities to be implemented in completing the TCRA. The HASP is included as Appendix B. The HASP identifies the procedures, personnel responsibilities, and training necessary to protect on-site personnel and the general public during the completion of the removal action. The HASP is based on and incorporates a Job Hazard Analysis (JHA) that specifically identifies the potential hazards that may be encountered, provides for an assessment of each hazard, and describes procedures and measures, including a description of PPE to be employed in minimizing the potential harm that may result from such hazards. Thus, the HASP describes the measures to be taken in managing risks to human health from hazards associated with the TCRA. The JHA will be reviewed at the start of each new task to ensure that the site workers are familiar with the health and safety requirements of the work. The JHA will be modified as necessary if existing conditions or the work require a change to the procedures and measures that are employed to minimize the potential harm that may result from identified hazards.

The HASP includes a Community Air Monitoring Plan (CAMP). The CAMP identifies the procedures that will be employed to minimize the potential risk associated with fugitive dust and the volatilization of volatile organic compounds (VOCs) during the implementation of the TCRA. The CAMP specifies that real-time air monitoring for VOCs and particulate matter (i.e., dust) along the perimeter of the work area will be performed. Because fugitive dust is of particular concern not only during active construction but during non-working hours, the air monitoring activities will include monitoring during overnight and week-end hours, if necessary. The CAMP is designed to minimize the potential spread of contaminant-laden dust and to identify the hazard associated with any fugitive dust.

The HASP provided in Appendix B has been prepared in accordance with USEPA's Standard Operating Safety Guidelines (USEPA, 1992). This HASP has been designed to incorporate all applicable Occupational, Safety, and Health Administration (OSHA) requirements, including those for Hazardous Waste Operations and Emergency Response (HAZWOPER), (29 CFR 1910.120) activities. Also, the HASP has been designed to incorporate the use of Best Management Practices (BMP) necessary for the health and safety of employees, contractors, and visitors at the site. As provided by the HASP, all site workers and subcontractors are required to comply with all of the requirements of the OSHA HAZWOPER standard and be current in this training. This standard requires site workers involved in the TCRA activities to have training,



medical surveillance, and PPE. Also, site workers are required to comply with all other applicable OSHA regulations.

It is the responsibility of all site workers and subcontractors to see that all operations conducted at this site are carried out in a safe and efficient manner. Before beginning any work on site, all personnel and subcontractors must read and understand the HASP.

The information contained within the HASP represents a compilation of information obtained from previous site investigations and/or historical site background information. The HASP will be modified as necessary, if new information becomes available. All changes to the HASP will be made with the approval of the site Health and Safety Manager (HSM).

It is intended that the use of the HASP will provide for a safe work environment for all employees, contractors, and visitors at the site.



5. MONITORING WELL ABANDONMENT

Monitoring wells GEC-4, MW-05S, MW-LEA-01, MW-LEA-02, MW-LEA-03 and piezometers P-2 and P-20 are installed within the area of the cap (Drawing 2-1). Monitoring wells GEC-4, MW-LEA-01, MW-LEA-02, and MW-LEA-03 are installed to depths of 15 feet below grade (fbg), 14 fbg, 11.5 fbg, and 10 fbg, respectively. The depths of each of these wells extend beyond the planned depths of excavation. Accordingly, these wells will have to be properly abandoned to minimize the potential for contaminant migration at depth. The depths to which piezometers P-2 and P-20 are installed are unknown. If the depths of these piezometers exceed the depths of the planned excavation at each piezometer location, then the piezometers will be properly abandoned. Monitoring well MW-05S is installed to a depth of 8 fbg. The bottom of this well is within the depth of planned excavation. Thus, this well will not have to be abandoned prior to excavation. This monitoring well will be removed during the soil excavation activities.

In accordance with Appendix 1 of the RIDEM *Rules and Regulations for Groundwater Quality* (RIDEM, 2005), the well abandonment procedures will entail the inspection of each well to be abandoned to ensure that there are no obstructions that will interfere with the well abandonment process. Any obstructions will be removed by cleaning out the well, if possible. Once it is verified that there are no obstructions in the well, the screen and casing of the well will be pulled from the ground using a hollow-stem auger drill rig. The well location will then be over-drilled to a depth that corresponds to the depth at which the well was installed.

A cement-bentonite grout will then be placed to seal the over-drilled well location using pressure grouting techniques. This will be accomplished with a tremie pipe, starting at the bottom of the boring and slowly raising the conductor pipe toward the top of the boring at a rate no faster than the grout material fills and displaces water from the bored hole and until the boring is completely filled. The grout mixture used should be a Portland cement mixed with 5 percent to 8 percent high solids bentonite clay according to the correct water-to-cement ratio depending on the percent by weight of bentonite added.



6. DRUM CONTINGENCY PLAN

6.1 Overview

If an intact container (drum), or impaired container(s) (drum(s)) that could be an on-going source of contamination, is encountered along a boundary or within the boundary of the excavation, then the drum and any similar drums will be removed in accordance with this Drum Contingency Plan (DCP). This plan identifies the procedures and the sequence of tasks to be implemented in removing unearthened drums. These tasks include drum inspection, removal, handling and staging, sampling and characterization, and disposal. The HASP provided in Appendix B identifies the potential hazards that may arise from an unearthened drum, provides for an assessment of these hazards, and describes the procedures and measures to be implemented in minimizing the potential harm that may result from such hazards.

The HASP procedures to be followed include those described for air monitoring. Adherence to these procedures will ensure that the proper level of PPE is being utilized. Also, these procedures will minimize the potential for exposure to airborne contaminants. The potential physical and chemical hazards encountered during the process of drum excavation, handling, characterization, and on-site transport are identified in the JHA within the HASP. The potential hazards associated with off-site transport of materials for disposal are identified in the T&DP provided as Appendix A.

6.2 Drum Inspection

Once a drum is located within the limits of excavation, the excavation activities will cease immediately to secure the area and make notifications to the LEA Health and Safety Supervisor (HSS), the LEA Project Manager, the USEPA OSC, and the RIDEM project manager. Following notification, these individuals will conduct a safety meeting at the site to discuss the procedures described in this document as well as the details of the next steps to be taken. Once a course of action is agreed to by all parties, the proper and necessary precautions will be taken to remove the drum from the work area.

It is anticipated that, under the direction of the HSS, the soil and sediment surrounding the drum will be removed to the extent possible, using the excavating equipment. If needed, soils surrounding the drum will be removed by hand. However, exposing the drum will first be attempted using construction equipment to minimize the potential for exposure to personnel working within the excavation.



To the extent possible, an assessment of the drum will be made. This assessment will include a visual inspection of the drum and documenting its condition. In documenting the condition of the drum, a unique identifier will be assigned to the drum. Observed conditions including the drum size, drum type (plastic, metal), and drum-head type (bung, lid) will be noted. Other notable conditions will include whether the drum has any markings (manufacturer or after-market markings) or labels, contains liquids, is dented, rusted, bulging, leaking, or is surrounded by stained soils or sediments, or whether an odor is observed to be emanating from the drum or surrounding soils or sediments.

As part of the drum inspection process, the ambient air quality surrounding the drum will be monitored using a four-gas meter and a PID. If possible, the atmosphere within the drum will be checked using this equipment. Upon inspecting the drum, the LEA HSS will report the findings to the LEA HSM and Project Manager, the USEPA OSC, and the RIDEM on-site personnel.

6.3 **Drum Removal, Handling, and Staging**

Following drum inspection, drums will be removed using the excavating equipment, or to prevent drum rupture, equipment suitable for work near drums such as an excavator equipped with a drum grapppler or a skid-steer equipped with a bucket sling or other equipment suitable for drum handling. The equipment used to remove the drum will ultimately be selected in the field based upon the condition of the drum. Drum handling will be minimized to the extent possible after removal to minimize stress on the containers.

Intact drums in good condition will be transferred to a designated staging area within the work zone. The drums will be placed on polyethylene sheeting that is surrounded by and draped over straw bales. An inspection will be made of these drums to assess whether the drums should be overpacked prior to shipment. The drums that are temporarily staged in the designated staging area will be covered with plastic sheeting.

Drums in fair or poor condition, characterized as drums that are rusted, bulging, dented or otherwise damaged and that have the potential to release their contents, will be placed in an overpack drum or on a spill pallet near the excavation prior to transferring the drum to the staging area. When drums are to be overpacked, they will be placed upright in the salvage drum for ease of access for subsequent sampling. Empty drums that are in poor condition will be handled as excavation debris and will be placed in dump trailers along with the excavated soil and sediment to be transported for off-site disposal.



6.4 Drum Sampling and Characterization

Drums that contain liquids or solids will be sampled. Once staged, the drums will be inspected again to identify any markings that would indicate the drum contents prior to sampling. If drum markings suggest that a material with a high-hazard is contained in the drum, then the LEA site Health and Safety Officer (HSO) will be notified. If the HSO determines that the proper PPE and equipment are on-site to safely open the container, then the drums will be sampled. Drums shall not be opened without the proper PPE and without first monitoring the atmosphere within the drum using a PID. Drum lids will be removed using non-sparking tools. If it is determined that the PPE and equipment on-site are insufficient to safely open the drums, then the equipment will be provided, or, alternatively, a hazardous waste materials vendor will be contracted to handle the containers. Any bulging drums will be opened using remote entry tools such as a drum punch mounted on a backhoe, or alternatively will be handled by the hazardous waste materials vendor.

All drum contents will be evaluated visually. The following observations will be made and documented on the field sampling report form:

- material type (e.g., solid, liquid, sludge) and color;
- if possible, material identification (e.g., resin, filtercake, dye residue, etc.);
- estimated volume (percent);
- PID and four-gas meter readings;
- any changes to the drum's exterior condition including expansion or distention; and
- any other notable observations.

When sampling liquids in a drum, open-head drums will require removal of the drum lid prior to sampling. If the drum has only a bung opening, the drum will be positioned so that the bung is up: Drums with the bung on the end will be positioned upright; and, drums with bungs on the side will be laid on-side with the bungs up. The bung will be slowly opened with a non-sparking bung wrench, allowing gas pressure to release. The bung will be removed and a sample collected through the bung hole.

Liquids will be sampled using a clean, dedicated glass thief. Sludge-like and viscous materials will be handled as liquids, if possible. However, this may not be practical for sludge-like materials high in solids content. In this case, the drum will be opened and sampled with a sampling trier, soil auger, trowel or scoop. Solids will also be sampled using one of these devices. Composite samples will be collected from the drums that contain solids by obtaining



two grab samples: One sample obtained at a depth of one-third into the solid material; and, one sample obtained at a depth of two-thirds into the solid material. The grab samples will then be composited appropriately.

All drum samples will be analyzed by an environmental laboratory for the parameters required by the off-site disposal facility to obtain approval and acceptance of the drums. Upon receipt of the laboratory analytical results, arrangements will be made for proper off-site disposal.



7. SITE MANAGEMENT AND CONTROLS

7.1 Condition Survey

Prior to implementing any construction activities at the site, a condition survey will be performed. This survey will consist of a preconstruction photographic and audio-video digital versatile disc (DVD) survey for the purpose of establishing the existing surface conditions of the exterior site improvements that exist in all of the areas of the site to be affected by the TCRA activities. The ground photography will consist of color video taping the surface features in this area, including all concrete side walk, concrete curbing, reinforced concrete ramp, paved asphalt driveway and parking, drainage, and landscaped features. An audio narrative will be made simultaneously with and will support the video coverage. Prior to audio-video taping, all areas to be surveyed will be inspected visually to document features not readily visible by taping methods. This documentation will include hand-written notes and digital still photodocumentation. The purpose of the preconstruction survey is to provide the necessary information to aid in restoring the surface features upon completing the TCRA activities.

7.2 Underground Utility Facilities Clearance

In accordance with Chapter 39-1.2 of the State of Rhode Island General Law, owners of underground utility facilities will be notified of the planned site activities using the RI Dig-Safe System. This notification will include a description of all areas where drilling and excavation activities will occur with a request to field-locate all underground utility facilities that may conflict with the planned activities. In addition, a limited geophysical survey will be conducted in the Groundwater Action Area to identify the location of any subsurface features that may conflict with the planned drilling and excavation activities. This limited survey will include the use of ground penetrating radar (GPR) and magnetic locator instrumentation.

7.3 Layout and Survey Control

In preparing to implement the TCRA, a topographic and as-built survey of the Groundwater Action Area will be performed by a professional land surveyor licensed by the State of Rhode Island. In addition, the surveyor will establish and field-locate the area of the cap and the areas and depths of excavation using grade stakes. The layout and survey control will be performed given the planned components identified in the design drawings. Upon constructing the impermeable cap, the surveyor will survey the final grade contours of the Groundwater Action

Area as well as the limits of the cap. The survey data and information will be used to document the as-built conditions at the site.

7.4 **Photographic Survey**

During the implementation of the TCRA activities, digital photographs of each major construction activity will be taken to document the site conditions, the activity being performed, and the completed work. The photographic survey will be used to document the as-built conditions of the cap, as well as the restoration of the adjacent areas that are disturbed during the removal action. The photographic survey will provide a record of the major construction phases and components of the TCRA. Specifically, the photographs will document the sequence of construction activities including: cutting and clearing trees; coffer dam installation; de-watering; excavation; installation of the cap materials; and site restoration.

7.5 **Site and Work Area Security**

Because the TCRA activities will be performed in the area of the Brook Village parking lots temporary fencing will be erected to prohibit pedestrian and vehicular traffic from entering the work area. The temporary fencing will provide a secure work area will consist of 6-foot high chain-link fence panels that are supported on stands and anchored with sand bags. The temporary fence will be erected along the perimeter of the work to the north and east. The work area will border the existing Cap No. 2 fence to the south. The River will border the work area to the west.

During daily construction activities, a section of the fence will be removed to allow construction equipment, trucks, and personnel to access to the work area. At the end of each day, this section of fence will be replaced to secure the site. Signs will be posted at the opening in the fence to identify that the construction area is restricted. Posted signs will also be used to direct pedestrian traffic in and out of the Brook Village building toward the walkway on the east side of the Brook Village/Centerdale Manor driveway. Site workers will monitor the work area to prevent unauthorized access. At the end of each work day, construction equipment will be stored within the perimeter of the fence.

The picket fence that exists along the western extent of the Brook Village parking area will be removed to allow the implementation of the TCRA. This fence is not sufficiently constructed to allow for re-installation of the fence. Therefore, upon completing the construction activities, a new picket fence will be installed to replace the existing fence.



7.6 Soil Erosion and Sedimentation Controls

Prior to the onset of the construction activities, soil erosion and sedimentation controls will be established in the Groundwater Action Area, as needed and in accordance with the *Rhode Island Soil Erosion and Sediment Control Handbook* (RIDEM, 1989). Soil erosion and sedimentation controls will include the use of straw bales and/or the installation of silt fence to prevent any disturbed and unprotected soil that may be eroded by storm water from being transported beyond the work area and into the River. When excavated soil and sediment are not directly loaded into dump trailers for transportation off-site, then every effort will be taken to place the excavated material within the area of excavation so that soil erosion and sedimentation controls are not needed. At all times, exposed soil and materials that are excavated and temporarily staged on site will be covered with polyethylene sheeting to eliminate the potential for the generation of fugitive dust.

7.7 Equipment

Heavy equipment will be used on-site to install sheeting, excavate soil and sediment, haul waste materials, and place and compact materials brought to the site to construct the cap. Some of the equipment that will be used includes tree clearing and chipping equipment, excavators, skid-steers, tri-axle dump trailers, and asphalt paving equipment. Various hand tools and equipment will also be used to complete the construction activities.

7.8 Clearing

Once the proposed limits of the cap are staked in the field, brush and trees along the River embankment that are within the footprint of the cap will be cleared and removed from the site. Trees that are felled will be cleared and chipped along with the shrubs and brush using traditional clearing and chipping machinery. The removed trees and shrubs will be chipped on-site, and the chipped material will be disposed off-site.

7.9 Water Treatment

Any surface water or groundwater that is pumped to maintain a dry work area during the planned construction activities will be treated. The treatment system will consist one weir tank, 25-micron sediment filter bags, and 2,000-lb granular activated carbon vessels, placed in series/parallel. This treatment system is designed to remove suspended material and turbidity in the water. The system has been designed to handle pumped water at a rate of 200 gallons per minute (gpm). A schematic of the water treatment system is provided Figure 9-1.



The treated water will be discharged into the River, pending approval by RIDEM. The treated water will be sampled to measure turbidity in the field on the days that a discharge is made. The recorded turbidity measurements will be compared to a discharge limit of 12.45 Nephelometric Turbidity Units (NTUs) in assessing the effectiveness of the treatment system.

Upon completing the dewatering activities, the weir tank will be cleaned and emptied by pumping the water and residual sediment from the tank through the particulate filter bags and carbon. The sediment that is mechanically filtered from the water will be placed in dump trailers along with the treatment system carbon and excavated material to be transported off-site for disposal.

7.10 **Materials and Stockpile Staging**

Rip rap material along the embankment of the River will be removed and temporarily staged on site. This material will be re-placed as part of the cover material for the cap along the embankment, or will be placed as backfill within the areas of deeper excavation. Other cover materials for the cap will be placed in a location as close to the planned placement of the material upon delivery to the site. Materials to be used as part of the cover for the impermeable cap will consist of stone, topsoil, and asphalt materials. These materials will be handled on-site with the equipment identified above. Materials delivered to the site that will not be used immediately will be placed in an area that will prevent erosion of the material and sedimentation within the River. Hay bales or silt fence will be placed around these staged materials as an erosion and sedimentation control.

7.11 **Construction Equipment Decontamination Methods**

A tracking pad and decontamination wash station will be installed to prevent impacted soil from being tracked out of the work area. The tracking pad will be constructed of filter fabric and crushed stone placed over an area of approximately 50 feet in length. The pad will be maintained to ensure that it is properly removing any impacted material from the construction vehicle tires. The location of the tracking pad is shown in Drawing 7-1 along with other site management controls.

Construction equipment such as a backhoe bucket that is used to excavate impacted soil and sediment will be decontaminated. Both dry and wet decontamination will be used at the decontamination wash station, as may be necessary. Solids that are collected in the area of the tracking pad and decontamination wash station will be placed in dump trailers along with the



excavated material to be disposed off-site. Wash water removed from the station will be filtered and discharged through the construction dewatering water treatment system.

7.12 **Traffic Control**

Traffic will be controlled in accordance with the traffic plan provided in Drawing 1-1. Construction traffic will enter the site property via the Brook Village entrance from the south-bound lane of Route 44 (Smith Street). Trucks loaded with excavated material will exit the site property by turning left onto Route 44 (Smith Street) North. This traffic control plan (TCP) incorporates a police detail to be provided by the Town of North Providence Police Department and stationed at the Brook Village entrance to the site property. The transportation routes specified in this TCP have been designed to facilitate loading of excavated material to be transported off-site and to limit the amount of disruption to the Town of North Providence community and local traffic.

It is anticipated that there will be truck traffic entering and existing the site property throughout most of each work day. As shown in Drawing 1-1, the area of the existing Brook Village/Centredale Manor driveway and Cap No. 1 will be used to facilitate on-site traffic and the flow of trucks to be loaded with excavated material. The TCP has been designed so that the trucks to be used to transport the excavated material off-site do not traverse impacted soil. A paved, clean surface will be maintained for truck traffic to obviate the need for vehicle decontamination. Thus, these trucks should not have to be decontaminated. However, if during loading activities the tires of these trucks come into contact with impacted material, then they will be decontaminated.

8. SEQUENCE OF CONSTRUCTION ACTIVITIES

8.1 Overview

Once the site management and controls have been established, the TCRA activities will be conducted. As planned, the general sequence of construction activities is as follows:

- demolition activities
- surface water management and dewatering activities
- excavation activities
- backfilling activities
- groundwater monitoring point installation
- off-site disposal
- subgrade preparation for liner system
- engineered cap
- piezometer installation
- site restoration

A description of these activities is provided in the sections that follow.

8.2 Demolition Activities

Demolition activities will need to take place in the planned area of the cap to provide materials staging areas and truck access through the work area. These activities will include the removal of the existing concrete curbing and reinforced concrete ramps. The concrete that is removed will either be broken into manageable pieces and temporarily staged on-site for use as backfill or will be recycled at a local facility. Topsoil and soils within the islands will be removed and temporarily staged on-site for use as backfill within the areas excavated to depths generally greater than approximately four fbg.

Underground utility facilities will be disconnected, de-energized, and locked-out/tagged-out. These utilities include the electrical lighting and sprinkler systems. The contractor who maintains the sprinkler system will be contacted to disconnect the portion of the system to be compromised during the construction activities so that the system may be temporarily modified to provide irrigation to the other areas of the site that are not affected by the TCRA. Once the electrical lighting system is disconnected and de-energized and locked-out/tagged-out, the light



pole will be taken down and the light pole base and any subsurface conduit that is located will be removed during the excavation activities. Temporary lighting will be provided by erecting a temporary light pole on the Centerdale Manor property located east of the work area and driveway. The power to this temporary pole will be provided by tapping into the nearest light pole on the Centerdale Manor property.

The existing asphalt surface in the work area will be maintained as long as possible to minimize the potential for contaminant dispersion. The asphalt will be removed as needed to allow construction activities to progress. Any asphalt that is cut and removed will be recycled off site at a local asphalt recycling facility.

8.3 **Surface Water Management and Dewatering**

The TCRA activities will be conducted during the summer months when River flow rates and discharge are expected to be low. However, the River conditions are known to change quickly during precipitation events and can be unpredictable due to the release of surface water from upstream, private flood control dams. To divert surface water away from the work area and to minimize the potential for hazards associated with flooding during the excavation of sediment beneath the River bed and soil along the embankment, an interlocking sheet piling cofferdam system will be installed within the River.

The interlocking sheet piling cofferdam will be installed such that the sheets extend approximately 18 feet into the ground beneath the River bed. The top of the sheets will extend approximately 12 feet above the bed of the river. This system will be installed adjacent to the work area, over an approximate 150-foot reach of the River embankment. At the upstream and downstream ends of the coffer dam, the sheets will be angled up the slope of the embankment. The location of the cofferdam is shown in Drawings 2-1 and 2-2. The cofferdam dam will sufficiently divert surface water away from the work area allowing any remaining water within the work area to be controlled by pumping. The sediment and soil within the work area will then be excavated under dry conditions.

Prior to placement of the cap cover materials, the sheet piling will be driven below the elevation of the River bed. The top of the sheet piles will be covered with rip rap. The interlocking sheet piling will provide a subsurface barrier to shallow groundwater flow in the Groundwater Action Area.

Because the sheet piling cofferdam will provide a barrier between the river and the area of excavation, dewatering the work area can be controlled by pumping any remaining water from



submersible pumps placed within temporary stone-filled sumps. The sumps will be spaced along the length of the sheeting as is necessary to maintain a dry work area. The submersible pumps will be removed prior to backfilling the area of excavation along the toe of the embankment.

8.4 Soil and Sediment Excavation

All excavation activities will be conducted so that dust is controlled. Thus, water or other dust suppressants will be used during construction activities. If the measures that are taken to suppress dust are insufficient, then all construction activities will cease immediately and will resume only after adequate measures are in place to control the dust. Dust monitoring will be performed in accordance with the HASP provided in Appendix B.

As shown in Drawings 2-1, 2-2, and 2-3, impacted soils and sediments will be excavated to specified lines and grades with the exception that if an intact container(s), or impaired container(s) that could be an on-going source of contamination, is encountered along a boundary or within the boundary of the excavation, then the container(s) will be removed in accordance with the Drum Contingency Plan provided in Section 6. Shallow soils within the planned areas of excavation will be used to backfill areas of deeper excavation. These soils will be temporarily stockpiled within soil containment bins in the area of the cap, placed as close to or within the excavated area to be backfilled. Once the materials to be used as backfill are excavated, soils at lower elevations will be excavated and temporarily stockpiled within soil containment bins in the area of the cap, placed as close to or within the excavation. These materials will be loaded from the stockpile, along with the sediments that are excavated from the River bed, directly into dump trailers for off-site disposal.

8.5 Backfilling

It is anticipated that the excavated soil that will be temporarily staged on-site will be adequate to meet the subgrades of the cap. The subgrade elevations are provided on Drawings 2-1, 2-2, and 2-3. The area of the River bed that is excavated will be backfilled with imported, $\frac{3}{4}$ -inch stone. As needed to support the future use of the Groundwater Action Area as a parking lot, backfill materials will be placed in 18-inch lifts and will be compacted with a vibrating trench roller or reversible plate compactor capable of providing a minimum of 10,000 pounds of compaction.

8.6 Groundwater Monitoring Well Installation

Monitoring wells will be installed during the placement of the $\frac{3}{4}$ -inch stone within the excavated River bed. One monitoring well will be installed upstream of the cap and one monitoring well

will be installed at the downstream extent of the cap, as shown in the Excavation Plan provided in Drawing 2-1. The monitoring wells have been designed to obtain representative groundwater samples at these locations to possibly assess whether any constituents of concern are being transported and discharged into the River.

Each monitoring well will be constructed of two-inch diameter polyvinyl chloride (PVC) screen and riser (Drawing 2-4). The screen will consist of a two-foot section of 0.012-slot, pre-packed screen. The screen will be thread-coupled to a cap at the bottom of the screen. The PVC riser of each groundwater monitoring point will be thread-coupled to the screen and placed along the embankment above the impermeable liner and uniaxial geonet and below the geocell. Each point will be completed with an expandable, locking cap within a 3' x 3' protective vault set flush with the ground surface. The annulus of the pre-packed screen interval of each monitoring point will be overpacked and backfilled within the ¾-inch stone. A bentonite seal will be placed in the annular space above the crushed stone.

8.7 **Off-Site Disposal**

The materials that are excavated for off-site disposal will be transported to the Bennett Environmental, Inc. (Bennett) incinerator facility located in St. Ambroise, Quebec. These materials will be transported in accordance with the T&DP provided as Appendix A. As specified in the T&DP, the materials that are loaded for off-site transport to and disposal at the Bennett facility will be offered by LEA personnel who are RCRA- and DOT-trained personnel

8.8 **Subgrade Preparation for Liner System**

Once the subgrades have been achieved, the surface will be fine graded, visually inspected and compacted to ensure that no debris or rocks exist in the top few inches that may pose a risk to the integrity of the impermeable high-density polyethylene (HDPE) liner. To ensure the liner is protected, a layer of non-woven geotextile fabric as required in the Construction Specifications provided in Appendix C will be placed on the subgrade prior to the installation of the impermeable HDPE liner.

8.9 Engineered Cap

8.9.1 Cap Components

The engineered cap will consist of a: geosynthetic HDPE liner; manufactured drainage layer system; uniaxial geonet; lightweight, expandable, HDPE cellular confinement system (geocell) for slope stabilization; and, two-foot thick cover material layer consisting of bankrun gravel or stone and either a layer of filter fabric and topsoil, rip rap, or processed stone and pavement as necessary to match the surrounding areas.

8.9.2 Filter Fabric and Geosynthetic Membrane Liner

As needed, a non-woven geotextile fabric will be placed on the subgrade to protect the geosynthetic impermeable, membrane liner. The impermeable liner will consist of a 60-mil HDPE textured liner and will be seamed in-place. The liner has been designed to eliminate the infiltration of water and to have an overall effective permeability of 1×10^{-7} centimeters per second (cm/s). Integrity testing of the liner and the welds will be performed in accordance with the Construction Specifications provided as Appendix C.

8.9.3 Drainage Layer

An engineered drainage system will be installed to move storm water that infiltrates the surface material above the impermeable liner towards the River. The drainage layer material will be a geocomposite heat-laminated on both sides with a non-woven needlepunched geotextile, as presented in the Construction Specifications provided as Appendix C. The drainage layer is designed to perform a drainage function under a range of anticipated loads, gradients, and boundary conditions. The drainage layer will be sown in place to make a continuous layer above the liner. The testing requirements for this drainage layer are identified in the Construction Specifications provided as Appendix C.

8.9.4 Uniaxial Geonet

A geosynthetic consisting of integrally connected parallel sets of ribs will be installed over the drainage layer. This uniaxial geonet has been designed to provide slope stabilization. The specifications for this geosynthetic are provided in Appendix C.

8.9.5 Geocell

A cellular confinement system (geocell), having a height of six inches, will be placed upon the uniaxial geonet. The geocell will be composed of HDPE strips, connected by a series of offset, full-depth welds to form a three-dimensional honeycomb system. The geocell system will be threaded together with tendons in accordance with the Construction Specifications provided as Appendix C. The geocell layer will be installed to run-out along the top of the embankment to hold the stone in place along the sloped embankment. Along the embankment, the polyethylene cells will be filled and covered with approximately six inches of ¾-inch stone. Along the area east of the embankment, the polyethylene cells will be filled with bankrun gravel that is screened to remove stones greater than 4 inches in diameter.

8.9.6 Cover Material and Finished Subgrade

A bankrun gravel material screened to remove stones greater than 4 inches in diameter will be placed above the geosynthetic materials. The depth of the bankrun gravel material will vary depending upon the area of the cap being covered. In landscaped areas, the bankrun gravel will be approximately 18 inches, with a non-woven geotextile filter fabric and 6 inches of topsoil placed upon it to create two feet of cover material. In paved areas, the bankrun gravel will be approximately 14 inches with 6 inches of processed stone and a four-inch paved bituminous asphalt concrete surface. The bankrun gravel will be graded and compacted similar to the backfill material below the engineered control.

Along the edge of the river embankment, approximately 6 inches of ¾" stone will be placed over the geocell system. A 12-inch layer of rip rap will be placed above the stone-filled geocell system. The rip rap will consist of that temporarily stockpiled on site prior to the excavation activities. Any additional rip rap that is needed to complete the engineered cap will be sized to match the existing rip rap.

8.10 Piezometer Installation

Prior to placing the impermeable liner and cover materials, three piezometers will be installed within the area of the hydraulic mound to replace piezometers P2 and P20 and monitoring well MW-05S that will be properly abandoned, as needed, and removed during excavation activities. The piezometers will be located as shown in Drawing 2-1. The piezometers will be constructed of two-inch diameter PVC screen and casing. The piezometers will be installed such that the screened interval intersects the water table.

The piezometers will be constructed to provide accurate and representative groundwater elevation measurements. The screen will consist of a five-foot section of 0.012-slot, pre-packed screen. The screen will be thread-coupled to a cap at the bottom and to the casing at the top of the piezometer. Each piezometer will be completed with a cap and will be set above the ground surface within a flush-mounted, watertight locking cover. The annulus of the screened interval of each piezometer will be packed with No. 0 sand (20/40 mesh). The sand pack will be placed to at least 0.5 feet above the screened interval. A bentonite seal of at least 0.5-foot thick will be placed in the annular space above the sand-pack.

Once the piezometers are constructed to within approximately 2 feet of the final grade, the engineered cap will be constructed. A liner skirt will be placed around each piezometer prior to the installation of the HDPE liner. A field seam connection between the appurtenance skirt and the liner will be made as provided in the Construction Specifications included as Appendix C.

8.11 **Site Restoration**

8.11.1 Final Grades

The Groundwater Action Area will be restored to return the parking lots to the lines and grades that existed prior to the construction activities. Within the landscaped areas between the parking lot and the river embankment, a berm will be extended at the top of the sloped embankment. The proposed restoration grade elevations are shown in Drawing 2-1, 2-2, and 2-3.

8.11.2 Slope Protection

As indicated above, the slope of the River embankment will be protected with ¾-inch stone and a 12-inch layer of rip rap. The rip rap will consist of the rip rap stockpiled on site at the start of the project. Additional imported material may be used to supplement this material, if needed. Rip rap will be placed with the excavator and will be keyed into the rip rap at the toe of the slope such that it is locked in-place.

8.11.3 Asphalt Sub-base and Paving

The asphalt sub-base and pavement will be restored to match the sub-base and materials that abut the area of the cap. Line stripping will be provided to match the condition of the parking lots prior to the implementation of the construction activities.

8.11.4 Turf Establishment

Upon completing the placement of the subgrade materials over the engineered cap, a topsoil layer will be placed in the landscaped areas. Once the subsurface sprinkler and electrical lighting systems are restored, turfgrass sod will be placed within the landscaped areas of the parking lot, or these areas will be amended with fertilizer and seeded utilizing a hydroseed and fertilizer mixture. In the area west of the picket cedar fence, the topsoil will be amended with fertilizer and seeded utilizing a hydroseed and fertilizer mixture. The fertilizer to be applied will be a standard 10-10-10 mixture added directly to the hydroseed mix. The seed mixture to be applied will include a blend of Fescue, Kentucky bluegrass and perennial ryegrass.

8.11.5 Fence Replacement

The picket cedar fence located along the western extent of the Brook Village parking lots will be replaced with a new fence.

8.12 **As-Built Condition Survey**

A land surveyor licensed in the State of Rhode Island will provide a final as-built survey once all construction activities are completed. The survey will identify the structures and as-built conditions of the improvements provided by the construction activities. The as-built survey will be incorporated into the plans for the site and included in the CWR to be submitted to USEPA, as required by the Order.

9. CONSTRUCTION QUALITY CONTROL

9.1 Overview

A Construction Quality Control Plan (CQCP) has been prepared as part of this WP and is presented in this section. This plan provides for a system to establish and maintain effective quality controls during the implementation of the TCRA. The construction quality controls consist of construction plans and specifications as well as quality assurance procedures that will: (i) assure that specified construction materials are purchased and installed in accordance with the project plans and specifications; and, (ii) assure that the TCRA construction is consistent with the engineered design. The Construction Specifications provided as Appendix C identify the requirements for submittals, materials testing, and construction inspection for each phase of construction.

9.2 Quality Control Organization and Personnel

The quality control organization for the project will consist of personnel in the field and in the offices of LEA. On-site quality control inspection will be provided by the construction site superintendent. The on-site personnel will be responsible for performing each phase of quality control identified in the sections that follow. Office personnel will be responsible for the final review and approval of submittals, maintaining the proper quality control documentation, and providing support in the event that any deficiencies or inconsistencies are identified and require correction. The LEA project manager will be present at quality control and construction meetings as well as any inspection meetings that may need to be held. Construction quality control performance will be reviewed, as may be necessary, during on-site progress meetings.

9.3 Quality Control Phases

9.3.1 Preparatory Phase

As part of the quality control preparatory phase, a product sample and a Certificate of Compliance will be obtained at least ten days prior to the delivery of the construction materials to be used in implementing the TCRA. The Certificate of Compliance shall include specifications of the material and a statement from the manufacturer, as appropriate, attesting to the fact that the materials conform to the specifications provided in Appendix C. The quality control preparatory phase will be performed to allow sufficient time to correct any of the

construction material submittals or to complete any testing required before the start of each phase of construction.

Also the quality control preparatory phase will include an inspection and review of:

- specifications and drawings, material submittals, and test reports;
- inspection requirements;
- construction materials and installation equipment, including special construction equipment;
- special construction methods;
- the task-specific JHA;
- completed prerequisite work; and
- a schedule of each task.

9.3.2 Initial Phase

The quality control initial phase will consist of an inspection to be performed at the start of each construction task. The construction site superintendent will conduct this inspection to ensure that the construction task will be performed in accordance with the engineered design. As part of the initial phase, the inspector for each task will be identified who will review the task-specific JHA with the site workers. Any discrepancies or deviations from the construction plans and specifications will be documented on daily field report forms. The construction site superintendent will discuss the discrepancies and deviations with the LEA Project Manager and the USEPA OSC. A plan will be developed through this discussion, as needed, in resolving the issues.

9.3.3 Follow Up Phase

The quality control follow-up phase will ensure that the work is being tested and completed in accordance with the plans and specifications. Also, this phase will ensure that any specific requirements identified during previous quality control inspections are being met. For each task, the site superintendent or designated representative will review the work on a daily basis to determine whether the work conforms to the specifications, health and safety requirements and any specific procedures or deficiencies previously identified.

9.4 **Quality Control Submittals and Review**

A list of all of the submittals that are required to be provided by the Construction Specifications is provided in Table 9-1. All submittals will be reviewed to ensure that the materials provided and installed as part of the TCRA conform to the design requirements. To facilitate this review process, the requirements and format for each submittal are provided in the Construction Specifications (Appendix C). Based on this review, the OSC will approve, approve with comment, or reject the submittal.

9.5 **Testing Verification and Documentation**

A list of all of the testing requirements and test results that are required to be submitted is provided in Table 9-2. Geosynthetic materials testing will be performed as identified in the Construction Specifications (Appendix C). The purpose of material testing is to verify that the materials provided and installed as part of the TCRA conform to the design requirements.

To ensure that the earth materials that are being imported to the site to be placed above the impermeable liner are of sufficient quality, chemical analyses will be performed on these materials prior to receiving any material loads at the site. Stone products manufactured from rock quarries will not be tested as it is assumed that the rock is from a virgin quarry. Visual inspection of the quarry will be required by a representative from LEA. Soil materials, including bankrun gravel, will be tested for the presence of petroleum (extractable total petroleum hydrocarbons), VOCs, polychlorinated biphenyls (PCBs), pesticides, herbicides, semi-volatile organic compounds (SVOCs), and select metals (RCRA-8 metals, consisting of arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) to ensure that there are no concentrations of these constituents that exceed RIDEM standards. Materials containing any constituents at concentrations that exceed RIDEM standards will be rejected and another source will be located and sampled prior to accepting the materials.

Test reports will be provided for each test performed as required by this section and the Construction Specifications (Appendix C). Each test report will indicate the time and date of the test, the test procedure, the calibration date of the test equipment (if applicable), the identification control number, and the test result.

9.6 **Deficiencies and Corrective Actions**

In the event that a deficiency is identified or work is not compliant with the specifications, the site superintendent and LEA Project Manager will be notified immediately. These individuals



will discuss the deficiencies with the contractor performing the work and actions to correct the work will be taken immediately. The site superintendent will confirm that the work has been corrected prior to allowing any contractor to continue to perform additional tasks affected by the non-conforming work.

9.7 **Documentation**

The site superintendent shall maintain all quality control records on-site in the field notebook. The quality control records will include documentation on the list of submittals and test results and any non-compliance reports. In addition, documentation on the quantities of materials received at the site will be maintained in the field notebook. The quality control documentation maintained in the field notebook will be updated on a daily basis and will be available for review in the field project office.



10. MEETINGS

10.1 Overview

To facilitate communication with the OSC and representatives of RIDEM, weekly progress meetings will be scheduled throughout the implementation of this WP, as required by Paragraph 2 of the SOW. In addition to these weekly progress meetings, it will be necessary to conduct additional meetings to facilitate the implementation of the required activities. Descriptions of the implementation-phase meetings are provided in this section.

10.2 Preconstruction Meeting

A preconstruction meeting will be held with the OSC to review the timing and phasing of activities. Critical tasks that will need to be completed prior to initiating field activities will be identified at this time. The limits of the work area will also be identified at this time. Issues regarding security, including the effectiveness of any existing fence and posted signs to limit access to the portion of the Site where work is proposed in this WP, hours of operation, and any other issues related to implementation of the planned activities will be discussed at this meeting.

10.3 Community Relations Meetings

Prior to the onset of construction activities, one meeting will be held with the residents of the Brook Village apartment complex and one meeting will be held with the residents of the Centredale Manor apartment complex. The meetings, to be facilitated by the USEPA Community Involvement Coordinator, will be held to explain the nature of the construction activities to be performed. During these meetings, an explanation of the impacts that the residents may expect during the duration of the project will be provided. Also, the meetings will be held to answer any questions and receive any input that the residents may have prior to the implementation of the project.

10.4 Progress Meetings

Progress meetings will be held weekly with representatives from EPA and RIDEM to discuss the status of the project and any issues that may affect the progress of implementation activities.

10.5 **Pre-Final and Final Inspection**

Upon substantial completion of the construction of the SOW, USEPA will conduct a pre-final inspection to identify any remaining actions that are required to complete the construction activities required by the Order. Any such remaining actions required by the Order that are identified by USEPA will be implemented prior to a final inspection. USEPA will conduct a final inspection to confirm that all of the actions identified in the pre-final inspection have been completed and to confirm that all of the requirements and performance criteria associated with this aspect of the Order have been attained.



11. REPORTING

11.1 Overview

During the implementation of this TCRA, reports are required to be submitted to USEPA in accordance with Paragraph 44 of the Order. The reports are required to document and record the status of the project. The reports that are required to be submitted include Progress Reports and a Completion of Work Report (CWR). Descriptions of each of these types of reports are provided in this section.

11.2 Progress Reports

Monthly progress reports will be submitted during the implementation of this TCRA. A description of all significant developments occurring during the previous month will be provided in each report, including a description of the actions performed and any problems encountered. A summary of all activities planned for the ensuing month will also be provided, along with a description of any anticipated problems that may affect the implementation schedule. The progress reports will be used to document the percentage of construction completed, problems encountered during the previous month, and planned resolutions of past or anticipated problems.

11.3 Completion of Work Report

Upon completing the construction activities associated with the SOW, a CWR summarizing the actions taken to comply with the Order will be submitted to EPA for review and approval. The CWR will conform to the requirements set forth in Section 300.165 of the NCP entitled "OSC Reports." The CWR will include:

- a synopsis of the work performed and a certification that it was performed in accordance with the SOW;
- an identification of any modifications to the SOW and why the changes were necessary to complete the work;
- CQA construction documentation;
- volumes of soil, sediment and waste transported off-site for proper disposal;
- a photographic survey that provides a summary and chronology of the work that was completed during the implementation of the TCRA;
- "as-built" drawings; and,
- an estimate of the cost to complete the TCRA.



In addition, the CWR will include the following certification signed by a person who supervised or directed the preparation of the report:

“Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

An electronic version of the CWR will be provided at the request of USEPA.



12. SCHEDULE

The TCRA will be implemented in accordance with the sequence of construction activities presented in Section 8. It is anticipated that the planned activities will begin in August 2009, with the mobilization of equipment to the site. A schedule for the implementation of the TCRA is provided as Figure 10-1.

The construction activities have been estimated to continue for approximately 17 weeks from the start of the project. As provided by the OSC, construction activities will not begin until 0730 am on each day of construction. Specific, limited tasks may be exempted from this work schedule on approval from the OSC. The OSC, or his/her designee, will be briefed each morning to identify the tasks that will be conducted for that particular day.

In accordance with Paragraph 45 of the Order, the CWR will be submitted to USEPA for review and approval within 45 days of the completion of the other tasks required under the Order and SOW.



REFERENCES

- Battelle, 2005. *Interim Final Remedial Investigation Report*. Prepared for the United States Environmental Protection Agency - Region 1 and the United States Army Corps of Engineers New England District. June 30.
- State of Rhode Island and Providence Plantations Department of Environmental Management. 1996. *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases*. Division of Site Remediation. DEM-DSR-01-93. August 1996.
- State of Rhode Island and Providence Plantations Department of Environmental Management. 2007. *Rules and Regulations for Hazardous Waste Management*. February 2007.
- State of Rhode Island Department of Environmental Management. 1998. *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act*. April 1998.
- State of Rhode Island Department of Environmental Management. 2007. *Air Pollution Control Regulation No. 5 – Fugitive Dust*. Office of Air Resources. July 2007.
- State of Rhode Island Department of Environmental Management. 1989. *Rhode Island Soil Erosion and Sediment Control Handbook*. Providence, Rhode Island; U.S. Department of Agriculture Soil Conservation Service and Rhode Island State Conservation Committee.
- State of Rhode Island Department of Environmental Management. 2005. *Rules and Regulations for Groundwater Quality*. Office of Water Resources. March 2005.
- United States Environmental Protection Agency. 2004. *CSTAG Recommendations on the Centredale Manor Restoration Project (CMRP) Superfund Site*. Memorandum from Stephen J. Ells and John Meyer, CSTAG, to Ms. Anna Krasko. Washington, DC, August 18, 2004.
- State of Rhode Island General Law 1956, Chapter 39-1.2.
- United States Environmental Protection Agency. *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites*. Office of Solid Waste and Emergency Response Directive 9285.6-08. Washington, DC, February 12, 2002.
- United States Environmental Protection Agency. *Standard Operating Safety Guidelines*. 1992. Publication 9285.1-03. June.

TABLES

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
Federal Regulatory Requirements	Protection of Wetlands (Executive Order 11990), 40CFR 6.302(a) and Statement of procedures on Floodplain Management and Wetlands Protection (40 CFR 6, App. A)	Applicable	Federal agencies are required to avoid undertaking or providing assistance for new construction located in wetlands unless there is no practicable alternative and the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.	LEA will provide soil erosion and sediment controls in accordance with the RI Soil Erosion and Sediment Control Handbook to minimize any potential erosion that may impact the wetlands. In addition, LEA will disturb the least amount of area within the wetland and associated buffer to complete the TCRA. Restoration of the Groundwater Action Area will be completed as soon as possible.
	Floodplain Management (Executive Order 11988-40 CFR 6.302(b) and Statement of procedures on Floodplain Management and Wetlands Protection (40 CFR 6, App. A)	Applicable	Federal agencies are required to avoid impacts associated with the occupancy and modification of a floodplain and avoid support of floodplain development wherever there is a practicable alternative.	Dioxin-impacted soil and sediment exist in the floodplain and there is no alternative to removing the material. In addition, the least amount of area within the River and floodplain wetland will be disturbed in completing the removal activities, and restoration of the Groundwater Action Area will be performed as soon as practicable.
	Rivers and Harbors Act (33 U.S.C. Section 403): Section 10	Applicable	These regulations set forth criteria from the United States Army Corps of Engineers for placing dams/structures in navigable waters of the United States.	The WP incorporates procedures to satisfy these criteria.

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
Federal Regulatory Requirements (continued)	Clean Water Act – Section 404(b)(1) Guidelines for specification of disposal sites for dredged or fill material (40 CFR part 230)	Applicable Action Location	These guidelines outline requirements for the discharge of dredged or fill materials into surface waters, including wetlands. Under these requirements, no activity that adversely impacts a wetland shall be permitted if a practicable alternative that would have less adverse impact exists. If there is no practicable alternative, impacts must be mitigated.	Clean fill materials will be placed into the area of the excavated River bed. Any impacts to the surface water will be minimized by maintaining a dry work area during the sediment excavation and removal activities and maintaining a barrier between the excavation and the surface waters associated with the River during backfilling operations.
	40 CFR 264.170 – 178 – Subpart I – Use and Management of Containers	Applicable Action Chemical	These regulations identify the requirements for the use and management of containers containing hazardous waste.	Soil will be loaded end-dump trucks provided with 6-mil plastic liners and bowed tarpaulins that completely cover each truck container preventing precipitation from accumulating on or in the container. Each truck will be placarded appropriately. Each 55-gallon drum will be closed after waste is placed, labeled as hazardous waste, and dated.
	40 CFR 265.1087 – Subpart CC – Air Emission Standards for Tanks, Surface Impoundments and Containers	Applicable Action Chemical	This subpart establishes controls on airborne emissions from tanks, surface impoundments and containers.	Each container shall remain in a closed, sealed position at all times that hazardous waste is in the container, except when waste is being added, removed, or inspected.

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
Federal Regulatory Requirements (continued.)	40 CFR 262 – Standards Applicable to Generators of Hazardous Waste: Subpart B – The Manifests 262.20: General Requirements 262.21: Tracking Numbers, Printing, and Obtaining Manifests 262.22: Number of Copies 262.23: Use of the Manifest Subpart C – Pre-Transport Requirements 262.30: Packaging 262.31: Labeling 262.32: Marking 262.33: Placarding 262.34: Accumulation Time Subpart D – Recordkeeping and Reporting 262.40: Recordkeeping 262.41: Biennial Report 262.42: Exception Reporting 262.43: Additional Reporting Subpart E – Exports of Hazardous Waste 262.50: Applicability 262.51: Definitions 262.52: General Requirements 262.53: Notification of Intent to Export 262.54: Special Manifest Requirements 262.55: Exception Reports 262.56: Annual Reports 262.57: Recordkeeping 262.58: International Agreements	Applicable Action Chemical Location	These Subparts provide the procedures required to properly export waste for disposal including the proper notification to USEPA and Canadian Ministry, the special manifesting requirements, the reporting requirements, and recordkeeping.	With the assistance of representatives from the selected transportation and disposal vendor, LEA, on behalf of the Generator, will obtain and sign all manifests for transporting hazardous waste from the site to the disposal facility. The T&DP establishes the procedures that will be followed in satisfying the pre-transport, recordkeeping, and reporting requirements. LEA, through the transportation and disposal vendor, will provide the required notification of intent to export hazardous material. LEA, on behalf of the Generator, will file annual and biennial reports, as required, with the USEPA and other regulatory agencies.

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARAR
State Regulatory Requirements	Freshwater Wetlands Act (RI Gen. Laws 2-1-18 through 2-1-24); Rule #10, Protection of Wetlands Functions and Values	Applicable	Any activity which alters a wetland must avoid all probable impact to freshwater wetlands to the maximum extent possible. If impacts cannot be avoided, they must be reduced to the maximum extent possible.	Clean fill materials will be placed into the area of the excavated River bed. Any impacts to the surface water will be minimized by maintaining a dry work area during the sediment excavation and removal activities and maintaining a barrier between the excavation and the surface waters associated with the River during backfilling operations
	Rhode Island Water Quality Regulations, RIDEM, 7/11/06 (Surface Water)	Applicable Action Chemical Location	Incorporated RI Ambient Water Quality Standards. Classifies water use and defines water quality goals to protect public health and welfare, enhance the quality of state water, and serve the purpose of the Clean Water Act.	Clean fill materials will be placed into the area of the excavated River bed. Any impacts to the surface water will be minimized by maintaining a dry work area during the sediment excavation and removal activities and maintaining a barrier between the excavation and the surface waters associated with the River during backfilling operations.
	Regulations for Rhode Island Pollutant Discharge elimination System, RIDEM, 2/25/03	Applicable Action Location	Applicable for discharges to surface waters and to protect waters from discharges of pollutants.	Any surface water or groundwater that is pumped to maintain a dry work area during the planned construction activities will be treated. The treatment system will consist of one weir tank, 25-micron sediment filter bags, and 2,000-lb granular activated carbon vessels, placed in series/parallel. This treatment system is designed to remove suspended material and turbidity in the water. The treated water will be sampled to measure turbidity in the field on the days that a discharge is made. The recorded turbidity measurements will be compared to a discharge limit of 12.45 NTUs in assessing the effectiveness of the treatment system and complying with the substantive provisions of these regulations.

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

State Regulatory Requirements (continued)	Rules and Regulations for Groundwater Quality, RIDEM, 5/15/06	Applicable Action Chemical Location	Incorporated RI Groundwater Standards. Intends to protect and restore quality of groundwater resources for use as drinking water and other beneficial uses, to assure protection of public health and welfare and the environment	Potentially impacted soil and sediment will be excavated from the saturated zone of the subsurface to pre-established lines and grades agreed-upon by USEPA.
	Air Pollution Control Regulations, RI Dept. of Health, Division of Air Pollution Control, effective 8/2/67, amended 7/19/07 - Regulation No. 1 - Visible Emissions	Applicable Action	No contaminant emissions will be allowed for periods of more than three minutes in any one hour which is greater or equal to 20% opacity.	Construction activities will be conducted such that dust is controlled by applying water or other dust suppressants to the work area, as needed. Air monitoring for dust will be conducted to monitor work and ambient air conditions.
	Rhode Island Air Pollution Control Regulation 5 – Fugitive Dust, RIDEM, 7/19/07	Applicable Action	Reflects that reasonable precautions be taken to prevent particulate matter from becoming airborne.	Construction activities will be conducted such that dust is controlled by applying water or other dust suppressants to the work area, as needed. Air monitoring for dust will be conducted to monitor work and ambient air conditions.
	Rhode Island Air Pollution Control Regulation 7 – Emissions Detrimental to Persons or Property, RIDEM, 7/19/07	Applicable Action Chemical	Prohibits emissions of contaminants which may be injurious to human, plant, or animal life or cause damage to property or which unreasonably interferes with the enjoyment of life and property.	Construction activities will be conducted such that dust is controlled by applying water or other dust suppressants to the work area, as needed. Air monitoring for dust will be conducted to monitor work and ambient air conditions. Also, air monitoring for VOCs will be conducted in the work area and along the perimeter of the work area. Applicable controls will be used to ensure that the prohibitions of this regulation are maintained.
	Rhode Island Air Pollution Control Regulation 15 – Control of Organic Solvent Emissions, RIDEM, 7/19/07	Applicable Action Chemical	Limits the amount of organic solvents emitted to the atmosphere.	Air monitoring for VOCs will be conducted in the work area and along the perimeter of the work area. Applicable controls will be used to ensure that the prohibitions of this regulation are maintained.

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

State Regulatory Requirements (continued)	Rhode Island Air Pollution Control Regulation 17 - Odors. 7/19/07	Applicable Action Location	Prohibits the release of objectionable odors across property lines.	Air monitoring for VOCs will be conducted in the work area and along the perimeter of the work area. Applicable controls will be used to ensure that the prohibitions of this regulation are maintained. Also, unearthed soils and sediments will be covered, as needed, with a odor control compound to meet the requirements of this regulation.
	Rhode Island Air Pollution Control Regulation 22 – Air Toxics, RIDEM, 7/19/07	Applicable Action Chemical	This regulations prohibits the emissions of specified contaminants at rates which would result in ground level concentrations greater than acceptable ambient levels in the regulation.	Air monitoring for VOCs will be conducted in the work area and along the perimeter of the work area. Applicable controls will be used to ensure that the prohibitions of this regulation are maintained. Also, unearthed soils and sediments will be covered, as needed, with a emissions control compound to meet the requirements of this regulation.
	Rhode Island Air Toxics Guidelines, RIDEM, 4/04	Applicable Action Chemical	Companion to Air Pollution Control Regulation No. 22 – Air Toxics	Construction activities will be conducted such that dust is controlled by applying water or other dust suppressants to the work area, as needed. Air monitoring for dust will be conducted to monitor work and ambient air conditions. Also, air monitoring for VOCs will be conducted in the work area and along the perimeter of the work area. Applicable controls will be used to ensure that the requirements of the regulation are met.

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

State Regulatory Requirements (continued)	Rhode Island Guidelines for Air Quality Modeling for Air Toxics Substances, RIDEM, 9/04	Applicable Action Chemical	Companion to Air Pollution Control Regulations Nos. 9 (Air Permits) and 22 (Air Toxics)	Construction activities will be conducted such that dust is controlled by applying water or other dust suppressants to the work area, as needed. Air monitoring for dust will be conducted to monitor work and ambient air conditions. Also, air monitoring for VOCs will be conducted in the work area and along the perimeter of the work area. Applicable controls will be used to ensure that the requirements of the regulation are met.
	Rhode Island Rules and Regulations for Hazardous Waste Management, Section 8, RIDEM 3/4/07	Applicable Action Location	Outlines operational requirements for all hazardous waste treatment, storage, and disposal facilities.	The TCRA will be implemented such that hazardous waste is not store on-site for more than 90 days and that containment, inspection, and documentation complies with the federal regulations 40 CFR 262.34 and 264.175.
	Rhode Island Rules and Regulations for Hazardous Waste Management, Section 9, RIDEM 3/4/07	Applicable Action Location	Outlines requirements for general waste analyses, security procedures, inspections, and safety. Sets design, construction, and operational requirements for hazardous waste containers and tanks.	Soil and sediment to be excavated for off-site disposal has been characterized. Excavated soil and sediment will be temporarily stockpiled on-site in soil/sediment storage bins. Soil and sediment will be loaded end-dump trucks provided with 6-mil plastic liners and bowed tarpaulins that completely cover each truck container preventing precipitation from accumulating on or in the container. Each truck will be placarded appropriately. Each 55-gallon drum will be closed after waste is placed, labeled as hazardous waste, and dated.
	Rhode Island Rules and Regulations for Hazardous Waste Management, Section 10, RIDEM 3/4/07	Applicable Action Location	Outlines design, operational, and closure requirements for new hazardous waste landfills.	The cap will be constructed to meet the substantive requirements of these regulations.

TABLE 2-1

**Applicable or Relevant and Appropriate Requirements
Time Critical Removal Action
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

State Regulatory Requirements (continued)	Rhode Island Rules and Regulations for Hazardous Waste Management, RIDEM 3/4/07, Sections 12 and 13	Applicable Action Location	Requires minimal standards for solid waste landfill capping. Specifies type and depth of cap barrier layers and engineering standards. Includes measures to protect against odors and dust.	The cap will be constructed to meet the substantive requirements of these regulations.
	Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, RIDEM February 2004	Applicable Action Chemical	Incorporated cleanup standards for residential and industrial/commercial properties.	The cap will be constructed to meet the substantive requirements of these regulations.
	Rhode Island Rules and Regulations for Solid Waste Management, RIDEM Solid Waste Regulation No. 1, 10/25/05	Applicable Action Chemical Location	Applicable for the minimization of environmental hazards associated with operation of solid waste facilities, including management and disposal of dredged material.	The excavation of sediment and placement of soil and clean backfill material will be conducted to meet the substantive requirements of these regulations.
	Rhode Island Rules and Regulations for Solid Waste Management, RIDEM Solid Waste Regulation No. 2, 2/97	Applicable Action Chemical Location	Applicable for the construction of final covers and leachate collection systems; and Applicable for all monitoring plans that result from on-site remedial actions.	The cap will be constructed to meet the substantive requirements of these regulations.
	Rhode Island Hazardous Substance Community Right-to-Know Act, RIGL 23-24.4	Applicable Action Chemical Location	Establishes rules for public right to know concerning hazardous waste storage, discharge, emissions and transportation.	The TCRA activities are being conducted under USEPA. All reporting requirements needed to satisfy this Act will be followed in completing the TCRA.

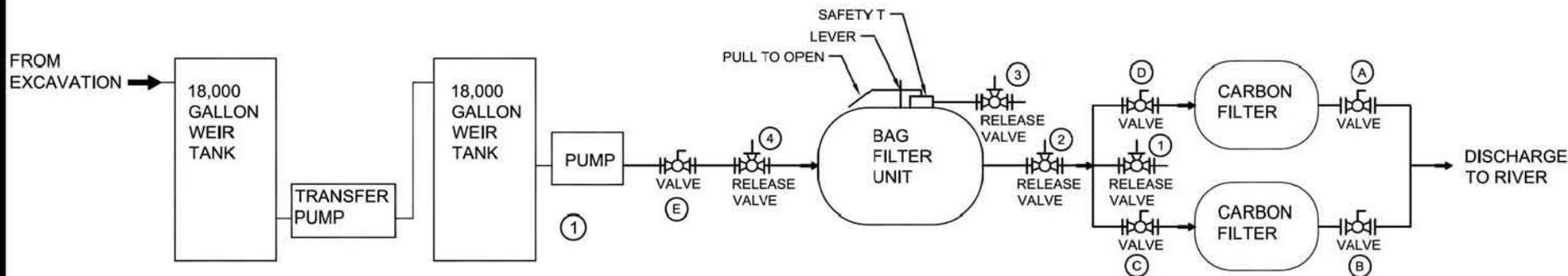
TABLE 9-1
Submittal Requirements
Time Critical Removal Action
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island

Material	Work Plan Reference	Requirements
Geosynthetics (6-ounce nonwoven filter fabric; 60-mil, textured HDPE; drainage net; geogrid; geocell)	Appendix C - Construction Specifications - Section 02771 - Geosynthetics - Part 1.3, Page 02771-2	Product data sheets and representative samples of each geosynthetic no later than 10 days prior to installation
Geosynthetics (6-ounce nonwoven filter fabric; 60-mil, textured HDPE; drainage net; geogrid; geocell)	Appendix C - Construction Specifications - Section 02771 - Geosynthetics - Part 1.3, Page 02771-2	Manufacturer's Material Certification

TABLE 9-2
Testing Requirements
Time Critical Removal Action
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island

Material	Work Plan Reference	Requirements
Topsoil (Loam)	Appendix C - Construction Specifications - Section 02200 - Earthwork - Part 2.1, Page 02200-1	Chemical Analysis
Bankrun Gravel	Appendix C - Construction Specifications - Section 02200 - Earthwork - Part 2.1, Page 02200-1	Chemical Analysis
Bankrun Gravel	Appendix C - Construction Specifications - Section 02200 - Earthwork - Part 2.1, Page 02200-1	Sieve Analysis
Process	Appendix C - Construction Specifications - Section 02200 - Earthwork - Part 2.1, Page 02200-1	Sieve Analysis
Backfill	Appendix C - Construction Specifications - Section 02200 - Earthwork - Part 3.5, Page 02200-3	Compaction (ASTM D2922)
Flexible Membrane Liner (60-mil, textured HDPE)	Appendix C - Construction Specifications - Section 02771 - Geosynthetics - Part 3.4, Page 02771-7	Test seams (calibrated, field tensionmeter)

FIGURES



NOTES:

1. FLOW RATE THROUGH THE TREATMENT TRAIN WILL BE AS MUCH AS APPROXIMATELY 350 GALLONS PER MINUTE DEPENDING UPON PRESSURE AND HEAD DUE TO THE PARTICULATE FILTERS. DISCHARGE MONITORING FOR TURBIDITY FROM THE TREATMENT TRAIN WILL BE PERFORMED TWICE DAILY DURING WATER DISCHARGE.
2. BAG FILTER UNIT HOUSE (6) 25 μ PARTICULATE FILTERS.
3. EACH CARBON FILTER CONSISTS OF 2,000 LBS OF GRANULLAR ACTIVATED CARBON CONTAINED IN A 5,000 GALLON VESSEL.

BAG FILTER CHANGE-OUT PROCEDURE

1. SHUT DOWN PUMP (CONTROL AT AUTO BOX)
2. CLOSE VALVES A, B, C, D, E IN ORDER.
3. CRACK/OPEN RELEASE VALVE 1,2,3,4. ALLOW SYSTEM TO DRAIN. PULL UPON T SAFETY LATCH. PULL BACK ON LEVER TO OPEN HOUSING.
CAUTION WATCH PRESSURE VALVE @ BAG FILTER LEVER WHEN OPENING.
4. CHANGE OUT FILTERS.
5. CLOSE RELEASE VALVES 1, 2, AND 4; LEAVE RELEASE VALVE 3 OPEN.
6. OPEN VALVES A, B, C, D, E IN ORDER.
7. START PUMP.
8. CLOSE RELEASE VALVE 3 ONCE AIR IS REMOVED FROM SYSTYEM.

CENTREDALE MANOR RESTORATION PROJECT SUPERFUND SITE
NORTH PROVIDENCE, RHODE ISLAND

WATER TREATMENT SYSTEM

Comm.No.
15RP901

FIGURE 9-1



Activity D	Activity Name	Original Duration	Start	Finish	August 2009			September 2009				October 2009				November 2009				December 2009			January 2010	
					09	16	23	30	06	13	20	27	04	11	18	25	01	08	15	22	29	06	13	20
Centredale Manor					70d Aug-17-09 Nov-23-09																			
A1010	Remove Cedar Fence	1d	Aug-17-09	Aug-17-09	Remove Cedar Fence																			
A1000	Mobilize	1d	Aug-17-09	Aug-17-09	Mobilize																			
A1001	Condition Survey	1d	Aug-17-09	Aug-17-09	Condition Survey																			
A1002	Install Temporary Fence & Signs	1d	Aug-17-09	Aug-17-09	Install Temporary Fence & Signs																			
A1003	Establish Air Monitoring and Other Site Controls	1d	Aug-17-09	Aug-17-09	Establish Air Monitoring and Other Site Controls																			
A1020	Clearing	1d	Aug-18-09	Aug-18-09	Clearing																			
A1021	Field Survey Limits of Sheeting System	1d	Aug-20-09	Aug-20-09	Field Survey Limits of Sheeting System																			
A1040	Install Sheeting System	15d	Aug-24-09	Sep-14-09	Install Sheeting System																			
A1050	Set up Dewatering/Treatment System	2d	Aug-24-09	Aug-25-09	Set up Dewatering/Treatment System																			
A1055	Install Decon Pad & Truck Route Signage	2d	Aug-26-09	Aug-27-09	Install Decon Pad & Truck Route Signage																			
A1190	Survey - Cut Grade Stakes, Layout Area of Excavation	1d	Aug-28-09	Aug-28-09	Survey - Cut Grade Stakes, Layout Area of Excavation																			
A1150	Sawcut Asphalt	1d	Aug-31-09	Aug-31-09	Sawcut Asphalt																			
A1160	Remove Concrete Curb	2d	Sep-01-09	Sep-02-09	Remove Concrete Curb																			
A1165	Remove and Dispose Asphalt	1d	Sep-03-09	Sep-03-09	Remove and Dispose Asphalt																			
A1195	Clear Rip Rap & Stockpile	2d	Sep-04-09	Sep-08-09	Clear Rip Rap & Stockpile																			
A1290	Remove Light Pole Base/Circuit and LO/TO Sprinkler System	1d	Sep-09-09	Sep-09-09	Remove Light Pole Base/Circuit and LO/TO Sprinkler System																			
A1060	Excavate Material/Stockpile/Backfill Under Cap or Load for T&D	15d	Sep-15-09	Oct-05-09	Excavate Material/Stockpile/Backfill Under Cap or Load for T&D																			
A1080	Install Piezometers	2d	Oct-06-09	Oct-07-09	Install Piezometers																			
A1070	Liner & Drainage Layer	3d	Oct-08-09	Oct-12-09	Liner & Drainage Layer																			
A1075	Install Uniaxial Geogrid & Geocell System	5d	Oct-13-09	Oct-19-09	Install Uniaxial Geogrid & Geocell System																			
A1090	Place 18" Fill Material, Bottom Up	2d	Oct-20-09	Oct-21-09	Place 18" Fill Material, Bottom Up																			
A1100	Place Stone & Rip Rap on Slope, Keeping Back From Sheeting	2d	Oct-22-09	Oct-23-09	Place Stone & Rip Rap on Slope, Keeping Back From Sheeting																			
A1120	Drive Sheeting Below Rip Rap	3d	Oct-26-09	Oct-28-09	Drive Sheeting Below Rip Rap																			
A1130	Cover Sheeting w/ Rip Rap	2d	Oct-29-09	Oct-30-09	Cover Sheeting w/ Rip Rap																			
A1140	Decon Dewatering Treatment System	2d	Nov-02-09	Nov-03-09	Decon Dewatering Treatment System																			
A1210	Remove Decon Pad	1d	Nov-04-09	Nov-04-09	Remove Decon Pad																			
A1215	Remove and Dispose Remaining Asphalt	1d	Nov-05-09	Nov-05-09	Remove and Dispose Remaining Asphalt																			
A1240	Reset Concrete curb	3d	Nov-06-09	Nov-10-09	Reset Concrete curb																			
A1245	Re-Install Cedar Fence	2d	Nov-11-09	Nov-12-09	Re-Install Cedar Fence																			
A1250	Process Base (6" layer)	2d	Nov-13-09	Nov-16-09	Process Base (6" layer)																			
A1260	Topsoil	1d	Nov-17-09	Nov-17-09	Topsoil																			
A1270	Pave	1d	Nov-18-09	Nov-18-09	Pave																			
A1280	Pavement Markings	1d	Nov-19-09	Nov-19-09	Pavement Markings																			
A1300	Asbuilt Survey	1d	Nov-20-09	Nov-20-09	Asbuilt Survey																			
A1310	Demobilize	1d	Nov-23-09	Nov-23-09	Demobilize																			

Finish Date:	Nov-23-09
Data Date:	Aug-17-09
Run Date:	Aug-06-09

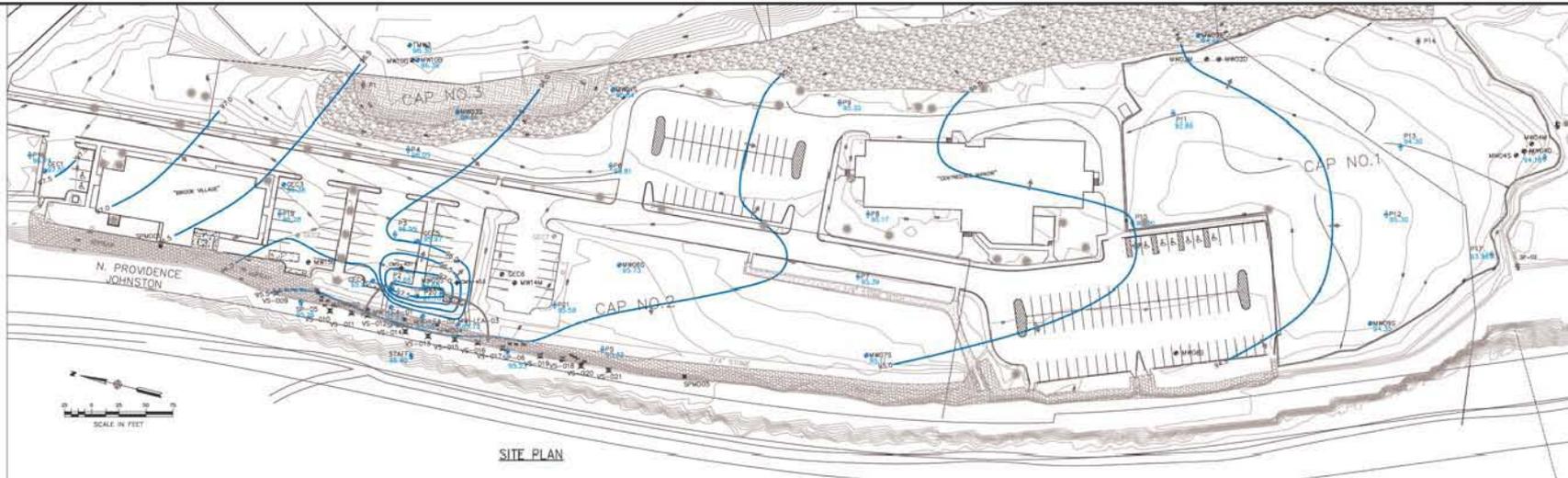
- Actual Work
- Remaining Work
- Critical Remaining Work
- Milestone
- Summary



Sheet 1 of 1

Centredale Manor Restoration Project Superfund Site
Construction Schedule - Figure 10-1

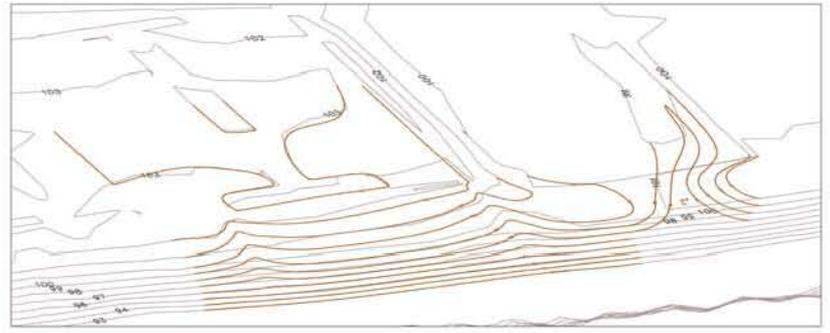
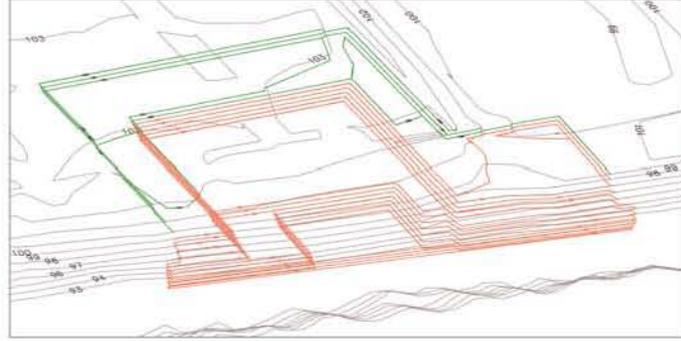
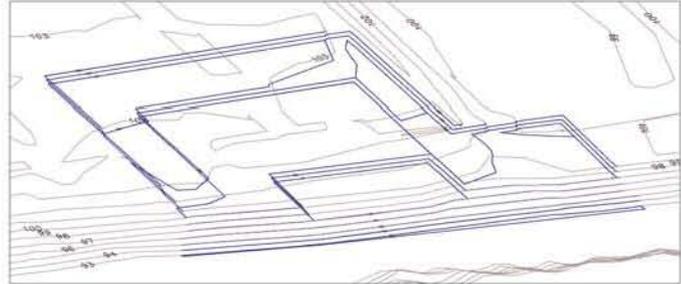
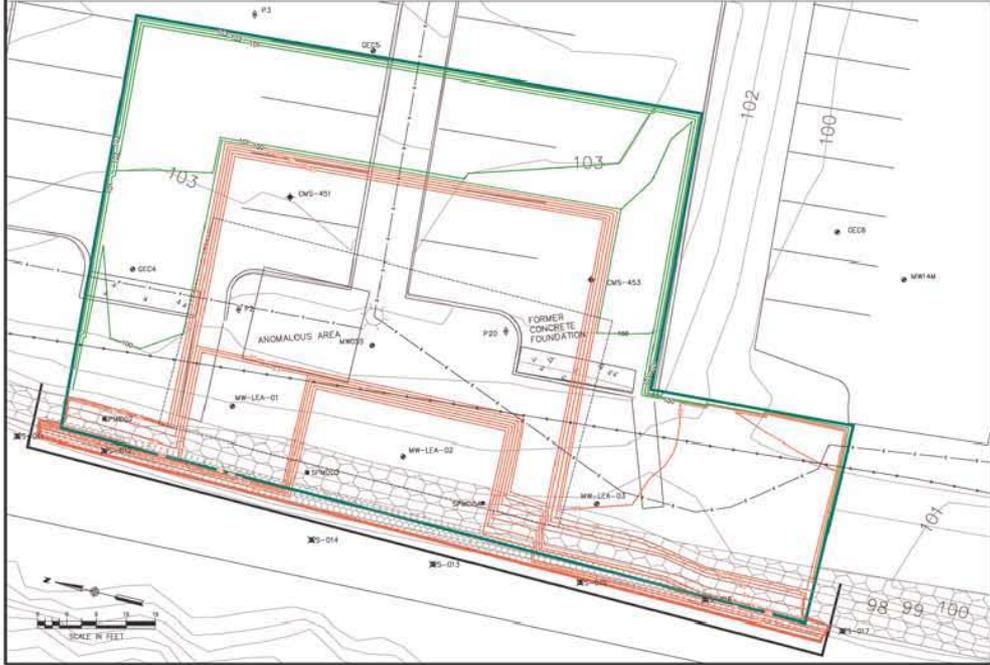
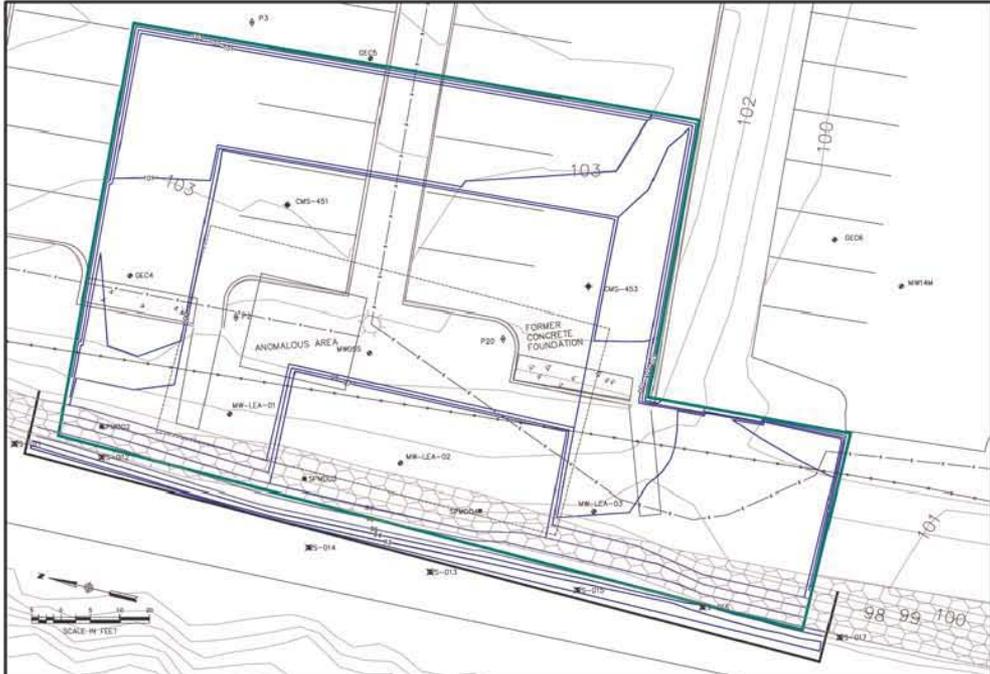
DRAWINGS



LEGEND

- MONITORING WELL
 - PIEZOMETER
 - STAFF GAUGE
 - SOIL BORING
 - SEMI-PERMEABLE MEMBRANE DEVICE
 - WATER BATTERY SAMPLE LOCATION
 - PROPOSED MONITORING POINT
 - PROPOSED PIEZOMETER SAMPLE LOCATION
 - LIGHT POLE
 - UTILITY POLE
 - STORM SEWER
 - ELECTRICAL BOX
 - TREE
 - GROUND SURFACE
 - ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL
 - EXCAVATED BACKFILL SOIL CONTOUR
 - EXCAVATED DISPOSED SOIL CONTOUR
 - NEW GRADE CONTOUR
 - 97.5' GROUNDWATER CONTOUR
 - GROUNDWATER FLOW DIRECTION
- AREA OF CAP
 - SOIL WITHIN THIS AREA BETWEEN ELEVATION 103.0 & 99.0 TO BE USED TO BACKFILL AREAS OF DEEPER EXCAVATION. SOIL WITHIN THIS AREA BETWEEN ELEVATION 99.0 & 95.0 TO BE DISPOSED OFFSITE.
 - SOIL WITHIN THIS AREA BETWEEN ELEVATION 101.0 & 99.0 TO BE USED TO BACKFILL AREAS OF DEEPER EXCAVATION. SOIL WITHIN THIS AREA BETWEEN ELEVATION 99.0 & 93.0 TO BE DISPOSED OFFSITE.
 - SOIL WITHIN THIS AREA BETWEEN ELEVATION 101.0 & 97.0 TO BE USED TO BACKFILL AREAS OF DEEPER EXCAVATION. SOIL WITHIN THIS AREA BETWEEN ELEVATION 97.0 & 93.0 TO BE DISPOSED OFFSITE.
 - SEDIMENT WITHIN THIS AREA BETWEEN ELEVATION 93.0 & 91.0 TO BE DISPOSED OFFSITE.
- NOTE:**
1. REMOVED ASPHALT AND CONCRETE TO BE RECYCLED OFFSITE.
 2. ONLY CONTAMINATED SOIL EXCAVATED FROM THE AREAS DESIGNATED ON THIS FIGURE WILL BE DISPOSED OFFSITE.
 3. ALL OTHER EXCAVATED SOIL WILL BE USED TO BACKFILL THE EXCAVATED AREAS REFERENCED ABOVE.
 4. SEMI-PERMEABLE MEMBRANE DEVICE LOCATIONS ARE SHOWN BASED ON THE SURVEY COORDINATES PROVIDED IN THE BATTLEFIELD DATABASE.

CENTRALIA MANOR RESTORATION PROJECT, SUPERFUND SITE		DATE: 08/25/09	
SHALLOW GROUNDWATER REMEDY		SCALE: 1" = 20' @ 1"	
SITE PLAN, EXCAVATION PLAN, GRADING PLAN		DRAWN BY: J. B. BROWN	
PROJECT NO. 15819001		DATE: 08/25/09	
SHEET NO. 2-1		SCALE: 1" = 20' @ 1"	
PROJECT LOCATION: NORTH PROVIDENCE, RHODE ISLAND		DRAWN BY: J. B. BROWN	
CLIENT: LEA		DATE: 08/25/09	
PROJECT NO. 15819001		SCALE: 1" = 20' @ 1"	
SHEET NO. 2-1		DATE: 08/25/09	
PROJECT LOCATION: NORTH PROVIDENCE, RHODE ISLAND		DRAWN BY: J. B. BROWN	
CLIENT: LEA		DATE: 08/25/09	
PROJECT NO. 15819001		SCALE: 1" = 20' @ 1"	
SHEET NO. 2-1		DATE: 08/25/09	



LEGEND

- MONITORING WELL
- PEZOMETER
- STAFF GAUGE
- SOIL BORING
- SOIL-PERMEABLE MEMBRANE DEVICE
- VAPOUR CAPTURE SAMPLE LOCATION
- PROPOSED MONITORING POINT
- PROPOSED PEZOMETER SAMPLE LOCATION
- LIGHT POLE
- UTILITY POLE
- STORM SEWER
- ELECTRICAL BOX
- TRUCK
- GROUND SURFACE
- ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL
- FENCE
- ELECTRICAL UNDERGROUND UTILITY
- UNKNOWN UNDERGROUND UTILITY
- AREA OF CAP
- EXCAVATED BADFILL SOIL CONTOUR
- EXCAVATED DISPOSIL SOIL CONTOUR
- NEW GRADE CONTOUR

Original Slope Results	Excavated Slope Results	Excavated Slope Results
Existing Surface Area: 10,000 sq ft	Existing Surface Area: 10,000 sq ft	Existing Surface Area: 10,000 sq ft
Excavated Area: 2,000 sq ft	Excavated Area: 2,000 sq ft	Excavated Area: 2,000 sq ft
Volume of Excavation: 10,000 cu yd	Volume of Excavation: 10,000 cu yd	Volume of Excavation: 10,000 cu yd
...

APPENDIX A

Transportation and Disposal Plan

**TRANSPORTATION AND DISPOSAL PLAN
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA**

**Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island**

September 10, 2009

Prepared for

**Emhart Industries, Inc.
c/o Sullivan & Worcester LLP
1666 K Street, NW
Washington, DC 20006**

Prepared by

**LOUREIRO ENGINEERING ASSOCIATES, INC.
100 Northwest Drive
Plainville, Connecticut, 06062**

An Employee Owned Company

Comm. No. 15RP901

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APPENDICES

Appendix A	Draft Hazardous Waste Manifest
Appendix B	Export/Import Notifications/Permits

ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
CFR	Code of Federal Regulations
LEA	Loureiro Engineering Associates, Inc.
MOE	Ministry of Environment
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RIDEM	Rhode Island Department of Environmental Management
TCP	Traffic Control Plan
TCRA	Time-Critical Removal Action
T&DP	Transportation and Disposal Plan
TSA	Transportation and Safety Act
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
WP	Work Plan

UNITS

cy	cubic yards
lbs	pounds



1. INTRODUCTION

1.1 Overview

Various wastes will be generated during the implementation of the Time-Critical Removal Action (TCRA) for the Groundwater Action Area. These wastes include debris from clearing operations, concrete and asphalt demolition debris, excavated dioxin-impacted soil and sediment, water generated from construction dewatering activities, water generated from decontamination activities, and disposable personal protective equipment (PPE). The procedures for transporting, and disposing these wastes are described in this Transportation and Disposal Plan (T&DP). The T&DP has been designed to satisfy the objectives of the Applicable or Relevant and Appropriate Requirements (ARARs) presented in the following section and Section 2.4 of the Work Plan (WP).

1.2 Applicable or Relevant and Appropriate Requirements

Excavated dioxin-impacted soil and sediment is considered to be hazardous waste. The Rhode Island (RI) Rules and Regulations for Hazardous Waste Management – Sections 5, 8, and 9 identify the requirements and procedures for these wastes and incorporates a number of federal regulations including those promulgated under the Resource Conservation and Recovery Act (RCRA) and the Transportation and Safety Act (TSA). The RCRA regulations are found in 40 Code of Federal Regulations (CFR) and the TSA regulations are found in 49 CFR. The generator requirements enforced by the United States Environmental Protection Agency (USEPA) under the RCRA regulations are contained in 40 CFR 262. The generator requirements enforced by the United States Department of Transportation (DOT) under the TSA regulations are contained in 49 CFR 173. In addition to these ARARs, the ARARs include:

- 40 CFR 263.10 through 263.31 and 49 CFR 177.800 through 177.854 – Transportation and Carrier Requirements
- 40 CFR 265.170 through 265.178 – Subpart I – Use and Management of Containers;
- 40 CFR 265.1087 – Subpart CC – Air Emission Standards for Tanks, Surface Impoundments and Containers; and,
- 40 CFR 264 and 265 – Disposal Facility Requirements

All handling, transportation, and disposal of the wastes generated during the TCRA will be conducted in compliance with these regulations.



2. OBJECTIVES

The primary objective of this T&DP is to ensure that all hazardous and non-hazardous wastes that are transported for off-site disposal are done so in a safe manner and in compliance with all ARARs. To ensure that all wastes will be transported in a safe manner, this T&DP provides procedures for proper containerization, labeling, inspection, transport, disposal, and reporting. Also, these procedures are provided for the on-site transport of wastes, and the delivery of materials to the site that are to be used in the TCRA. The plan identifies the treatment and disposal facilities to be utilized, and the transportation routes that the transporters will use to deliver wastes to the disposal facilities.



3. SITE MANAGEMENT AND CONTROLS

It is anticipated that during the TCRA there will be truck traffic entering and existing the site property throughout most of each work day. This traffic will include the receipt of material supplies to be used in the construction activities and the shipment of wastes off-site. Traffic associated with these construction activities will be controlled in accordance with the traffic plan provided in Drawing 1-1 of the WP. Construction traffic will enter the site property via the Brook Village entrance from the south-bound lane of Route 44 (Smith Street). Trucks loaded with excavated material will exit the site property by turning left onto Route 44 (Smith Street) North. The traffic control plan (TCP) provided in Section 7.12 of the WP incorporates a police detail to be provided by the Town of North Providence Police Department and stationed at the Brook Village entrance to the site property. The transportation routes specified in the TCP have been designed to facilitate loading of excavated material to be transported off-site and to limit the amount of disruption to the Town of North Providence community and local traffic.



4. WASTE STREAMS

4.1 Clearing Debris

Clearing debris will include trees that are felled, cleared, and chipped along with shrubs and brush. The chipped material will be shipped off-site to a local recycling facility. Stumps and roots within the footprint of the cap will be removed excavated, handled, and disposed along with the soil and sediment to be transported for off-site disposal.

4.2 Demolition Debris

Demolition debris will include pieces of concrete and asphalt that are generated during the removal of the existing pre-fabricated concrete curbs, reinforced concrete ramps, asphalt parking lot, and asphalt leak-offs. The concrete will be placed as backfill material in the excavation. The asphalt will be transported off-site to a local recycling facility.

4.3 Dioxin-Impacted Soil and Sediment

Approximately 700 cubic yards (cy) of dioxin-impacted soil and sediment will be transported off-site for disposal. This waste will be transported to Bennett Environmental Inc.'s (Recupere Sol Inc.'s) facility in Saint-Ambroise, Quebec, Canada for destruction through incineration.

4.4 Water Generated from Construction Dewatering Activities

In accordance with Section 7.9 of the WP, any surface water or groundwater that is pumped to maintain a dry work area will be treated to remove suspended material and turbidity in the water. The treated water will be discharged into the Woonasquatucket River downstream of the work area, pending approval from the Rhode Island Department of Environmental Management (RIDEM).

4.5 Water Generated from Decontamination Activities

Water used to decontaminate non-disposable protective clothing and equipment will be treated along with the water generated during construction dewatering activities, and will be discharged into the Woonasquatucket River downstream of the work area, pending approval from RIDEM.



4.6 **Personal Protective Equipment**

Disposable gloves, Tyvek[®] suits, rubber booties, used respirator cartridges, and other PPE of a disposable nature that are used during removal activities will be assumed to be contaminated and will be disposed with the dioxin-impacted soil and sediment to be transported for off-site incineration.

4.7 **Miscellaneous Debris and Waste**

Miscellaneous debris includes anthropogenic material such as fragments of wood, metal, brick, glass, plastic, paper, vitrified clay, asphalt, slag, and any other manmade materials that may be contained within the fill material deposited within the Groundwater Action Area. Also, miscellaneous debris includes cobbles and boulders. Miscellaneous waste includes any drums and drummed waste that may be encountered within and excavated from the ground. In addition, miscellaneous waste includes sediment that is mechanically filtered from the water generated during the construction dewatering activities. The miscellaneous debris and waste will be handled as excavation debris and depending upon the depth from which the debris is excavated will be either used as backfill material and placed within the excavation, or placed in dump trailers along with the excavated soil and sediment to be transported for off-site incineration.

4.8 **Work Waste**

Work waste includes trash generated from the use of the field office such as paper, cardboard, and plastic. This waste will be disposed as a non-hazardous waste or will be recycled, as appropriate, in accordance with applicable regulations.

5. DISPOSAL FACILITIES

5.1 Hazardous Waste Disposal

Hazardous waste generated during the implementation of the TCRA includes dioxin-impacted soil and sediment. Miscellaneous debris and waste and contaminated PPE will be included with this waste which will be transported to Bennett Environmental Inc.'s (Recupere Sol Inc.'s) facility located in Saint-Ambroise, Quebec, Canada for destruction through incineration.

Transportation will be performed in accordance with the RI Rules and Regulations for Hazardous Waste Management – Section 5.03 “Generators-Waste Shipment”. The RI regulations state that the material must be accompanied by a properly prepared waste manifest and must be properly packaged. Because the soil and sediment will be transported to Canada, the transportation and disposal of the material must comply with federal regulation 40 CFR 262-Subpart E – Exports of Hazardous Waste.

With the assistance of representatives from the selected transportation and disposal vendor, Loureiro Engineering Associates, Inc.'s (LEA's) wholly-owned subsidiary, WorkWaste, will, on behalf of the Generator, obtain and sign all manifests for transporting hazardous waste from the site to the disposal facility. Also, LEA, through the transportation and disposal vendor, will provide the required notification of intent to export hazardous material.

5.2 Non-Hazardous Waste Disposal

Non-hazardous wastes generated during the implementation of the TCRA include clearing debris, demolition debris, water generated from decontamination activities, and work waste. The clearing debris will be recycled at the Smithfield Peat facility located in Smithfield, Rhode Island. Demolition debris will be recycled at the Patriot Hauling facility located in Johnston, Rhode Island. Water used to decontaminate non-disposable protective clothing and equipment will be treated along with the water generated during construction dewatering activities, and will be discharged into the Woonasquatucket River downstream of the work area, pending approval from RIDEM. Work waste will be disposed at the Rhode Island Resource Recovery Corporation landfill located in Johnston, Rhode Island.

The disposal facilities identified in this T&DP may be modified during the TCRA based on the wastes encountered from drum removal and soil and sediment excavation activities.



6. HAZARDOUS WASTE TRANSPORTATION

6.1 Transportation Vehicle Types and Capacities

Soil and sediment excavated for off-site disposal will be loaded into end dump tractor trailers. Given the gross vehicle weight limitations for these vehicles, each end dump will be loaded with approximately 20 cubic yards (cy) (up to 23 tons) of excavated material. Alternative transportation vehicles may include roll-off containers that are situated on tractor trailers. Each roll-off container will be limited to transporting approximately 20 cubic yards (up to 23 tons) of excavated material.

The container of each transportation vehicle will be lined with a polyethylene liner prior to arriving at the site. Once the excavated material is loaded into the lined container, a visual inspection will be performed to ensure that no material has spilled onto the sides of the transport vehicle. The container of the transportation vehicle will then be covered with a bowed tarpaulin. The bowed tarpaulin will prevent rain from entering the container and will also eliminate the potential for the generation of dust during transport.

In the event that drums are excavated that contain hazardous waste, the drums will be over-packed as needed and will be loaded into and transported in a box truck.

6.2 Licensing and Registration Requirements

Waste haulers who are used to transport waste off-site will be licensed and permitted in all states and Canadian provinces through which they travel. Upon request by USEPA, copies of permits and licenses obtained by the waste hauler will be made available.

6.3 Transportation Routes

Hazardous waste that is shipped from the site will be transported to Veolia Environmental Systems, NA's (Veolia's) 10-day intransit facility located in Latham, New York. Once at this facility, Veolia will re-manifest the waste on a Canadian Ministry of Environment (MOE) Hazardous Waste Manifest. The hazardous waste will not be stored at this facility, but will pass through this facility. Further, there will only be one transporter per load. The transporter that picks up the load will deliver the load to Bennett Environmental Inc.'s (Recupere Sol Inc.'s) facility located in Saint-Ambroise, Quebec, Canada. The license plate number of the truck and

trailer will be copied from the USEPA Hazardous Waste Manifest to the MOE Hazardous Waste Manifest so that each load may be tracked from the site to the Bennett facility.

6.4 **Transport Vehicle Decontamination**

Dump trailers that are mobilized to the site to transport waste will enter the Brook Village/Centerdale Manor driveway and will turn around on Cap No. 1, as shown in the traffic plan provided in Drawing 1-1 of the WP. These vehicles will exit the site property as described in Section 3. The TCP has been designed so that the trucks to be used to transport the excavated material off-site do not traverse impacted soil. A paved, clean surface will be maintained for truck traffic to obviate the need for vehicle decontamination. Thus, transport vehicle decontamination should not be necessary. However, if during loading activities the tires of these trucks come into contact with impacted material, then they will be decontaminated.

6.5 **Weighing Transport Vehicles**

Each transport vehicle will be equipped with gauges to estimate the approximate weight of the vehicle prior to leaving the site. In addition, each transport vehicle will be weighed en route to Veolia's 10-day intransit facility located in Latham, New York. Weighing transportation vehicles is required to confirm that the gross vehicle weight does not exceed restrictions for the travel route or any weight acceptance criteria of the disposal facility. If necessary, waste will be removed from overweight transports to meet the roadway or facility requirements. All waste shipments will be weighed again on certified scales at Bennett Environmental Inc.'s (Recupere Sol Inc.'s) facility located in Saint-Ambroise, Quebec, Canada, to obtain the certified weights upon which the final disposal costs will be based.

6.6 **Labeling, Marking, and Placarding**

Prior to transporting hazardous waste off-site, each container will be labeled as per 49 CFR Part 172, Subpart E. In addition, each container will be marked as per 49 CFR Part 172.304. Finally, the transport vehicle will be properly placarded as per 49 CFR Part 172, Subpart F. All RCRA and/or DOT regulated materials shipped off-site for disposal will be transported in properly labeled, marked, placarded and permitted vehicles.

6.7 **Manifesting**

Hazardous wastes shipped off-site for disposal will be documented by a Hazardous Waste Manifest, as per USEPA regulations provided in 40 CFR, Section 262. In accordance with



USDOT regulations, a copy of the manifest will accompany each shipment of waste from the site to Bennett Environmental Inc.'s (Recupere Sol Inc.'s) facility located in Saint-Ambroise, Quebec, Canada. Based on pre-characterization of the materials to be transported to this facility, the hazardous waste manifests will include USEPA Hazardous Waste Codes D039 (tetrachloroethylene), D040 (trichloroethylene), and F020 (2,3,7,8-tetrachlorodibenzodioxin). A copy of a draft Hazardous Waste Manifest for the TCRA is provided in Appendix A. Copies of the Export/Import notifications/permits that have been filed so that the material may be accepted by the Bennett facility are provided in Appendix B.

6.8 **Offering Waste**

Hazardous waste materials that are loaded for off-site transport will be offered by technical representatives of LEA who have had the requisite USDOT and RCRA training. These trained and authorized individuals (to be determined) will sign the appropriate Hazardous Waste Manifests and related documents on behalf of the generator. These individuals are the only individuals with the delegated responsibility for proper preparation of the shipment documentation.

6.9 **Transporter Requirements**

A transporter/carrier may not transport hazardous waste from the site unless it is accompanied by a properly prepared hazardous waste manifest. In addition, the transporter/carrier must ensure that the manifest and related documents are readily available for review by the authorities in the event of an accident or inspection. Finally, the transporter/carrier must give the manifest to a person representing the designated disposal facility receiving the waste. When waste shipments are ready to exit the Site, the truck driver will be presented with the completed paperwork as required by regulation. He/she will sign the manifest(s) and carry the manifest(s) in the cab of the transport vehicle at all times until the shipment arrives at Bennett Environmental Inc.'s (Recupere Sol Inc.'s) facility located in Saint-Ambroise, Quebec, Canada.



7. RECORDKEEPING AND REPORTING

7.1 Recordkeeping

In accordance with 40 CFR, Part 262, Subpart D, and the Administrative Settlement Agreement and Order on Consent for Removal Action (Order), transportation and disposal documentation will be retained until ten years after receipt of USEPA's Notification of Completion of Work. This documentation includes manifests, biennial reports, and any exception reports that may be generated. In addition, this documentation may include any test results, waste analyses, or other determinations regarding the waste materials transported off-site for disposal.

7.2 Shipment Logs

The LEA representative responsible for offering waste will maintain a log of all waste shipments on site. The log will contain, at a minimum, the shipment date, the name of the hauling company, and the truck number/license plate number. Also, the shipment log will contain any other pertinent information pertaining to each shipment.

7.3 Biennial Reporting

On behalf of the generator, LEA will prepare and submit a Biennial Report to the Region I Administrator by March 1st of each even-numbered year. The report will identify the hazardous waste shipment activities conducted in fulfilling the Order during the implementation of the TCRA, as required by the biennial reporting requirements specified in 40 CFR Part 262.41.

7.4 Exception Reports

If a properly signed copy of any manifest is not received from the designated disposal facility within 35 days of the date the waste was accepted for transport, the LEA technical representative offering the hazardous waste must contact the transporter/carrier and/or the owner or operator of the disposal facility to determine the status of the hazardous waste. If the manifest copy is not received within 45 days, then an Exception Report must be submitted to the Region I Administrator, in accordance with the requirements for the Exception Report specified in 40 CFR, Part 262.42.



8. MATERIAL DELIVERIES

In addition to the wastes to be shipped off-site, the activities being conducted under the TCRA will require that a significant amount of materials be delivered to the site. Listed below are the currently identified materials to be received and their approximate quantities:

- Gasoline/Diesel Fuel - Quantity not Available. Expect bi-weekly deliveries in bulk for the duration of the TCRA.
- Liquid-Phase Granular Activated Carbon – Approximately 4,000 pounds (lbs) for the construction dewatering water treatment system.
- Bankrun Gravel – Approximately 325 cy
- ¾” Stone – Approximately 60 cy
- Riprap – Approximately 125 cy
- Topsoil – Approximately 80 cy
- Process – Approximately 70 cy
- Bituminous Asphalt – Approximately 70 cy
- Super Absorbent Biodegradable Polymer – Approximately 4,000 lbs, in 40-lb sacks.
- Rusmar Emission and Odor Control Foam – Approximately 900, in 2 450-lb drums.

These materials will be placed in a location as close to the planned placement of the material upon delivery to the site.

APPENDIX A

Draft Hazardous Waste Manifest

US EPA ARCHIVE DOCUMENT



Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number R I D 0 0 0 0 2 9 6 1 1	2. Page 1 of 1	3. Emergency Response Phone (877) 818-0087	4. Manifest Tracking Number 000355633 VES					
5. Generator's Name and Mailing Address EMHART INDUSTRIES, INC. C/O LEA 100 NORTHWEST DRIVE PLAINVILLE, CT 06062		Generator's Site Address (if different than mailing address) EMHART INDUSTRIES, INC. 2072-2074 SMITH STREET NORTH PROVIDENCE, RI 02911								
6. Transporter 1 Company Name VEOLIA ES TECHNICAL SOLUTIONS		U.S. EPA ID Number N J D 0 8 0 6 3 1 3 6 9								
7. Transporter 2 Company Name		U.S. EPA ID Number								
8. Designated Facility Name and Site Address RECUPERE SOL, INC. 80, RUE DES MELEZER ST. AMBROISE, PQ		U.S. EPA ID Number N O T R E Q 1 1 7								
9a. HM		9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))		10. Containers No. Type		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	UN3077, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, n.o.s., (2,3,7,8-TETRACHLORODIBENZODIOXIN (F020)),						T	F020	D040	
	TETRACHLOROETHYLENE (D039), 8, III, RQ (2,3,7,8-TETRACHLORODIBENZODIOXIN)							D039		
	3.									
	4.									
14. Special Handling Instructions and Additional Information 1) ERG:171 +- ER Service Contracted by VESTS										
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.										
Generator's/Offoror's Printed/Typed Name					Signature			Month	Day	Year
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____										
17. Transporter Acknowledgment of Receipt of Materials										
Transporter 1 Printed/Typed Name					Signature			Month	Day	Year
Transporter 2 Printed/Typed Name					Signature			Month	Day	Year
18. Discrepancy										
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection										
18b. Alternate Facility (or Generator) Manifest Reference Number: _____ U.S. EPA ID Number _____										
18c. Signature of Alternate Facility (or Generator)								Month	Day	Year
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)										
1.		2.		3.		4.				
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a										
Printed/Typed Name					Signature			Month	Day	Year

Land Disposal Restriction Notification Form

Generator Name EMHART INDUSTRIES, INC.

EPA ID Number RID000029011

Manifest 000355033VES

This notice is being provided in accordance with 40 CFR 268.7 to inform you that this shipment contains waste restricted from land disposal by the USEPA under the land disposal restriction program. Identified below for each container is the designation of the waste as a wastewater or non-wastewater, the Clean Water Act (CWA) permit status associated with the treatment/disposal facility, applicable waste codes and any corresponding subcategories, list of any F001-F005 solvent constituents that are present in the waste, and any underlying hazardous constituents (UHC) that are present.

Container Number: **MF-1110138000-001 (1/ 1)**

WIP / Approval Code: **091487 / RSI-091487**

Form Designation / CWA Status: **Non-Wastewater / Non-CWA**

Waste Codes (Subcategories): **D039, D040, F020**

Constituents (F001 - F005): **None**

UHCs Present: **TETRACHLORODIBENZODIOXIN; (2,3,7,8-),
HEPTACHLORODIBENZOFURAN; (1,2,3,4,6,7,8-),
HEXACHLORODIBENZOFURAN; (1,2,3,6,7,8-),
OCTACHLORODIBENZOFURAN; (1,2,3,4,6,7,8,9-),
OCTACHLORODIBENZODIOXIN; (1,2,3,4,6,7,8,9-), 2,4,5-
TRICHLOROPHENOL (NON F-LISTED)**

Treatment Requirements: **Restricted waste requires treatment to applicable standards.**

Additional Notices:

I hereby certify that all information in this and associated land disposal restriction documents is complete and accurate to the best of my knowledge and information.

Signature _____

Title _____ Date _____

APPENDIX B

Export/Import Notification/Permits



Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
P-2009-02633
MODIFIÉ
2009/06/09
year/mo/day
année/mois/jour

IMPORT PERMIT

PERMIS D'IMPORTATION

Page 1 of/de 2

THIS PERMIT IS ISSUED PURSUANT TO:/CE PERMIS EST DÉLIVRÉ CONFORMÉMENT A:

THE PLANT PROTECTION ACT AND REGULATIONS/LOI ET RÈGLEMENT SUR LA PROTECTION DES VÉGÉTAUX	
<u>Importer/Importateur</u> BENNETT ENVIRONMENTAL INC./RECUPERE SOL INC. 80 RUE DES MÉLÈZES SAINT-AMBROISE, QUEBEC G7P2N4 Requérant: COTE, BLOI Téléphone: 418-695-3302 POSTE 260 Fax: 418-695-3303 Courriel: ECOTE@RECUPERESOL.COM	<u>Exporter/Exportateur</u> ORIGINE MULTIPLE ÉTAT DE NEW YORK ÉTATS-UNIS
<u>Quarantine/Destination/Quarantaine</u> Même adresse que celle de l'importateur indiquée ci-dessus.	<u>Producer/Producteur</u>
Valid/Valide from/du 2009/06/08 to/au 2010/06/08 year/month/day year/month/day année/mois/jour année/mois/jour	<u>Country of Propagation or Production / Le pays de multiplication ou de production</u> ÉTATS-UNIS (RHODE-ISLAND)
For the entry of/ Pour l'entrée de: _____ Single shipment/Chargement simple <input checked="" type="checkbox"/> Multiple shipments/Chargements multiples	
Place of entry into Canada/Lieu d'entrée au Canada: TOUS LES PORTS RÉGLEMENTÉS	
FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE: (Description of things(s)/Description de la ou des choses) SOL POUR LA TRANSFORMATION	
A PERSON WHO IMPORTS A THING UNDER THIS PERMIT SHALL COMPLY WITH ALL THE CONDITIONS SET OUT HEREIN/TOUTE PERSONNE QUI IMPORTE UNE CHOSE EN VERTU DE CE PERMIS DEVRA RESPECTER TOUTES LES CONDITIONS DÉCRITES CI-DESSOUS	

Selected Conditions / Conditions Choies

SOL POUR LA TRANSFORMATION

1. L'importation est autorisée en vertu de l'article 43 du Règlement sur la protection des végétaux. Le Certificat Phytosanitaire d'origine n'est pas nécessaire.
2. Le matériel doit être acheminé directement au lieu ou à l'établissement approuvé. Le matériel doit être emballé et transporté dans des contenants étanches robustes. Ce matériel ne doit pas être vendu ou distribué. Pour utilisation industrielle seulement. Le matériel doit être isolé en tout temps afin d'empêcher toute introduction d'organismes nuisibles dans l'environnement. Le matériel résiduel doit être traité afin d'éviter toute contamination.
3. En tout temps (c.-à-d., pendant l'importation, l'étude, et l'entreposage, et jusqu'à ce que le matériel soit traité), le matériel doit être identifié par des étiquettes et autres méthodes d'identification efficaces.
4. L'importateur doit garder un registre de toutes les importations. Ce registre doit indiquer l'endroit où se trouve le matériel et son statut (p. ex., traité, entreposé...).
5. L'importateur doit obtenir les autorisations appropriées d'Environnement Canada et des autorités provinciales responsables en matière d'environnement avant toute importation.



Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:

P-2009-02633

MODIFIÉ

2009/06/09

year/mo/day

année/mois/jour

IMPORT PERMIT

PERMIS D'IMPORTATION

Page 2 of/de 2

THIS PERMIT IS ISSUED PURSUANT TO:/CE PERMIS EST DÉLIVRÉ CONFORMÉMENT A:

THE PLANT PROTECTION ACT AND REGULATIONS/LOI ET RÈGLEMENT SUR LA PROTECTION DES VÉGÉTAUX

Importer/Importateur

BENNETT ENVIRONMENTAL INC./RECUPERE SOL INC

80 RUE DES MÉLÈZES
SAINT-AMBROISE, QUEBEC
G7P2N4

Requérant: COTE, ELQI

Téléphone: 418-695-3302 POSTE 260 Fax: 418-695-3303

Courriel: ECOTE@RECUPERESOL.COM

Exporter/Exportateur

ORIGINE MULTIPLE

ÉTAT DE NEW YORK
ÉTATS-UNIS

Selected Conditions / Conditions Choies (Continued/Suite)

6. Si le sol importé est envoyé à un autre établissement pour d'autres analyses, traitements, ou pour destruction, un inspecteur de l'ACIA doit vérifier que l'établissement recevant le sol soit approuvé avant l'émission d'un certificat de circulation.

Authorized By:/Approuvé par:

For the Minister of Agriculture and Agri-Food
Pour le ministre d'agriculture et agroalimentaire

L'information est exigée pour l'Agence canadienne d'inspection des aliments afin de la vérification des produits d'importation. L'information peut être accessible ou protégée comme exigée sous les dispositions de l'accès à la Loi de l'information.

06/10/2009 14:47 FAX 613 228 6605

CFIA Import-Export

0001/0002



Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
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<u>Quarantine/Destination/Quarantaine</u> Même adresse que celle de l'importateur indiquée ci-dessus.	<u>Producer/Producteur</u>
Valid/Valide from/du 2009/06/08 to/au 2010/06/08 year/month/day year/month/day année/mois/jour année/mois/jour	<u>Country of Production or Production / Le pays de matriculation ou de production</u> ÉTATS-UNIS (RHODE-ISLAND)
For the entry of/ Pour l'entrée de: <input type="checkbox"/> Single shipment/Chargement simple <input checked="" type="checkbox"/> Multiple shipments/Chargements multiples	
Place of entry into Canada/Lieu d'entrée au Canada: TOUS LES PORTS RÉGLEMENTÉS	
FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE: (Description of things(s)/Description de la ou des choses) SOL POUR LA TRANSFORMATION	
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Selected Conditions / Conditions Choies

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1. L'importation est autorisée en vertu de l'article 43 du Règlement sur la protection des végétaux. Le Certificat Phytosanitaire d'origine n'est pas nécessaire.
2. Le matériel doit être acheminé directement au lieu ou à l'établissement approuvé. Le matériel doit être emballé et transporté dans des contenants étanches robustes. Ce matériel ne doit pas être vendu ou distribué. Pour utilisation industrielle seulement. Le matériel doit être isolé en tout temps afin d'empêcher toute introduction d'organismes nuisibles dans l'environnement. Le matériel résiduel doit être traité afin d'éviter toute contamination.
3. En tout temps (c.-à-d., pendant l'importation, l'étude, et l'entreposage, et jusqu'à ce que le matériel soit traité), le matériel doit être identifié par des étiquettes et autres méthodes d'identification efficaces.
4. L'importateur doit garder un registre de toutes les importations. Ce registre doit indiquer l'endroit où se trouve le matériel et son statut (p. ex., traité, entreposé...).
5. L'importateur doit obtenir les autorisations appropriées d'Environnement Canada et des autorités provinciales responsables en matière d'environnement avant toute importation.

06/10/2008 14:47 FAX 613 228 6605

CFIA Import-Export

0002/0002



Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
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Page 2 of 2

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Selected Conditions / Conditions Choies (Continued/Suite)

6. Si le sol importé est envoyé à un autre établissement pour d'autres analyses, traitements, ou pour destruction, un inspecteur de l'ACIA doit vérifier que l'établissement recevant le sol soit approuvé avant l'émission d'un certificat de circulation.

Authorized By:/Approuvé par:

For the Minister of Agriculture and Agri-Food
Pour le ministre d'agriculture et agroalimentaire

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

August 19, 2009

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

EPA Notice No.:330/09

GERRY BELAND
VECLIA ES TECHNICAL SOLUTIONS, LLC
10 TERMINAL DRIVE
LATHAM, NY 12210

EPA I.D. No.: NYR000136788

Dear GERRY BELAND:

This is to acknowledge receipt of your notice, dated June 23, 2009, of intent to export hazardous waste to Canada as required by Title 40, Code of Federal Regulations, Part 262, Subpart E, Section 262.53 promulgated pursuant to the Resource Conservation and Recovery Act (RCRA). In accordance with the U.S.-Canada Bilateral Agreement on the Transboundary Movement of Hazardous Waste, the U.S. Environmental Protection Agency (EPA) forwarded your notice to the Government of Canada and Canada has no objection to your shipment(s) of hazardous waste.

This letter constitutes the EPA Acknowledgment of Consent for the export of the following hazardous waste as specified in your notice:

Waste Stream 1: SOIL CONTAMINATED WITH 2, 3, 7, 8 T

Waste Description: SOIL CONTAMINATED WITH 2, 3, 7, 8 T
EPA Waste Code: F020, D039, D040
DOT Shipping Name: WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S.
DOT Hazard Class: 9
DOT I.D. No. UN3077
Total Volume to be Exported: 3000 Tons
Estimated Frequency: 140 loads per Year

You may ship this waste to the following consignee:

RECUPERE SOL INC.
CENTRE DE TRAITEMENTS DES SOLS
80,RUE DE MELEZES
SAINT-AMBROISE (QUEBEC) G7P 2N4
NC0000000434

Shipments may occur during the period from August 19, 2009 to August 19, 2010.

You are also reminded of the following **special RCRA requirements for export shipments of hazardous waste**. Specific details of these requirements are contained in Title 40 of the Code of Federal Regulations, Part 262, Subpart E.

1. If the major terms of the original notice of intent to export on which this consent is based should change, you must renotify EPA. Please mail your renotification to: USEPA, Ariel Rios Building, Mail Code 2254A, 1200 Pennsylvania Avenue, NW, Washington, D.C. **20460**, with "ATTENTION: INTERNATIONAL COMPLIANCE ASSURANCE DIVISION" prominently displayed on the front of the envelope. (262.53(c)) Alternately, notices may be sent by courier to the same office at the Ariel Rios Building, Room 6144, 1200 Pennsylvania Avenue, NW, Washington, DC 20004.
2. The Uniform Hazardous Waste **Manifest** Form for each shipment must identify the **point of departure** from the United States in Item 15, Special Handling Instructions. (262.54(c))
3. The following statement must be added to the end of the first sentence of the **certification** set forth in Item 16 of the Uniform Hazardous Waste Manifest Form: "and conforms to the terms of the attached EPA Acknowledgment of Consent". (262.54(d))
4. A **copy** of this Acknowledgment of Consent must be attached to the U.S. hazardous waste manifest that accompanies each shipment of hazardous waste. (262.54(h))
5. You must provide the waste transporter with an additional copy of the U.S. hazardous waste manifest accompanying the shipment for delivery to a **U.S. Customs** official at the point the hazardous waste leaves the United States in accordance with 263.20(g)(4) and (262.54(i)).
6. You must file an **exception report** with the USEPA, Ariel Rios Building, Mail Code 2254A, 1200 Pennsylvania Avenue, NW, Washington, DC **20460**, ATTN: INTERNATIONAL COMPLIANCE ASSURANCE DIVISION, if you have not received a copy of the manifest signed by the transporter stating the date and place of departure from the U.S. within forty five (45) days from the date it was accepted by the initial transporter; if within ninety (90) days from the date the waste was accepted by the initial transporter, the primary exporter has not received written confirmation from the consignee that the hazardous waste was received; or if the waste is returned to the United States. (262.55). Alternately, exception reports may be sent by courier to the same office at the Ariel Rios Building, Room 6144, 1200 Pennsylvania Avenue, NW, Washington, DC **20004**.

7. You must file an **annual report** by March 1 of each year with the USEPA, Ariel Rios Building, Mail Code 2254A, 1200 Pennsylvania Avenue, NW, Washington, DC 20460, ATTN: INTERNATIONAL COMPLIANCE ASSURANCE DIVISION, summarizing all hazardous waste shipments exported during the previous calendar year. The report must include all items listed in 262.56. Alternately, annual reports may be sent by courier to the same office at the Ariel Rios Building, Room 6144, 1200 Pennsylvania Avenue, NW, Washington, DC 20004.

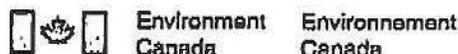
All shipments of hazardous waste must conform to all applicable State and Federal hazardous waste regulations and transportation requirements as well as these specific export requirements.

Any questions you may have concerning this Acknowledgment of Consent or other export requirements may be directed to Mrs. Jean Shaw (Phone 202/564-7111), or Ms. Tyria Nesmith (Phone 202/564-4369), EPA, Office of Enforcement and Compliance Assurance.

Sincerely,



For Robert G. Heiss, Director
International Compliance Assurance Division
Office of Federal Activities (2254A)



Eloi Cote
 Bennett Environmental Inc.
 208-1540 Cornwall Drive
 Oakville, Ontario
 L6J 7W5

19 August 2009 / 19 août 2009

IMPORT PERMIT FOR HAZARDOUS WASTE

Issued Under Subparagraph 185(1)(b)(i) of the *Canadian Environmental Protection Act, 1999*

PERMIS D'IMPORTATION POUR DÉCHETS DANGEREUX

Délivré en vertu du sous-alinéa 185(1)b)(i) de la *Loi canadienne sur la protection de l'environnement (1999)*

File Number / No. de dossier : 09/00330/IMP

The Department of the Environment has received confirmation from the authorities of Quebec, that they have authorized the final disposal of the hazardous waste described below.

Le ministère de l'Environnement a reçu la confirmation que les autorités du Québec autorisent l'élimination finale du déchet dangereux décrit ci-dessous.

This IMPORT PERMIT is issued to Bennett Environmental Inc. in accordance with subparagraph 185(1)(b)(i) of the *Canadian Environmental Protection Act, 1999* (CEPA 1999) for the import of the hazardous waste described below into Quebec, Canada.

Ce PERMIS D'IMPORTATION est délivré à Bennett Environmental Inc. en vertu du sous-alinéa 185(1)b)(i) de la *Loi canadienne sur la protection de l'environnement (1999)* (LCPE (1999)) pour l'importation du déchet dangereux décrit ci-dessous vers le Québec, Canada

This IMPORT PERMIT is valid for the period of 19 August 2009 to 19 August 2010.

Ce PERMIS D'IMPORTATION est valide pour la période du 19 août 2009 au 19 août 2010.

**Waste Description for 1 Hazardous Waste /
Description de déchet pour 1 déchet dangereux**

1) Q15//D10//S23//C50+41//H12//A651//Y44+41
 PIN / NIP : N/A EIWHRMR ID # /
 Class / Classe : N/A No. d'identité REIDDMRD : HAZ6
 Quantity / Quantité : 2,724,000 kg Basel Code / Code Bâle : A4110
 HS Code / Code HS : 3825.90.00.00 Packing Group / Groupe d'emballage : N/A
 Notice / Notification : 515591

From / De:

Veolia ES Technical Solutions, L.L.C.
 10 Terminal Drive
 Latham, New York
 United States of America
 12110

To / À:

Bennett Environmental Inc.
 Recupere Sol Inc., 80 Rue Des Melezes
 Ste. Ambroise, Quebec
 G7P 2N4

215 Authorized Carriers / 215 Transporteurs Agréés

2171-2799 Québec inc.;	2641-8517 Quebec Inc. (Transport Marchand 1990 Inc.)
2646-6003 Québec inc.;	9075-1520 Quebec Inc. (Claude Joubert)
9100-3699 Quebec Inc (JPL)	9140-3766 Quebec Inc. (Francois Marchand)
A&A Meideiros	Aaron Ingersoll
Alan Vahlkamp	Ameritech Environmental Services
Andrew Halupke	Andrew Nelkin
Andrew Saeli	Arthur Louis Pollock
Arthur Medeiros	B & L Trucking
B & M Carriers	Barbara Langston
Barry Beegle	Bart Grayling / Perry Stanfa TRKG
Ben Rogers	BK Trucking
Brian Bowser	Brian Double
Brian Higgins	Brookins Transport
Brookville Carriers Flat-Bed GP	Bryan Sulzman
Buckham Transport	Canadian National Railways Company
Chad & Diana Wise	Chauncy Bowser
Chester G. Conley	Chris Sepaniak
Christopher Chervanka	Christopher Sommers/Sommers Transport Inc.
Clarence McLleese	Clayton Stephenson
Clifford Weinhardt	Clyde Reece
Craig Hodge	Crisco Transit inc.;
Curtis LaPorte	Daniel Croak
Darrel Novak	David Confer
David Payne	David Rupert
David Tidaback	David Wagner / Canaan Construction
Dennis Ebers	Donald Urquhart

Douglas Fugle
 Edward Derler / Derler Farms
 Eric Harn
 Eric Woltering
 FMC Leasing/A. Nelkin
 Fran Schieble
 Frank Fay
 Frank Tucci Inc.
 Gary Conway
 Gene Foreman
 General Freight GP
 Gestion K.I.K. Inc. (dba Karl Fillion)
 Glen-Tay Transportation GP
 Gordon Whitt
 Greg M Rasler/GR Trucking
 Gregory Gibbs
 Irene Brill
 James Langston
 James Zoner
 JB Apgar Trucking
 Jeffrey Hanrahan
 Jesse DeGarmo
 John Davenport
 John Reid
 Johnson Bros II LLC
 Joseph Nageotte
 Josh Stanfa / Perry Stanfa Trucking
 Keith Titus Co. Corp.
 Ken Greenwood
 Kevin Bean
 Kingsway/TFI 4 SEC/Transforce
 Laidlaw Carriers Flatbed GP Inc.
 Laidlaw Carriers Tank GP Inc.
 Larry Heston
 LATA Inc.
 Leonard Williams
 Lloyd Cooper
 Mark Faltisko / Marks Trucking
 MCQ Handling Inc.
 Michael Poff / Poff Trucking
 Mike Martin
 Neil Smith
 Page E.T.C. Inc.
 Peter Hodge Transport Ltd.

Edward Clements
 Elden Neifert
 Eric Hartman
 Ewins Charles
 Fortier Transport Inc.
 Frank Anderson
 Frank Joe Tucci
 Freehold Cartage Inc.
 Gary Frable / Frable Trucking
 Gene Reynolds
 Gerald Strodbeck
 Glenn Hamilton
 Goko, Inc.
 Grace Transport Inc.
 Gregory Gaudin
 Harry Holcomb
 James Jenary
 James Sargent
 Jay Fauzey
 Jeff Sargent
 Jeffrey Marsh / Jeralyn Walters
 Jimmy Roberts
 John Houser
 John Schieble
 Joseph Bretz
 Joseph Zallo / Zallo Trucking
 Keith Klostermann
 Kelly Johnson
 Kenneth Halfhill/Halfhill Trucking
 Kevin Henry
 Laidlaw Carriers Bulk GP Inc.
 Laidlaw Carriers PCS GP
 Laidlaw Carriers Van GP Inc.
 Larry Hood
 Lee Maulik
 Lewis Nunn
 Mark D Raber
 Mark Reynolds
 Michael Clark
 Michael Thiemann
 Montague Michael
 New England Disposal Technologies, Inc.
 Page Transportation Inc.
 Preferred Transport

Quintin Lawley
 Randy Jolliff
 Remorquage St. Michel Inc.
 Richard Launer
 Richard Weaver / R&T Transport Inc.
 Robert & Karin Bean
 Robert Lambrix
 Rodney Jones
 Roland Poirier inc.
 Ronald B Jordan
 Ronald Slagle
 Scott Smith
 Sean Marlin
 Shawn Magagna
 Stepehn Straszheim
 Steven Thompson
 T.R.M. Transport inc.
 Thomas Flanagan
 Timothy Bryant
 Timothy Deaton
 Timothy Weber
 Todd Hausman
 Transport Andre Menard Inc. (2646-6003
 Quebec Inc.)
 Transport F. Gilbert Ltée
 Transport Marc Express Inc.
 Transport Marc Pare Inc.
 Transport Pollock et Filles Inc. (9164-6554
 Quebec Inc.)
 Transport Robert (1973) Ltée
 Transport Serge Beauregard Inc.
 Transport TYT Inc.

 U.S. Bulk Transport, Inc.
 Wayne Fatheree
 Wayne Marlin
 Weaver Clinton
 WETCO Inc.
 William Hendrickson
 William Henson
 William Schaffner

Randy Eppinger
 Raymond Withey
 Richard Carder
 Richard Stevenson
 Robbie D. Wood Inc.
 Robert Entwistle
 Robert Smith
 Rodney King
 Roland Poirier Inc.
 Ronald Henshaw
 Scott Green
 Sean Boas / SKS Trucking
 Shawn Arango
 Sidney Huntoon
 Steve Schultz
 Stone Transportation
 Thomas Bauman
 Thomas Whitehill
 Timothy Damschroder
 Timothy Ruggiero
 Todd Green
 TR Transport & Association
 Transport Denis Painchaud (6185681 Canada
 Inc.)
 Transport J.M.K. inc.
 Transport Marc Leblanc Inc.
 Transport Pierre Poirier
 Transport Real Poirier Inc.

 Transport Rollex Ltee
 Transport SGJ
 Transport Dany Gaucher Inc. (9063-3314
 Quebec Inc.)
 Victor Tracy
 Wayne Hines
 Wayne Mattice
 Wendell Norris / Wendell Norris TRKG
 William Empson / Empson Trucking
 William Hendrickson / Mountaintop Trucking
 William Rooney

4 Ports of Entry and Customs Offices /
4 Points d'entrée et bureaux de douane

Lacolle / Champlain St-Bernard-de-Lacolle
Stanstead (55) / Derby Line

Philipsburg / Highgate
Trout River / Malone

Please take note that it is your responsibility as the importer of the hazardous waste to ensure that the requirements set out in the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations* (EIHWRMR) made pursuant to CEPA 1999 are complied with at the time of movement of the hazardous waste and until the import is completed. This includes, but is not limited to, ensuring that you, as the importer, and the authorized carriers of the hazardous waste are insured in accordance with section 37 of the EIHWRMR.

Veillez noter qu'en tant qu'importateur de déchet dangereux, il vous incombe de vous assurer que vous respectez, au moment du mouvement du déchet dangereux et jusqu'à ce que l'importation soit terminée, les exigences établies dans le *Règlement sur l'exportation et l'importation de déchets dangereux et de matières recyclables dangereuses* (REIDDMRD) et dans la LCPE (1999). Ces exigences comprennent notamment l'obligation de vous assurer que vous, comme importateur, et les transporteurs agréés du déchet dangereux, détenez une police d'assurance conformément à l'article 37 du REIDDMRD.

It is your responsibility to ensure that you are in compliance with all other applicable Canadian laws.

Vous devez vous assurer de respecter toutes les autres lois canadiennes applicables.

The import of hazardous wastes or hazardous recyclable materials, in violation of CEPA 1999 or the EIHWRMR, may be prosecuted as offences under section 272 or 273 of CEPA 1999.

Toute importation de déchets dangereux ou de matières recyclables dangereuses qui contrevient à la LCPE (1999) ou au REIDDMRD peut entraîner une poursuite pénale en vertu de l'article 272 ou 273 de la LCPE (1999).

Signed for and on behalf of the Minister of the Environment /
Signé au nom du ministre de l'Environnement



Carolyn Blain
Director / Directrice

Waste Reduction & Management / Réduction et gestion des déchets
Public and Resources Sectors / Secteurs publics et des ressources
Environment Canada / Environnement Canada



Environment
Canada

Environnement
Canada

Ottawa, Ontario
K1A 0H3

Eloi Coté
Bennett Environmental Inc.
208-1540 Cornwall Drivee
Oakville, Ontario
L6J 7W5

19 August 2009 / 19 août 2009

SUBJECT: Provincial conditions placed on consent for imports of hazardous wastes pertaining to permit number 09/00330/IMP

OBJET: Conditions provinciales sur le consentement aux importations de déchets dangereux concernant le numéro de permis 09/00330/IMP

Please note that the province of Quebec has placed some conditions on their consent to the enclosed import permit. We have attached these conditions to this letter for your information. Should you require more information, please contact Quebec Ministry of Sustainable Development, Environment and Parks.

Veillez noter que la province du Québec a placé des conditions sur leur consentement au permis d'importation comprise avec cette lettre. Nous les avons attachées à cette lettre à titre de renseignement. Si vous avez besoin de plus de renseignements, veuillez contacter le Ministère du Développement durable, de l'Environnement et des Parcs du Québec.

Should you have any questions regarding this letter, please contact Lynne Richer at (819) 953-1116 or by email lynne.richer@ec.gc.ca.

Si vous avez des questions à propos de cette lettre, veuillez contacter Lynne Richer au (819) 953-1116 ou par courriel lynne.richer@ec.gc.ca.

Joachim (Joe) Wittwer
Head / Chef

Regulatory Operations Section/ Section des opérations de la réglementation
Waste Reduction & Management / Réduction et gestion des déchets
Public and Resources Sectors / Secteurs publics et des ressources
Environment Canada / Environnement Canada

Canada

Direction régionale du Centre de contrôle environnemental du Québec
de Montréal, Laval, Lanaudière et Laurentides

Le 18 août 2009

Mesdames Lynne Richer, Francoine Pretty et Louise Lamothe
Environnement Canada
Section des opérations de la réglementation
Division de la réduction et de la gestion des déchets
Secteurs publics et des ressources
Place Vincent-Massey
14^e Étage, 351, boulevard St-Joseph,
Gatineau (Québec) K1A 0H3

Mesdames,

Par la présente nous vous faisons part de notre position visant la notification EPA
suivante :

EC#	Notification	Nom de l'exportateur	Destinataire	Position *
9-330 IMP	515591	Veolia ES Technical Solutions, L.L.C.	Récupère Sol inc. (Bennett Env., Inc.)	Accepté avec remarque et conditions *

* La demande vise la quantité de 2 724 000 kg de sols contaminés principalement aux dioxines et furanes et au trichloroéthylène. Ces sols proviennent de l'exportateur américain Veolia ES Technical Solutions, Latham, New York, du même site (centre de transfert). Il est toutefois à noter que les sols sont générés originalement au site Centerdale Manor Superfund Site, North Providence, Rhode Island.

Les informations disponibles au dossier indiquent que les installations de la compagnie Récupère Sol de Saint-Ambroise permettent le traitement de ces contaminants sous réserve des conditions déjà prévues aux certificats d'autorisation, et plus spécifiquement des conditions suivantes :

- 1 - Limiter le taux d'alimentation en dioxines et furanes à 0,2 gramme par heure;
- 2 - Limiter le taux d'alimentation en composés organochlorés totaux à 15 kilogrammes par heure.

...2

Bureau de Montréal

5199, rue Sherbrooke Est, bureau 3860
Montréal (Québec) H1T 3X9
Internet: <http://www.mddep.gouv.qc.ca>

Téléphone : (514) 873-3636
Télécopieur : (514) 864-1990

3 - Fournir à la direction régionale du ministère du Développement durable, de l'Environnement et des Parcs 2 analyses supplémentaires avant que le premier 1 800 000 kg soit reçu chez Récupère Sol.

2

Veuillez agréer, Mesdames, nos meilleures salutations.

Lucie Baril-Matthieu

Lucie Baril-Matthieu

NOTICE - NOTIFICATION

Administrative form for proposed movements of hazardous wastes or hazardous recyclable materials
 Formulaire administratif en vue de projets d'envois de déchets dangereux et de matières recyclables dangereuses

1 OPTION Indicate the option that applies to this notice. / Indiquez l'option qui s'applique à cette notification. <input checked="" type="checkbox"/> Disposal / Élimination <input type="checkbox"/> Recycling / Recyclage <input type="checkbox"/> Recycling, Pre-approved Facility / Recyclage, Installation approuvée au préalable			
2 EXPORTER OR FOREIGN EXPORTER EXPORTATEUR OU EXPÉDITEUR ÉTRANGER		3 FOREIGN RECEIVER OR IMPORTER DESTINAIRE ÉTRANGER OU IMPORTATEUR	
Registration Number: / N° d'immatriculation: NYR 000 136 788		Registration Number: / N° d'immatriculation: 1141254640	
Name: / Nom: Veolia ES Technical Solutions		Name: / Nom: Bennett Environmental / Récupère Sol inc.	
Address: / Adresse: Shipping Site Address: / Adresse du site d'envoi: 10 Terminal Drive Latham, New York 12110		Address: / Adresse: Receiving Site Address: / Adresse du site de réception: Bennett Environmental 208-1540 Cornwall Road Oakville, ON Canada, L6J 7W5	
IDEM		Récupère Sol inc. 80 rue des Mélèzes Saint-Ambroise, QC Canada, G7P 2N4	
Tel. No.: / N° de tél.: (508) 804-4809	Fax No.: / N° de téléc.: (508) 804-480	Tel. No.: / N° de tél.: (418) 695-3302	Fax No.: / N° de téléc.: (418) 695-3303
E-mail address: / Adresse électronique: Steve.Garcia@veoliaes.com	Contact person: / Personne ressource: Steve Garcia	E-mail address: / Adresse électronique: ecote@recuperesol.com	Contact Person: / Personne ressource: Éloi Côté
Name of Insurance Company: / Nom de l'assureur:	Policy No.: / N° de Police:	Name of Insurance Company: / Nom de l'assureur: American Home Insurance	Policy No.: / N° de Police: EG4179193
4 AUTHORIZED CARRIER TRANSPORTEUR AGRÉÉ		5 AUTHORIZED FACILITY (IF OPERATION D13, D14, D17, R12, R13, R16) INSTALLATION AGRÉÉE (DANS LE CAS DES OPÉRATIONS D13, D14, D17, R12, R13 OU R16)	
Registration Number: / N° d'immatriculation:		Registration Number: / N° d'immatriculation: N/A	
Name: / Nom: Please reference to Address: / Adresse: Bennett's approved carriers list	Modes of Transport: Moyens de transport: <input checked="" type="checkbox"/> Road/Route <input type="checkbox"/> Rail/Rail <input type="checkbox"/> Marine/Mer <input type="checkbox"/> Air/Air If other authorized carriers used, attach a list. S'il y a d'autres transporteurs agréés, annexe une liste. <input type="checkbox"/> Attached / ci-joint	Name: / Nom: Address: / Adresse:	Receiving Site Address: / Adresse du site de réception: <input type="checkbox"/> Attached / ci-joint
Tel. No.: / N° de tél.: ()	Fax No.: / N° de téléc.: ()	Line No.: / N° de la ligne.:	D/R code: / Code D/R:
E-mail address: / Adresse électronique:	Contact person: / Personne ressource:	Tel. No.: / N° de tél.: ()	Fax No.: / N° de téléc.: ()
Name of Insurance Company: / Nom de l'assureur:	Policy No.: / N° de Police:	E-mail address: / Adresse électronique:	Contact person: / Personne ressource:

SHIPPING DETAILS - DÉTAILS SUR LES ENVOIS

6 NUMBER OF SHIPMENTS: ~175 NOMBRE D'ENVOIS:		7 PORT OF EXIT / ENTRY OR CUSTOMS OFFICE(S): BUREAU(X) DE DOUANE OU POINT DE SORTIE/D'ENTRÉE:		<input checked="" type="checkbox"/> Attached / ci-joint	
8 FIRST AND LAST SHIPMENTS: PREMIER ET DERNIER ENVOIS:		First Premier: 09	Y - A: 07	M - M: 15	D - J: 15
9 TRANSIT COUNTRY(IES) / PAYS DE TRANSIT:		Country: / Pays: N/A	Length of Stay: / Durée du transit: N/A <input type="checkbox"/> Attached / ci-joint		
10 HAZARDOUS INFORMATION / RENSEIGNEMENTS DANGEREUX - (For additional hazardous information please see Appendix to the Notice. / Veuillez consulter l'annexe à la notification pour des renseignements dangereux supplémentaires.)					
International Waste Identification Code (IWIC) Code international d'identification des déchets (CIID)	Basel Annex VIII or OECD App. 4 Code / Annexe VIII de Bâle ou App. 4 Code OCDE	TDGR PIN NIP du RTMD	Class Classe	Quantity Quantité	Packing / Risk Group Groupe d'emballage/risque
1) Q15//D10//S23//C50+41//H12//A651//Y44-41	A4110	N/A	N/A	2 724 000	<input checked="" type="checkbox"/> kg <input type="checkbox"/> L N/A
Customs Code Code de douane	ID No & Description of Sch. 3-7 N° d'id. et description de l'Ann. 3 à 7	POP name, quant. & conc. POP nom, quant. et conc.	Description(s) of the D/R process(es) to be used Description(s) du (des) processus D/R mis en oeuvre		
3825.90.00.00	HAZ6	11, 185 g, 68 ng TEQ/g	D10 Thermal Treatment of contaminated soils		
11 EXPORTS OF HAZARDOUS WASTE: Options considered for reducing or phasing out of the waste and the reason the disposal is happening outside of Canada EXPORTATION DE DÉCHETS DANGEREUX: Solutions envisagées pour réduire ou pour supprimer les déchets et les raisons pour l'élimination en lieu étranger N/A					
12 STATEMENT OF PERSON SUBMITTING THE NOTICE: In the case of an export or import, the contract(s) referred to in paragraphs 9(f) or 16(e) is/are in force and if the waste or material cannot be disposed of or recycled in accordance with the export or import permit, the exporter or importer will undertake alternative arrangements required under the Regulations or will return the waste or material to the facility from which it was imported in accordance with s. 34 or 35. In the case of an export, import or transit, the insurance policy will cover the period specified by the Regulations and the information in the notice is complete and correct. DÉCLARATION PAR L'AUTEUR DE LA NOTIFICATION: Dans le cas d'une exportation ou d'une importation, le(s) contrat(s) visé(s) aux alinéas 9f) ou 16e) est (sont) en vigueur et si les déchets ou les matières ne peuvent être éliminés ou recyclés conformément au permis d'exportation ou d'importation, l'exportateur ou l'importateur mettra en oeuvre les mesures d'arrangements alternatifs prévues au Règlement ou à les ramener à l'installation d'origine conformément aux articles 34 ou 35. Dans le cas d'une exportation, d'une importation ou d'un transit, la police d'assurance sera en vigueur pour la période visée par le Règlement, et les renseignements figurant à la notification sont complets et exacts.					
Name: / Nom: Éloi Côté		Signature:		Date: 20 juillet 2009	Tel. No.: / N° de tél.: (418) 695-3302 ext. 260

US EPA ARCHIVE DOCUMENT

APPENDIX B

Site-Specific Health and Safety Plan

**SITE-SPECIFIC HEALTH AND SAFETY PLAN
TIME CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA**

**Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island 02911**

September 10, 2009

Prepared for

**Emhart Industries, Inc.
c/o Sullivan & Worcester LLP
1666 K Street, NW
Washington, DC 20006**

Prepared by

**LOUREIRO ENGINEERING ASSOCIATES, INC.
100 Northwest Drive
Plainville, Connecticut, 06062**

An Employee Owned Company

Comm. No. 15RP901

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
CFR	Code of Federal Regulations
CAMP	Community Air Monitoring Plan
COCs	Contaminants of Concern
CRZ	Contaminant Reduction Zone
EMP	Emergency Management Plan
EZ	Exclusion Zone
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
HSO	Health and Safety Officer
HSS	Health and Safety Supervisor
JHA	Job Hazard Analysis
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
OSHA	Occupational, Safety, and Health Administration
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
PPE	Personal Protective Equipment
SVOCs	Semi-Volatile Organic Compounds
SZ	Support Zone
TCRA	Time-Critical Removal Action
T&DP	Transportation and Disposal Plan
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

UNITS

mg/m ³	milligrams per cubic meter
µg/m ³	micrograms per cubic meter
ppm	parts per million

SIGNATURE PAGE

Timothy J. Williamson Health & Safety Manager		Date
David N. Scotti, P.G. Health & Safety Supervisor		Date
Steven J. Murdock Health & Safety Officer		Date
Jeffrey J. Loureiro, P.E. Technical Coordinator		Date

1. SITE DESCRIPTION

1.1 Site Location

As described by the United States Environmental Protection Agency (USEPA), the Centredale Manor Restoration Project Superfund Site (site) includes two parcels, 2072 and 2074 Smith Street, that encompass approximately 9.7 acres, as well as certain sediments and floodplain areas of the Woonasquatucket River (River) from Route 44 (Smith Street) southerly to Allendale Dam and further to an area just below Lyman Mill Dam. The site consists of certain contaminated areas within this area as well as any other location to which contamination from that area has come to be located, or from which that contamination came.

The 2072 Smith Street parcel is occupied by Brook Village Apartments; an eleven-story apartment building that houses approximately 135 elderly residents. A series of four paved parking lots extend to the south of this building. The area of the parcel surrounding the building and parking lots includes landscaped areas and a paved driveway that provides access onto Smith Street. The parcel also includes a soil cap (Cap No. 2) located adjacent to the River. The parcel is bordered to the north by Smith Street, to the west by the River, to the east by a drainage ditch (a former tailrace), and to the south by the 2074 Smith Street parcel.

Centredale Manor Apartments occupies the 2074 Smith Street parcel and consists of an eight-story apartment building that houses approximately 130 elderly residents. Two paved parking lots are located on this parcel: one to the north and one to the west of the building. The apartment building, parking lots, and associated landscaped areas are located on the northern end of the parcel. The parcel also includes two constructed caps: Cap No. 1 on the southern end of the parcel, which is bordered by Allendale Pond, the former tailrace, and the River; and Cap No. 3 along the eastern extent of the parcel that includes a drainage channel and occupies the area of the former tailrace. The property is bordered to the north by the Brooks Village Apartments property.

The site proper that is comprised of the Brook Village and Centerdale Manor properties is bounded to the north by Route 44 (Smith Street); to the east by Cap No. 3 (former tail race); to the south by Allendale Pond; and to the west by the River. The surrounding community is populated by residential and commercial properties.

1.2 Site Historical Use

Prior to 1936, the properties that comprise the site were occupied by a woolens mill. A chemical company began operating at the site in approximately 1943 and continued to operate at the site until the early 1970s. The historical use of the site property also included an incinerator-based drum reconditioning facility from 1952 until 1971. A major fire occurred at the site in 1972, destroying most of the structures at the site. The Brook Village apartment building was constructed and opened in 1977 and the Centredale Manor apartment building was constructed and opened in 1983.

Constituents of concern were first identified at the site in 1996 when fish collected from the River were reported to contain elevated levels of dioxins. Since that time, USEPA has documented elevated levels of contaminants including dioxins/furans, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals in soil, sediment, surface water, and groundwater at the site.

1.3 Groundwater Action Area

The Groundwater Action Area encompasses a portion of the Brook Village parking area and an adjacent area to the west that extends to the River. This area has been established by USEPA based on the area of shallow groundwater flow that has the potential to discharge to the River as shown in Drawing 2-1 of the Work Plan. Shallow groundwater within this area may discharge to the River due to a hydraulic “mound” surrounding monitoring well MW-05S. The presence of the hydraulic mound in the vicinity of monitoring well MW-05S results in a hydraulic gradient for shallow groundwater flow toward the River.

The Groundwater Action Area is bounded to the north by the northern-most parking lot of the Brook Village apartment building; to the east by the Brook Village/Centerdale Manor driveway; to the south by Cap No. 2; and to the west by the River.

2. TIME-CRITICAL REMOVAL ACTION SCOPE OF WORK / TASKS

The Time-Critical Removal Action (TCRA) activities include (i) focused excavation limited to specified lines and grades and off-site disposal of potentially impacted soils and sediments; (ii) installing steel sheeting to control surface water during the construction activities; (iii) backfilling and re-grading the area of excavation; (iv) constructing an impermeable cap over the Groundwater Action Area; (v) installing groundwater monitoring points; and, (vi) conducting one round of groundwater monitoring. The excavated soil and sediment materials will be temporarily staged on-site to be used as backfill or will be loaded for transportation off-site to an approved, permitted facility. The major tasks to be performed in implementing the TCRA are presented in Table 1.

3. RESPONSIBILITIES OF PROJECT PERSONNEL

3.1 Health and Safety Personnel and Responsibilities

The key project personnel and their responsibilities for health and safety during the implementation of the TCRA are identified in Table 2. The site-specific health and safety personnel include the Health and Safety Manager (HSM), Health and Safety Officer (HSO), and Health and Safety Supervisor (HSS). The responsibilities of the site workers are also identified in Table 2. These responsibilities include signing the Site-Specific Health and Safety Plan (HASP) Acceptance Form provided in Appendix A.

3.2 OSHA Training

All personnel who perform intrusive site work involving potential exposure to the site chemical hazards shall meet all of the Occupational, Safety, and Health Administration (OSHA) training requirements including those for Hazardous Waste Operations and Emergency Response (HAZWOPER), found in Title 29, Part 1910.120 of the Code of Federal Regulations (29 CFR 1910.120) activities. These training requirements include those for 40-hour initial health and safety training, annual 8-hour refresher training, and supplemental training required for on-site supervisors. Also, all site workers are required to comply with all other applicable OSHA regulations.

It is the responsibility of each site worker and subcontractor to see that all operations conducted at this site are carried out in a safe and efficient manner. Before beginning any work on site, all personnel and subcontractors must read and understand this HASP.

A training log for the site personnel expected to work on this TCRA is provided in Table 3. Copies of personnel training certificates are provided in Appendix B.

3.3 Medical Surveillance

All site workers must have a current medical evaluation in accordance with respirator protection and HAZWOPER standards. Personnel with medical restrictions, whether prescribed by their personal physician or the company shall abide by those restrictions. If asked to perform a task and doing so would violate a medical restriction, personnel shall inform the HSO that they are not permitted to perform the requested task.

4. SITE MANAGEMENT AND HEALTH AND SAFETY CONTROLS

4.1 Site Access

Access onto the site will be controlled using a sign in/sign out log. Visitors to the site must be accompanied by site personnel familiar with the TCRA activities being conducted.

4.2 Communication

On-site communication will be conducted through:

- | | | | |
|-------------------------------------|--------------------|-------------------------------------|---------------|
| <input checked="" type="checkbox"/> | Oral Communication | <input type="checkbox"/> | Two-Way Radio |
| <input type="checkbox"/> | Cellular Telephone | <input checked="" type="checkbox"/> | Air Horn |
| <input checked="" type="checkbox"/> | Hand Signals | <input type="checkbox"/> | Siren |
| <input type="checkbox"/> | Other | | |

Communication with off-site personnel will be conducted using mobile, hand-held telecommunication devices such as a cellular telephone.

4.3 Daily Health and Safety Briefing

Each day that TCRA activities are conducted, the HSO, or his/her designee, will conduct a daily health and safety briefing on the following topics, as appropriate:

- The level of personal protective equipment (PPE) required for each task and the decontamination procedures that will be used.
- The monitoring requirements and threshold levels that require a change in PPE.
- A review of emergency procedures that will be instituted in the event of an accident or incident, including but not limited to personnel responsibilities, communications, first aid, and reporting procedures.
- A review of the adequacy of the health and safety measures and procedures implemented to date, noting any deficiencies in the health and safety program or in worker compliance with the program.
- A health and safety topic of interest that is applicable to the day's planned activities.

The Daily Health and Safety briefing must be recorded on the Daily Field Summary Report.

4.4 **Work Zones**

Site health and safety controls must be established prior to the initiation of any field activities. The TCRA activities will be managed and controlled to ensure the safety of site workers, visitors, and the surrounding residential community by establishing a temporary fence around the entire work area. Within the work area, three work zones will be established for each task: the Exclusion Zone (EZ); the Contaminant Reduction Zone (CRZ); and the Support Zone (SZ).

4.4.1 Exclusion Zone

For the TCRA activities, the EZ will generally be defined as the area that encompasses the areas of soil and sediment excavation, stockpiling, and loading. The EZ includes the areas of drilling as well as the area in which the cap will be installed. When personnel enter the EZ wearing PPE they must enter the EZ through the designated entry point and must use the "buddy system." Under these conditions, all persons entering the EZ must be able to:

- Maintain two-way contact with his/her buddy and other site personnel.
- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical exposure and heat stress.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the support personnel (in the SZ), or others if emergency help is needed.

4.4.2 Contaminant Reduction Zone

The CRZ is a designated area immediately adjacent to the EZ within which site personnel and equipment are to be decontaminated. For the TCRA, all personnel must exit the EZ through the CRZ. There will be one and only one CRZ for the soil and sediment excavation, stockpiling, loading, and backfilling operations. No site personnel will be allowed to exit the EZ from areas outside the CRZ.

Exiting the CRZ will require that all contaminants be removed by doffing disposable PPE and/or by decontaminating PPE and equipment at the designated decontamination/wash area within the CRZ. One 55-gallon lined drum will be staged at this location to contain PPE. At the end of each day, the PPE will be removed from the site in accordance with the Transportation and Disposal Plan (T&DP).

4.4.3 Support Zone

The SZ is the outermost area in which work will be conducted and is considered to be a non-contaminated, clean area. The support zone will be equipped with appropriate first-aid materials and equipment to support activities occurring in the EZ and CRZ. The SZ will include the field office trailer and other areas of work not defined by the EZ or CRZ. Visitors will only be allowed to enter the SZ.

4.5 Evacuation Routes

A Site Plan is provided as Figure 1. This plan will be posted in the field office. Emergency meeting areas are identified on this plan along with evacuation routes. The boundaries of the work area including the general boundaries of the EZ, CRZ, and SZ are also shown. The actual location and boundary of work zones will be determined and marked in the field. Existing site conditions such as the prevailing wind direction, locations of utilities, roads, and access for emergency response personnel shall be considered when determining zone locations.

4.6 Health and Safety Audits

The HSO and/or the HSM will conduct health and safety audits. The audits will be documented on a Health and Safety Audit form, an example of which is provided in Appendix C.

4.7 General Health and Safety Control Principles

Other site management and health and safety controls are presented as general safe work practices in Table 4.

5. JOB HAZARD ANALYSIS

The primary objective of this HASP is to specify the measures and procedures to be implemented during the TCRA activities in mitigating the hazards identified through a Job Hazard Analysis (JHA). A Job Hazard Analysis (JHA) of each of the planned TCRA activities has been performed. This analysis involved the identification of the hazards associated with each major TCRA activity. The JHA is presented as Appendix D. A summary of the JHA is provided in Table 5.

The general hazards associated with the planned TCRA activities include physical hazards, chemical hazards, and biological hazards. Every effort will be made to eliminate these hazards. The TCRA activities for which hazards cannot be eliminated will be engineered and planned to reduce the potential for exposure to these hazards. Engineering controls will include the use of PPE. The general hazards associated with the planned TCRA activities are summarized as follows:

Chemical hazards – The primary contaminants-of-concern (COCs) at the site include dioxins/furans. Other COCs include PCBs, VOCs, SVOCs, and metals. The COCs are present at varying concentrations in one or more of the following media: sediment, surface soil, subsurface soil, and groundwater. The hazards associated with these COCs include potential human exposure through inhalation, ingestion, and/or skin absorption. These hazards also include potential exposure to the environment through contaminant transport and dispersion including transport by fugitive dust. A contaminant Fact Sheet for the primary COCs, dioxins/furans, is included in Appendix E.

Physical hazards – The primary physical hazards associated with the planned TCRA activities include those that may result in: slips, trips, and falls, particularly along the sloped embankment of the River; drowning; drilling; drum handling; heat stress; cold stress; cuts; foreign objects in the eye; being struck by falling trees; being struck by heavy equipment, or vehicles; electrical shock from power tools; back injuries from lifting; and hearing impairment due to excessive noise from equipment and machinery.

Biological hazards – The biological hazards at the site include those attributed to contact with flora and fauna. Contact with poisonous plants such as poison ivy or sumac may result in allergic reactions to site personnel. Hazards attributed to contact with fauna may arise from

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parasitic contact, defensive contact by insects or mammals, and disease-inspired contact including contact from ticks.

6. HAZARD MITIGATION MEASURES

Based on the hazards identified through the JHA process, measures and procedures have been prescribed to eliminate or reduce the potential for exposure to these hazards. The Hazard Mitigation Measures are included in Appendix F. These measures include engineering controls such as the use of PPE. For each planned TCRA task, the appropriate level of PPE is identified in Table 6. A description of the OSHA levels of PPE is provided in Table 7.

The JHA was performed to identify the appropriate level of monitoring needed to assess the need to modify the prescribed level of PPE. The monitoring requirements are identified in Table 8, along with action levels that may trigger the need to modify the prescribed level of PPE. Copies of Air Monitoring Logs are provided in Appendix G.

If respirators are to be donned, then the site personnel must adhere to LEA's respiratory protection program. Facial hair that interferes with the respirator seal will not be allowed. Copies of Air Purifying Respirator Logs are provided in Appendix H.

7. COMMUNITY AIR MONITORING PLAN

7.1 Overview

The purpose of this Community Air Monitoring Plan (CAMP) is to define the safety measures and procedures to be implemented at the site to limit the potential for site workers, visitors, and members of the surrounding community to be exposed to risks associated with contaminants that become airborne during the TCRA activities. The safety measures and procedures to be implemented during these activities include real-time air monitoring for dust, mists, and aerosols (particulate matter, PM) and VOCs. Monitoring will be conducted along the perimeter of the work areas while the soil and sediment excavation, stockpiling, loading, and backfilling, activities are ongoing. The real-time air monitoring will be conducted to alert site workers that threshold levels that are defined in this CAMP may be exceeded if modifications to existing procedures or site conditions are not made. The specific air monitoring procedures and mitigation measures to be implemented in accordance with this CAMP are described in the sections that follow.

7.2 Meteorological Data

The HSO or his/her designee will record site meteorological data consisting of wind speed, wind direction, temperature, and barometric pressure. These data will be recorded using a Davis Corporation wireless instrument station. The meteorological data will be recorded at a minimum of two times each day. These results will be utilized to position the air monitoring equipment in appropriate upwind and downwind locations.

7.3 Air Monitoring Procedures

Portable air monitoring equipment will be used to record concentrations of PM and VOCs. This equipment will be stationed appropriately based upon the wind direction. Background levels of PM and VOCs in air will be established by measuring and recording the concentrations of PM and VOCs at a location that is upwind (background) of the work area. These background levels will be established on a daily basis at the start of each work day, and periodically throughout the day if weather conditions result in a change to upwind and downwind locations relative to the work area. In addition, PM and VOC monitoring will be conducted at two monitoring stations that are located along the downwind boundary of the work area. The monitoring equipment will

be set at a height of approximately four to five feet above the ground surface to measure the air concentrations within the breathing zone of an average adult.

Field personnel will be responsible for calibrating all meteorological and air monitoring equipment at the start of each day and as necessary throughout each work day. Also, field personnel will be responsible for setting up and checking the PM and VOC measurements/alarms at each monitoring station. Other responsibilities will include inspections of the work area, equipment, and off-site area for any dust or other visible emissions which are present during the TCRA activities.

7.4 Action Levels

Concentrations of PM are generally classified by aerodynamic particle size, which is specified in microns. A subscript is used to denote the size classification of the PM, so PM less than 10 microns in diameter is usually indicated as PM₁₀. The National Ambient Air Quality Standards (NAAQS), adopted by USEPA, establishes the maximum concentrations and time periods that are considered acceptable for PM₁₀. Over a 24-hour period, an average concentration of 0.150 milligrams per cubic meter (mg/m³) or 150 micrograms per cubic meter (µg/m³) of PM₁₀ will meet the NAAQS.

If the downwind PM₁₀ particulate level is 150 µg/m³ greater than background (upwind perimeter) for the 15-minute period, then dust suppression techniques shall be employed. Also, if dust is visible, all work will cease and preventative measures to eliminate the generation of fugitive dust will be implemented. Work may continue with dust suppression techniques, provided that downwind PM₁₀ particulate levels do not exceed 150 µg/m³ above the upwind level and provided that no visible dust is detected. If, after implementation of dust suppression techniques, downwind PM₁₀ particulate levels are greater than 150 µg/m³ above the upwind level, work shall cease and methods and procedures shall be re-evaluated and changes shall be initiated to reduce particulate levels to less than 150 µg/m³ above background conditions and to prevent the generation of visible dust.

The VOC action level will be set at 5 parts per million (ppm) measured using a Photovac 2020 photoionization detector (PID) calibrated to an isobutylene standard of 100 ppm. In defining this action level, the American Conference of Governmental Industrial Hygienist's (ACGIH's) lowest "do not exceed" level for all potential contaminants of concern was used as an upper

limit. Vinyl chloride at 5 ppm was used as the worst-case scenario. Should the downwind VOC levels exceed 5 ppm for the 15-minute average, then work will cease until one or more preventative measures are in place or other actions are taken to eliminate the concentrations of VOCs in air beyond the work area.

7.5 Preventative Measures

Site workers will be instructed to perform their tasks in a manner that does not generate volatile emissions or dust. These instructions will be reiterated during daily health and safety briefings. The preventative measures to be employed may include, but may not be limited to:

- Reviewing the planned operations for each day, with a focus on understanding the anticipated concentrations of compounds to be encountered.
- Reviewing meteorological and field conditions that may affect the potential for dust and volatile emissions during operations. Such conditions include wind direction and speed, temperature, amount of cloud cover, antecedent moisture condition, and the relative dryness/wetness of the soil.
- Maintaining the appropriate volatile emission control materials in the work area such that they are in place and ready to be used. The materials to be used during the TCRA include Rusmar AC-904 (or equivalent). A copy of the Material Safety Data Sheet (MSDS) for this product, as well as the MSDS for the polymer to be mixed with excavated soil and sediment to adsorb free liquids, is provided in Appendix I.
- Apply water directly to the soil and sediment, as may be needed, following excavation to moisten the soil and sediment to minimize the release of volatile emissions and the generation of fugitive dust.
- Cover stockpiled soil and sediment with tarps, polyethylene sheeting, or similar material as needed and at the end of each work day.

8. DECONTAMINATION

Both dry and wet decontamination procedures are to be used during the implementation of the TCRA. A summary of these procedures is provided in Table 9.

9. EMERGENCY MANAGEMENT PLAN

A list of Emergency Contacts for the site is provided in Appendix J. A map that demarcates the shortest route to the nearest hospital is also provided in Appendix J. This information must be posted in the field office and is to be reviewed by all site personnel.

The emergency response and health and safety equipment to be maintained in the field office or on the site includes a first aid kit and fire extinguishers. A fire extinguisher (Type ABC) is to be provided in each field vehicle.

In addition, an Emergency Management Plan (EMP) has been developed and is designed to protect personnel, property, and the environment from hazardous releases as well as from accidents that occur during the implementation of the TCRA for the Groundwater Action Area. The EMP is provided as Appendix K. The plan describes the emergency management system and the procedures to respond to releases and emergencies. This plan also describes the countermeasures to minimize any adverse impact to the environment, and to reduce injuries from hazardous conditions resulting from accidents. The procedures outlined in this plan are to be carried out immediately whenever there is a fire, explosion, spill, or release of hazardous constituents that could threaten human health or the environment. This EMP applies to all spills, releases, fires, explosions, or other hazardous conditions regardless of size.

An Accident Investigation/Incident Report Form, provided in Appendix L, is to be completed by the personnel involved whenever there is a near miss or accident. The completed form is to be submitted to the HSS and HSM.

10. CONFINED SPACE ENTRY

The TCRA activities include confined space entry during the soil and sediment excavation and water treatment system decontamination activities. The LEA Confined Space Entry program summarized as Appendix M shall be followed during these activities.

TABLES

Table 1

**TASKS TO BE PERFORMED
 TIME-CRITICAL REMOVAL ACTION
 SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA**
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

Tasks To Be Performed
Site Preparation – Mobilization/Demobilization; Remove cedar fence; Erect temporary fence and signs; Clearing; Construct Tracking Pad/Decontamination Wash Station; Install Soil Containment Bins; Utility Disconnects; Asphalt/Concrete Removal
Pre-Condition / Site Survey
Monitoring Well/Piezometer Abandonment
Install Cofferdam/Steel Sheet piling
Construction Dewatering and Water Treatment
Excavate Impacted Soil and Sediment
Load Impacted Soil and Sediment/Backfilling
Install Cap
Site Restoration
Piezometer Installation and Development
Groundwater Sampling
Air Monitoring

Table 2

**HEALTH & SAFETY RESPONSIBILITIES OF PROJECT PERSONNEL
 TIME-CRITICAL REMOVAL ACTION
 SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910**

Health & Safety Manager (HSM)	Health & Safety Supervisor (HSS)	Health & Safety Officer (HSO)	Site Personnel
<ul style="list-style-type: none"> • Responsible for making company-wide decisions concerning health and safety • Provides Health and Safety guidance regarding site-specific risks, which are based upon information provided in the site history and condition, and ongoing daily on-site monitoring 	<ul style="list-style-type: none"> • Responsible for providing health and safety guidance to the HSO, site personnel, and contractors on the requirements of this HASP • Assist the HSM in identifying potential hazards • Assist the HSM in identifying the resources needed to complete the work safely • Assist the HSM in identifying PPE, engineering controls, and emergency response procedures • Assist the HSO in briefing site personnel about the site hazards and proper procedures to control them • Assist the HSO in monitoring compliance with 	<ul style="list-style-type: none"> • Develop the HASP and associated Emergency Management Plan • Assure compliance with the HASP • Maintain Health and Safety records • Instruct site workers on the requirements of the HASP and the Emergency Management Plan • Assure that the appropriate health and safety materials, supplies, and equipment are available and properly utilized by all site workers • Correct any work practices or conditions under HSO control that may result in exposure to hazardous substances or injury to personnel • Brief the HSS and HSM on site health and safety issues • Conduct Daily Health and Safety briefings • Keep a copy of the HASP on-site and readily accessible to all employees, contractors and visitors • Assure that any employee wearing a respirator has been trained, medically evaluated and fit tested according to the OSHA respiratory standard • Assure that all site workers have been trained in 	<ul style="list-style-type: none"> • Maintain OSHA training requirements for HAZWOPER and Construction activities. • Visitors are to be escorted at the site. • Provide certification that they have read this HASP, understand the procedures by signing the HASP Plan Acceptance Form • Attend daily Health and Safety briefings. • Be aware of anticipated chemical, physical, and biological hazards and know what to do when these hazards are encountered. • Be trained on PPE-use, safe work practices, decontamination procedures, emergency procedures, and hazard communications. • Properly use the required PPE and respiratory protective equipment.

Health & Safety Manager (HSM)	Health & Safety Supervisor (HSS)	Health & Safety Officer (HSO)	Site Personnel
	<p>the HASP and implementing corrective actions as soon as deficiencies are identified</p> <ul style="list-style-type: none"> Assist the HSO in preparing and submitting health and safety reports including those for accidents and incidents 	<p>PPE requirements and the OSHA Hazard Communication standard</p> <ul style="list-style-type: none"> Look for signs and symptoms of potential employee exposure to site hazards and correct any unsafe conditions as soon as possible Maintain good housekeeping Complete employee accident investigation reports, including a State of Rhode Island Employer's First Report of Injury for all accidents and injuries and submit the reports promptly to the HSS, HSM, and LEA management Initiate and oversee emergency procedures as specified in this HASP and the Emergency Management Plan Maintain effective site operations, minimize the number of personnel and equipment in the exclusion zone or contaminated area. Ensure that modifications to the HASP are approved by the HSS and HSM. 	<ul style="list-style-type: none"> Have a current medical evaluation in compliance with OSHA regulations for HAZWOPER activities, including respiratory protection. Be fit tested and physically capable of using a respirator (if/when one is required). Should respiratory protection be required, field workers shall not have facial hair that interferes with its proper fit. Use the buddy system. When working in the exclusion zone, maintain visual contact with a buddy and other personnel in the area; field personnel should be close enough to assist each other during an emergency. Procedures for entering and leaving the exclusion zone must be planned and all necessary equipment must be present before entering the exclusion zone.

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

EMPLOYEE NAME	COMPANY	JOB CLASS	AERIAL & SCISSOR LIFT (Good for 3 Years)	ASBESTOS ABATEMENT SUPERVISOR (40 HOUR INITIAL COURSE), 40 CFR PART 763 & CT TITLE 19a PART 332a-22	CONCEPTUAL SITE MODELING	CONFINED SPACES
Averill, Margaret	NH, WW	Vice President				
Brisson, David	LEA	Sr. Project Geologist				4/2/09 LEA
Brown, Charles (Scott)	LEA	Sr. Technician			5/7/04 & 6/22/05 Skoularikis	4/2/09 LEA
Clarke, Alexander	LEA	Sr. Technician			5/7/04 Skoular kis	11/28/05 Susca
D'Amico, Richard	LEA	Scientist			5/3/06 Skoular kis	1/6/06 Susca, Myska
Darigis, Gregory	LEA	Sr. Technician				
Dow, Jeffery	NH, WW	Technical Specialist				
Easler, Roger	LCI	Driver				
Emmons, Nathan	LEA	Scientist 1				4/2/09 LEA
Gallagher, Michael	LCI	Yard Manager	8/28/08, Myska & Buzz			
Gelinas, Paul	NH, WW	Env. Field Technician				

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

EMPLOYEE NAME	COMPANY	JOB CLASS	CT CRANE OP. LICENSE	CT HOISTING CERTIFICATE	DISASTER SITE WORKER	DOT HAZARDOUS MATERIALS SHIPMENT 49 CFR PART 172, SUBPART H	DRIVER SAFETY AWARENESS	ERGONOMICS AWARENESS
Averill, Margaret	NH, WW	Vice President						
Brisson, David	LEA	Sr. Project Geologist				2/2/07 Berdeen		
Brown, Charles (Scott)	LEA	Sr. Technician				12/7/07 Berdeen		
Clarke, Alexander	LEA	Sr. Technician				8/20/08 Berdeen		
D'Amico, Richard	LEA	Scientist				9/14/07 Berdeen	12/20/06 Computer	
Darigis, Gregory	LEA	Sr. Technician						
Dow, Jeffery	NH, WW	Technical Specialist				8/12/08 Berdeen		
Easler, Roger	LCI	Driver						
Emmons, Nathan	LEA	Scientist 1				12/7/07 Berdeen		
Gallagher, Michael	LCI	Yard Manager				8/20/08 Berdeen		
Gelinas, Paul	NH, WW	Env. Field Technician				8/12/08 Berdeen		

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

EMPLOYEE NAME	COMPANY	JOB CLASS	ELECTRICAL SAFE WORK PRACTICES 29 CFR 1910.333 & NFPA 70E	FALL PROTECTION & FALL ARREST SYSTEMS	FIRST AID	CPR	BBP
Averill, Margaret	NH, WW	Vice President					
Brisson, David	LEA	Sr. Project Geologist			7/19/07 Sitler	7/19/07 Sitler	7/19/07 Sitler
Brown, Charles (Scott)	LEA	Sr. Technician			7/19/07 Sitler	7/19/07 Sitler	7/19/07 Sitler
Clarke, Alexander	LEA	Sr. Technician			7/12/07 Sitler	7/12/07 Sitler	7/12/07 Sitler
D'Amico, Richard	LEA	Scientist			9/17/08 Sitler	9/17/08 Sitler	9/17/08 Sitler
Darigis, Gregory	LEA	Sr. Technician			7/12/07 Sitler	7/12/07 Sitler	7/12/07 Sitler
Dow, Jeffery	NH, WW	Technical Specialist			10/21/08 Sitler	10/21/08 Sitler	10/21/08 Sitler
Easler, Roger	LCI	Driver					
Emmons, Nathan	LEA	Scientist 1					
Gallagher, Michael	LCI	Yard Manager					
Gelinas, Paul	NH, WW	Env. Field Technician			9/17/08 Sitler	9/17/08 Sitler	9/17/08 Sitler

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

AED	EMPLOYEE NAME	COMPANY	JOB CLASS	FORKLIFT	GROUNDBREAKING	HAZARD COMMUNICATION	HAZARDOUS WASTE OPERATIONS 40-HOUR
	Averill, Margaret	NH, WW	Vice President			November-98	November-97
7/19/07 Sittler	Brisson, David	LEA	Sr. Project Geologist			November-98	June-92
7/19/07 Sittler	Brown, Charles (Scott)	LEA	Sr. Technician		9/22/08 Myska	July-01	May-99
7/12/07 Sittler	Clarke, Alexander	LEA	Sr. Technician				January-04
9/17/08 Sittler	D'Amico, Richard	LEA	Scientist				1/26/06 CONDOR
7/12/07 Sittler	Darigis, Gregory	LEA	Sr. Technician				5/18/06 CONDOR
10/21/08 Sittler	Dow, Jeffery	NH, WW	Technical Specialist				6/16/09 NE Consortium
	Easler, Roger	LCI	Driver			7/19/01 Twomey	3/2000, Field Safety Corp.
	Emmons, Nathan	LEA	Scientist 1				10/11/07 CONDOR
	Gallagher, Michael	LCI	Yard Manager	8/28/08, Myska & Buzz			
9/17/08 Sittler	Gelinas, Paul	NH, WW	Env. Field Technician				6/16/09, NE Consortium

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

HAZARDOUS WASTE OPERATIONS 8-HOUR SUPERVISOR	EMPLOYEE NAME	COMPANY	JOB CLASS	HAZARDOUS WASTE OPERATIONS 8-HOUR REFRESHER 29 CFR 1910.120(e)(8) & 1926.65(e)(8)	HOISTING AND RIGGING	INCIDENT INVESTIGATION & RCA
	Averill, Margaret	NH, WW	Vice President	June-07		7/15/09 Susca; 7/21/04 Susca
	Brisson, David	LEA	Sr. Project Geologist	3/4/09 LEA		
	Brown, Charles (Scott)	LEA	Sr. Technician	3/4/09 LEA		
	Clarke, Alexander	LEA	Sr. Technician		3/4/09 LEA	2/20/08 Susca
	D'Amico, Richard	LEA	Scientist	3/4/09 LEA		
	Darigis, Gregory	LEA	Sr. Technician	3/31/09 LEA		
	Dow, Jeffery	NH, WW	Technical Specialist			
	Easler, Roger	LCI	Driver	3/4/09 LEA		
	Emmons, Nathan	LEA	Scientist 1	3/31/09 LEA		
	Gallagher, Michael	LCI	Yard Manager	2/21/08 TW		
	Gelinas, Paul	NH, WW	Env. Field Technician	6/16/09 NE Consortium (site worker)		

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

Job Hazard Analysis	Laser Operator	EMPLOYEE NAME	COMPANY	JOB CLASS	LEAD AWARENESS, Enviromed Services, 4 Hours, 29 CFR 1910.1025	LEAD ABATEMENT WORKER (32 HOUR INITIAL COURSE), CT GEN. STATUTE 20-477	LO/TO Control of Hazardous Energy 29 CFR 1910.147
7/27/04 Susca		Averill, Margaret	NH, WW	Vice President			
9/17/04 Susca		Brisson, David	LEA	Sr. Project Geologist			
		Brown, Charles (Scott)	LEA	Sr. Technician	9/17/04 Susca		6/16/06 Myska, Beck
9/17/04 Susca		Clarke, Alexander	LEA	Sr. Technician			
		D'Amico, Richard	LEA	Scientist			
		Darigis, Gregory	LEA	Sr. Technician			
		Dow, Jeffery	NH, WW	Technical Specialist			
		Easler, Roger	LCI	Driver			
		Emmons, Nathan	LEA	Scientist 1			
		Gallagher, Michael	LCI	Yard Manager			
		Gelinas, Paul	NH, WW	Env. Field Technician			

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

MEDICAL EXAMINER'S CERTIFICATION	MTAC SAFETY & COMPLIANCE TRAINING	EMPLOYEE NAME	COMPANY	JOB CLASS	OSHA 10-HOUR CONSTRUCTION	OSHA 30-HOUR CONSTRUCTION	OSHA 10-HOUR GENERAL INDUSTRY
		Averill, Margaret	NH, WW	Vice President			
		Brisson, David	LEA	Sr. Project Geologist			
		Brown, Charles (Scott)	LEA	Sr. Technician			
		Clarke, Alexander	LEA	Sr. Technician			
		D'Amico, Richard	LEA	Scientist			
		Darigis, Gregory	LEA	Sr. Technician			
expires 10/3/09		Dow, Jeffery	NH, WW	Technical Specialist			
Expires 2/15/10	5/15/07	Easler, Roger	LCI	Driver			
		Emmons, Nathan	LEA	Scientist 1			
Expires 5/16/09		Gallagher, Michael	LCI	Yard Manager			
Expires 4/3/10		Gelinas, Paul	NH, WW	Env. Field Technician	10/4/07, Wendy Johnson		

Table 3

**SITE PERSONNEL TRAINING LOG
 TIME-CRITICAL REMOVAL ACTION
 SHALLOW GROUNDWATER REMEDY - GROUNDWATER**

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Centredale Manor Restoration Project Superfund
 North Providence, Rhode Island 02910

OSHA 30-HOUR GENERAL INDUSTRY	PLUMBING & PIPING LIMITED CONTRACTOR, P7, STATE OF CT	EMPLOYEE NAME	COMPANY	JOB CLASS	POWDER ACTUATED TOOLS	RCRA HAZARDOUS WASTE 40 CFR PARTS 262 & 265
		Averill, Margaret	NH, WW	Vice President		
		Brisson, David	LEA	Sr. Project Geologist		3/5/09 Paradis
		Brown, Charles (Scott)	LEA	Sr. Technician		3/5/09 Paradis
		Clarke, Alexander	LEA	Sr. Technician		3/5/09 Paradis
		D'Amico, Richard	LEA	Scientist		3/5/09 Paradis
		Darigis, Gregory	LEA	Sr. Technician		
		Dow, Jeffery	NH, WW	Technical Specialist		
		Easler, Roger	LCI	Driver		
		Emmons, Nathan	LEA	Scientist 1		3/5/09 Paradis
		Gallagher, Michael	LCI	Yard Manager		8/20/08 Berdeen
		Gelinas, Paul	NH, WW	Env. Field Technician		

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SCAFFOLD SAFETY COMPETENT PERSON	SEXUAL HARRASSMENT PREVENTION	EMPLOYEE NAME	COMPANY	JOB CLASS
		Averill, Margaret	NH, WW	Vice President
		Brisson, David	LEA	Sr. Project Geologist
		Brown, Charles (Scott)	LEA	Sr. Technician
		Clarke, Alexander	LEA	Sr. Technician
		D'Amico, Richard	LEA	Scientist
April-06		Darigis, Gregory	LEA	Sr. Technician
		Dow, Jeffery	NH, WW	Technical Specialist
		Easler, Roger	LCI	Driver
		Emmons, Nathan	LEA	Scientist 1
		Gallagher, Michael	LCI	Yard Manager
		Gelinas, Paul	NH, WW	Env. Field Technician

Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
NDWATER REMEDY - GROUNDWATER ACTION AREA
 Jale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

SITE PERSONNEL
TIME-CRITICAL
SHALLOW GROUNDWATER INVESTIGATION
 Centredale Manor Facility
 North Providence, Rhode Island

Standard Operating Procedures (Loureiro Engineering Associates, Inc.)	TRENCHING & EXCAVATIONS COMPETENT PERSON	EMPLOYEE NAME	COMPANY	JOB CLASS	WASTE MANIFESTING
		Averill, Margaret	NH, WW	Vice President	
4/13/06 Skoularikis		Brisson, David	LEA	Sr. Project Geologist	
5/16/02, 7/25/03, 2/4/05, 1/20/06 & 4/13/06 Skoularikis		Brown, Charles (Scott)	LEA	Sr. Technician	8/23/06 Averill
2/4/05, 1/20/06 & 4/13/06 Skoularikis	1/13/06 Safety Priority	Clarke, Alexander	LEA	Sr. Technician	
1/20/06, 2/3/06 Skoularikis	1/13/06 Safety Priority	D'Amico, Richard	LEA	Scientist	
		Darigis, Gregory	LEA	Sr. Technician	
		Dow, Jeffery	NH, WW	Technical Specialist	
	1/5/00 CONDOR	Easler, Roger	LCI	Driver	
		Emmons, Nathan	LEA	Scientist 1	
		Gallagher, Michael	LCI	Yard Manager	
		Gelinas, Paul	NH, WW	Env. Field Technician	

Table 3
SONNEL TRAINING LOG
ICAL REMOVAL ACTION
REMEDY - GROUNDWATER ACTION AREA
 Restoration Project Superfund Site
 lence, Rhode Island 02910

WELDER CERTIFICATION	MISCELLANEOUS			
	*7/2/08, Foley DOT Training, Kelly Canty			
	*7/2/08, Foley DOT Training (incl. CDL), Kelly Canty			
	6/3/09, Inspector Initial Training (expires 6/3/2010), ATC Associates; 6/10/09, Asbestos Site Inspector Initial Training (expires 6/10/2010), ATC Associates; 6/3/09, EPA Lead Inspector Technician Training (expires 12/3/09), ATC Associates			
	*7/2/08, Foley DOT Training (incl. CDL), Kelly Canty			
	NH Weighmaster License expires 6/30/09			

Gordon, Bob	LCI	Foreman	8/28/08, Myska & Buzz			3/13/08 Myska, 7/2/07 Susca, Myska, 11/19/05 Susca
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

EMPLOYEE NAME	COMPANY	JOB CLASS	AERIAL & SCISSOR LIFT (Good for 3 Years)	ASBESTOS ABATEMENT SUPERVISOR (40 HOUR INITIAL COURSE), 40 CFR PART 763 & CT TITLE 19a PART 332a-22	CONCEPTUAL SITE MODELING	CONFINED SPACES
Grimm, Heather	LEA	Scientist				
Griswold, Sue	LCI	Laborer	4/2/07 Myska			9/16/08 Laborer's Union, 3/13/08 Myska, 10/2/07 Myska
Murdock, Steve	LEA	Sr. Project Scientist				4/2/09 LEA
Scotti, David	LEA	Project Manager			6/22/05, 8/22/06 Skoular kis	
Sweeton, Jon	LEA	Sr. Technician			5/3/06 Skoular kis	11/28/05 Susca
Tudisca, Santo	LCI	General Superintendent	8/28/08, Myska & Buzz			11/1/08 IUOE, 11/19/05 Susca

Gordon, Bob	LCI	Foreman						
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

EMPLOYEE NAME	COMPANY	JOB CLASS	CT CRANE OP. LICENSE	CT HOISTING CERTIFICATE	DISASTER SITE WORKER	DOT HAZARDOUS MATERIALS SHIPMENT 49 CFR PART 172, SUBPART H	DRIVER SAFETY AWARENESS	ERGONOMICS AWARENESS
Grimm, Heather	LEA	Scientist				2/2/07 Berdeen		10/10/08 Gaouette
Griswold, Sue	LCI	Laborer						
Murdock, Steve	LEA	Sr. Project Scientist				8/14/01 Mark Morgano		
Scotti, David	LEA	Project Manager				1994 GTI		
Sweeton, Jon	LEA	Sr. Technician				12/7/07 Berdeen		
Tudisca, Santo	LCI	General Superintendent			4/16/07, OSHA			

Gordon, Bob	LCI	Foreman	11/18/04 Susca		9/17/08 Sitler	9/17/08 Sitler	9/17/08 Sitler
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

EMPLOYEE NAME	COMPANY	JOB CLASS	ELECTRICAL SAFE WORK PRACTICES 29 CFR 1910.333 & NFPA 70E	FALL PROTECTION & FALL ARREST SYSTEMS	FIRST AID	CPR	BBP
Grimm, Heather	LEA	Scientist					
Griswold, Sue	LCI	Laborer					
Murdock, Steve	LEA	Sr. Project Scientist			4/6/2006 SCCT Chapter	8/7/08 Earth Technology	
Scotti, David	LEA	Project Manager	11/18/04 Susca				
Sweeton, Jon	LEA	Sr. Technician	11/18/04 Susca		10/21/08 Sitler	10/21/08 Sitler	10/21/08 Sitler
Tudisca, Santo	LCI	General Superintendent					

9/17/08 Sittler	Gordon, Bob	LCI	Foreman	8/28/08, Myska & Buzz			1/27/05 CONDOR
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

AED	EMPLOYEE NAME	COMPANY	JOB CLASS	FORKLIFT	GROUND BREAKING	HAZARD COMMUNICATION	HAZARDOUS WASTE OPERATIONS 40-HOUR
	Grimm, Heather	LEA	Scientist		9/22/08 Myska		1/5/07 CONDOR
	Griswold, Sue	LCI	Laborer			9/10/08 Laborer's Union	9/19/08 Laborer's Union (40 or 8?)
	Murdock, Steve	LEA	Sr. Project Scientist		9/22/2008 Myska	1/31/00 Twomey	2/3/00 CONDOR
	Scotti, David	LEA	Project Manager			10/02/1998 GeoSyntec; 7/19/01 Twomey	6/8/87 Groundwater Technology
10/21/08 Sittler	Sweeton, Jon	LEA	Sr. Technician		9/22/08 yska	November-98	8/3/90, 24-hour, Industrial H&S Consultants; 5/1/91, 40-hour, Field Safety Consulting
	Tudisca, Santo	LCI	General Superintendent	8/28/08, Myska & Buzz		1/28/05, IUOE	

	Gordon, Bob	LCI	Foreman	3/4/09 LEA		
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

HAZARDOUS WASTE OPERATIONS 8-HOUR SUPERVISOR	EMPLOYEE NAME	COMPANY	JOB CLASS	HAZARDOUS WASTE OPERATIONS 8-HOUR REFRESHER 29 CFR 1910.120(e)(8) & 1926.65(e)(8)	HOISTING AND RIGGING	INCIDENT INVESTIGATION & RCA
	Grimm, Heather	LEA	Scientist	3/4/09 LEA		
	Griswold, Sue	LCI	Laborer	4/14/08 LEA		
	Murdock, Steve	LEA	Sr. Project Scientist		3/4/09 LEA	
3/23/1990 GTI; 1/14/2005 Susca	Scotti, David	LEA	Project Manager	4/9/07 Myska		6/2/09 Susca
	Sweeton, Jon	LEA	Sr. Technician	3/31/09 LEA		
November 2009 IUOE	Tudisca, Santo	LCI	General Superintendent			

2/15/2006; 8/11/04 Susca		Gordon, Bob	LCI	Foreman	9/12/08 at LEA		4/5/05 (Authorized) Susca; 9/15/04 Susca
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

Job Hazard Analysis	Laser Operator	EMPLOYEE NAME	COMPANY	JOB CLASS	LEAD AWARENESS, Enviromed Services, 4 Hours, 29 CFR 1910.1025	LEAD ABATEMENT WORKER (32 HOUR INITIAL COURSE), CT GEN. STATUTE 20-477	LO/TO Control of Hazardous Energy 29 CFR 1910.147
		Grimm, Heather	LEA	Scientist			
		Griswold, Sue	LCI	Laborer	2008 LEA (Williamson)		
		Murdock, Steve	LEA	Sr. Project Scientist	2008 LEA (Williamson)		
7/27/04 Susca		Scotti, David	LEA	Project Manager			
9/17/04 Susca		Sweeton, Jon	LEA	Sr. Technician			4/5/05 (Authorized) Susca; 9/23/04 (Awareness) Susca
2/15/06		Tudisca, Santo	LCI	General Superintendent	9/12/08 at LEA		4/5/05 (Authorized) Susca

		Gordon, Bob	LCI	Foreman	10/1/08 Click Safety		
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

MEDICAL EXAMINER'S CERTIFICATION	MTAC SAFETY & COMPLIANCE TRAINING	EMPLOYEE NAME	COMPANY	JOB CLASS	OSHA 10-HOUR CONSTRUCTION	OSHA 30-HOUR CONSTRUCTION	OSHA 10-HOUR GENERAL INDUSTRY
		Grimm, Heather	LEA	Scientist			
		Griswold, Sue	LCI	Laborer	9/10/08 Peter Rice		
		Murdock, Steve	LEA	Sr. Project Scientist			
		Scotti, David	LEA	Project Manager			
		Sweeton, Jon	LEA	Sr. Technician			
7/25/07, expires 7/25/09		Tudisca, Santo	LCI	General Superintendent	7/27/06, David D'Ostilio		

		Gordon, Bob	LCI	Foreman		
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Table 3

**SITE PERSONNEL TRAINING LOG
 TIME-CRITICAL REMOVAL ACTION
 SHALLOW GROUNDWATER REMEDY - GROUNDWATER**
 Centredale Manor Restoration Project Superfund
 North Providence, Rhode Island 02910

N AREA

OSHA 30-HOUR GENERAL INDUSTRY	PLUMBING & PIPING LIMITED CONTRACTOR, P7, STATE OF CT	EMPLOYEE NAME	COMPANY	JOB CLASS	POWDER ACTUATED TOOLS	RCRA HAZARDOUS WASTE 40 CFR PARTS 262 & 265
		Grimm, Heather	LEA	Scientist		3/5/09 Paradis
		Griswold, Sue	LCI	Laborer		
		Murdock, Steve	LEA	Sr. Project Scientist		
		Scotti, David	LEA	Project Manager		
		Sweeton, Jon	LEA	Sr. Technician		12/7/07 Nave
		Tudisca, Santo	LCI	General Superintendent		

1/27/06 Safety Priority		Gordon, Bob	LCI	Foreman
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SCAFFOLD SAFETY COMPETENT PERSON	SEXUAL HARRASSMENT PREVENTION	EMPLOYEE NAME	COMPANY	JOB CLASS
		Grimm, Heather	LEA	Scientist
		Griswold, Sue	LCI	Laborer
		Murdock, Steve	LEA	Sr. Project Scientist
	12/10/04 Wheeler Clinic	Scotti, David	LEA	Project Manager
		Sweeton, Jon	LEA	Sr. Technician
1/27/06 Safety Priority		Tudisca, Santo	LCI	General Superintendent

	1/27/06 Safety Priority	Gordon, Bob	LCI	Foreman	
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Table 3
SITE PERSONNEL TRAINING LOG
TIME-CRITICAL REMOVAL ACTION
NDWATER REMEDY - GROUNDWATER ACTION AREA
 Dale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

SITE PERSONNEL
TIME-CRITICAL
SHALLOW GROUNDWATER ACTION AREA
 Centredale Manor F
 North Providence

Standard Operating Procedures (Loureiro Engineering Associates, Inc.)	TRENCHING & EXCAVATIONS COMPETENT PERSON	EMPLOYEE NAME	COMPANY	JOB CLASS	WASTE MANIFESTING
		Grimm, Heather	LEA	Scientist	
		Griswold, Sue	LCI	Laborer	
	5/3/03 Training Solutions Assoc.	Murdock, Steve	LEA	Sr. Project Scientist	
7/25/03, 2/4/05, 9/14/05, 9/23/05 Skoularikis		Scotti, David	LEA	Project Manager	
5/16/02, 7/25/03, 2/4/05, 9/14/05, 9/23/05, 5/26/06 Skoularikis	1/13/06 Safety Priority	Sweeton, Jon	LEA	Sr. Technician	
	1/27/06 Safety Priority	Tudisca, Santo	LCI	General Superintendent	

	Foley "DOT Qualified" D&A Testing Program Coverage - expires 12/31/08; *7/2/0
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Table 3
PERSONNEL TRAINING LOG
PERMIT TO EXCAVATE AND DEMOLITION ACTION
REMEDIATION - GROUNDWATER ACTION AREA
 Restoration Project Superfund Site
 Providence, Rhode Island 02910

WELDER CERTIFICATION	MISCELLANEOUS
	*7/2/08, Foley DOT Training, Kelly Canty
	8/31/06 Respiratory Protection Training - Paul Errico Associates; 12/22/04 Advanced RCRA Topics I & II and Land Disposal Restrictions I & II - McCoy & Associates; 6/16/03 Field Health and Safety Officer Training - Paul Errico Associates; 4/23/03 Petroleum Tanks - Lorman Educational Services
	Transportation Engineering Technology/Highway Construction/Level II, expires 6/1/2012
	State of CT Plumbing and Piping Contractor - expires 10/31/09; 10/20/05, Disaster Site Worker, Dept. of Consumer protection; *7/2/08, Foley DOT Training (incl. CDL), Kelly Canty; 9/9/08, Foley Supervisor Reasonable Suspicion D&A Training, Kelly Canty

Williamson, Timothy	LEA/LCI	Safety Manager	8/28/08, Myska & Buzz			
Zurkowski, Robert	LEA	Technician				

Williamson, Timothy	LEA/LCI	Safety Manager						
Zurkowski, Robert	LEA	Technician						

Williamson, Timothy	LEA/LCI	Safety Manager	2/26/09 Gardner		9/17/08 Sittler	9/17/08 Sittler	9/17/08 Sittler
Zurkowski, Robert	LEA	Technician			7/19/07 Sittler	7/19/07 Sittler	7/19/07 Sittler

9/17/08 Sittler	Williamson, Timothy	LEA/LCI	Safety Manager	8/28/08, Myska & Buzz	9/22/08 Myska		February-97
7/19/07 Sittler	Zurkowski, Robert	LEA	Technician				3/22/07 CONDOR

	Williamson, Timothy	LEA/LCI	Safety Manager	2/5/08 Susca, 6/8/07 Susca		
	Zurkowski, Robert	LEA	Technician	3/31/09 LEA		

7/15/09 Susca; 5/5/09 Susca; 2/20/08 Susca		Williamson, Timothy	LEA/LCI	Safety Manager	9/12/08 at LEA		
		Zurkowski, Robert	LEA	Technician			

		Williamson, Timothy	LEA/LCI	Safety Manager	Instructor, expires 9/27/11	Instructor, expires 9/27/11	
		Zurkowski, Robert	LEA	Technician			

		Williamson, Timothy	LEA/LCI	Safety Manager		
		Zurkowski, Robert	LEA	Technician		

		Williamson, Timothy	LEA/LCI	Safety Manager
		Zurkowski, Robert	LEA	Technician

		Williamson, Timothy	LEA/LCI	Safety Manager	
		Zurkowski, Robert	LEA	Technician	

	9/9/08, Foley Supervisor Reasonable Suspicion D&A Training, Kelly Canty

Table 4
SAFE WORK PRACTICES
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island 02910

Safe Working Requirements

- Smoking is prohibited within the work area, including the support zone.
- There is to be no horseplay while at the site.
- Be cautious of heavy equipment at the site. Operators have limited visibility in close proximity to the equipment and may not necessarily see someone standing directly behind the machine.
- Be cautious of weather conditions. If the weather seems to be unsafe, work activities should be halted until conditions appear to be safe again.
- Be careful while using a cellular phone while at the job site. The use of a cellular phone while driving is prohibited.
- The location of first aid kits, fire extinguishers, exits, refuge locations, and the HASP with emergency phone numbers and directions should be known at all times while at the jobsite.
- Read and understand the conditions which are listed on the Job Hazard Analysis.
- Be aware of emergency communication signals while at the job site.
- Do not use over-the-counter or prescribed drugs in a manner inconsistent with the label (unless approved by a doctor), which may cause conditions such as extreme drowsiness to occur while operating machinery.
- Be aware of any mark outs from Dig Safe Rhode Island or any other private underground utility locator.
- It is important to always ask questions if a specific task has not been clarified before work is started.
- Eating and drinking should not occur in the work or decontamination zones.
- It is important to keep any storage areas clear of hazards which may results in tripping, pests, or harsh chemical reactions. Storage areas should be neat and tidy so that someone can find what he/she is looking for and so that there is no fear of tripping over materials or materials falling on top of someone.
- Use correct personal protective equipment while working at the site.
- Make sure that readings are consistently being taken to monitor the air at both upwind and downwind locations at the site to protect not only the workers at the site, but the community which may be affected by the concentrations of certain contaminants in the air.
- If a worker is not clear on how to perform a task or how to operate a piece of equipment, ask someone who can help.

General Health and Safety Requirements

- Warning signs, barricades, and flag persons will be placed or used as needed to warn others of any site hazards.
- Fire Protection/Fire Prevention: Operations involving the potential for fire hazards shall be conducted in a manner as to minimize the risk of fire. Non-sparking tools and fire extinguishers shall be used or be made available as appropriate. Sources of ignition shall be removed. When necessary, explosion-proof instruments and/or bonding and grounding will be used to prevent fire or explosion. The provisions outlined in 29 CFR 1910 Subpart L, shall apply.
- Fire extinguishers will be placed in heavy equipment and other site vehicles. Access to fire extinguishers will be discussed in the daily health and safety briefing.
- Close access to fire extinguishers shall be maintained at all times.
- A first aid kit will be kept in field office for the duration of all site activities.
- Eyewashes shall be located in areas where chemicals or particulates could get in a person's eyes.
- Chemicals will be properly stored in cabinets.
- Wastes generated during site activities will be placed in appropriate receptacles and labeled in accordance with federal, state, and municipal regulations.

Site Worker Requirements

- Eye protection with side shields will be worn by all personnel while conducting Site work as per 29 CFR 1910.151 (c).
- Head protection (i.e. hard hat) meeting the protection standard of American National Standards Institute (ANSI) Z89.1-1969 will be worn by all personnel entering the work area.
- All Site workers are required to wear steel-toe/shank footwear that complies with ANSI Z41.1-1967.
- Ear protection will be provided in areas where site activities require that workers be exposed to high sound levels (90dBA). If levels are above 85 dBA, workers will comply with the LEA hearing conservation program.
- Eating, drinking, chewing gum or tobacco, smoking, or any practices that increase the probability of hand-to-mouth transfer and ingestion of material are prohibited in any work area.
- Hands and face must be thoroughly washed upon leaving the work area. Provisions for water will be made by the HSO.
- When decontamination procedures for outer garments are in effect, comply with the decontamination procedures required by HSO.
- Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, or discolored surfaces; do not

lean, sit, or kneel on contaminated surfaces. Do not place equipment on contaminated surfaces.

- Field personnel taking prescription and/or non-prescription medication must notify their physician and HSS prior to the fieldwork in order to confirm that the medication will not effect their ability to conduct on-site activities.

Table 5
Summary of Job Hazard Analysis
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island 02910

Tasks To Be Performed	
1 Site Preparation – Mobilization; Clearing	8 Excavate Impacted Soil and Sediment
2 Pre-Condition Site Survey	9 Load/Backfill Excavated Soil/Sediment
3 MW/Piezometer Abandonment	10 Install and Sample Piezometers - Drilling
4 Install Cofferd Dam/Drive Steel Sheet piling	11 Place Cap – Geosynthetic Materials
5 De-watering and Water Treatment	12 Place Cap – Cover Materials
6 LO/TO Utilities	13 Decontamination - Water Treatment System
7 Saw-cut Asphalt/Remove Concrete Curb	14 Site Restoration

TASKS	1	2	3	4	5	6	7	8	9	10	11	12	13	14
PHYSICAL HAZARDS														
Slips, Trips, Falls	X	X									X	X		
Drowning											X	X		
Operating Heavy Equipment	X		X	X				X	X	X	X	X		X
Electricity/Hazardous Energy			X		X	X		X	X	X	X	X		X
Drilling			X							X				
Noise	X	X					X	X	X	X		X		X
Respiratory Impairment (Dust)	X						X	X	X			X		
Excavation and Trenching					X	X		X	X					
Manual Material Handling	X		X		X		X			X	X	X	X	X
Hand/Foot Protection	X		X				X			X	X	X		X
Eye & Face Protection	X		X	X	X	X	X			X			X	
Diesel/Gasoline Exhaust	X		X	X	X		X	X	X	X	X	X	X	X
Cold Stress														
Heat Stress														
Confined Spaces													X	
Fire														
CHEMICAL HAZARDS – Dioxins/Furans; PCBs; VOCs; SVOCs; Metals														
Dermal Exposure			X		X			X	X	X			X	
Respiratory Impairment			X		X			X	X	X			X	
Ingestion			X		X			X	X	X			X	
BIOLOGICAL HAZARDS														
Flora and Fauna	X	X		X										
Insects	X	X		X										
Bloodborne Pathogens	X	X		X									X	
Medical Waste		X												
SEE THE HAZARD MITIGATION MEASURES PROVIDED IN APPENDIX D														

US EPA ARCHIVE DOCUMENT

Table 6

**PERSONAL PROTECTIVE EQUIPMENT
 TIME-CRITICAL REMOVAL ACTION
 SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910**

Tasks To Be Performed	Associated PPE¹ Level
Site Preparation – Mobilization/Demobilization; Remove cedar fence; Erect temporary fence and signs; Clearing; Construct Tracking Pad/Decontamination Wash Station; Install Soil Containment Bins; Utility Disconnects; Asphalt/Concrete Removal	Level D
Pre-Condition / Site Survey	Level D
Monitoring Well/Piezometer Abandonment	Level D
Install Cofferdam/Steel Sheet piling	Level D
Construction Dewatering and Water Treatment	Level D
Excavate Impacted Soil and Sediment	Level C ²
Load Impacted Soil and Sediment/Backfilling	Level C ²
Install Cap	Level D
Site Restoration	Level D
Piezometer Installation and Development	Level D
Groundwater Sampling	Level D
Air Monitoring	Level D

Notes:

- 1 Descriptions of Personal Protection Equipment (PPE) Levels can be found in Table 7.
- 2 PPE Level may be down-graded to Level D based on real-time air monitoring.

Table 7

**LEVELS OF PERSONNEL PROTECTIVE EQUIPMENT
 TIME-CRITICAL REMOVAL ACTION
 SHALLOW GROUNDWATER REMEDY - GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910**

Level D*	Modified Level C	Level C*	Level B*
Coveralls / Outer Protective Clothing	Full-facepiece, air-purifying, canister-equipped respirator	Full-facepiece, air-purifying, canister-equipped respirator	Pressure-demand, full-facepiece SCBA or pressure-demand supplied-air respirator with escape SCBA
Safety boots/shoes	Outer chemical-resistant gloves	Chemical-resistant clothing (coveralls/long-sleeved jacket; hooded one or two piece chemical splash suit; disposable chemical-resistant one-piece suit)	Chemical-resistant clothing (coveralls and long-sleeved jacket; hooded, one or two piece chemical splash suit; disposable chemical-resistant one-piece suit)
Safety glasses/chemical splash goggles	Chemical-resistant safety shoes/boots	Inner and outer chemical-resistant gloves	Inner and outer chemical-resistant gloves
Hard hat	Hard hat	Chemical-resistant safety shoes/boots	Chemical-resistant safety boots/shoes
Gloves (optional)	Tyvek suit (optional)	Hard hat	Hard hat
Escape mask (optional)	Two-way radio (optional)	Two-way radio (optional)	Two-way radio communications
Face shield (optional)	Coveralls (optional)	Coveralls (optional)	Coveralls (optional)
	Disposable boot covers (optional)	Disposable boot covers (optional)	Disposable boot covers (optional)
	Face shield (optional)	Face shield (optional)	Face shield (optional)
	Escape mask (optional)	Escape mask (optional)	Long cotton underwear (optional)
	Long cotton underwear (optional)	Long cotton underwear (optional)	

* All items are referenced in the *NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, dated October 1985

Table 8
NOISE AND AIR MONITORING REQUIREMENTS
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA
 Centredale Manor Restoration Project Superfund Site
 North Providence, Rhode Island 02910

TASKS TO BE PERFORMED				
1 Site Preparation – Mobilization; Clearing	4 Install Cofferdam/Drive Steel Sheet Piling	7 Saw-cut Asphalt/Remove Concrete Curb	10 Install/Sample Piezometers-Drilling	13 Decon - Water Treatment System
2 Pre-Condition Site Survey	5 De-watering and Water Treatment	8 Excavate Impacted Soil and Sediment	11 Place Cap – Geosynthetic Materials	14 Site Restoration
3 MW/Piezometer Abandonment	6 LO/TO Utilities	9 Load/Backfill Excavated Soil/Sediment	12 Place Cap – Cover Materials	

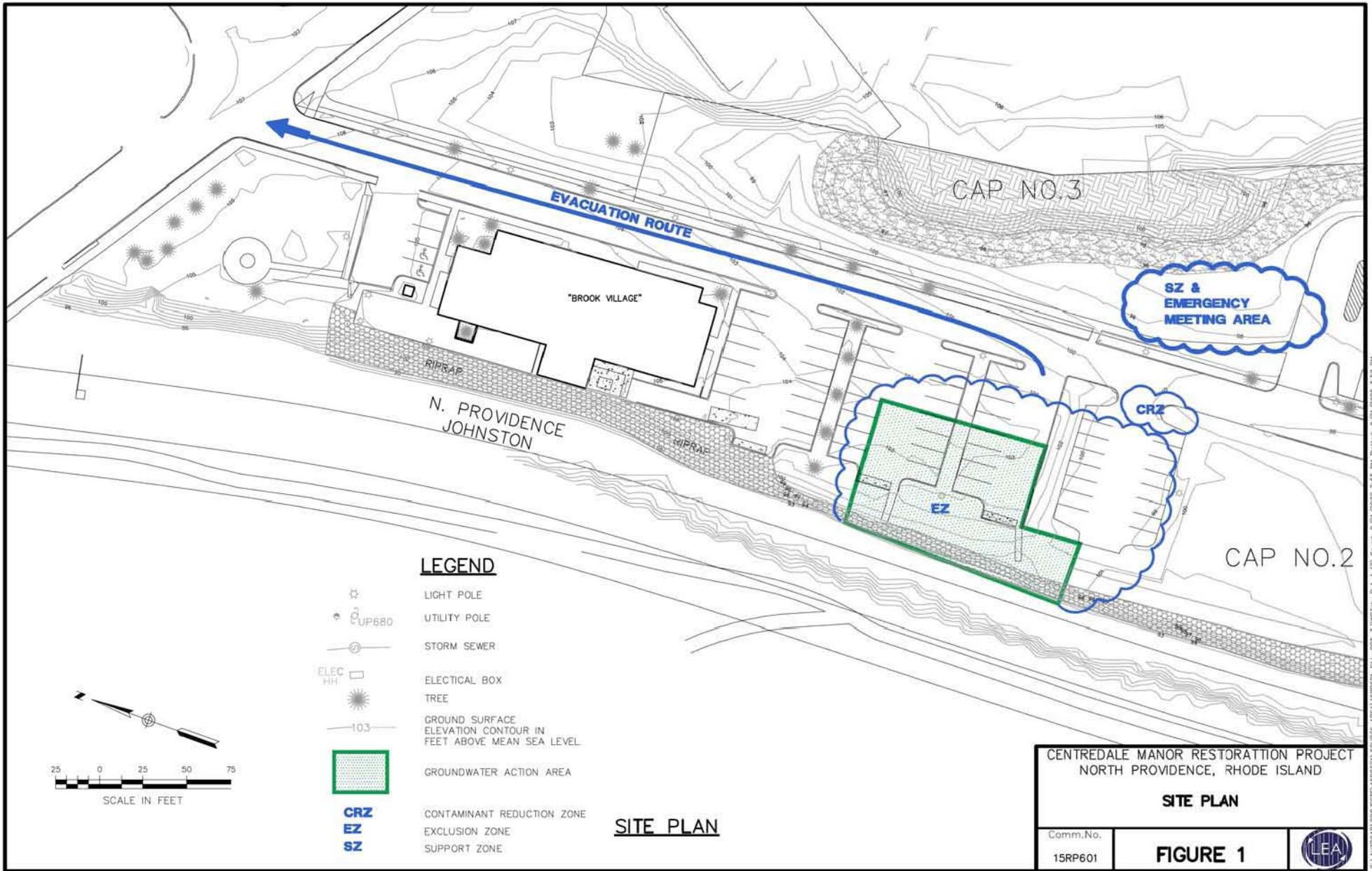
NOISE AND AIR MONITORING REQUIREMENTS						
Instrument	Tasks	Action Levels	Frequency	Calibration		
Quest Q-400 Noise Dosimeter	1 3 4 7 8 9 10 12	0-85 dBA (8-Hr TWA) 85-90 dBA (8Hr TWA) >90 dBA (8 Hr TWA)	Level D Level D Stop Work – Implement Engineering Controls	Immediately prior to initiating the task and periodically thereafter for each day the task is performed.	Daily or as recommended by the manufacturer.	
Photo ionization Detector (PID), Photovac 2020 or MiniRae 2000 (11.7 ev)	3 5 8 9 10 13	0-5 ppm 5-100 ppm for unknown >100 ppm for unknown	Level D Level C Stop work - Implement Engineering Controls	Immediately prior to initiating the task and continuously thereafter for each day the task is performed.	Daily or as recommended by the manufacturer.	
MIEDR 4000 Area Aerosol Monitor and TSI 8520 DustTRACK Aerosol Monitor	3 7 8 9 10 12 14	Background – 150 µg/m ³ above background > 150 µg/m ³ above background Visible Dust	Level D Stop Work - Implement Engineering Controls Stop Work - Implement Engineering Controls	Immediately prior to initiating the task and continuously thereafter for each day the task is performed.	Daily or as recommended by the manufacturer.	
MSA Gas Meter	O ₂ LEL H ₂ S	3 5 8 9 10 13	>19.5% and <21.5% <19.5% or >21.5%	Level D Stop Work – Evaluate Site Conditions w/ HSM	Immediately prior to initiating the task and continuously thereafter for each day the task is performed.	Daily or as recommended by the manufacturer.
			0-10% 10-20% >20%	Level D Level C Stop Work – Evaluate Site Conditions w/ HSM		
			0-5 ppm 5-10 ppm >10 ppm	Level D Level C Stop Work – Evaluate Site Conditions w/ HSM		

To exceed an Action Level, the air monitoring reading should remain above the Action Level for a duration of at least two minutes. Readings elevated for only a few seconds every 15 or 20 minutes do not exceed the Action Level and do not require an adjustment to the level of PPE. Field activities shall stop if breathing zone levels reach and exceed an Action Level, or site conditions dictate that additional health and safety precautions are needed. Field staff will then leave the area and notify the HSO of the situation and he/she shall contact the project manager, HSM and HSS. The HSO with guidance from the HSS and/or HSM will be responsible for reassessing the hazards and prescribing revised health and safety requirements as necessary, including an upgrade of respiratory protection, protective clothing, revising work schedules, revising decontamination procedures, and evacuation procedures.

Table 9
Decontamination Procedures
TIME-CRITICAL REMOVAL ACTION
SHALLOW GROUNDWATER REMEDY – GROUNDWATER ACTION AREA
Centredale Manor Restoration Project Superfund Site
North Providence, Rhode Island 02910

Personnel Protective Equipment - OSHA Site-Safety Levels D, C (Modified), and C	
Step 1	Exit: Exit Exclusion Zone (EZ) into the Contaminant Reduction Zone (CRZ) only through the assigned and designated location.
Step 2	Equipment Drop: Deposit used equipment onto plastic drop cloth or into a plastic-lined tub. Remove all gross contamination and clean the equipment with a fine cloth or wipe. Deposit cloths and wipes in the lined drum provided in the CRZ.
Step 3	Outer Boots/Gloves: Remove gross contamination from outer boots and wash boots with a stiff brush and a decontamination solution (Alkanox [®] soap and water) in a small boot-wash (tub). Scrub and wash outer gloves with the decontamination solution.
Step 4	Rinse: Rinse chemical-resistant outer boots and outer gloves with water.
Step 5	Tape Removal: Remove tape from outer boots and gloves and deposit in the lined drum.
Step 6	Outer Boot Removal: Remove disposable outer boots and place in the lined drum. Remove chemically-resistant, non-disposable outer boots (If using non-disposable boots, it is preferable to have them dedicated to the project.)
Step 7	Outer Glove Removal: Remove disposable gloves and place in the lined drum.
Step 8	Coveralls Removal: Remove disposable Tyvek [®] coveralls and place in the lined drum.
Step 9	Respirator Removal: Remove respirator, remove used cartridges, clean, disinfect, dry, and properly store respirator. Dispose of spent cartridges. Install new cartridges, and don respirator along with new outer gloves and boot covers (joints taped) if worker is to return to EZ.
Step 10	Inner glove removal: Remove and dispose of inner gloves in the lined drum.
Step 11	Exit the CRZ via the Support Zone (SZ).
Step 12	Field Wash: Wash and rinse hands and face.

FIGURES



- LEGEND**
-  LIGHT POLE
 -  UP680 UTILITY POLE
 -  STORM SEWER
 -  ELEC HH ELECTRICAL BOX
 -  TREE
 -  -103 GROUND SURFACE ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL
 -  GROUNDWATER ACTION AREA
 -  CRZ CONTAMINANT REDUCTION ZONE
 -  EZ EXCLUSION ZONE
 -  SZ SUPPORT ZONE

SITE PLAN

CENTREDALE MANOR RESTORATION PROJECT NORTH PROVIDENCE, RHODE ISLAND		
SITE PLAN		
Comm.No. 15RP601	FIGURE 1	

G:\AUTOCAD\PROJECTS\15RP601\SOURCE AREA\15RP601-CELL-001-3.DWG (1:0) Sheet: 9/27/2009 2:55 PM Plotted: 9/27/2009 3:09 PM

APPENDIX A

Site-Specific Health and Safety Plan Acceptance Form

PLAN ACCEPTANCE FORM

SITE HEALTH AND SAFETY PLAN

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

**Centredale Manor Restoration Project Superfund Site – Time-Critical Removal Action
Shallow Groundwater Remedy – Groundwater Action Area**

Name

Signature

Date

Return to the HSO or HSS **before** starting work on the subject project work site.

Appendix B
Personnel Training Certificates

U.S. ENVIRONMENTAL PROTECTION AGENCY

This certifies that
MARGARET COCHRAN
has completed the
HAZARDOUS MATERIALS INCIDENT RESPONSE OPERATIONS (165.5)



OFFICE OF EMERGENCY AND REMEDIAL RESPONSE

Course Director

Training Coordinator,
Environmental
Response Branch

The New England Consortium

(Partially supported by the National Institute of Environmental Health Sciences)

This is to certify that

Margaret Averill

Certificate #18039

has successfully completed the

8-Hour Hazardous Waste Site Worker Health and Safety Refresher Course

per requirements of 29 CFR 1910.120

June 14, 2007 at Lowell MA

conducted in conjunction with

ConnectiCOSH

MassCOSH

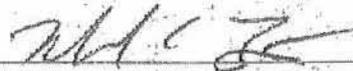
New Hampshire COSH

RICOSH

Western MassCOSH

Work Environment Program at the University of Massachusetts Lowell

Signed: _____



➤ To verify authenticity of this certificate, please call The New England Consortium (978) 934-3257

Continuing Education Units 0.8

Next refresher due - June 2008



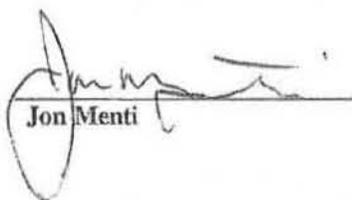
NETC

Certificate of Training

Awarded to

Jeff Berdeen

in Recognition of Successful Completion of the
40 Hour HAZWOPER General Site Worker Course
In Accordance with OSHA 29 CFR 1910.120(e)(3)(i).



Jon Menti

9/17/98
Date

CERTIFICATE OF COMPLETION

This is to certify that

Jefferson Berdeen

Has successfully completed the

Uniform Hazardous Waste Manifest Training

offered by

Loureiro Engineering Associates, Inc.



Loureiro Engineering Associates, Inc.

A handwritten signature in black ink, appearing to read "NS", is written over a horizontal line. The signature is stylized and cursive.

Nick D. Skoularikis, Ph.D., LEP
Director of Quality
August 23, 2006



The New England Consortium

(Partially supported by the National Institute of Environmental Health Sciences)



This is to certify that
Jefferson R. Berdeen

Certificate #: 18123010

has successfully completed the

(102) 8-hour Site Worker Refresher

Health & Safety Training per requirements of 29 CFR 1910.120

Training Date(s): June 16, 2009

Event #: 726409

CEUs: 0.8

This training was delivered in conjunction with:

Connecti COSH

Mass COSH

New Hampshire COSH

RI COSH

Western Mass COSH

To verify authenticity of this certificate, please call The New England Consortium at (978) 934-3257

Handwritten signature of Paul Morse in black ink.

Paul Morse, Project Director/co-PI

Handwritten signature of David Coffey in black ink.

David Coffey, Training Manager

Hazardous Materials Training

CERTIFICATION

This certificate has been awarded to:

Jefferson R. Berdeen

at

Rocky Hill, Connecticut

Seminar 2368

For successfully completing the Lion Technology Inc. two-day Hazardous Materials Transportation Certification Workshop on regulations of the United States Department of Transportation, regarding the safe and legal transportation of materials designated as hazardous and for attaining a passing grade on the final proficiency test.

This training is designed to satisfy the General Awareness, Function-Specific, and Security Awareness training requirements of 49 CFR 172.704(a) for typical managers and supervisors of hazardous materials transportation functions. Training was conducted by Lion Technology Inc., Lafayette, NJ 07848 (973-383-0800).

This training completed on: 14 July 2006

National Registry of Professionals - Member PIN: 300-5206

1.3 CEUs, 1.0 CHMM CM Points, 2.0 ABIH CM Points, 13 NEHA CE Contact Hours Awarded

Rocanna Sifton

INSTRUCTOR





Certificate of Completion

This is to certify that

David Brisson

has completed a

**40-Hour Health & Safety Course for
Hazardous Waste Operations & Emergency Response**

consistent with the requirements as set forth in 29CFR Part 1910.120

June, 1992

DATE

4.0 CEU

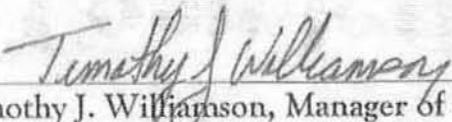
MICHAEL H. ZISKIN
Principal Instructor
FIELD SAFETY CONSULTING, INC.
Stamford, Connecticut

CERTIFICATE OF COMPLETION

This is to certify that
David Brisson
Has successfully completed
An 8 Hour Refresher course in
Hazardous Waste Operations
in Accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company


Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

Presented By

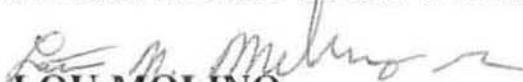
CONDOR

CHARLES BROWN

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

*Presented this
May 27, 1999*

CONDOR GEOTECHNICAL SERVICES, INC


LOU MOLINO

CERTIFICATE OF COMPLETION

This is to certify that
Charles Brown
Has successfully completed
An 8 Hour Refresher course in
Hazardous Waste Operations
in Accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company

Timothy J. Williamson

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

CERTIFICATE OF COMPLETION

This is to certify that

Jeffrey Chase

Has successfully completed
Hazardous Materials Site Work Refresher
29 CFR 1910.120(e)(8) and 1926.65(e)(8)



John T. Myska
Senior Health & Safety Project Engineer

CERTIFICATE OF COMPLETION

This is to certify that

Jeffrey Chase

Has successfully completed

An 8 Hour Refresher course in

Hazardous Waste Operations

in Accordance with OSHA 29CFR 1910.120 (e)(8)

conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in black ink, reading "Timothy J. Williamson". The signature is written in a cursive style and is positioned above a horizontal line.

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

Presented By

CONDOR
ALEX CLARKE

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

Presented this

JANUARY 9, 2004

CONDOR GEOTECHNICAL SERVICES, INC

Philip T. Cruz
Philip T. Cruz

CERTIFICATE OF COMPLETION

This is to certify that

Alex Clarke

Has successfully completed

An 8 Hour Refresher course in

Hazardous Waste Operations

in Accordance with OSHA 29CFR 1910.120 (e)(8)

conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in black ink, reading "Timothy J. Williamson". The signature is written in a cursive style and is positioned above a horizontal line.

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

Presented By

CONDOR

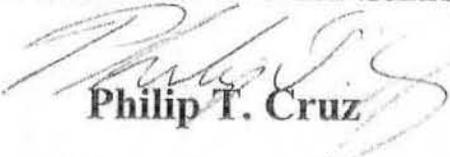
RICHARD D'AMICO

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

Presented this

JANUARY 26, 2006

CONDOR GEOTECHNICAL SERVICES, INC


Philip T. Cruz

CERTIFICATE OF COMPLETION

This is to certify that

Rich D'Amico

Has successfully completed
An 8 Hour Refresher course in
Hazardous Waste Operations
in Accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in cursive script, reading "Timothy J. Williamson". The signature is written in dark ink and is positioned above a horizontal line.

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

Presented By

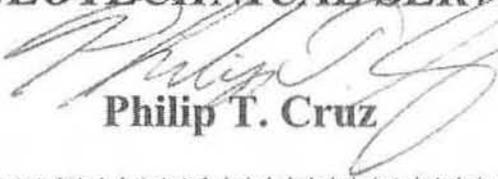
CONDOR
GREG DARIGIS

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

Presented this

MAY 18, 2006

CONDOR GEOTECHNICAL SERVICES, INC


Philip T. Cruz

CERTIFICATE OF COMPLETION

This is to certify that

Greg Darigis

Has successfully completed an 8 hour refresher course in

Hazardous Waste Operations
in accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 31, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in black ink, reading "Timothy J. Williamson". The signature is written in a cursive style and is positioned above a horizontal line.

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

CERTIFICATE OF COMPLETION

This is to certify that

Roger R. Easler

has successfully completed a

**40-Hour Health & Safety Course For Hazardous
Waste Operations & Emergency Response**

consistent with the requirements as set forth in 29 CFR Part 1910.120



David W. Roberge, CHMT, CHMI
Instructor
Field Safety Corporation
March 2000



Field Safety Corporation
North Branford, CT
(203) 483-6003
www.fieldsafety.com

CERTIFICATE OF COMPLETION

This is to certify that
Roger Easler
Has successfully completed
An 8 Hour Refresher course in
Hazardous Waste Operations
in Accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in black ink, reading "Timothy J. Williamson". The signature is written in a cursive style and is positioned above a horizontal line.

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

40 hr Hazwoper

Certificate of Completion

NATHAN EMMONS

Redacted

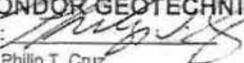
ADDRESS

I certify that the above named individual has completed a 40 Hour Course in Hazardous Materials and Site Investigation as required by OSHA 29 CFR 1910.120(e).

Issued on OCTOBER 11, 2007

Serial Number 8939

CONDOR GEOTECHNICAL SERVICES, INC.

By: 

Title: Instructor

Philip T. Cruz

CERTIFICATE OF COMPLETION

This is to certify that

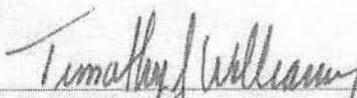
Nate Emmons

Has successfully completed an 8 hour refresher course in

Hazardous Waste Operations
in accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 31, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company



Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.



I.U.O.E LOCAL 478
(203) 237-3962 (800) 841-0478



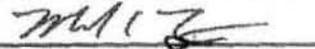
REFRESHER EXPIRES **JUN 2009**

200916084

IUOE LOCAL 478
SAFETY & HAZMAT
240 Cheshire Road
Meriden, CT 06451

Sandy,
For Re.
Tim

The New England Consortium Training Certificate
Paul Gelinas
has successfully completed the
40-Hour Hazardous Waste Site Personnel
Basic Health and Safety Course
per requirements of 29 CFR 1910.120
on September 10-14, 2007 at Lowell, MA


Course Coordinator

OSHA 001305409 

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

Paul P. Gelinas

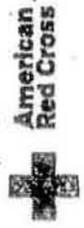
has successfully completed a 40-hour Occupational Safety and Health
Training Course in
Construction Safety & Health

Wendy E. Johnson **10/4/2007**
(Name) (Date)



Together, we can save a life

This recognizes that
Paul Gelinas
has completed the requirements for
CPR-Adult
conducted by
Watermark Environmental
Date completed 10/8/2007
The American Red Cross recognizes this certificate
as valid for 1 year(s) from completion date.



Together, we can save a life

This recognizes that
Paul Gelinas
has completed the requirements for
Standard First Aid
conducted by
Watermark Environmental
Date completed 10/8/2007
The American Red Cross recognizes this certificate
as valid for 3 year(s) from completion date.

The New England Consortium Training Certificate

Paul P. Gelinis

has successfully completed the

8hr.Hazardous Waste Site Worker Refresher

per requirements of 29 CFR 1910.120

Cert.#18123412

Lowell, MA.

June 16, 2009

Bridget McGuinness

Coordinator

Presented By

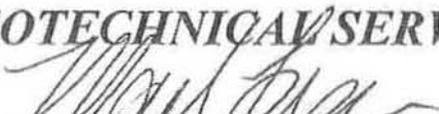
CONDOR

KEN GEMMELL

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

*Presented this
February 3, 2000*

CONDOR GEOTECHNICAL SERVICES, INC


Marian S. Fournier

CERTIFICATE OF COMPLETION

This is to certify that

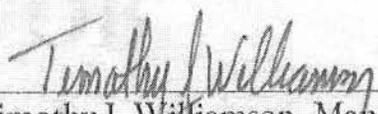
Ken Gemmell

Has successfully completed an 8 hour refresher course in

Hazardous Waste Operations
in accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 31, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company



Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Presented By

CONDOR

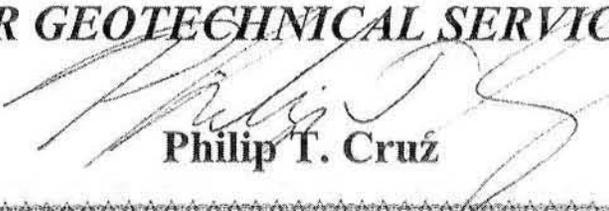
ROBERT GORDON

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

Presented this

JANUARY 27, 2005

CONDOR GEOTECHNICAL SERVICES, INC


Philip T. Cruz

CERTIFICATE OF COMPLETION

This is to certify that

Bob Gordon

Has successfully completed

An 8 Hour Refresher course in

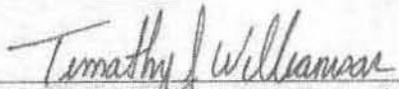
Hazardous Waste Operations

in Accordance with OSHA 29CFR 1910.120 (e)(8)

conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company


Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

CERTIFICATE OF COMPLETION

Loureiro Engineering Associates, Inc.

certifies that

Sue Griswold

has successfully completed an
Hazardous Waste Site Supervisor Refresher

in accordance with

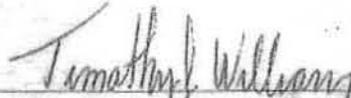
OSHA 29CFR 1910.120 and

OSHA 29CFR 1926.65

Conducted April 14, 2008



Loureiro Engineering Associates, Inc.
An Employee Owned Company


Instructor: Timothy J. Williamson
Loureiro Engineering Associates, Inc.

Certificate of Completion

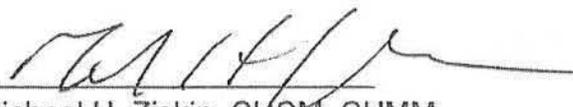
This is to certify that

Sophia Kim

has successfully completed a

**40-Hour Health & Safety Course For Hazardous
Waste Operations & Emergency Response**

consistent with the requirements as set forth in 29 CFR Part 1910.120



Michael H. Ziskin, CHCM, CHMM
Executive Vice President

July 14, 2008



Field Safety Corporation
North Branford, CT
(203) 483-6003
www.fieldsafety.com

CERTIFICATE OF COMPLETION

This is to certify that

Sophia Kim

satisfactorily completed refresher training as described in
29CFR 1910.120(e)(8) and
29 CFR 1910.120(q)(8) of the
Occupational Safety & Health Administration
on July 30, 2009

0.8 CEUs



Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in black ink, appearing to read "Jeremy Paradis", is written over a horizontal line.

Jeremy Paradis
C.E.T. Instructor
Loureiro Engineering Associates, Inc.
July 30, 2009

Presented By

CONDOR

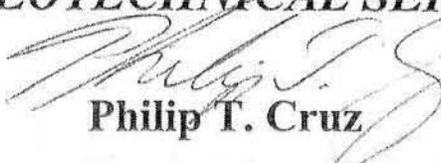
PIERRE LALIBERTE

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

Presented this

JANUARY 26, 2006

CONDOR GEOTECHNICAL SERVICES, INC

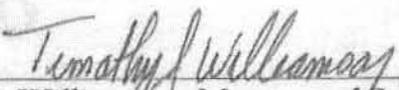

Philip T. Cruz

CERTIFICATE OF COMPLETION

This is to certify that
Pierre Laliberte
Has successfully completed
An 8 Hour Refresher course in
Hazardous Waste Operations
in Accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company



Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

National HAZMAT Program
1293 Airport Road • Beaver, West Virginia • 26413 • (304) 253-1074

Completion Date: 03/13/2009
I/JOE Local Union # _____



This is to certify that
LIBORIO LORENZO
has successfully completed the
**40-hour HAZWOPER
General Site Worker**
specifically designed for workers in accordance
with OSHA 29 CFR 1910.120.

Kh. F. Sl
Certified Instructor

RECEIPT No 116095

Presented By

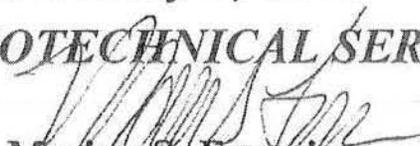
CONDOR

STEVE MURDOCK

*has completed a 40 Hour course in
Hazardous Materials and Site Investigations
required by OSHA 29 CFR 1910.120*

*Presented this
February 3, 2000*

CONDOR GEOTECHNICAL SERVICES, INC


Marian S. Fournier

CERTIFICATE OF COMPLETION

This is to certify that
Steve Murdock
Has successfully completed
An 8 Hour Refresher course in
Hazardous Waste Operations
in Accordance with OSHA 29CFR 1910.120 (e)(8)
conducted on March 4, 2009

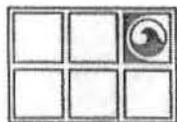


Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in cursive script that reads "Timothy J. Williamson".

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher



GROUNDWATER TECHNOLOGY, INC.

certifies that

Dave Scotti

has successfully met certificate requirements on

this *8th* day of *June*, 1987

for participation in a 40 hour training program in

Hazardous Waste Health and Safety

in accordance with OSHA 29 CFR 1910.120

K. J. DiLuigi

Kenneth J. DiLuigi, CSM, CIHT, Regional Safety Director

Frank Aceto

Frank Aceto, Regional Manager

CERTIFICATE OF AWARD

This certificate recognizes

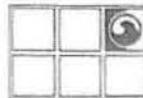
Dave Scotti

*as having successfully completed
the 8-hour supervisory course for Hazardous
Waste Activities in compliance with
OSHA 29 CFR 1910.120*

K. E. Di Ruggo

Trainer

MAR 23 1990



GROUNDWATER
TECHNOLOGY, INC.

Marilyn E. Grant

Marilyn E. Grant, Director
Corporate Health & Safety

CERTIFICATE OF ACHIEVEMENT

This certifies that

Keith Volkert

has successfully completed the

**40 Hour Health & Safety Training for
Hazardous Waste Site Activities
per 29 CFR 1910.120**

conducted by
ATC Associates Inc.
73 William Franks Drive
West Springfield, MA 01089
(413) 781-0070

Samuel Merritt
Principal Instructor *K*

April 11-15, 2005
Date of Course

April 15, 2006
Expiration Date

Gregory J. Marsch
Regional Manager

HM-1882
Certificate Number

April 15, 2005
Examination Date

CERTIFICATE OF COMPLETION

This is to certify that

Keith Volkert

Has successfully completed

An 8 Hour Refresher course in

Hazardous Waste Operations

in Accordance with OSHA 29CFR 1910.120 (e)(8)

conducted on March 4, 2009



Loureiro Engineering Associates, Inc.
An Employee Owned Company

A handwritten signature in black ink, reading "Timothy J. Williamson". The signature is written in a cursive style and is positioned above a horizontal line.

Timothy J. Williamson, Manager of Safety
Loureiro Engineering Associates, Inc.

Refresher

Certificate of Completion

This is to certify that

Kyle Zalaski

has successfully completed a

**40-Hour Health & Safety Course For Hazardous
Waste Operations & Emergency Response**

consistent with the requirements as set forth in 29 CFR Part 1910.120



Michael H. Ziskin, CHCM, CHMM
Executive Vice President

October 13, 2008



Field Safety Corporation
North Branford, CT
(203) 483-6003
www.fieldsafety.com

CERTIFICATE OF COMPLETION

This is to certify that

Kyle Zalaski

Has successfully completed training on
Hazardous Materials Employee Training
Consistent with the requirements set forth in
49 CFR Code Section 172.704

on

March 5, 2009



Louriero Engineering Associates, Inc.
AN EMPLOYER COMMITMENT

A handwritten signature in dark ink, appearing to read "Jeremy Paradis", written over a horizontal line.

Jeremy Paradis
Louriero Engineering Associates, Inc.
Project Manager

VORTEX

Environmental Training Center

This is to certify that

DAVID CANZONIERI

has successfully completed the requisite training for:

"ANNUAL REVIEW" (8 hr.)

*Hazardous Waste Operations and Emergency Response
Course to Satisfy Requirements of 29 CFR 1910.120*



8/6/09

Date of Course

8/6/10

Expiration Date

John Carlone
Training Provider

09675

Group Certificate Number

3670 West Shore Road, Unit #1, Warwick, RI 02886 1.800.VORTEXX

New England Laborers' Training Academy

LIUNA Local 271



DAVID J. ANZONIERI

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT



The Commonwealth of Massachusetts
DEPARTMENT OF PUBLIC SAFETY
HOISTING ENGINEER LICENSE
Number HF 042234

State of Rhode Island and Providence Plantations
Rhode Island Department of Labor and Training
PAYLOADER/BACKHOE 00002947

Administrator [Signature] 10/31/2009
Expiration Date

STATE OF CONNECTICUT
HOISTING CERTIFICATE

THIS CERTIFICATE DOES NOT IMPLY COMPETENCY

[Signature]
SIGNATURE

MUST BE PRESENTED WITH A VALID PHOTO I.D.

OSHA

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

BRIAN BOLDUC

has successfully completed a 10-hour Occupational Safety and Health Training Course in

[Signature] Construction Safety & Health
12/11/00
(Trainer) (Date)



LOCAL 57



Forklift Operator

This is to certify that

BRIAN BOLDUC

has completed the Forklift Operator course in accordance with OSHA 29 CFR Parts 1910, 1915, 1917, 1918, 1926.

Instructors Signature [Signature]
Date 6/12/08

INTERNATIONAL UNION OF OPERATING ENGINEERS
AFL-CIO

VINCENT J. GIULINI, General President CHRISTOPHER J. DANLEY, General Secretary-Treasurer
MEMBERSHIP CARD • JAN. 2008 Thru DEC. 2009

BRIAN BOLDUC

2032094
REGISTER NUMBER



07/07/1987
DATE INITIATED

057
MEMBER OF LOCAL

PROVIDENCE, RI
CITY, STATE OR PROVINCE

Date Completed:

8/28/92

International Union of Operating Engineers
Hazmat Training Program

Local



This is to certify that

BRIAN HOLONC
has successfully completed the 40-hour
Hazardous Waste Training Program
specifically designed for workers in
accordance with OSHA at
29 CFR 1910.120.

Receipt #

12354



Brian Holonc
Certified Instructor

REFRESHER EXPIRATION DATE **Mar** 2004 200413086

REFRESHER EXPIRATION DATE **Apr** 2007 200712387

REFRESHER EXPIRATION DATE **Apr** 2005 200509785

REFRESHER EXPIRES **APR** 2010 201012728

200612817

National HAZMAT Program
(804) 253-8674

APPENDIX C

**Loureiro Engineering Associates, Inc.
Health and Safety Audit Sheet**

Loureiro Engineering Associates, Inc. Health and Safety Audit Sheet

Job: _____ **Location:** _____ **Auditor:** _____
Supervisor: _____ **Date:** _____

Y or N

- _____ 1. Is the JHA posted on job site?
- _____ 2. Does the JHA properly address the job being performed, is it being followed?
- _____ 3. Are Company Cardinal Rules being followed?
- _____ 4. Are MSDS books on the job site?
- _____ 5. Does the MSDS book reflect chemicals/substances used on the jobsite?
- _____ 6. Are all chemicals and fuels labeled and in proper containers?
- _____ 7. Do ladders have inspection stickers on them?
- _____ 8. Employees properly guarded from falls or are they using fall protection when needed?
- _____ 9. Is Scaffolding Certification filled out daily?
- _____ 10. Are slings and lifting devices in good condition?
- _____ 11. Are slings and lifting devices properly labeled and certified?
- _____ 12. Are electrical cords in proper working condition?
- _____ 13. Are electrical cords grounded and industrial grade?
- _____ 14. Are power tools insulated and good working condition?
- _____ 15. Are employees using GFCIs?
- _____ 16. Are hand tools in good working condition and being used properly?
- _____ 17. Are employees wearing proper PPE?
- _____ 18. Is jobsite kept clean and free of debris?
- _____ 19. Are trenches and excavation properly sloped or trench boxes in use?
- _____ 20. Are trenches, excavations and open holes properly barricaded and blocked off?
- _____ 21. Are flammables stored in a proper flammable storage cabinet?
- _____ 22. Are hot work permits being filled out when necessary?
- _____ 23. Are compressed gases secured with a chain and imcompatables seperated?
- _____ 24. Connex boxes kept neat and clean?
- _____ 25. Is heavy equipment being inspected daily by operator?
- _____ 26. Is heavy equipment being properly maintained?
- _____ 27. Are employees working under suspended loads?
- _____ 28. Is their proper signage and barricades when employees are performing overhead work?
- _____ 30. Are weekly toolbox talk or safety meetings being held?
- _____ 31. Are incident reports being filled out and being processed within 24 hours?
- _____ 32. Are confined space entry permits being filled out?
- _____ 33. Are proper LOTO procedures being followed when needed?
- _____ 34. Are only authorized employees performing LOTO?
- _____ 35. Do employees seem to be follow company safety policy?

Write Down any findings and Corrective Action by writing the question # and an explanation.

Finding	Corr. Action	Due Date	Person Resp.	Comp. Date

Employee Interview Questions. Please ask these questions to one employee.

- 1. Do you know the company cardinal rules?
- 2. Do you feel like the company provides a safe workplace?
- 3. Any concerns or suggestions to improve our company safety program?

Please make a copy of this inspection and give it to Company Safety Officer. Safety Officer will follow up on the written corrective action to make sure they are closed within the time given.

APPENDIX D

Job Hazard Analysis

JOB HAZARD ANALYSIS
ALL ACCIDENTS CAN BE PREVENTED !

JHA Rev.#	Job or Operation Title: Centredale Manor Restoration Project Superfund Site – Time-Critical Removal Action Shallow Groundwater Remedy - Groundwater Action Area	
Location Centredale Manor Restoration Project Superfund Site	Job Address 2072/2074 Smith St., N. Providence, RI	Employees /Subs LEA/LCI/TBD – See Attached List of Project Personnel
Date Performed August 12, 2009	Performed By Mark Winbourne / David N. Scotti	Verified By Tim Williamson
Special or Primary Hazards	Physical: Heavy Machinery, Drilling, Excavating along River Embankment, Noise, Dust, Confined Space Entry; Chemical: Dioxins/Furans, VOCs, SVOCs, PCBs; Biological: Flora and Fauna	
Personal Protective Equipment	OSHA Site Safety Level C/Level D: Steel-toed/shank foot ware, hard hats, safety glasses, safety vests/shirts, hearing protection, respiratory protection	

The following questions only address High Risk Exposures to look for and do not include all hazards that may be present during your task.

1. Is there any potential for an exposure to hazardous energy (electrical, mechanical, stored, etc.)?
2. Is there any potential for a Fall to occur throughout this entire task?
3. Are there specific procedures such as: access/egress to task locations, hoisting and rigging, lockout/tagout, overhead power lines or Call Before You Dig (CBYD) that must be performed?
4. Do you have complete control of area processes and equipment throughout the completion of your assigned task?
5. Do all employees/ co-workers on site know of the identified hazards?
6. Are all Standard Work Processes (SWP) being followed?

Basic Job Steps	Existing and/or Potential Hazards	Corrective Measures
<u>General Site:</u>	Physical: steep slope, wooded, soft/wet ground (slip/trip/fall), heat stress	Use caution when traversing the work area, wear steel-toed/shank foot ware, and maintain close-fitting clothes to avoid snags, take sufficient breaks and drink plenty of fluids.
	Biological: snakes, ticks, poisonous plants	Wear close-fitting clothes with layers, socks tucked to avoid infiltration of plant and animal life. Keep first aid kit and HASP handy for emergency bite information. Use the buddy system to ensure quick care. Identify the nearest hospital location should more than first aid treatment be required. Maintain a first aid kit on site.
	Chemical Hazards: Dioxins/Furans, PCBs, SVOCs, VOCs, Metals	Use engineering controls including PPE. Whenever possible, stand upwind of work area. Minimize soil and sediment handling.
<u>Mobilization-Demobilization:</u>		
1. Lifting/loading equipment	Material handling & equipment movement	Provide spotter, stay clear of lifted loads.
2. Driving to Site	Motor vehicle accidents, equipment shifting	Obey traffic laws, stay alert, load equipment in stable fashion. Wear your seatbelt and comply with the "hands free" cellular phone laws.
3. Off-load equipment	Material handling & equipment movement	Provide spotter, stay clear of lifted loads.
<u>Site Preparation:</u>		
1. Construction staking & survey/layout	Damage to utilities, exposure to hazardous energy	Notify Rhode Island One-Call System at least three full working days in advance of activities. Perform GPR survey prior to excavation.
2. Facilities demolition (remove concrete curb, fence, signs, asphalt)	Physical: flying objects, heavy loads, rusted nails	Don face/eye protection, don work gloves, use proper lifting techniques, do not lift awkward or loads over 50 lbs without assistance.
3. Clearing	Physical: noise, flying objects, falling branches and trees	Stay clear of subcontractor operations, don face/eye protection, wear ear plugs/ear muffs.
<u>Coffer Dam Installation and Construction Dewatering:</u>	Noise, overhead operations, drowning	Stay clear of subcontractor operations, wear ear plugs or ear muffs, wear hard hat, follow Hazard Mitigation Measures for working near/over water.

Basic Job Steps	Existing and/or Potential Hazards	Corrective Measures
<u>Confined Space Entry Setup of Equipment at Job Site</u> 1. Positioning of confined space equipment and Monitoring	Confined space, atmospheric conditions/breathing space – exposure to unhealthy atmosphere	Monitor with gas meters per CSE procedures, allow for natural ventilation if conditions warrant, follow LEA Confined Space Entry Program procedures and Hazard Mitigation Measures
2. Enter space to begin inspection	Slip, trip, fall; exposure to unhealthy air	Use a ladder to enter, continuous air monitoring, have attendant supervise entry attendant. Wear proper PPE. Have three points of contacts at all times when entering and exiting.
3. Exit space	Slip, trip, fall	Use ladder and have three points of contact at all time when exiting.
<u>Concrete Cutting/Removal</u>	a. Dust b. Excessive noise c. Cuts/lacerations d. Underground utility encounter e. Machine/equipment damage f. Release of fuel to environment	a. Wear proper PPE, proper decontamination of equipment and personnel, implement dust Hazard Mitigation measures. b. PPE – Hearing protection c. Maintain safe distance from blade in motion, saw operated by trained personnel only, wear proper PPE. d. CBYD and proper utility mark out; follow LEA's groundbreaking pre-intrusion Cardinal Rule. e. Routine inventory and maintenance of equipment, equipment used by trained workers. f. Refueling will be conducted on asphalt, spill clean-up kit will be located at refueling area, vehicles will be attended while refueling, no topping off
<u>Soil Excavation/Stockpiling/Loading/Backfilling:</u> 1. Excavating Contaminated Soil and Sediment	Usage of heavy equipment. Potential fall hazards. Slip/trip/fall hazard. Excavation collapse. Exposure to contaminants of concern.	Stay out of excavation areas. Install protective systems (trench box, sloping, etc.) in excavations greater than 5' deep. Wear proper PPE at all times. Maintain buddy system. Use spotter.
	Material handling & equipment movement. Possible spill in water due to equipment failure (hydraulic line, etc.).	Provide spotter, stay clear of lifted loads. Conduct thorough daily equipment inspection. Maintain an emergency spill control kit on site.
2. Material Handling (stumps, rocks)	Usage of heavy equipment and hand tools. Potential slip/trip/fall hazards.	Use equipment properly and wear proper PPE.
3. Equipment Decontamination	Usage of heavy equipment and hand tools. Potential slip/trip/fall hazards.	Use equipment properly and wear proper PPE.

Basic Job Steps	Existing and/or Potential Hazards	Corrective Measures
<u>Waste Management</u>		
Segregate Excavated Materials	Waste not properly manifested	Create individual storage areas for each soil type (off-site disposal or backfilling) Track loads by original location and storage area



Pre-Intrusion Worksheet and Permit: Job Hazard Analysis Addendum

Required for any project involving subsurface intrusion (drilling or excavation).

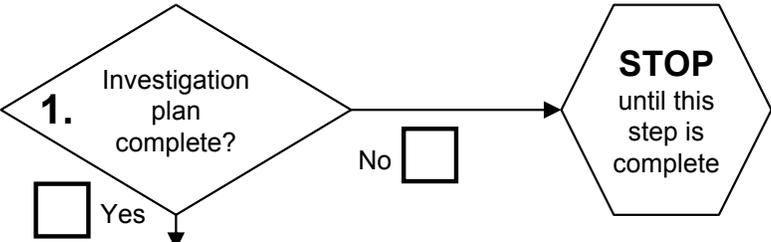


Project Number	Project Location		
Project Manager	Approved By:	Date	Revised By:
			Date

PLACE INITIALS IN YES or NO BOX

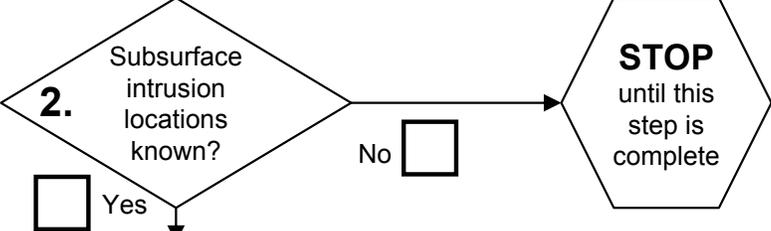
Is the investigation plan complete? **A revised Pre-Intrusion Worksheet is required for any additions or changes to initial intrusion plan or in areas not previously investigated for utilities.**

Notes:



Are subsurface intrusion locations known and defined? If NO, have the boundaries of potential intrusion sites been identified sufficiently to continue the pre-intrusion planning?

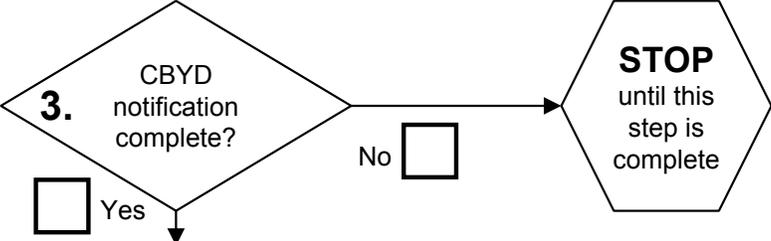
Notes:



Has a CBYD notification been completed? **CBYD COORDINATOR** to list CBYD ticket number and expiration date in notes below.

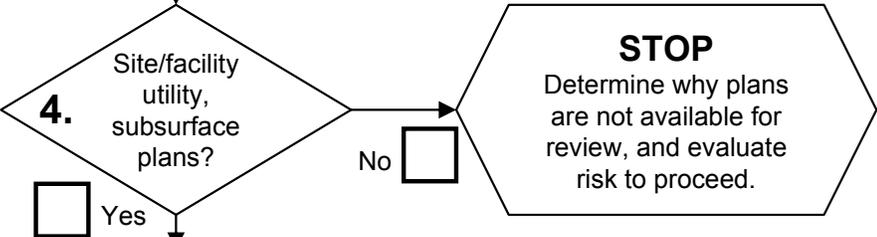
CBYD Ticket No. _____ Expiration Date: _____

COORDINATOR Signature: _____



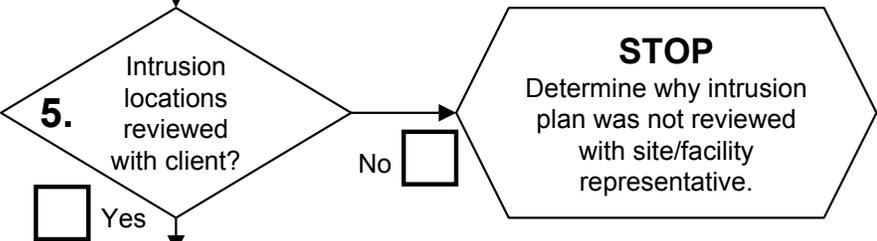
Have facility and site utility and subsurface structure plans and documents been obtained? IF NO, explain briefly below:

Notes:



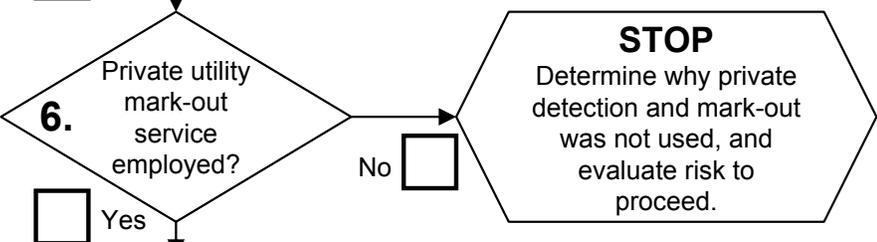
Have proposed subsurface intrusion locations been reviewed with the client site, facility, or project representative(s)? IF NO, explain briefly below:

Notes:



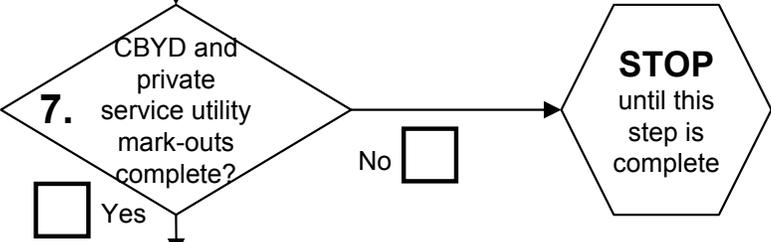
Has a private utility mark-out service been contracted? List contractor, locator technology, and scheduled investigation date. IF NO, explain briefly below:

Notes:



Are all utilities indicated by CBYD marked? IF NO, explain:

Notes:



Continue on Page 2



Required for any project involving subsurface intrusion (drilling or excavation).

Project Number	Project Location
----------------	------------------

Continued From Page 1

Are there signs of utility and non-utility subsurface structures (examples: manholes, culverts, signs, clearings)? Indicate results of further investigation and approval to proceed.

Notes:

8. Signs of subsurface structures not identified?

No

Yes

STOP
Investigate potential subsurface structures and/or utilities. Evaluate risk to proceed.

Is there adequate and safe access and egress from proposed locations for personnel and equipment? IF NO, explain briefly below:

Notes:

9. Adequate and safe access and egress?

Yes

No

STOP
Investigate and resolve site access and egress safety issues. Evaluate risk to proceed.

Are there any other obstacles to the proposed intrusion location (examples: overhead power lines, trees, fences)? Indicate results of further investigation and approval to proceed if YES.

Notes:

10. Other obstacles, such as overhead lines, trees?

No

Yes

STOP
Investigate hazards and revise JHA. Evaluate risk to proceed.

Do any proposed intrusions intersect sight-lines of utility access point and utility use point (example: water entry to property and water meter location in or on building)? Indicate results and approval to proceed if YES.

Notes:

11. Do intrusions intersect sightline of utility access and point(s) of use?

No

Yes

STOP
Investigate potential subsurface utilities if not previously marked. Evaluate risk to proceed.

Is there visible scarring in any surface paving or concrete near the proposed intrusion locations? Indicate results of further investigation and approval to proceed if YES.

Notes:

12. Visible scarring in surface near proposed intrusions?

No

Yes

STOP
Investigate potential subsurface object(s) if not previously marked. Evaluate risk to proceed.

Has the assigned work crew been briefed on the observations and information in this worksheet and the project JHA? List date of review and reviewer signature:

Notes:

13. Work crew briefed on JHA and SSI permit?

Yes

No

STOP
until this step is complete

Does excavated material appear to be native? IF NO, proceed with caution and indicate results of further investigation and approval to proceed.

Notes:

14. Is excavated material native?

Yes

No

STOP
Proceed with caution, anticipating potential subsurface object. Evaluate risk to proceed.

Deliver copy of completed Permit to LEA Safety Officer for evaluation and continuous safety improvement analysis.

APPENDIX E
Contaminant Fact Sheet

Dioxins and Furans

What are dioxins and furans?

Dioxins and furans is the abbreviated or short name for a family of toxic substances that all share a similar chemical structure. Dioxins, in their purest form, look like crystals or a colorless solid. Most dioxins and furans are not man-made or produced intentionally, but are created when other chemicals or products are made. Of all of the dioxins and furans, one, 2,3,7,8-tetrachloro-p-dibenzo-dioxin (2,3,7,8 TCDD) is considered the most toxic.

What are dioxins and furans used for?

Dioxins and furans are not made for any specific purpose; however, they are created when products like herbicides are made. They are also created in the pulp and paper industry, from a process that bleaches the wood pulp. In addition, they can be produced when products are burned.

How can dioxins and furans enter and leave your body?

Dioxins and furans can enter your body through breathing contaminated air, drinking contaminated water or eating contaminated food. About 90% of exposure to dioxins and furans is from eating contaminated food. Dioxins and furans can build up in the fatty tissues of animals.

How can you be exposed to dioxins and furans?

You can be exposed to dioxins and furans by eating contaminated food. Dioxins and furans typically stay and build up in the fatty tissues of animals. This means that eating beef, pork, poultry, fish as well as dairy products can be a

source of exposure.

There are several sources of exposure to dioxins and furans. If you work in or near a municipal solid waste incinerator, copper smelter, cement kiln or coal fired power plant you can be exposed to dioxins and furans. Individuals who burn their household waste or burn wood can be exposed as well. Even forest fires can contribute to the creation of small amounts of dioxins and furans.

Dioxins and furans have been found in the air, soil, and food. Dioxins and furans are mainly distributed through the air. However, only a small percentage of exposure is from air. Eating contaminated food is the primary source of exposure.

What are the health effects of exposure to dioxins and furans?

Dioxins and furans can cause a number of health effects. The most well known member of the dioxins/furans family is 2,3,7,8 TCDD. The U.S. Environmental Protection Agency (EPA) has said that it is likely to be a cancer causing substance to humans. In addition, people exposed to dioxins and furans have experienced changes in hormone levels. High doses of dioxin have caused a skin disease called chloracne. Animal studies show that animals exposed to dioxins and furans experienced changes in their hormone systems, changes in the development of the fetus, decreased ability to reproduce and suppressed immune system.

What levels of exposure have resulted in harmful health effects?

The U.S. EPA has set a limit of 0.00003 micrograms of 2,3,7,8-TCDD per liter of

drinking water (ug/L). The Food and Drug Administration recommends not eating fish and shell fish with more than 50 parts per trillion (50 ppt) of 2,3,7,8-TCDD.

Where can you get more information?

Contact your state health or environmental department, or:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road, N.E., E-29
Atlanta, Georgia 30333

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). *Toxicological Profile, Chlorinated Dibenzo-p-Dioxins (CDDs)*. Atlanta, GA: U.S. Public Health Service, U.S. Department of Health and Human Services, 1999.
2. Chiefs of Ontario, Effects on Aboriginals from the Great Lakes Environment Project (EAGLE). *Fact Sheet 11: Dioxins and Furans* <http://www.chiefs-of-ontario.org/eagle/factsheet11.htm>
3. U.S. Environmental Protection Agency. *Priority PBTs : Dioxins and Furans Fact Sheet*. Washington, D.C.: Office of Pollution Prevention and Toxics.
4. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Library of Medicine Bethesda, MD, 2001.

APPENDIX F

Hazard Mitigation Measures



HAZARD MITIGATION MEASURES

Bloodborne Pathogens

- Bloodborne pathogens are not visible and may be overlooked as a biological hazard
- Site workers are likely to come in contact with these organisms more frequently than any other biological hazard
- Areas such as waste piles, sewage discharges, and rusted metallic surfaces as well as insect and animal bites are all potential sources of pathogens
- Employees involved in this type of work require OSHA bloodborne pathogens training
- All injuries will be reported to the HSO who will provide first aid and follow-up with necessary medical surveillance



◀◀◀ LEA CARDINAL RULES ▶▶▶

- **JOB HAZARD ANALYSIS (JHA)**

A written JHA will be performed during the proposal/bidding phase, prior to beginning work and any time that work/environmental conditions or work activities change. All controls defined in the JHA must be implemented.

- **INCIDENT REPORTING/INVESTIGATION**

All Incidents affecting workers, facilities, equipment and property under our management or affected by our work activities, must be reported within 24 hours and investigated from root cause(s) within 5 business days.

- **LOCK OUT/TAG OUT (LOTO)**

Prior to performing work on machines or equipment, Authorized employees and subcontractors shall identify all hazardous energy forms, bring them to and verify a Zero Energy State and secure them using LOTO.

- **GROUND FAULT CIRCUIT INTERRUPTERS (GFCIs)**

Employees and subcontractors shall use approved Ground Fault Circuit Interrupters (GFCIs) on all portable tools and portable electrical devices.

- **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

PPE REQUIRED FOR ALL FIELD, CONSTRUCTION AND MAINTENANCE ACTIVITIES: Safety glasses w/ side shields; Safety shoes/boots; Safety vests (Class 2 for roadwork) or approved safety T-shirts (outside work); Hard hats (construction areas), Long pants and shirts with sleeves.

- **UNDERGROUND UTILITY CLEARANCE**

Before breaking ground for any invasive activity, the Company Utility Clearance policy shall be implemented. All utilities on private property shall be located by a qualified private utility locator. The H+JHA shall be re-evaluated based on the utility locations marked in the field.



HAZARD MITIGATION MEASURES

COLD STRESS

- Be aware of the symptoms of cold stress and appropriate first aid measures. Because of the considerable danger to personnel, outdoor work should be suspended if the ambient temperature drops below 0°F or if the wind chill factor drops below -29°F. Minimize wind chill effects by wearing a wind resistant outer shell.
- Wear appropriate clothing: Proper insulation and good ventilation is critical. Don layers of loose fitting clothing.
- Schedule work during the warmest times of the day and minimize lengthy periods of outdoor activity. Provide extra work breaks and additional shifts, if necessary.
- Provide warm shelter and warm, non-caffeinated beverages.
- Plan for work appropriately if cold weather is to be a potential hazard.
- If necessary, provide heaters and windbreaks.
- Utilize a buddy system.
- Keep first aid supplies and equipment available.



HAZARD MITIGATION MEASURES

Diesel/ Gasoline Exhaust

Exhaust fumes can have serious health effects on people who are exposed to them. Symptoms can include headaches and nausea to cancer and respiratory disease. The following information lists ways in which harmful exhaust fumes may be avoided at work.

- Vehicles should be tuned up on a regular basis to limit the exhaust fumes which are emitted; the vehicles should also be checked for any leaks or cracks which may allow the release of exhaust.
- Vehicles should not be left in an idle state for an extended period of time.
- Air cleaners and particle traps should be used in the vehicles to provide cleaner exhaust.
- When driving a diesel-powered vehicle, keep the windows up as much as possible.
- Stand clear of exhaust fumes if a vehicle is operating.
- Make sure the areas in which the vehicles are operating are properly ventilated.



HAZARD MITIGATION MEASURES

DRILLING

◀◀◀ CARDINAL RULE ▶▶▶

ADHERE TO LEA GROUNDBREAKING AND EXCAVATION PRE-INTRUSION PLANNING GUIDE TO PREVENT ACCIDENTAL UNDERGROUND FACILITY CONTACT

- Conduct a pre-mobilization survey to identify drill rig accessibility and potential hazards including, but not limited to, potential overhead hazards such as electrical power lines and potential hazards associated with site topographic features (stability).
- Prior to the commencement of drilling activities, review the locations of subsurface facilities and potential overhead hazards and re-assess drill rig stability relative to site topographic features and current site conditions.
- Monitor weather conditions. Drilling operations shall cease during electrical storms or when electrical storms are imminent.
- DO NOT attempt to achieve more production than that for which the drilling equipment is designed.
- All drilling contractor personnel shall be familiar with the operation of the drilling equipment and the safety procedures to be followed during drilling.
- The oversight geologist and other support personnel shall review with the driller the location and operation of all emergency shutdown controls.
- Never mobilize a drill rig with the mast in the upward position.
- Set up equipment on stable ground. Use hydraulic jacks and outriggers appropriately given the site conditions.
- All personnel except drill crew personnel shall stay clear of the drilling operations and work area.
- Drill crew personnel shall don appropriate personal protective equipment (PPE) and shall wear tight-fit clothing at all times.
- Provide total containment of all drilling spoils.

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HAZARD MITIGATION MEASURES

DRILLING



HAZARD MITIGATION MEASURES

DROWNING – WORKING OVER OR NEAR WATER

- Employees working over or near water, where the danger of drowning exists, shall be provided with U.S. Coast Guard-approved personal floatation device, life jacket, or buoyant work vests.
- Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.
- Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
- At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water.
- Ring buoys and a skiff must be provided irrespective of any fall protection provided to workers.



HAZARD MITIGATION MEASURES

ELECTRICAL SAFETY

◀◀◀ CARDINAL RULES ▶▶▶

ADHERE TO LEA GROUNDBREAKING AND EXCAVATION PRE-INTRUSION PLANNING GUIDE TO PREVENT ACCIDENTAL UNDERGROUND ELECTRIC FACILITY CONTACT

- All electrically powered equipment and extension cords will be used in accordance with the national Electric Code and OSHA standard.
- All electrically powered equipment shall be Underwriters Laboratories- (UL) approved and grounded by a cord having an identified grounding conductor and multi-contact polarized plug-in receptacle.
- All extension cords used on-site will be equipped with ground fault circuit interrupters.
- Electrically powered equipment and extension cords shall be visually inspected for damage before each use.
- Equipment found defective shall be removed from service and properly tagged until repaired.
- The HSO will inform Site workers of any known electrical exposures (e.g., utility lines, equipment or tools). However, it is the responsibility of all personnel to exercise caution when working with or around electrical equipment or utility lines.
- The following safety precautions shall be undertaken when assigned Site activities require that work be done in close proximity to electrical lines. Any work closer than 10 feet or with equipment that could come within a 10 foot radius of high voltage overhead lines requires a formal safety evaluation and approval of the HSM.
- Any electrical circuits that pose a potential exposure on the job site will be de-energized and locked out. Lockout will consist of a padlock, and a red tag. The tag will identify the time, date and type of work to be completed and the expected time and date of completion.
- Unprotected energized utility lines near proposed excavations will be de-energized before excavation begins, if possible, with the same padlock and red tag system;
- Any utility lines that must remain energized will be identified by the HSO and their



HAZARD MITIGATION MEASURES

ELECTRICAL SAFETY

location marked in red on the plot plan and other work documents. All possible efforts must be made to avoid contact with electrical power lines.

- All personnel working near energized electrical lines will follow a safe work procedure approved by the HSO and use approved electrically insulated equipment; all temporary wiring must be protected, off of the ground, and inspected daily for any signs of degradation;
- All personnel will use the following safety precautions when operating electrical tools:
 - a. Electrical equipment using temporary 120-volt, single phase, 15 and 20-ampere receptacle outlets must use a ground fault interrupter (GFI) or be part of an effective grounding conductor program (29 CFR 1926.404). The HSO will determine the appropriate requirements for the grounding conductor program.
 - b. Emergency generators used will be grounded via a properly inserted ground rod. Gasoline for these generators will only be handled in safety cans and properly stored away from sources of ignition.
 - c. All electrical equipment, power cords, and GFCIs shall be inspected daily for any signs of degradation. Intrinsically safe tools with explosion proof wiring will be used in all areas where flammable vapors or liquids could potentially exist;
 - d. Grounding capability of all systems will be tested weekly.
 - e. All electrically powered equipment shall be Underwriters Laboratories-(UL) approved and grounded by a cord having an identified grounding conductor and multi-contact polarized plug-in receptacle.
 - f. All extension cords used onsite will be equipped with ground fault circuit interrupters.
 - g. Electrically powered equipment and extension cords shall be visually inspected for damage before each use.



HAZARD MITIGATION MEASURES

ELECTRICAL SAFETY

- Equipment found defective shall be removed from service and properly tagged until repaired.



HAZARD MITIGATION MEASURES

ELECTRICITY & HAZARDOUS ENERGY CONTROL

◀◀◀ CARDINAL RULES ▶▶▶

ADHERE TO LEA GROUNDBREAKING AND EXCAVATION PRE-INTRUSION PLANNING GUIDE TO PREVENT ACCIDENTAL UNDERGROUND ELECTRIC FACILITY CONTACT

ADHERE TO LEA POLICY ON LOCKOUT/TAGOUT - Prior to performing work on machines or equipment, authorized employees and subcontractors shall identify all hazardous energy forms, bring them to and verify a Zero Energy State and secure them using LOTO. The control of hazardous energy (lockout/tagout) applies not just to electricity but to all types of energy whose unexpected or sudden release could cause injury. Common energy sources include electrical, mechanical, hydraulic, pneumatic, chemical and thermal.

ADHERE TO LEA POLICY ON GROUND FAULT CIRCUIT INTERRUPTERS - Employees and subcontractors shall use approved Ground Fault Circuit Interrupters (GFCIs) on all portable tools and portable electrical devices.

- At the beginning of any job, the individual in charge of the work group should hold a job debriefing covering at least the following topics: Hazards associated with the job; Work procedures involved; Special precautions; Energy source controls; and Personal protective equipment requirements.
- Only qualified individuals may work on or with exposed energized parts.
- Rubber gloves and protectors (leather over-gloves) should be worn whenever testing, switching, or working on energized electrical equipment. Use the appropriate class of high voltage glove based on the voltage rating of the electrical equipment being serviced.
- Do not fold gloves or expose them to undue stress, pressure, or force. Visually inspect rubber gloves for cracks, punctures, or other damage before each use. Verify that the gloves have been lab tested within the last six months.
- Robber blankets, used in conjunction with insulated clamps for positioning, provide temporary insulation from energized conductors. Blankets are available in various sizes and shapes and are classified in the same manner as rubber gloves.



HAZARD MITIGATION MEASURES

ELECTRICITY & HAZARDOUS ENERGY CONTROL

- Do not wear jewelry with gloves.
- Use padlocks, hasps, and tags to lock out electrical equipment whenever work is being performed on the equipment.
- Consider an overhead wire to be energized unless the owners of the line or the electrical utility authorities have indicated that it is not energized and it has been visibly grounded.
- Minimum clearance of 10 feet shall be maintained for energized lines of 50 kV or below. Minimum clearance of 10 feet plus 0.04 inch per 1 kV over 50kV, or twice the length of the line insulator, but never less than 10 feet.
- Protective grounds should be applied whenever personnel are working on electrical equipment that could be re-energized.
- Use extension cords only when necessary and only on a temporary basis. Replace cracked or worn extension cords with new, #16 gauge cords that have the listing, of a nationally-recognized testing laboratory, safety closures, and other safety features.
- Use only three-wire extension cords for equipment with three-prong plugs. Never remove the third (round or U-shaped) prong, which is a safety feature designed to reduce the risk of shock and electrocution
- Perform all work in accordance with the National Electrical Code (NEC), OSHA standards, and applicable sections of the National Fire Protection Association (NFPA) Code, including NFPA 70E.
- Prior to the commencement of subsurface investigation activities, review the locations of subsurface electric facilities and potential overhead electrical hazards.



HAZARD MITIGATION MEASURES

EXCAVATION AND TRENCHING

- Excavation activities will be conducted during daylight.
- Personnel scheduled for these activities shall be familiar with the requirements of the OSHA excavation standard.
- Excavation and trenching activities will be conducted in accordance with the plans previously submitted to and approved by the New York City Department of Buildings.
- Any trench over 5 feet deep will require sloping back appropriately. Alternative measures to protect workers, such as shoring or trench boxes, may be provided where sidewall support is required. Trenches will not be left uncovered or unprotected at the end of the day.
- In many instances, Site personnel will be required to work in and around various types of excavations. Assessments of soil and excavation conditions must be made continuously while work is being done in order to maintain a safe working environment. Serious harm and fatalities have occurred when changes in the soil or excavation conditions have gone unnoticed; therefore, the following items are required of all Site personnel:
 - Excavated material, equipment, and debris shall be kept a minimum of 2 feet from the rim of the excavation; Excavations greater than 5 feet in depth must be benched, sides sloped at 1:1 (horizontal to vertical), or provided with shoring and bracing;
 - No person will enter any excavation containing water without actively shoring the side walls.
- Excavations will be inspected daily by the HSO for indications of possible cave-ins, failure of protective systems, hazardous atmospheres or other conditions that could present a safety hazard.
- The HSO will remove workers from any excavation found unsafe until necessary precautions to ensure their safety have been instituted.
- All trenches 25 feet long and 4 feet deep must be equipped with 2 remote means of egress. Ladders used for egress will have recessed rungs, secured at the top of the excavation, have a recommended slope of 4:1 (vertical to horizontal), and extend at least two rungs above excavation.



HAZARD MITIGATION MEASURES

EXCAVATION AND TRENCHING

- Heavy equipment movement around any excavation should be minimized. Additional stronger shoring capable of restraining the additional forces will be provided if heavy equipment movement is necessary near the excavation.
- The atmosphere within the excavation shall be monitored continuously while any Site worker is in the excavation



HAZARD MITIGATION MEASURES

EYE & FACE PROTECTION

- **Under no circumstances are regular eyeglasses to be considered a substitute for approved eye protection.**
- Contact lenses do not fulfill the personal protective equipment requirements for ocular safety when worn by individuals performing eye hazardous tasks. OSHA (29CFR1910.134), requires individuals who wear contact lenses in the workplace to combine them with appropriate industrial safety eyewear.
- At the beginning of any job, the individual in charge of the work group should hold a job debriefing covering at least the following topics: Hazards associated with the job; Work procedures involved; Special precautions; Energy source controls; and Personal protective equipment requirements.
- Use protective eye and face devices that comply with ANSI Z87.1-1989, *American National Standard Practice for Occupational and Educational Eye and Face Protection*.
- Identify whether the tasks have the potential to generate dusts, flying particles, molten metal, or chemical splashes, and whether UV and/or IR radiation exposure is a concern.
- Implement engineering and administrative controls to minimize exposure to hazards.
- Do not touch the face or eyes during work activities.



HAZARD MITIGATION MEASURES

SLIP, TRIP & FALL PREVENTION

Slippery wet or oily surfaces:

- Use floor mats on interior floors and hallways when wet.
- Be sure the floor mats lay flat and don't create additional trip hazard by curling up or shifting when walked upon.
- Place portable warning signs to alert others.
- Clean up spills as soon as possible.
- Apply traction tapes and coatings on steps, platforms and machine surfaces.

Stability and condition of walking surfaces:

- Repair loose flooring and protruding nails.
- Fill holes and cracks in flooring and walks, and maintain access/egress paths.
- Never use boxes, chairs, or furniture as platforms for work.
- Contrast paint edges on steps, curbs and raised surfaces.

Lighting and Visibility:

- Maintain and repair lights over stairs and in work or storage areas.
- Don't forget emergency lighting.
- Use portable lights in dimly lit and exterior locations.
- Use warning signs to alert workers of trip or slip hazards.

Fall protection safeguarding features:

- Maintain and repair railings on stairways and ramps.
- Install temporary guard railings and cover openings in floors and walls during work involving or adjacent to exposed openings or edges.



HAZARD MITIGATION MEASURES

SLIP, TRIP & FALL PREVENTION

Housekeeping and path obstructions:

- Carefully route extension cords away from pathways.
- Clean up work areas frequently.
- Discard material as you work, rather than dropping or tossing waste material aside.
- Clutter-free below the knees.
- Keep tools and materials off of the floor, and store materials away from walking or working areas to prevent workers from tripping, stepping, or climbing over them.

Ladder and Stepladder Safety:

- Maintain 3 point contact at all times when climbing and working on any ladder.
- Never stand on the top two steps of a stepladder or extension ladder.
- Choose the proper ladder for the job.
- Never use a closed stepladder as a straight ladder, and always select a ladder that allows you to access the work maintaining 3 point contact at all times.
- Carry tools in tool-belts, not in your hands when climbing a ladder.
- Use the 4-step firefighter technique to quickly pitch a ladder at the proper angle:
 - 1: Place toes against ladder foot-pads;
 - 2: Stand erect facing ladder;
 - 3: Extend arms at shoulder height;
 - 4: Palms of hands should rest on rung at about shoulder height. Adjust ladder if needed.



HAZARD MITIGATION MEASURES

FIRE

- Maintain portable fire extinguishers at the job site.
- Know the locations of the fire extinguishers at the job site and know what types of fire extinguishers put out what types of fires.
- Know routes of egress and evacuation and whom to contact in the event of a fire.
- Understand how to operate the fire extinguishers at the job site before they are needed. Instructions for proper use are printed on each fire extinguisher.
- Not all fire extinguishers put out all types of fires, and using the wrong type of fire extinguisher may spread the fire.

Types of Fire/Extinguishers:

Class A – Extinguisher has an “A” on a Green Triangle

Will extinguish wood, paper, cloth fires within 75 feet of employees.

Class B - Extinguisher has an “B” on a Red Square

Will extinguish combustible liquids, greases, flammable gasses within 50 feet of potential fire.

Class C - Extinguisher has an “C” on a Blue Circle

Will extinguish electrical fires within 50 feet of potential fire.

Class D - Extinguisher has an “D” on a Yellow Star

Will extinguish combustible metals such as potassium and magnesium within 75 feet of potential fire.

Understand that people are more important than property – If a fire cannot be properly controlled by fire extinguishers, then Get Away, Warn Others to Get Away, and Call the Fire Department.



HAZARD MITIGATION MEASURES

HAND AND FOOT PROTECTION

- Under no circumstances is regular footwear to be considered a substitute for approved steel-toed/steel-shank boots. Steel-toed/steel-shank footwear is MANDATORY.
- Appropriate work gloves must be used at all times, as required.
- Be aware of “pinch points” when working with tools and heavy equipment.
- Use proper lifting techniques to avoid dropping heavy loads on hands and feet.
- Be aware of moving machinery and heavy equipment in the work area.
- Use proper tools for lifting heavy equipment and follow the guidelines for using the lifting tools.



HAZARD MITIGATION MEASURES

HEAT STRESS

- Provide plenty of liquids. Drinking water is the single most important method of replacing body liquids, lost through perspiration.
- Avoid caffeinated beverages.
- If heat cramp symptoms are experienced, such as muscle cramps, ankle swelling, or feeling faint, some electrolyte replacement through sport drinks or a mixture of fruit juice and water may be needed.
- Eat a healthy diet and drink plenty of water to ward off heat related injuries.
- When practicable, the most labor-intensive tasks should be carried out during the coolest part of the day.
- Provide cooling devices or on-site showers as necessary.
- When the ambient air adjusted temperature exceeds 65 degrees Fahrenheit (°F) and personnel are wearing protective clothing, a heat stress monitoring program shall be implemented. Adjusted ambient temperature ($t_{a\ adj}$) is the ambient temperature (t_a) adjusted for solar radiation, and is calculated as: $t_{a\ adj}; ^\circ F = t_a ^\circ F + (13 \times \% \text{ sunshine})$.
- Frequency of site worker monitoring should increase as the ambient temperature increases or if slow recovery rates are indicated. Suggested work period duration is as follows:

Ambient Temperature (Adjusted)	Work Duration for Permeable PPE (level D)	Work Duration for Impermeable PPE (levels C, B, modified D)
65°F - 77.5°F	120 minutes	120 minutes
77.5°F - 82.5°F	120 minutes	90 minutes
82.5°F - 87.°F	90 minutes	60 minutes
87.5°F - 90°F	60 minutes	30 minutes



HAZARD MITIGATION MEASURES

Insects

Employees working in environments prone to insects should be aware of which insects may be in that environment and how to limit exposure. Anyone with known severe allergies to insects shall inform those within the workgroup of the allergy and the necessary response in the event of a bite. If a prescriptive allergy kit for anaphylaxis is necessary, its location shall be known and close by at all times. Insect repellents should be made available at the job site, as needed.

To limit exposure:

- Apply insect repellents according to manufacture's directions (some repellents should not be applied to skin).
- Wash off repellent as soon as it is no longer needed.
- Wear light colored, smooth finished clothing.
- Wear long sleeve shirts with the cuffs buttoned.
- Wear long pant with the cuff tucked into boots
- Avoid perfumed products such as lotions and aftershaves.
- Do not swat at stinging insects as they are more likely to attack if they feel threatened.

If bitten or stung:

- Identify the insect, if possible.
- Monitor the bitten or stung area closely for a reaction. Continue to monitor the location as some symptoms may not be evident for several days or up to two weeks.
- Administer prescriptive allergy medication (as prescribed by a physician) if necessary.
- Some spider bites, from black widows or brown recluse can be life-threatening. Try to contain the spider for identification and seek immediate medical attention.
- Seek medical attention if you receive 10 or more stings.
- Promptly remove ticks or stingers.
- Most insect bites can be treated with over the counter remedies such as antihistamines, calamine lotion, topical hydrocortisone, or aloe vera.



HAZARD MITIGATION MEASURES

Insects

- Seek immediate medical attention if you develop a systemic reaction such as difficulty breathing, sweating, cramps, hives, or vomiting; if you have a general overall sickness with fever, headache, nausea and vomiting or severe symptoms such as neck stiffness, disorientation, tremors, after being bitten or if any pain and swelling persist for more than 72 hours.



HAZARD MITIGATION MEASURES

LADDERS

Set Up:

- Follow the 4 to 1 rule when setting up a single or extension ladder. The distance between the foot of the ladder and the base of the wall should be about one fourth of the distance from the base to where the ladder touches the wall.
- Never use a ladder in a horizontal position.
- Before climbing, make sure ladder feet are firmly and evenly supported.
- If the ladder is used to climb onto a platform, roof or landing, it should extend at least 3 feet above the step off point.
- If a ladder is placed in a doorway, the door should be locked, blocked, or guarded.
- Do not try to extend a ladder by placing it on top of a box or other object.

Ascending and Descending:

- Two hands and a foot or two feet and a hand should be on the ladder at all times.
- Do not carry objects up and down the ladder. Raise and lower needed tools and materials with a rope or bucket.
- Face the ladder when climbing up or down.
- To avoid slipping, make sure shoes are clean before climbing on a ladder.
- One person should be on a ladder at a time.
- Do not climb higher than the third rung from the top on a single or straight ladder or the second step from the top on a stepladder.

Other Precautions:

- Use fiberglass ladders when working around electricity.
- Always move ladders in a horizontal position to avoid contact with power lines.

- Ladders should be inspected for defects prior to use.
- A ladder that is found to be defective and in need of repair should be tagged and taken out of service.
- Do not overreach when using a ladder.
- Keep ladders clean since dirt and paint can hide defects.



HAZARD MITIGATION MEASURES

MANUAL MATERIAL HANDLING

- Stretch the lower back and hips before lifting.
- Use totes or toolboxes with handles when possible to reduce hand, arm and back strain.
- Wear gloves with dots or non-slip palm coatings to significantly reduce hand grip and arm strain when lifting and carrying boxes and other slippery items.
- Keep loads centered and stabilized when using wheelbarrows, and never overload.
- Increasing bucket or pail handle diameter to a comfortable grip size can greatly reduce hand fatigue and contact stress.
- Use the diagonal lift (bag/sack lift) for lifting heavy bags/sacks.
- Use teamwork and mechanical aids whenever possible.



HAZARD MITIGATION MEASURES

MATERIAL STORAGE

All storage areas must be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. The following procedures are suggested:

- All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse.
- Each worker required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with personal fall arrest equipment.
- Non-compatible materials shall be segregated in storage.
- Bagged materials shall be stacked by stepping back the layers and cross-keying the bags at a height of at least every ten bags.
- Brick stacks shall not be more than seven feet in height. When a loose brick stack reaches a height of four feet, it should be tapered back two feet in every foot of height above the four-foot level.
- When masonry blocks are stacked higher than six feet, the stack shall be tapered back one-half block per tier above the six-foot level.
- Structural steel, poles, pipe, bar stock, and other cylindrical materials unless racked, shall be stacked and blocked so as to prevent spreading or tilting.



HAZARD MITIGATION MEASURES

Medical Waste

Medical waste includes hypodermic needles, bandages, anything with blood, and many other items. If medical waste is found at the site during the implementation of the scope of work, the following measures should be taken:

- Use appropriate gloves and other PPE if the need for picking up sharp objects exists; dispose of any sharp objects in appropriate plastic (sharps) containers.
- Medical waste should be separated from non-medical waste.
- If medical waste must be transported, a group consisting of at least two people should be involved in the transport.
- If medical waste indicates an emergency, call 911.
- If a spill is present, contact appropriate personnel.
- Wash hands immediately and thoroughly if there has been any exposure to medical waste.



HAZARD MITIGATION MEASURES

NOISE ABATEMENT AND HEARING PROTECTION

- Know the effects of noise, including: (i) workers being startled, annoyed, or distracted; (ii) physical damage to the ear, pain, and temporary and/or permanent hearing loss; and, (iii) communication interference that may increase potential hazards due to the inability to warn of danger and proper safety precautions to be taken.
- Utilize feasible administrative or engineering controls if workers are subjected to noise exceeding an 8-hour, time-weighted average (TWA) sound level of 90 dBA (decibels on the A-weighted scale).
- When you are exposed to noise levels that are at or above 85 dBA, averaged over 8 working hours, specific Occupational Safety and Health Administration (OSHA) rules take effect which involve monitoring of noise exposure, audiometric testing, baseline audiograms, annual audiograms, audiogram evaluations, hearing protectors, training, and record keeping.
- Wear hearing protection when applicable.



HAZARD MITIGATION MEASURES

OPERATING HEAVY EQUIPMENT

Heavy Equipment includes backhoes, bulldozers, and dump trucks used during excavation and soil screening.

- ONLY trained and authorized personnel should operate heavy equipment.
- Complete an inspection log before operating any equipment. Do not operate the equipment if deficiencies are noted during the inspection.
- Mobile equipment must have backup alarms, adequate mirrors, and flag person if necessary.
- Booms of excavators must not come any closer than ten feet to overhead electric lines. If necessary, call the HSS for approval and appropriate precautions.
- Before digging, confirm the locations of underground utility lines are marked by the utility companies. If the utility markup is not completed STOP WORKING and contact SHSO.
- Follow appropriate equipment startup procedures. Brakes, steering, clutches and controls shall be tested.
- Remember, heavy equipment has the right-of-way over regular vehicles and pedestrians. Yield to heavy equipment.
- Listen for warning signals on heavy equipment.
- Perform a visual inspection and walk around parked heavy equipment before moving to assure that equipment is in good condition and that there are no personnel on the ground that could be injured or objects that could be damaged by vehicle movement.
- Use hand rails and footholds when mounting and dismounting equipment,
- Pay attention to workers on the ground whom may be in the path and provide warning prior to moving the equipment.
- Permit no one to ride on, or in, heavy equipment. This includes any portion of a backhoe, bulldozer, forklift or the back of a pickup truck, except in locations specifically designed for passenger use and approved by the HSO.



HAZARD MITIGATION MEASURES

OPERATING HEAVY EQUIPMENT

- Locate and flag underground utilities and buried cables, prior to intrusive activities.
- Keep hauling vehicles under positive control at all times while operating. Vehicles shall be kept in gear when descending grades.
- Do not use heavy equipment on slopes with steepness exceeding 3H:1V unless operations are consistent with manufacturer's recommendations.
- Operate equipment with booms, blades, buckets, beds, etc., lowered or in a stable position while on slopes. Safety cables tethered to appropriate anchors shall be used for equipment working on steep slopes, where appropriate.
- Apply basic lock-out/tag-out (LO/TO) procedures: equipment attachments shall be fully lowered or blocked; controls shall be set in the neutral position; motors shall be stopped; and, brakes shall be set.
- If you are working with an operator as a ground guide, or in some other capacity to observe clearance of the equipment and give warning to the equipment operator in situations where it is difficult for the equipment operator to maintain the desired clearance by visual means, ensure that the operator maintains eye contact with you.
- For all nearby electric lines, an overhead wire will be considered to be energized unless the owner of the line or the electrical utility authority indicates that it is not energized and it has been visibly grounded. Maintain the following clearance:

i. Energized Lines:

<u>Line Rating</u>	<u>Minimum Clearance</u>
50 kV or below	10 feet
Over 50 kV	10 feet plus 0.04 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet

ii. In transit, equipment clearance must be a minimum of:

<u>Line Rating</u>	<u>Minimum Clearance</u>
50 kV or below	4 feet
Over 50 kV to 345 kV	10 feet
Over 345 kV to 750 kV	16 feet

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Loureiro Engineering Associates, Inc.

HAZARD MITIGATION MEASURES

OPERATING HEAVY EQUIPMENT

US EPA ARCHIVE DOCUMENT



HAZARD MITIGATION MEASURES

Subsection 7

OPERATING PORTABLE TOOLS

◀◀◀ CARDINAL RULES ▶▶▶

ADHERE TO LEA GROUNDBREAKING AND EXCAVATION PRE-INTRUSION PLANNING GUIDE TO PREVENT ACCIDENTAL UNDERGROUND ELECTRIC FACILITY CONTACT

- Route cords, hoses, and cables supplying power to portable power tools to prevent tripping hazards or contact with equipment or machinery.
- Avoid abusing the power supply lines of portable equipment. Excessive scraping, kicking, stretching, and exposure to grease and oils will damage lines or cause them to fail prematurely, and possibly injure the operator or fellow works.
- Inspect cords, hoses, and cables for wear or deterioration. Defective power supply lines shall not be used.
- Do not use electrically powered tools near flammable materials or explosive atmosphere, unless they are of the explosion-proof type meeting the National Electrical Code for explosive area. Employees operating the equipment should be aware of sparks and or metal fragments when using this equipment.
- Ground-check portable electric power tools with metal cases initially and quarterly. At no time will electrical power equipment be operated without proper grounding. All electrical cords and cables, including extension cords, shall include a third wire ground.
- Prohibit operations of electric tools in wet or damp areas except in unusual emergency circumstances. When operation is required in wet or damp conditions, extreme care will be exercised to ensure effective grounding of equipment and proper use of protective gear.
- Size cords adequately for length and the electrical demand of the tool. Otherwise, they may cause a fire hazard.



HAZARD MITIGATION MEASURES

Subsection 7

OPERATING PORTABLE TOOLS

- Limit use of tools to the purpose for which the tool is intended. (e.g., wrenches will not be used as hammers). Defective tools (e.g., with mushroomed heads or split or defective handles) shall not be used.
- Protect tools from corrosion damage.
- Keep tools free of accumulated dirt and unnecessary oil or grease. Moving and adjustable parts shall be lubricated frequently to prevent wear and misalignment.



HAZARD MITIGATION MEASURES

RESPIRATION & RESPIRATORY PROTECTION

- Know the odor and odor threshold of the chemicals of concern. Some toxic chemicals present in the atmosphere may not be detected by human senses and may be odorless and colorless; their toxic effect may not produce immediate symptoms.
- Use engineering controls, including ventilation, to reduce vapor concentrations and use engineering controls, such as applying water or foams, to eliminate or minimize the generation of dust.
- Wear respiratory protection as indicated by air monitoring results and/or as required by the HASP. Employees must follow the company respiratory protection program: In addition to having medical approval for respirator use, must know and be able to demonstrate a knowledge of the following:
 - (i) why a respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
 - (ii) the limitations and capabilities of respiratory equipment;
 - (iii) how to use respiratory equipment effectively in emergency situations, including situations in which the respiratory equipment malfunctions;
 - (iv) how to inspect, put on and remove, use and check the seals of a respirator;
 - (v) procedures for maintenance and storage of a respirator;
 - (vi) medical signs and symptoms that may limit or prevent the effective use of respirators;
 - (vii) the general requirements of 29CFR1910.134, *Respiratory Protection*, including Appendix D, which deals with dust masks.

Be aware that improperly using the right respirator for a specific atmosphere or using the wrong respirator could result in exposure to a very serious health hazard. Also, be aware that the lungs are extremely vulnerable to chemical agents. Even substances that do not directly affect the lungs may pass through lung tissue into the bloodstream, where they are transported to other vulnerable areas of the body.



HAZARD MITIGATION MEASURES

SILICA

When working in areas where possible exposure to respirable crystalline silica dust exists, adhering to the following procedures is recommended:

- Recognize when silica dust may be generated and plan ahead to eliminate or control the dust at the source.
- Do not use silica sand or other substances containing more than 1 percent (%) crystalline silica as abrasive blasting materials. Use less hazardous materials.
- Use engineering control and containment methods such as wet sawing of silica-containing materials to control the hazard and protect adjacent workers from exposure.
- Routinely maintain dust control systems to keep them in good working order.
- Practice good personal hygiene.
- Wear disposable or washable protective clothing.
- Shower (if possible), and change into clean work clothes before leaving the job site.
- Conduct air monitoring to measure worker exposures and ensure that controls are providing adequate protection for workers.
- Use adequate respiratory protection when source controls cannot keep silica exposures below the NIOSH REL.

APPENDIX G

Air Monitoring Logs

AIR MONITORING LOG

SITE: Centredale Manor Restoration Project Superfund Site – Tim-Critical Removal Action, Shallow Groundwater Remedy – Groundwater Action Area

ACTIVITY: _____

PERSONNEL: _____

INSTRUMENTS USED (INCLUDE LAST CALIBRATION DATE):

<u>DATE/TIME</u>	<u>LOCATION</u>	<u>INSTRUMENT</u>	<u>READING</u>

MONITORING PERFORMED BY: _____

NAME

DATE

US EPA ARCHIVE DOCUMENT

APPENDIX H

Air Purifying Respirator Logs

AIR PURIFYING RESPIRATOR LOG

SITE: Centredale Manor Restoration Project Superfund Site – Tim-Critical Removal Action, Shallow Groundwater Remedy – Groundwater Action Area

LOCATION: _____

DATES OF INVESTIGATION: _____

<u>User</u>	<u>Date of Use</u>	<u>Cleaned and inspected prior to use (initials)</u>	<u>Cartridges changed prior to use (yes, no, na)</u>	<u>Total hours on cartridge</u>
-------------	--------------------	--	--	---------------------------------

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

Site Health and Safety Officer or Project Manager:

Date:

Return to Office Health and Safety Representative at the completion of field activities.

APPENDIX I

Material Safety Data Sheets



MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-645

SECTION I: GENERAL INFORMATION

- Manufacturer's Name: RUSMAR INCORPORATED
- Manufacturer's Address: 216 Garfield Avenue • West Chester, PA 19380
- Manufacturer's Phone No.: 610-436-4314
- Chemical Family: Aqueous anionic surfactant mixture
- Trade Name: RUSMAR AC-645

SECTION II: HAZARDOUS INGREDIENTS

- Paints, Preservatives, and Solvents - None
- Alloys and Metallic Coatings - None
- Hazardous Mixtures and Other Materials - None

SECTION III: PHYSICAL DATA

- Boiling Point: 100° C
- Vapor Pressure: 25mm Hg at 25° C
- Vapor Density (Air = 1): N/A
- Water Solubility: Complete
- Appearance/Odor: Translucent, white, milk-like, odorless, viscous liquid
- Specific Gravity: 1.01 to 1.06
- % Volatile, By Volume: None
- Evaporation Rate: N/A

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

- Flash Point (Method): Nonflammable
- Flammable Limits: N/A
- Extinguishing Media: N/A
- Special Fire Fighting Procedures: None
- Unusual Fire and/or Explosion Hazards: None

SECTION V: HEALTH HAZARD DATA

- Threshold Limit Value: Not Determined
- Effects of Overexposure: This material is not expected to present an inhalation or ingestion hazard. It may cause an eye or skin irritation upon direct contact.
- Emergency and First Aid Procedures: Wash thoroughly with clean water



MATERIAL SAFETY DATA SHEET

LONG DURATION FOAM AC-645

SECTION VI: REACTIVITY DATA

- Material is stable
- No material incompatibility
- Hazardous Decomposition Products: Low levels of sulfur oxides on exposure to high temperatures (concentrate). Foam is non-combustible.
- Polymerization will not occur

SECTION VII: SPILL OR LEAK PROCEDURES

- Steps to be taken in case material is released or spilled: If spilled indoors on a hard surface, the spill area may be slippery and should be thoroughly washed with water. Contain spill and absorb material with dirt or other appropriate absorbent.
- Waste Disposal Method: This material is completely biodegradable and can be disposed of in a sanitary landfill according to local regulations.

SECTION VIII: SPECIAL PROTECTION INFORMATION

- Respiratory Protection: None required for normal operations
- Ventilation: No special requirements
- Protective Gloves: Not required, but recommended
- Eye Protection: Not required, but recommended
- Other Protective Equipment: None

SECTION IX: SPECIAL PRECAUTIONS

- Storing/Handling Precautions: Avoid excessive heat. Material will freeze, but thawing will not cause changes in the product.
- Other Precautions: None

MATERIAL SAFETY DATA SHEET

REVISION DATE: 01/16/2008
PRINT DATE: 07/26/2008

1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

Polymers Inc Superabsorbent

Supplier : **Polymers, Inc./Watersorb.com**
1418 Rodgers Ave
Fayetteville AR 72701
Tel : 501-623-9918 Fax : 630-604-1966

2. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the preparation : Superabsorbent polyacrylate

3. HAZARDS IDENTIFICATION

The product when wet renders surfaces extremely slippery.
The product swells in water.

4. FIRST AID MEASURES

Inhalation : No hazards which require special first aid measures

Skin contact : No hazards which require special first aid measures.

Eye contact : Rinse thoroughly with plenty of water, also under the eyelids. In case
- of persistent eye irritation, consult a physician.

Ingestion : The product is not considered toxic based on studies on laboratory
- animals.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media : Water, water spray, foam, carbon dioxide
- (CO2), dry powder.

Fire extinguishing agents to avoid : None.

Special fire-fighting precautions : The product when wet renders surfaces
- extremely slippery. The product swells in
- water.

Protective equipment for firefighters : No special protective measures against fire
- required.

Polymers Inc Superabsorbent

K2 REVISION DATE: 01/16/2008
PRINT DATE: 07/26/2008

6. ACCIDENTAL RELEASE MEASURES

Personal precautions : No special precautions required.

Environmental precautions : Do not contaminate water.

Methods for cleaning up : Clean up promptly by scoop or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water

7. HANDLING AND STORAGE

Handling : Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Wash hands before breaks and at the end of workday.

Storage : Keep in a dry, cool place (0-35°C).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls : Use local exhaust if dusting occurs. Natural ventilation is adequate in absence of dusts.

Personal protection equipment

Respiratory protection : Dust safety masks are recommended where concentration of - total dust is more than 10 mg/m³.

Hand protection : Gloves are recommended. -

Eye protection : Safety glasses with side-shields. Do not wear contact lenses.

Skin protection : No special protective clothing required.

Hygiene measures : Wash hands before breaks and at the end of workday.

- Handle in accordance with good industrial hygiene and safety practice

9. PHYSICAL AND CHEMICAL PROPERTIES

Form :	powder
Color :	white
Odor :	none
Melting point (°C) :	not applicable
Flash point (°C) :	not applicable
Autoignition temperature (°C) :	not applicable

Polymers Inc Superabsorbent

K2 REVISION DATE: 01/16/2008
 PRINT DATE: 07/26/2008

Vapour pressure (mm Hg) :	Not applicable
Bulk density :	See Technical Bulletin
Water solubility :	Insoluble
Viscosity (mPa s) :	See Technical Bulletin

10. STABILITY AND REACTIVITY

Stability : Product is stable, No hazardous polymerization will occur.

Conditions to avoid : No special precautions required. The product swells in water.

Hazardous decomposition products : At elevated temperatures (> 300°C), thermal decomposition may produce *nitrogen oxides and carbon oxides*. Additionally, in the event of oxygen depletion, hydrocyanic acid can be formed.

-
-

11. TOXICOLOGICAL INFORMATION

Acute toxicity

- **Oral :** Not toxic : LD50/oral/rat > 5000 mg/kg
 - **Dermal :** Not toxic : LD50/dermal/rabbit > 2000 mg/kg

Irritation

- **Skin :** Not irritating
- **Eyes :** Moderate eye irritation due to effects all powders have on conjunctivae.

Sensitization : Not sensitizing.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Ecological injuries are not known or expected under normal use. Aquatic toxicity is unlikely due to low solubility.

Persistence / degradability : Not readily biodegradable, < 10% after 28 days.

13. DISPOSAL CONSIDERATIONS

Polymers Inc Superabsorbent

K2 REVISION DATE: 01/16/2008

PRINT DATE: 07/26/2008

Waste from residues / unused products : In accordance with federal, state and local regulations.

- **Contaminated packaging :** Can be landfilled or incinerated, when in compliance with local regulations.

14. TRANSPORT INFORMATION

Not regulated by DOT.

15. REGULATORY INFORMATION

All components of this product are on the TSCA and DSL inventories.

RCRA status : Not a hazardous waste.

Hazardous waste number : Not applicable

Reportable quantity (40 CFR 302) : Not applicable

Threshold planning quantity (40 CFR 335) : Not applicable

HMIS & NFPA Ratings	HMIS	NFPA
Health :	1	1
Flammability :	1	1
Reactivity :	0	0

16. OTHER INFORMATION

Person to contact :
Regulatory Affairs Manager

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication.

The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.



Material Safety Data Sheets

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480145-00 MOBIL DRIVE CLEAN OIL 10W-30
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL DRIVE CLEAN OIL 10W-30
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 613-228-1467
MSDS Internet Website: <http://emmsds.ihssolutions.com/>

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name Approx. Wt%

PHOSPHORODITHIOIC ACID, 1-5
O,O-DI-C1-14-ALKYL ESTERS,
ZINC SALT (2:1) ZDDP
(68649-42-3)

OTHER INGREDIENTS:

Substance Name Approx. Wt%

ALKYLATED PHENOL 1-5

See Section 8 for exposure limits (if applicable).

US EPA ARCHIVE DOCUMENT

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Amber Liquid. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area. (See Section 16 - Injection Injury)

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 200(392) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m³ (as oil mist) - ACGIH Threshold Limit Value (TLV), 10 mg/m³ (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m³ (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid

contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Amber
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): > 200(392) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.868
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 69.0
VISCOSITY AT 100 C, cSt: 10.5
POUR POINT C(F): -45(-49)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---OTHER TOXICOLOGY DATA---

Used gasoline engine oils have shown evidence of skin carcinogenic activity in laboratory tests when no effort was made to wash the oil off between applications. Used oil from diesel engines did not produce this effect.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ectotoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME CAS NUMBER CONC.

ZINC DITHIOPHOSPHATE 68649-42-3 <1%

The following product ingredients are cited on the lists below:

CHEMICAL NAME CAS NUMBER LIST CITATIONS

DIPHENYLAMINE 122-39-4 1

ZINC (ELEMENTAL ANALYSIS) (0.11%) 7440-66-6 22

ZINC DITHIOPHOSPHATE (<1.04%) 68649-42-3 18, 20, 21, 22, 24, 25

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL 6=IARC 1 11=TSCA 4 16=CA P65 CARC 21=LA RTK
2=ACGIH A1 7=IARC 2A 12=TSCA 5a2 17=CA P65 REPRO 22=MI 293
3=ACGIH A2 8=IARC 2B 13=TSCA 5e 18=CA RTK 23=MN RTK
4=NTP CARC 9=OSHA CARC 14=TSCA 6 19=FL RTK 24=NJ RTK
5=NTP SUS 10=OSHA Z 15=TSCA 12b 20=IL RTK 25=PA RTK
26=RI RTK

Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: AUTOMOTIVE ENGINE OIL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided

on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

 For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 480145-00,
 CMCS97: 971980, REQ: US - MARKETING, SAFE USE: L
 EHS Approval Date: 03APR2002

SYNONYM TRADE NAMES:
 MOBIL MOTOR OIL 10W-30

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
 Environmental Health and Safety Department, Clinton, USA
Emergency Numbers

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P



Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M BRAND 504 RESPIRATOR CLEANING WIPE.

MANUFACTURER: 3M

DIVISION: Occupational Health & Environ. Safety

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 04/27/2006

Supercedes Date: 05/16/2003

Document Group: 11-7028-1

Product Use:

Specific Use: Cleaning respirators.

SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
TOWELETTE	None	40 - 60
WATER	7732-18-5	40 - 60
PERFUME	Unknown	0.1 - 1
POLYOXYETHYLENE MONOOCTYLPHENYL ETHER	9036-19-5	0.1 - 1
BENZYL-C12-16-ALKYLDIMETHYL AMMONIUM CHLORIDES	68424-85-1	0.1 - 1

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Non-Woven Material

Odor, Color, Grade: Towelette impregnated with clear liquid, lemon scent

General Physical Form: Solid moist

Immediate health, physical, and environmental hazards:

This product, when used under reasonable conditions and in accordance with the 3M directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use may affect the performance of the product and may present potential health and safety hazards.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:

Mild Eye Irritation: Signs/symptoms may include redness, pain, and tearing.

Skin Contact:

No health effects are expected.

Inhalation:

No health effects are expected.

Ingestion:

No health effects are expected.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

Not determined.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

Skin Contact: No need for first aid is anticipated.

Inhalation: No need for first aid is anticipated.

If Swallowed: No need for first aid is anticipated.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	<i>No Data Available</i>
Flash Point	<i>Not Applicable</i>
Flammable Limits - LEL	<i>Not Applicable</i>
Flammable Limits - UEL	<i>Not Applicable</i>
OSHA Flammability Classification:	<i>Not Applicable</i>

5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

US EPA ARCHIVE DOCUMENT

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: No unusual fire or explosion hazards are anticipated.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Not applicable.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

Keep out of the reach of children.

7.2 STORAGE

Store in a cool place. Store out of direct sunlight.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Not applicable.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

Avoid eye contact.

Allow cleaned equipment to thoroughly dry prior to use.

8.2.2 Skin Protection

Not applicable.

8.2.3 Respiratory Protection

Not applicable.

8.2.4 Prevention of Swallowing

Not applicable.

8.3 EXPOSURE GUIDELINES

None Established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Non-Woven Material
Odor, Color, Grade:	Towelette impregnated with clear liquid, lemon scent
General Physical Form:	Solid moist
Autoignition temperature	<i>No Data Available</i>
Flash Point	<i>Not Applicable</i>
Flammable Limits - LEL	<i>Not Applicable</i>
Flammable Limits - UEL	<i>Not Applicable</i>
Boiling point	Approximately 212 °F [<i>Details: CONDITIONS: Excluding towelette</i>]
Density	1.0 g/ml [<i>Details: Excluding Towlette</i>]
Vapor Density	<i>No Data Available</i>
Vapor Pressure	17.54 mmHg [<i>@ 20 °C</i>] [<i>Details: Excluding Towlette</i>]
Specific Gravity	Approximately 1 Units not avail. or not appl. [<i>Ref Std: WATER=1</i>] [<i>Details: CONDITIONS: Excluding towelette</i>]
pH	5.75 - 6.75 [<i>Details: CONDITIONS: Excluding towelette</i>]
Melting point	<i>Not Applicable</i>
Solubility in Water	Complete
Evaporation rate	<i>No Data Available</i>
Volatile Organic Compounds	<i>No Data Available</i>
Percent volatile	Approximately 90 % [<i>Details: CONDITIONS: Excluding towelette</i>]
VOC Less H ₂ O & Exempt Solvents	<i>No Data Available</i>
Viscosity	<i>No Data Available</i>

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: None known

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Carbon monoxide	Not Specified
Carbon dioxide	Not Specified

Hazardous Decomposition: Under recommended usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products may occur as a result of oxidation, heating, or reaction with another material.

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not determined. Not applicable.

CHEMICAL FATE INFORMATION

Not determined. Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Reclaim if feasible. If product can't be reclaimed, dispose of waste product in a sanitary landfill. Alternatively, incinerate the waste product in an industrial, commercial, or municipal incinerator.

EPA Hazardous Waste Number (RCRA): Not regulated

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

ID Number(s):

70-0703-1713-9, 70-0706-1360-2

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - No

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 0 Flammability: 1 Reactivity: 0 Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Revision Changes:

Section 1: Product use information was modified.
Section 16: NFPA hazard classification heading was modified.
Section 16: NFPA hazard classification for health was modified.
Section 16: NFPA hazard classification for flammability was modified.
Section 3: Potential environmental effects heading was modified.
Copyright was modified.
Section 5: Fire fighting procedures information was modified.
Section 7: Handling information was modified.
Section 15: 311/312 hazard categories heading was modified.
Section 15: International regulations information was modified.
Section 15: State regulations information was modified.
Section 15: US federal regulations information was modified.
Section 10: Hazardous polymerization heading was modified.
Section 2: Ingredient table was modified.
Section 16: NFPA explanation was modified.
Section 15: Inventories information was modified.
Section 12: Ecotoxicological information heading was modified.
Section 12: Chemical fate information heading was modified.
Section 9: Vapor pressure value was modified.
Section 5: Flammable limits (UE) information was modified.
Section 5: Flammable limits (LEL) information was modified.
Section 5: Flash point information was modified.
Sections 3 and 9: Odor, color, grade information was modified.
Section 9: Melting point information was modified.
Section 16: NFPA hazard classification for special hazards was modified.
Section 8: Exposure guidelines information - none - was modified.
Section 9: Flash point information was modified.
Section 9: Flammable limits (LEL) information was modified.

Section 9: Flammable limits (UEL) information was modified.
Section 10: Hazardous decomposition heading was modified.
Section 12: Ecotoxicological phrase was modified.
Section 12: Chemical Fate phrase was modified.
Section 6: Release measures note - reportability - was added.
Section 9: Density information was added.
Sections 3 and 9: Specific physical form information was added.
Sections 3 and 9: Specific physical form heading was added.
Section 2: Ingredient phrase was added.
Article disclaimer text (following the copyright) was deleted.

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US EPA ARCHIVE DOCUMENT

1 ITEM NUMBER: C-005 - XA002
 VERSION 5 EFFECTIVE DATE: 03/09/04 SUPERCEDES: 06/04/01 PREPARED BY: Denese Deeds
 Section(s) Revised: HMIS, II, IV, IX
 IDENTITY (As Used On Label and List): Jet Force Wasp & Hornet Killer

Emergency Medical Telephone Number 1-800/228-5635 (24 HRS) Outside the U.S.A. Call 651/632-9275
 PRODUCT HAZARD RATINGS (HMIS): - Health = 2* Fire = 4, Reactivity = 1, Protective Equipment = B
 (Rating Legend: - 4 = Extreme, 3 = Serious, 2 = Moderate, 1 = Slight, 0 = Minimal, * = Chronic Hazard)

SECTION I

CLAIRE MANUFACTURING
 500 VISTA AVE.
 ADDISON, IL 60101

TELEPHONE NUMBER FOR INFORMATION: 1-800-252-4731

DATE PRINTED: 3/17/04
 NAME OF PREPARER: Ron Cepa

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Chemical Names	CAS #	SARA SEC 313	ACGIH TLV-TWA/STEL	OSHA PEL-TWA/STEL	% By Wt.
Isoparaffinic Hydrocarbon	64742-47-8	No	NE/NE	NE/NE	80-90
Isopropanol	67-63-0	No	200ppm/400 ppm	400 ppm/NE	5-10
Carbon Dioxide	124-38-9	No	5000 ppm/30,000 ppm	5000 ppm/NE	1-5
Tetramethrin (1Cyclohexene-1,2-dicarboximido) methyl 2,2-dimethyl-3-(2-methylpropenyl) cyclopropane carboxylate)	7696-12-0	Yes	NE/NE	NE/Ne	0.200
d-Phenothrin (3-Phenoxybenzyl-(1RS, 3RS: 1RS, 3SR) 2,2-dimethyl-3-(2-methylprop-1-enyl) cyclopropane carboxylate	26002-80-2	Yes	NE/NE	NE/NE	0.125

Balance of ingredients are non-hazardous or below reportable levels.

SECTION III - PHYSICAL CHARACTERISTICS

Boiling Point: NA Vapor Pressure (psig): 108 @ 130F / 84 @ 70F Specific Gravity - calculated (H2O=1): 0.8136
 pH: NA Solubility/Water: Slight Vapor Density (AIR=1): >1
 Evaporation Rate (Ether=1): ND Appearance and Odor: Aerosol spray with solvent odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Aerosol Flammability: Product is to be labeled as flammable as described in 40 CFR 156.78.
 Flashpoint: None (Propellant); >183F (Concentrate)
 Flammable Limits - % Volume In Air: LEL: 0.5 (isoparaffinic hydrocarbon) UEL: 12.7 (isopropanol)
 Extinguishing Media: Carbon dioxide, water spray, foam, or dry chemical.
 Special Fire Fighting Procedures: Containers should be cooled with water to prevent vapor pressure build up.
 Use equipment or shielding, as required, to protect personnel from bursting, rupturing or venting containers.
 Unusual Fire and Explosion Hazards: Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH-approved positive pressure self-contained breathing apparatus (SCBA) and full protection clothing. At elevated temperatures (over 54C-130F) containers exposed to direct flame or heat contact should be cooled with water to prevent weakening of container structure.

SECTION V - REACTIVITY DATA

Stability: Stable Hazardous Polymerization: NA
 Incompatibility (Materials to Avoid): Oxidizing agents, acids, bases.
 Hazardous Decomposition Products: Carbon monoxide, carbon dioxide. Conditions to Avoid: Keep away from heat, sparks, flames and electric arcs. Dropping of containers may cause bursting.

SECTION VI - HEALTH HAZARD DATA

Route(s) of Entry - Inhalation: X Eyes: X Skin: X Ingestion:
 HAZARDS IDENTIFICATION: EYES: May cause moderate irritation. Can cause burning sensation, tearing, and redness.
 SKIN: May cause mild irritation. Harmful if absorbed through the skin. INHALATION: Prolonged exposure can be irritating to eyes, nose and respiratory tract. Can cause dizziness, headaches and incoordination. Under misuse or intentional misuse, product may cause asphyxiation. INGESTION: Exposure by ingestion is unlikely since an aerosol, but if occurs: Irritating to the mouth, throat and stomach. May cause nervous system effects such as fatigue, dizziness, headache, tremors and unconsciousness. Possible aspiration hazard. May cause inflammation of the lungs.
 AGGRAVATED MEDICAL CONDITIONS: May aggravate pre-existing eye, skin, respiratory conditions.
 CHRONIC EFFECTS/TARGET ORGANS: Nervous system.
 EMERGENCY AND FIRST AID PROCEDURES: EYES: Immediately flush with plenty of water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Get prompt medical attention.

2 SKIN: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Get medical attention if irritation persists. INHALATION: Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration. INGESTION: In the unlikely event of swallowing: Call a physician or Poison Control Center immediately. Do not give any liquid to the person. Do not induce vomiting unless told to do so by a poison control center or doctor. Never give anything by mouth to an unconscious person. Call a poison control center or doctor for treatment advice. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. Note to physician: Contains petroleum distillate - vomiting may cause aspiration pneumonia.

CARCINOGENICITY:

No regulated ingredients.

TOXICITY INFORMATION:

Isoparaffinic Hydrocarbon: No data available

Isopropanol:

LD50 Oral (Rat):	4700 mg/kg
LD50 Dermal (Rabbit):	13,000 mg/kg
LD50 Inhalation (Rat):	19,000 ppm/8hr

Tetramethrin:

LD50 Oral (Rat):	4640 mg/kg
LD50 Dermal (Guinea pig):	>20,000 mg/kg
LD50 Inhalation (Rat):	>2500 mg/m3/3hr

d-Phenothrin:

LD50 Oral (Rat):	>10,000 mg/kg
LD50 Dermal (Rat):	>5,000 mg/kg

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Releases or Spills: Remove all sources of ignition and ventilate area. Soak up spill with an inert absorbent and place into a designated disposal container. Consult local regulatory agency for proper disposition of material.

Waste Disposal Method: Do not puncture or incinerate containers. If empty: Place in trash or offer for recycling if available. If partly filled: Call your local solid waste agency or 1-800-CLEANUP for disposal instructions. Dispose of container in accordance with local, state, and federal regulations. Disposal regulations may be different for each state and/or locality.

Handling And Storing: Do not breathe vapors or spray mist. Avoid contact with eyes, skin or clothing.. Wash Thoroughly with soap and water after handling. Avoid contamination of food and feedstuffs. Keep away from heat, sparks and flame. Use with adequate ventilation. Do not puncture or incinerate containers. Do not expose to direct sunlight or store at temperatures above 120F (48.9C). Store as Level 3 Aerosol (NFPA 30B).

Other Precautions: Please read and follow the directions on the product label; they are your best guide to using this product in the most effective way, and give the necessary safety precautions to protect your health.

SECTION VIII - EMPLOYEE PROTECTION

Respiratory Protection (Type): None required if good ventilation is maintained. If exposure exceeds occupational exposure limits (Sec. II), use a NIOSH approved respirator to prevent overexposure.

Ventilation: General ventilation is adequate under normal conditions; mechanical ventilation is optional.

Protective Gloves: Chemical resistant gloves are recommended - consult glove manufacturer to determine the proper type for a specific operation.

Eye Protection: Safety glasses are recommended.

Other Protective Clothing or Equipment: Wear impervious clothing to prevent skin contact.

Work/Hygienic Practices: Ensure strict sanitary conditions are conformed to when working around chemicals.

Protective clothing and equipment should be in accordance with 29 CFR 1910.132 and CFR 1910.133.

SECTION IX-OTHER REGULATORY CONTROLS

FEDERAL:

Toxic Substance Control Act (TSCA): Ingredients of this product are listed on the EPA/TSCA Inventory of Chemical Substances or exempt as a registered pesticide.

STATE RIGHT-TO-KNOW:

Pennsylvania/New Jersey Right-To-Know (Chemical and CAS No.):

Refer to Section II.

SECTION X-TRANSPORTATION (D.O.T. CLASSIFICATION)

Shipping Name: Consumer Commodity

Hazard Class: ORM-D

NG - Negligible NA-- Not Applicable NE-- Not Established UN-- Unavailable ND-- Not Determined

While the information set forth herein is believed to be accurate as of the date hereof, the Company makes no warranty or guarantee, express or implied, and disclaims all liability arising out of the use of this information.

EFFECTIVE DATE: 03/09/04

SUPERCEDES: 06/04/01

PREPARED BY: Denese Deeds

Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product name **BIG ORANGE (LIQUID)**
Product use Industrial Solvent Degreaser
Product code **0415**
Date of issue 12/07/07 **Supersedes 03/24/05**

Emergency Telephone Numbers

For MSDS Information:
Compliance Services 1-877-1-BUY-ZEP (428-9937)

For Medical Emergency
INFOTRAC: (877) 541-2016 Toll Free - All Calls Recorded

For Transportation Emergency
CHEMTREC: (800) 424-9300 - All Calls Recorded
In the District of Columbia (202) 483-7616

Printing date: 12/07/07

Prepared By
Compliance Services Group
1420 Seaboard Industrial Blvd.
Atlanta, GA 30318

Section 2. Hazards Identification

Emergency overview

*Hazard Determination System (HDS): Health, Flammability, Reactivity

WARNING !

1	2	0
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COMBUSTIBLE. CAUSES EYE IRRITATION.

NOTE: MSDS data pertains to the product as delivered in the original shipping container(s). Risk of adverse effects are lessened by following all prescribed safety precautions, including the use of proper personal protective equipment.

Acute Effects	Routes of Entry	Dermal contact. Eye contact. Inhalation.
Eyes	Causes eye irritation. Inflammation of the eye is characterized by redness, watering and itching.	
Skin	May cause skin irritation. May cause skin sensitization. May cause allergic reactions in certain individuals. Skin inflammation is characterized by itching, scaling, or reddening.	
Inhalation	Avoid breathing vapors, spray or mists. Over-exposure by inhalation may cause respiratory irritation.	
Ingestion	May be harmful if swallowed. Aspiration hazard if swallowed. Can enter lungs and cause damage.	

Chronic effects Prolonged or repeated contact may dry skin and cause irritation. Contains material which may cause damage to the following organs: kidneys, lungs, liver.

Carcinogenicity Ingredients: Not listed as carcinogen by OSHA, NTP or IARC.

Additional Information: See Toxicological Information (Section 11)

Section 3. Composition/Information on Ingredients

Name of Hazardous Ingredients	CAS number	% by Weight
D-LIMONENE; orange distillate; citrus terpene; cyclohexene, 1-methyl-4-(1-methylethenyl)-, (R)-	5989-27-5	>90
NONYLPHENOXPOLY(ETHYLENEOXY)ETHANOL npe; poly(oxy-1,2-ethanediyl) alpha-(nonylphenyl)-omega-hydroxy	9016-45-9	1 - 5
NONYLPHENOXY POLY(ETHYLENEOXY) ETHANOL - npe; poly(oxy-1,2-ethanediyl) alpha-(nonylphenyl)-omega-hydroxy	9016-45-9	1 - 5

Section 4. First Aid Measures

Eye Contact	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention immediately.
Skin Contact	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Wash clothing before reuse. Get medical attention if irritation develops.
Inhalation	Move exposed person to fresh air. If irritation persists, get medical attention.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Fire Fighting Measures

National Fire Protection Association (U.S.A.)



Flash Point	Closed cup: 49.4°C (120.9°F) [Tagliabue.]
Flammable Limits	Not determined.
Flammability	COMBUSTIBLE.
Fire hazard	Combustible liquid and vapor. Keep away from heat, sparks and flame.
Fire-Fighting Procedures	Use dry chemical, CO ₂ , water spray (fog) or foam. Fire-fighters should wear appropriate protective equipment. Do not release runoff from fire to sewers or waterways.

Section 6. Accidental Release Measures

Spill Clean up	Eliminate all ignition sources. Put on appropriate personal protective equipment (see section 8). Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
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Section 7. Handling and Storage

Handling	Put on appropriate personal protective equipment (see section 8). Store and use away from heat, sparks, open flame or any other ignition source. Avoid contact with eyes, skin and clothing. Avoid breathing vapors, spray or mists. Use only with adequate ventilation. Do not ingest. Observe label precautions. Wash thoroughly after handling. Empty containers retain product residue and can be hazardous. Do not reuse container.
Storage	Keep away from heat and direct sunlight. Avoid all possible sources of ignition (spark or flame). Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Keep away from food, drink and animal feeding stuffs. Keep out of the reach of children.

Section 8. Exposure Controls/Personal Protection**Personal Protective Equipment (PPE)**

Eyes	Safety glasses.	
Body	For prolonged or repeated handling, use gloves. Recommended: Neoprene gloves. Nitrile gloves. Rubber gloves.	
Respiratory	Use with adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.	

Section 9. Physical and Chemical Properties

Physical State	Liquid.	Color Clear. Orange.
pH	Not applicable.	Odor Orange. [Strong]
Boiling Point	170°C (338°F)	Vapor Pressure 0.25 kPa (1.9 mm Hg)
Specific Gravity	0.85	Vapor Density 4.7 [Air = 1]
Solubility	Emulsifies in water.	Evaporation Rate <1 (Water = 1)
		VOC (Consumer) 789.37 (g/l). 6.59 lbs/gal 92.70%

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Incompatibility	Combustible materials should be stored away from extreme heat and away from strong oxidizing agents. Incompatible with some strong acids. Reactive with acidic clay (i.e. clay absorbent) Reactive or incompatible with the following materials: oxidizing materials.
Hazardous Polymerization	Will not occur.
Hazardous Decomposition Products	carbon oxides

Section 11. Toxicological Information**Acute Toxicity**

Product/ingredient name	Result	Species	Dose	Exposure
d-Limonene	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
Nonylphenoxypoly(Ethyleneoxy)Ethano	LD50 Dermal	Rabbit	2000 mg/kg	-
	LD50 Oral	Rat	3310 mg/kg	-

Section 12. Ecological Information

Environmental Effects No known significant effects or critical hazards.

Aquatic Ecotoxicity

Not available.

Section 13. Disposal Considerations**Waste Information**

Waste must be disposed of in accordance with federal, state and local environmental control regulations. Consult your local or regional authorities for additional information.

Waste Stream Code: D001
 Classification: - [Hazardous waste.]
 Origin: - [RCRA waste.]

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label
DOT Classification	Not applicable.	Not a DOT controlled material (United States).			
IMDG Class	Not determined.				

NOTE: DOT classification applies to most package sizes. For specific container size classifications or for size exceptions, refer to the Bill of Lading with your shipment.

PG* : Packing group

Section 15. Regulatory Information**U.S. Federal Regulations**

SARA 313 toxic chemical notification and release reporting:

No products were found.

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

All Components of this product are listed or exempt from listing on TSCA Inventory.

State Regulations

California Prop 65 No products were found.

Section 16. Other Information

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

*NOTE: Hazard Determination System (HDS) ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although these ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HDS ratings are to be used with a fully implemented program to relay the meanings of this scale.

Job Bid Item	Cost Code	Cat	Transaction Type	Transactn Date	Amount
09-133 1	0201504	M	Misc worksheet 1	9-21-09	3,125.23
09-133 1	0201504	S	Misc worksheet 1	9-21-09	5,136.00

POST ENTRIES TOTALS

	Posted	Rejected
Number of Entries	2	0
Amount of Entries	8,261.23	.00

Entry	Amount

Total Amount Posted	.00

Material Safety Data Sheet

Heavy Duty Brake Fluid DOT 3

MSDS No. 038

Date of Preparation: 10-29-99

Revision: 12-02-05

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Heavy Duty Brake Fluid DOT 3

Part Number(s): 2701, 2712, 2732 (Blend HD DOT 3)

CAS Number: Not applicable to mixtures

General Use: Automotive product

Manufacturer: Berryman Products, Inc., 3800 E. Randol Mill Rd., Arlington, TX 76011-5434

Phone: 1-800-433-1704, Emergency phone number: 1-800-535-5053.

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Section 2 - Composition / Information on Ingredients

THIS PRODUCT CONTAINS NO HAZARDOUS INGREDIENTS SUBJECT TO THE REPORTING REQUIREMENTS OF OSHA 29 CFR PART 1910.

Section 3 - Physical and Chemical Properties

Physical State: Liquid

Appearance and Odor: Yellow to Amber, Mild

Vapor Pressure: Not determined

Vapor Density (Air=1): Heavier than air

Density: N/A

Specific Gravity (H₂O=1, at 4 °C): 1.000-1.070

Boiling Point: 480 °F

Refractive Index: N/A

% Volatile: Not determined

Evaporation Rate: Slower than ether

Section 4 - Fire-Fighting Measures

Flash Point: >275 °F

Flash Point Method: CC

LEL: Not determined

Flammability Classification: Class IIIB

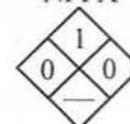
Extinguishing Media: Foam, dry chemicals, water spray.

Unusual Fire or Explosion Hazards: None.

Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Wear self-contained breathing apparatus pressure demand, MSNA/OSHA (approved or equivalent) and full protective gear. Use water spray to keep fire-exposed containers cool.

NFPA



Section 5 - Stability and Reactivity

Stability: Heavy Duty Brake Fluid DOT 3 is stable at room temperature in closed containers under normal storage and handling conditions.

Polymerization: Hazardous polymerization cannot occur.

Chemical Incompatibilities & Conditions to Avoid: None.

Hazardous Decomposition Products: Thermal oxidative decomposition of Heavy Duty Brake Fluid DOT 3 can produce carbon monoxide, carbon dioxide and trace amount of nitrogen.

Section 6 - Health Hazard Information

Potential Health Effects

Primary Entry Routes: Skin, dermal, inhalation and ingestion.

Target Organs: Eyes, skin, respiratory system.

Acute Effects: May cause minimal irritation to the eyes, skin, and lungs. If ingested, may cause irritation to the mouth, stomach and esophagus. Harmful or fatal if swallowed.

Carcinogenicity: IARC, NTP, and OSHA do not list Heavy Duty Brake Fluid DOT 3 as a carcinogen.

Chronic Effects: May irritate mucous membranes and cause dermatitis. May affect kidneys and central nervous system. Can cause nervous system depression.

Emergency and First Aid Procedures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately.
Eye Contact: Immediately flush eyes with plenty of water. Get medical attention, if irritation persists.
Skin Contact: Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.
Ingestion: GET MEDICAL ATTENTION IMMEDIATELY. Induce vomiting.
After first aid, get appropriate in-plant, paramedic, or community medical support.

Section 7 - Spill, Leak, and Disposal Procedures

Spill /Leak Procedures: Eliminate all sources of ignition. Stop spill at source. Wear appropriate personal protective equipment (Sec. 8). Contain the spill to facilitate cleanup with absorbent. Use non-sparking tools and equipment. Transfer to disposal containers.
Containment: For large spills, dike far ahead of liquid spill for later disposal. Do not release into sewers or waterways.
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state and local regulations.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 8 - Exposure Controls / Personal Protection

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.
Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.
Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.
Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.
Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Special Precautions and Comments

Handling Precautions: Wash thoroughly after handling.
Storage Requirements: Keep away from heat, sparks and flame. Keep container closed when not in use.
California Proposition 65: This product contains the following chemicals known to the state of California to cause cancer and/or reproductive toxicity: None.

DOT Transportation Data (49 CFR 172.101):

Part Number(s): 2701, 2712,
2732

Shipping Name: N/A

Hazard Class: Not regulated

ID No.: N/A

Packing Group: N/A

SARA Title III Section 313 Supplier Notification:

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the emergency Planning & Community Right-To-Know-Act of 1986 & of 40CFR 372: None.

Prepared By: Alicia L. Reed

Disclaimer: All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling and disposal of the product. Users also assume all risks in regards to the publications of use of, or reliance upon information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or process.

CLEAR GEAR LUBRICANT #WY904

Material Safety Data Sheet

Quick Identifier (In Plant Common Name)

Manufactured For: **PRO-LINK, INC.**
 Name & Address: **CANTON, MA 02021**

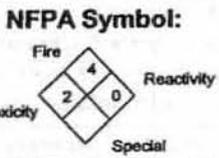
Emergency Telephone No.: **1-800.74.LINKS Mon. - Fri. 8-5**
(800) 255-3924 24 HOURS

Date Prepared: **June 3, 2002**

HMIS Symbol:

Health	2
Flammability	4
Reactivity	0

NFPA
 Minimal - 0 - Insignificant
 Slight - 1 - Slight
 Moderate - 2 - Moderate
 Serious - 3 - High
 Severe - 4 - Extreme



Prepared By: _____ Date: _____

SECTION 1 - IDENTITY

Common Name: (used on label) **Clear Gear Lubricant #WY904**
 (Trade name & Synonyms)

Chemical Name: **Mixture packaged in pressurized aerosol spray can.**

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s)	CAS No.	OSHA PEL	ACGIH TLV	Other Limits
Propane	74-98-6	1000 ppm	Not Est.	N/A
Butane	106-97-8	Not Est.	800 ppm	N/A
*Hexane	110-54-3	50 ppm	50 ppm	N/A

*Section 313 Supplier Notification - Indicates hazardous ingredients which are toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point	Not Established	Specific Gravity (H ₂ O=1)	0.7 (Concentrate)	Vapor Pressure (PSI)	70 psig.
Percent Volatile By Volume (%)	N/A	Evaporation Rate (BuAc=1)	Slower	pH	N/A
Solubility In Water	Not Soluble	Appearance and Odor	Clear liquid spray with light hydrocarbon odor.		

SECTION 4 - FIRE & EXPLOSION DATA

Flammability (per flame projection)	Extremely Flammable.	Flammable Limits in Air % by Volume	Lower Not Est.	Upper Not Est.	Extinguisher Media	Dry Chemical (B-C), Foam, CO ₂
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Special Fire Fighting Procedures: **Keep containers cool using water spray to avoid bursting. Use appropriate equipment to protect personnel from bursting containers.**

Unusual Fire and Explosion Hazards: **Contents under pressure. Do not use near fire, sparks, or flame. Do not puncture or incinerate container. Exposure to temperatures above 120°F may cause container to burst.**

SECTION 5 - PHYSICAL HAZARDS

Stability	Unstable <input type="checkbox"/> Stable <input checked="" type="checkbox"/>	Conditions to Avoid	Open Flames; Temp. > 120°F.	Hazardous Polymerization	May Occur <input type="checkbox"/> Will not Occur <input checked="" type="checkbox"/>	Conditions to Avoid	None
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Incompatibility (Materials to Avoid): **Strong oxidizers.**

Hazardous Decomposition Products: **CO, CO₂, Hydrocarbons.**

SECTION 6 - HEALTH HAZARDS

Routes of Entry Inhalation: Yes Eyes / Skin: Yes Ingestion: Unlikely

Signs and Symptoms of Exposure (Acute & Chronic) Inhalation: High concentrations of vapors may irritate nose and throat and cause symptoms of intoxication such as dizziness, nausea, headache or indigestion. Eye Contact: Direct spray or vapors will irritate and may harm eyes. Skin Contact: Product may cause irritation due to defatting of skin. Ingestion: Harmful or fatal if swallowed.

Medical Conditions Generally Aggravated by Exposure None known

Chemical Listed as Carcinogen or Potential Carcinogen National Toxicology Program Yes No I.A.R.C. Monographs Yes No OSHA Yes No

Emergency and First Aid Procedures**1. Inhalation**

Remove victim to fresh air. Apply artificial respiration if not breathing.

Get medical attention.

2. Eyes

Immediately flush eyes with water for at least 15 minutes. Get medical attention if irritation persists.

3. Skin

Remove contaminated clothing and wash skin with soap & water. Get medical attention if irritation persists.

4. Ingestion

Do not induce vomiting. Get medical attention immediately.

SECTION 7 - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type) Use respirator when TLV is exceeded.

Ventilation Local Exhaust Maintain adequate ventilation Mechanical (General) N/A Special N/A Other N/A

Protective Gloves Wear chemical resistant gloves. Eye Protection Wear safety glasses or goggles.

Other Protective Clothing or Equipment None required.

SECTION 8 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken Handling and Storage Use with adequate ventilation. Do not use near fire, sparks or flame. Do not puncture or incinerate container. Exposure to temperatures above 120°F may cause container to burst.

Other Precautions Read label precautions carefully.

Steps to be Taken in Case Material is Released or Spilled Absorb spill with inert material then place in a chemical waste container.

Dispose of in accordance with local, state and federal regulations.

Waste Disposal Methods This container may be recycled in aerosol recycling centers. Before offering for recycling, empty the can by using the product according to the label. DO NOT PUNCTURE! If recycling is not available, wrap the container and discard in the trash. Dispose of in accordance with local, state, and federal regulations.

We believe all information given is accurate. It is offered in good faith, but without guarantee. Since conditions are beyond our control, user assumes all responsibility and risk.

Material Safety Data Sheet

PENETRATING OIL #WY902

Quick Identifier (In Plant Common Name)

Manufactured For: **PRO-LINK, INC.**
 Name & Address: **CANTON, MA 02021**

Emergency Telephone No.: **1-800.74.LINKS Mon. - Fri. 8-5**
(800) 255-3924 24 HOURS

Date Prepared: **June 3, 2002**

HMIS Symbol:

Health	2
Flammability	1
Reactivity	0

HMIS— NFPA
 Minimal - 0 - Insignificant
 Slight - 1 - Slight
 Moderate - 2 - Moderate
 Serious - 3 - High
 Severe - 4 - Extreme

NFPA Symbol:



Prepared By: _____ Date: _____

SECTION 1 - IDENTITY

Common Name: (used on label) **Penetrating Oil #WY902**
 (Trade name & Synonyms)

Chemical Name: **Mixture packaged in pressurized aerosol spray can.**

SECTION 2 - HAZARDOUS INGREDIENTS

Principal Hazardous Component(s)	CAS No.	OSHA PEL	ACGIH TLV	Other Limits
Petroleum distillate	64741-44-2	Not Est.	400 ppm	
*Perchloroethylene (1)	127-18-4	100 ppm	25 ppm	100 ppm (STEL)
Petroleum Oil	64742-54-7 / 64742-53-6	Not Est.	Not Est.	

(1) Warning: This product contains a chemical(s) that are known to the state of California to cause Cancer and reproductive harm.

*Section 313 Supplier Notification - Indicates hazardous ingredients which are toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

SECTION 3 - PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point	121.1°C	Specific Gravity (H ₂ O=1)	1.35 - 1.41 (Concentrate)	Can Pressure (PSI)	85 - 90 psig
Volatile Organic Content (% Weight)	0%	Evaporation Rate (BuAc=1)	2.8	pH	N/A
Solubility In Water	Insoluble	Appearance and Odor (Conc)	Lt. Yellow-Gold – Clear Liquid with Ethereal Odor.		

SECTION 4 - FIRE & EXPLOSION DATA

Flammability (per flame projection)	Non-Flammable	Flammable Limits in Air % by Volume	Lower Not Est.	Upper Not Est.	Extinguisher Media	Foam, Dry Chemical, CO ₂
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Special Fire Fighting Procedures: **Keep containers cool using water spray. Use proper equipment to protect personnel from bursting containers.**

Unusual Fire and Explosion Hazards: **Contents under pressure. Do not expose to temperatures exceeding 120°F. as containers may vent, rupture or burst.**

SECTION 5 - PHYSICAL HAZARDS

Stability	Unstable <input type="checkbox"/> Stable <input checked="" type="checkbox"/>	Conditions to Avoid	Open Flames; Temp. > 120°F.	Hazardous Polymerization	May Occur <input type="checkbox"/> Will not Occur <input checked="" type="checkbox"/>	Conditions to Avoid	None
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Incompatibility (Materials to Avoid): **Strong oxidizers.**

Hazardous Decomposition Products: **CO, CO₂, Hydrogen chloride, trace amounts of chlorine.**

SECTION 6 - HEALTH HAZARDS

Routes of Entry Inhalation: Yes Eyes / Skin: Yes Ingestion: Unlikely

Signs and Symptoms of Exposure (Acute & Chronic) May cause transient irritation in eyes. Inhalation may cause nasal and respiratory irritation, dizziness, headaches. At high concentrations may cause symptoms of anesthesia.

Medical Conditions Generally Aggravated by Exposure Acute liver or kidney disease, neuritis and rhythm disorders of heart.

Chemical Listed as Carcinogen or Potential Carcinogen National Toxicology Program Yes No I.A.R.C. Monographs Yes No OSHA Yes No

Emergency and First Aid Procedures

1. Inhalation Remove victim to fresh air. Apply artificial respiration if necessary. Get medical attention.

2. Eyes Flush eyes with water for at least 15 minutes. Get medical attention if irritation persists.

3. Skin Wash affected areas w/ soap & water. Get medical attention if irritation persists.

4. Ingestion Do not induce vomiting. Get medical attention immediately.

NOTE TO PHYSICIAN: Do not give adrenaline to persons exposed to Perchloroethylene.

SECTION 7 - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type) Air supplied respirators should be used in confined areas.

Ventilation Local Exhaust Maintain adequate ventilation Mechanical (General) N/A Special N/A Other N/A

Protective Gloves Solvent resistant such as Viton or PVC. Eye Protection Glasses or Goggles.

Other Protective Clothing or Equipment Do not eat, drink or smoke in work area. Wash hands after use.

SECTION 8 - SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken Handling and Storage Do not store at temperatures above 120°F. Do not puncture or incinerate containers. Keep out of reach of children.

Other Precautions Read label precautions carefully.

Steps to be Taken in Case Material is Released or Spilled Soak up spilled liquid with absorbent material. Place in closed metal drum. Dispose of in accordance with local, state, and federal regulations.

Waste Disposal Methods Dispose of in accordance with local, state, and federal regulations.

CA Proposition 65 Statement This product contains a chemical known to the State of California to cause cancer.

We believe all information given is accurate. It is offered in good faith, but without guarantee. Since conditions are beyond our control, user assumes all responsibility and risk.

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: No. 2 Diesel Fuel

MSDS Number: 001847

Synonyms: CARB Diesel TF3; CARB Diesel; CARB Diesel 10%; CARB Diesel Ultra Low Sulfur - Dyed and Undyed; EPA Low Sulfur Diesel Fuel - Dyed and Undyed; EPA Off Road High Sulfur Diesel - Dyed; High Sulfur Diesel Fuel; Low Sulfur Diesel Fuel; No. 2 Diesel Fuel Oil; No. 2 High Sulfur Diesel - Dyed; No. 2 Low Sulfur Diesel - Dyed; No. 2 Low Sulfur Diesel - Undyed; No. 2 Low Sulfur Distillate; No. 2 Diesel with Renewable Diesel; No. 2 Ultra Low Sulfur Diesel - Dyed; No. 2 Ultra Low Sulfur Diesel - Undyed; Super Diesel Fuel; Super Diesel Fuel II-LS; Virgin Diesel Fuel; No. 2 Distillate; ULSD; Super Diesel Fuel; Super Diesel Fuel II-LS; Virgin Diesel Fuel; Distillate Blend Stock

Intended Use: Fuel

Manufacturer/Supplier: ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

Emergency Health and Safety Number: Chemtrec: 800-424-9300 (24 Hours)

MSDS Information: Phone: 800-762-0942
Email: MSDS@conocophillips.com
Internet: <http://w3.conocophillips.com/NetMSDS/>

2. HAZARDS IDENTIFICATION

<u>Emergency Overview</u>	<u>NFPA</u>
<p>WARNING!</p> <p>Flammable Liquid and Vapor Skin Irritant Aspiration Hazard</p>	

Appearance: Straw colored to dyed red
Physical Form: Liquid
Odor: Diesel fuel

Potential Health Effects

Eye: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin: Mild to moderate skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. No harmful effects from skin absorption have been reported.

Inhalation (Breathing): No information available on acute toxicity.

US EPA ARCHIVE DOCUMENT

Ingestion (Swallowing): Low degree of toxicity by ingestion. **ASPIRATION HAZARD** - This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, irritation of the respiratory tract, nausea, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration*
Diesel Fuel No. 2	68476-34-6	95-100
Renewable Diesel	Proprietary	0-5
Naphthalene	91-20-3	<1

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. FIRST AID MEASURES

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

Health: 1 Flammability: 2 Instability: 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors (see Section 5). Use water sparingly to minimize environmental contamination and reduce disposal requirements. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling: Wear protective gloves. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

Conditions for safe storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	US-ACGIH	OSHA	Other
Diesel Fuel No. 2	TWA: 100 mg/m ³ Skin	---	---
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 50 mg/m ³	TWA: 0.2 mg/m ³ (as total of 17 PNA's measured by NIOSH Method 5506) (ConocoPhillips Guidelines)

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Straw colored to dyed red
Physical Form:	Liquid
Odor:	Diesel fuel
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	0.40 mm Hg
Vapor Density (air=1):	> 3
Boiling Point/Range:	300-690°F / 149-366°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.81-0.88 @ 60°F (15.6°C)
Bulk Density:	7.08 lbs/gal
Percent Volatile:	Negligible @ ambient conditions
Evaporation Rate (nBuAc=1):	<1
Flash Point:	125 -180°F / 52 - 82°C
Test Method:	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
LEL (vol % in air):	0.3
UEL (vol % in air):	10.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizers

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Diesel Fuel No. 2

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC.

Target Organs: Limited evidence of renal impairment has been noted from a few older case reports involving excessive exposure to diesel fuel No. 2. However, renal toxicity has not been demonstrated to be a consistent finding of diesel fuel exposure.

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Diesel Fuel No. 2	> 5 g/kg	>5ml/kg	4.6 - 7.6 mg/L
Renewable Diesel	9 ml/kg (Rat)	>5ml/kg (Rabbit)	No data available

12. ECOLOGICAL INFORMATION

When middle distillate hydrocarbons escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with middle distillates can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of middle distillates are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of middle distillates. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled material. Direct toxicity and fouling of sea birds can occur if birds dive through floating layers of spilled material.

Phytotoxic effects of middle distillate hydrocarbons have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in middle distillates.

13. DISPOSAL CONSIDERATIONS

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description: Diesel fuel, Combustible liquid, NA1993, III
 Non-Bulk Package Marking: Not Regulated [49 CFR 173.150(f)(2)]
 Non-Bulk Package Labeling: Not Regulated [49 CFR 173.150(f)(2)]
 Bulk Package/Placard Marking: Combustible / 1993
 Packaging - References: None; None; 49 CFR 173.241
 (Exceptions; Non-bulk; Bulk)
 Hazardous Substance: See Section 15 for RQ's
 Emergency Response Guide: 128

International Maritime Dangerous Goods (IMDG)

Shipping Description: *Not regulated if flashpoint is >60° C closed-cup*
 Non-Bulk Package Marking: Diesel fuel, UN1202
 Labels: Flammable liquid
 Placards/Marking (Bulk): Flammable / 1202
 Packaging - Non-Bulk: P001, LP01
 EMS: F-E, S-E
 Note: *Proper Shipping name can be: Gas Oil or Diesel fuel or Heating Oil, light*

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: *Not regulated if flashpoint is >60° C closed-cup*
 UN1202
 Proper Shipping Name: Diesel fuel
 Hazard Class/Division: 3
 Subsidiary risk: None
 Packing Group: III
 Non-Bulk Package Marking: Diesel fuel, UN1202
 Labels: Flammable liquid
 ERG Code: 3L
 Note: *Proper Shipping name can be: Gas Oil or Diesel fuel or Heating Oil, light*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y309	309	310
Max. Net Qty. Per Package:	10 L	60 L	220 L

15. REGULATORY INFORMATION

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: Yes
 Chronic Health: Yes
 Fire Hazard: Yes
 Pressure Hazard: No
 Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration*	de minimis
Naphthalene	<1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

California Proposition 65:

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Naphthalene	Cancer
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant

Canadian Regulations:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class
B3 - Combustible Liquids
D2A
D2B

National Chemical Inventories:

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA. All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date: 16-Jun-2008
Status: Final
Previous Issue Date: 02-Jan-2008
Revised Sections or Basis for Revision: Product Name / Synonyms (Section 1)
MSDS Number: 001847

MSDS Legend:

ACGIH = American Conference of Governmental Industrial Hygienists; A DR = Agreement on Dangerous Goods by Road; CAS = Chemical Abstracts Service Registry; CEILING = Ceiling Limit (15 minutes); E INECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-DFG = Deutsche Forschungsgemeinschaft; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; N/A = Not Applicable; ND = Not Determined; NIOSH = National Institute for Occupational Safety and Health; NTP = [US] National Toxicology Program; OSHA = [US] Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value; TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 Workplace Exposure Limits

Disclaimer of Expressed and implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

[REDACTED]

SHERWIN-WILLIAMS CO

-- FLUORESCENT SPRAY PAINT, 3106 GREEN

MSDS Safety Information

FSC: 8010
 NIIN: 00-132-2861
 MSDS Date: 09/01/1996
 MSDS Num: CHXPW
 Product ID: FLUORESCENT SPRAY PAINT, 3106 GREEN
 MFN: 02
 Responsible Party
 Cage: 54636
 Name: SHERWIN-WILLIAMS CO
 Address: 31500 SOLON RD
 City: SOLON OH 44139
 Info Phone Number: 800-777-2966
 Emergency Phone Number: 215-566-2917
 Review Ind: Y
 Published: Y

Contractor Summary

Cage: 54636
 Name: SHERWIN-WILLIAMS CO THE
 Address: 101 PROSPECT AVE NW
 City: CLEVELAND OH 44115-1042
 Phone: 216-566-2242

Item Description Information

Item Name: LACQUER, FLOURESCEN

Ingredients

Cas: 74-98-6
 RTECS #: TX2275000
 Name: PROPANE. VP: 760
 % Wt: 14
 OSHA PEL: 1000 PPM
 ACGIH TLV: ASPHYXIAN

Cas: 106-97-8
 RTECS #: EJ4200000
 Name: BUTANE. VP: 760
 % Wt: 8
 OSHA PEL: 800 PPM
 TLV: 800 PPM

Cas: 110-54-3
 RTECS #: MN9275000
 Name: HEXANE (CERCLA). VP: 127

% Wt: 11
 OSHA PEL: 500 PPM
 ACGIH TLV: 50 PPM
 EPA Rpt Qty: 1 LB
 DOT Rpt Qty: 1 LB

 Cas: 107-83-5
 RTECS #: SA2995000
 Name: PENTANE, 2-METHYL-; (ISOHEXANE ISOMERS). VP: 250
 % Wt: 4
 OSHA PEL: N/K (FP N)
 ACGIH TLV: N/K (FP N)

 Cas: 64742-89-8
 RTECS #: 1003161VN
 Name: VM & P NAPHTHA. VP: 12
 % Wt: 16
 OSHA PEL: N/K (FP N)
 ACGIH TLV: N/K (FP N)

 Cas: 1330-20-7
 RTECS #: ZE2100000
 Name: XYLENE (SARA 313) (CERCLA). VP: 5.9
 % Wt: 1
 OSHA PEL: 100 PPM
 ACGIH TLV: 100 PPM; 150 STEL
 EPA Rpt Qty: 1000 LBS
 DOT Rpt Qty: 1000 LBS

 Cas: 67-64-1
 RTECS #: AL3150000
 Name: ACETONE (SARA 313) (CERCLA). VP: 180
 % Wt: 12
 OSHA PEL: 1000 PPM
 ACGIH TLV: 750 PPM; 1000 STEL
 EPA Rpt Qty: 5000 LBS
 DOT Rpt Qty: 5000 LBS

 Cas: 471-34-1
 RTECS #: FF9335000
 Name: CALCIUM CARBONATE
 % Wt: 3.3
 OSHA PEL: N/K (FP N)
 ACGIH TLV: N/K (FP N)

 Cas: 7727-43-7
 RTECS #: CR0600000
 Name: BARIUM SULFATE (CONTAINING INGREDIENT 10)
 % Wt: 18.3
 A PEL: 15 MG/M3 TDUST
 ACGIH TLV: 10 MG/M3 TDUST

 Cas: 7440-39-3
 RTECS #: CQ8370000

Name: BARIUM (SARA 313)
 % Wt: 10.8
 OSHA PEL: 0.5 MG/M3
 ACGIH TLV: N/K (FP N)

 RTECS #: 9999999VO

Name: VOLATILE ORGANIC COMPOUND AS PERCENT BY WEIGHT PER BAAQMD RULE 49: 52.9;
 VOC TOTAL: 3.77 LBS/GAL
 OSHA PEL: N/K (FP N)
 ACGIH TLV: N/K (FP N)

 Name: SUPDAT: OVEREXP TO SOLVENTS W/PERMANENT BRAIN & NERVOUS SYSTEM DMG.
 WARNING:THESE PRODS CONTAIN CHEM/S KNOWN TO

 Name: ING 12: STATE OF CALIFORNIA TO CAUSE CANCER & BIRTH DEFECTS OR OTHER
 REPRODUCTIVE HARM.

 Name: HNDLG/STOR PRECS: UNTIL ALL VAPS ARE GONE: KEEP AREA VENTD - DO NOT SMOKE
 - EXTING ALL FLAMES, PILOT LIGHTS &

 Name: ING 14: HEATERS - TURN OFF STOVES, ELEC TOOLS & APPLIANCES & ANY
 OTHER SOURCES OF IGNIT. CONSULT NFPA CODE. USE

 Name: ING 15: APPRVD BONDING & GROUNDING PROCS. CONTENTS UNDER PRESS. DO
 NOT PUNCTURE, INCIN OR EXPOSE TO TEMPS >330F.

 Name: ING 16: HEAT FROM SUNLIGHT, RADIATORS, STOVES, HOT WATER & OTHER HEAT
 SOURCES COULD CAUSE CNTNR TO BURST. DO

 Name: ING 17: NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN.

 Name: OTHER PRECS: AS NUISANCE PARTICULATES (LISTED "AS DUST" IN INGRED
 SECTION) WHICH MAY BE PRESENT AT HAZ LEVELS

 Name: ING 19: ONLY DURING SANDING OR ABRADING OF DRIED FILM. IF NO SPECIFIC
 DUSTS ARE LISTED, THE APPLIC LIMITS FOR

 Name: ING 20: NUISANCE DUSTS ARE ACGIH TLV 10 MG/M3 (TDUST), OSHA PEL 15 MG/M3
 (TDUST), 5 MG/M3 (RESPIRABLE FRACTION).

 Name: RESP PROT: NON-VOLATILE MATERIALS IN INGREDIENT SECTION.

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Health Hazards Data

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LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route Of Entry Inds - Inhalation: YES

Skin: YES

Ingestion: NO

Carcinogenicity Inds - NTP: NO

OSHA: NO

Effects of Exposure: IRRIT OF EYES, SKIN & RESP SYS. MAY CAUSE NERVOUS SYS
 DEPRESS. EXTREME OVEREXP MAY RSLT IN UNCON & POSS DEATH. HDCH, DIZZ, NAUS
 & LOSS OF COORD ARE INDICATIONS OF EXCESSIVE EXPOS TO VAPORS OR SPRAY

MISTS. REDNESS & ITCHING OR BURNING SENSATION MAY INDICATE EYE OR EXCESSIVE SKIN EXPOSURE. PRLNGD (EFTS OF OVEREXP)

Explanation Of Carcinogenicity: NOT RELEVANT

Signs And Symptoms Of Overexposure: HLTH HAZ: OVEREXP TO HEXANE MAY CAUSE DMG TO NERVE TISSUES OF ARMS & LEGS (PERIPHERAL NEUROPATHY), RESULTING IN MUSCULAR WEAK & LOSS OF COORDINATION. THIS EFT MAY BE INCREASED BY PRESENCE OF METHYL ETHYL KETONE. PRLNGD OVEREXP TO SOLV INGR EDS LISTED MAY CAUSE ADVERSE EFTS TO LIVER, URINARY, BLOOD-FORMING, (SUPDAT)

Medical Cond Aggravated By Exposure: NONE GENERALLY RECOGNIZED.

First Aid: INHAL: IF AFFECTED, REMOVE FROM EXPOSURE. RESTORE BRTHG. KEEP WARM & QUIET. SKIN: WASH AFFECTED AREA THOROUGHLY W/SOAP & WATER. REMOVE CONTAMINATED CLOTHING & LAUNDRER BEFORE REUSE. EYES: FLUSH EYES W/LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. GET MED ATTN. INGEST: NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. DO NOT INDUCE VOMITING. GIVE SEVERAL GLASSES OF WATER. SEEK MED ATTN.

Handling and Disposal

Spill Release Procedures: REMOVE ALL SOURCES OF IGNITION. VENTILATE AND REMOVE WITH INERT ABSORBENT.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Methods: WASTE FROM THIS PROD MAY BE HAZ AS DEFINED UNDER RCRA 40 CFR 261. WASTE MUST BE TESTED FOR IGNITABILITY TO DETERMINE APPLIC EPA HAZ WASTE NUMBERS. DO NOT INCINERATE. DEPRESSURIZE CNTNR. DISPOSE OF I/A/W FED, STATE & LOCAL REGS REGARDING POLLUTION.

Handling And Storage Precautions: CONTENTS ARE EXTREMELY FLAM. KEEP AWAY FROM HEAT, SPKS & OPEN FLAME. VAPS WILL ACCUMULATE READILY & MAY IGNITE EXPLOSIVELY. DURING USE &

Other Precautions: INTENTIONAL MISUSE BY DELIB CONC & INHALING CONTENTS CANBE HARMFUL/FATAL. USE ONLY W/ADEQ VENT. AVOID BRTHG VAP & SPRAY MIST. AVOIDCONTACT W/SKIN & EYES. WASH HANDS AFTER USING. THESE COATINGS MAY CONTAINMATS CLASSIFIED

Fire and Explosion Hazard Information

Flash Point Method: PMCC

Flash Point Text: <0F,<-18C

Lower Limits: 0.9%

Upper Limits: 13.1%

Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL, FOAM.

Fire Fighting Procedures: USE NIOSH APPRVD SCBA & FULL PROT EQUIP (FP N).

WATER SPRAY MAY BE INEFTIVE. IF WATER IS USED, FOG NOZZS ARE PEF. WATER MAY BE USED TO COOL CLSD CNTNRS(SUPDAT)

Unusual Fire/Explosion Hazard: ISOLATE FROM HEAT, ELEC EQUIP, SPARKS & OPEN FLAME. CLOSED CNTNRS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. APPLICATION TO HOT SURFS REQS SPECIAL (SUPDAT)

Control Measures

Respiratory Protection: IF PERSONAL EXPOS CANNOT BE CONTROLLED BELOW APPLIC LIMITS VY BENT, WEAR NIOSH APPRVD, PROPERLY FITTED ORGANIC VAPOR/PARTICULATE RESP. WHEN SANDING OR ABRADING DRIED FILM, WEAR DUST/MIST RESP APPRVD BY NIOSH FOR PROT AGAINST

Ventilation: LOC EXHST PEF. GEN EXHST ACCEPTABLE IF EXPOS MAINTAINED BELOW

APPLIC LIMS. REFER TO OSHA STDS 1910.98, 107, 108.
 Protective Gloves: CHEMICAL RESISTANT GLOVES.
 Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
 Other Protective Equipment: ANSI APPROVED EYE WASH & DELUGE SHOWER (FP N).
 Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
 Supplemental Safety and Health: FIRE FIGHT PROC: TO PVNT PRESS BUILD-UP &
 POSS AUTOIGNIT OR EXPLO WHEN EXPOSED TO EXTREME HEAT. EXPLO HAZS: PRECS.
 DURING EMER CNDTNS OVEREXP TO DECOMP PRODS MAY CAUSE A HLTH HAZ. SYMPS MAY
 NOT BE IMMED APPARENT. OBTAIN MED ATTN. EFTS OF OV EREXP: CARDIOVASCULAR
 & REPRO SYS. REPORTS HAVE ASSOC RPTD & PRLNGD

Physical/Chemical Properties

B.P. Text: <OF,<-18C
 Vapor Pres: SEE INGS
 Vapor Density: HVR/AIR
 Spec Gravity: 0.857 (FP N)
 Evaporation Rate & Reference: FASTER THAN ETHER
 Appearance and Odor: NONE SPECIFIED BY MANUFACTURER.

Reactivity Data

Stability Indicator: YES
 Stability Condition To Avoid: NONE SPECIFIED BY MANUFACTURER.
 Materials To Avoid: NONE KNOWN.
 Hazardous Decomposition Products: BY FIRE: CARBON DIOXIDE, CARBON MONOXIDE.
 Hazardous Polymerization Indicator: NO
 Conditions To Avoid Polymerization: NOT RELEVANT

Toxicological Information

Ecological Information

MSDS Transport Information

Regulatory Information

Other Information

Transportation Information

Responsible Party Cage: 54636
 Trans ID NO: 137554
 Product ID: FLUORESCENT SPRAY PAINT, 3106 GREEN
 S Prepared Date: 09/01/1996
 Review Date: 01/14/1999
 MFN: 2
 Multiple KIT Number: 0

 Detail DOT Information

DOT PSN Code: LFD
 DOT Proper Shipping Name: PAINT
 DOT PSN Modifier: INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS,
 VARNISH, POLISH, LIQUID FILLER, AND LIQUID LACQUER BASE
 Hazard Class: 3
 UN ID Num: UN1263
 DOT Packaging Group: II
 Label: FLAMMABLE LIQUID
 Special Provision: B52,T7,T30
 Packaging Exception: 150
 Non Bulk Pack: 173
 Bulk Pack: 242
 Max Qty Pass: 5 L
 Max Qty Cargo: 60 L
 Vessel Stow Req: B

 Detail IMO Information

IMO PSN Code: LCP
 IMO Proper Shipping Name: PAINT OR PAINT RELATED MATERIAL
 IMO PSN Modifier: (INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS,
 VARNISH, POLISH, LIQUID FILLER AND LIQUID LACQUER BASE) OR (INCLUDING PAINT
 THINNING OR REDUCING COMPOUND) o
 IMDG Page Number: 3268
 UN Number: 1263
 UN Hazard Class: 3.2
 IMO Packaging Group: I/II *
 Subsidiary Risk Label: -
 EMS Number: 3-05
 MED First Aid Guide NUM: 310

 Detail IATA Information

IATA PSN Code: SXI
 IATA UN ID Num: 1263
 IATA Proper Shipping Name: PAINT
 IATA PSN Modifier: (INCLUDING
 PAINT, LACQUER, ENAMEL, STAIN, SHELLAC, VARNISH, POLISH, LIQUID FILLER AND LIQUID
 LACQUER BASE)
 IATA UN Class: 3
 IATA Label: FLAMMABLE LIQUID
 UN Packing Group: II
 Packing Note Passenger: 305
 Max Quant Pass: 5L
 Max Quant Cargo: 60L
 Packaging Note Cargo: 307
 Exceptions: A7,A72

 Detail AFI Information

AFI PSN Code: SXI
 AFI Proper Shipping Name: PAINT OR PAINT RELATED MATERIAL

AFI PSN Modifier: (INCLUDING PAINT, LACQUER, ENAMEL, STAIN, SHELLAC SOLUTIONS, VARNISH, POLISH, LIQUID FILLER AND LIQUID LACQUER BASE) OR (INCLUDING PAINT THINNING OR REDUCING COMPOUNDS)

AFI Hazard Class: 3
 AFI UN ID NUM: UN1263
 AFI Packing Group: II
 Special Provisions: P5
 Back Pack Reference: A7.3

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HAZCOM Label

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Product ID: FLUORESCENT SPRAY PAINT, 3106 GREEN

Cage: 54636

Company Name: SHERWIN-WILLIAMS CO THE

Street: 101 PROSPECT AVE NW

City: CLEVELAND OH

Zipcode: 44115-1042

Health Emergency Phone: 215-566-2917

Label Required IND: Y

Date Of Label Review: 10/07/1998

Status Code: C

Label Date: 10/07/1998

Ignition

Flammable Hazard IND: Y

Eye Protection IND: YES

Skin Protection IND: YES

Signal Word: DANGER

Respiratory Protection IND: YES

Health Hazard: Moderate

Contact Hazard: Moderate

Fire Hazard: Severe

Reactivity Hazard: None

Hazard And Precautions: FLAMMABLE. ACUTE: EYES/SKIN: IRRITATION, REDNESS AND ITCHING OR BURNING SENSATION. INHALATION: RESPIRATORY SYSTEM IRRITATION. MAY CAUSE NERVOUS SYSTEM DEPRESSION, HEADACHE, DIZZINESS, NAUSEA, LOSS OF COORDINATION, UNCONSCIOUSNESS AND POSSIBLY DEATH. CHRONIC: HEXANE MAY CAUSE DAMAGE TO NERVE TISSUE OF ARMS AND LEGS RESULTING IN MUSCULAR WEAKNESS AND LOSS OF COORDINATION. OVEREXPOSURE TO SOLVENTS MAY CAUSE ADVERSE EFFECTS TO THE LIVER, URINARY, BLOOD-FORMING, CARDIOVASCULAR AND REPRODUCTIVE SYSTEMS AND HAS BEEN ASSOCIATED WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE.

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Material Safety Data Sheet								
White Traffic Paint Identity (As used on label and list)				Product # 13177				
		Occupational Safety and Health Administration Meets 29 C FR 1910.1200 Standard						
		HMIS Hazard Ratings						
		Health	2		0=Insignificant 1=Slight			
		Flammability	3		2=Moderate 3=High			
Reactivity	0		4=Extreme					
Transportation Information: Proper Shipping Name: Paint								
Hazardous Class:3- Flammable		Ref: 49 CFR 173.120		Identification No:UN1263		Label: Not available		
SECTION I								
Manufacturer's Name PRIDE Enterprises		Emergency Telephone Number 800-535-5053						
Address 2425 28th Street North, Suite 103 St. Petersburg, FL 33716		Telephone Number for Information 727-572-1987		Date Prepared November 10, 1997 Supersedes all previous				
SECTION II - Hazardous Ingredients/Identity Information								
Hazardous Components (Specific Chemical Identity; Common Name(s))	CAS#	% (Optional)	ACGIH PPM	TWA MG/M3	ACGIH PPM	STEL MG/M3	SARA Title III	RQ lbs.
Petroleum Distillate, Aliphatic	64742-89-8		100	200				
Talc (as silicates)	14807-96-6			2				
Toluene (a,b,c,d)	108-88-3	<15	100	377	150	565	Yes	1000
Xylene (mixed) (a,b,c)	1330-20-7	<2	100	434	150	651	Yes	1000
(a) A "Yes" in the SARA Title III column indicates a toxic chemical subject to annual reporting requirements of Section 313 of the Emergency Planning and Community Right-to Know Act of 1986 and of 40 CFR 372.								
(b) Indicates that the Resource Conservation and Recovery Act (RCRA) has determined the waste for this chemical is listed as hazardous and must be handled according to regulations in 40 CFR 260-281.								
(c) Indicates the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) has notification requirements for releases or spills to the environment of the Reportable Quantity (RQ) or greater amounts, according to 40 CFR 302.								
(d) Indicates listing in Table Z-2, 29 CFR 1910.1000, detailing acceptable ceiling concentration limits and acceptable maximum peak above the ceiling concentration for an 8 hour shift.								
SECTION III - Physical / Chemical Characteristics								
Boiling Point: 206° F			Specific Gravity (water=1): 1.5185					
Vapor Pressure (mm hg): 60 mm @20°			Volatile Organic Compounds (lbs/gal): 2.9					
Vapor Density (air=1): >1			Evaporation Rate(water=1): <1					
Solubility in water: Negligible			% Volatile (by wt): 23%					
Appearance & Color: White Viscous Liquid, Hydrocarbon Odor								

SECTION IV - Fire and Explosion Hazard Data**Flash Point (Method Used):** <20° F TCC **Flammability Limits:** LEL: 1.2 UEL: 6.8**Extinguishing Media:** CO₂; Water; Water Fog; Dry Chemical; Chemical Foam**Special Fire Fighting Procedures:** Firefighters must wear full face-piece self-contained breathing apparatus in positive pressure mode. Do not use solid stream of water, since stream will scatter and spread fire. Fine water spray can be used to keep fire-exposed containers cool.**Unusual Fire and Explosion Hazards:** Closed containers can explode due to buildup of pressure when exposed to extreme heat; do not use direct stream of water on pool fires as product may reignite on water surface. Caution - material is flammable.**SECTION V - Stability/Reactivity Data****Stability:** Unstable: ___ Stable: xxx **Conditions to avoid:** Extreme Temperatures**Incompatibility (Materials to avoid):** Strong oxidizers and strong acids**Hazardous Decomposition or Byproducts:** Thermal decomposition may yield CO; CO₂**Hazardous Polymerization:** May occur: ___ Will not occur: xxx**SECTION VI -Health Hazard Data****Routes of Entry - Signs and Symptoms of Exposure****Emergency and First Aid Procedures****Inhalation:** High concentrations are irritating to respiratory tract; may cause headache, dizziness, nausea, vomiting and malaise.

Remove victim to fresh air; provide oxygen; if breathing is difficult; administer CPR if victim is not breathing; seek medical attention.

Skin: Brief contact may cause slight irritation; prolonged contact may cause moderate irritation or dermatitis.

Remove contaminated clothing; wash affected area with soap and water; launder contaminated clothing before reuse; seek medical attention if condition persists.

Eyes: High vapor concentration or contact may cause irritation and discomfort.

Flush eyes with water for 15 minutes while holding eyelids open; get medical attention.

Ingestion: May result in vomiting; aspiration of vomitus into the lungs must be avoided; DO NOT induce vomiting. Minute amounts aspirated into the lungs can produce severe lung injury or death..

DO NOT induce vomiting; if vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs; seek medical attention. For ingestion of large amounts, 5 oz or more, vomiting may be induced only under the supervision of a physician.

Health Hazards (Acute and Chronic): Acute effects are possible irritation and discomfort; no known chronic effects have been established.**Carcinogenicity:** NTP? No **IARC Monographs?** No **OSHA Regulated:** No**Medical conditions generally aggravated by exposure:** Pre-existing skin, eye, or respiratory disorders may become aggravated through prolonged exposure.**SECTION VII - Handling and Storage****Steps to be taken in case material is released or spilled: Caution-Flammable!** Evacuate and ventilate area; confine and absorb into absorbent; place material into approved containers for disposal; for spills in excess of allowable time limits (RQ) notify the National Response Center (800) 4-8802; refer to CERCLA 40 CFR 302 for detailed instructions; refer to SARA Title III, Section 313, 40 CFR 372 for reporting requirements.**Waste disposal method:** Dispose of in accordance with local, state and federal regulations. Refer

to RCRA regulations 40 CFR 260-281 Part 261.20 for waste disposal instructions for ignitable materials; do not flush to sanitary sewer or waterway.

Precautions to be taken in handling and storage: Keep container closed when not in use; protect containers from abuse; protect from extreme temperatures. **Caution-Flammable** - Keep away from all sources of ignition. "Empty" containers may contain residue which may form explosive vapors. Do not weld or cut near empty container that has not been professionally reconditioned.

Other precautions: Use non sparking tools when opening and closing containers. Maintain well ventilated work areas to minimize exposure when handling this material.

SECTION VIII - Exposure Controls / Personal Protection

Respiratory protection (specific type): None required while threshold limits (Section II) are kept below maximum allowable concentrations; if TWA exceeds limits, NIOSH approved respirator must be worn.

Ventilation: Local exhaust: Required
Mechanical (general): Yes

Special: To maintain minimum TWA and STEL levels.
Other: Engineering and work controls as required.

Protective gloves: Neoprene or rubber

Eye protection: Goggles with side shields.

Other Protective Clothing/Equipment: Safety eyebath nearby

Work/Hygiene Practices: Practice safe workplace habits. Minimize body contact with this, as well as all chemicals in general.

The information contained herein is believed to be correct. However, PRIDE makes no warranty, expressed or implied, regarding the accuracy of these data or the results to be obtained from the use thereof. PRIDE assumes no responsibility for injury from the use of the product described herein.

Material Safety Data Sheet

Power Steering Fluid

MSDS No. 039

Date of Preparation: 10-29-99

Revision: 12-02-05

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Power Steering Fluid

Part Number(s): 2812

CAS Number: Not applicable to mixtures

General Use: Automotive product

Manufacturer: Berryman Products, Inc., 3800 E. Randol Mill Rd., Arlington, TX 76011-5434

Phone: 1-800-433-1704, Emergency phone number: 1-800-535-5053.

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% wt or % vol
Oil Mist (Mineral)	Mixture	90-100

Trace Impurities:

Ingredient	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH IDLH
	TWA	STEL	TWA	STEL	TWA	STEL	
Oil Mist (Mineral)	5 mg/m ³	none estab.	5 mg/m ³	none estab.	none estab.	none estab.	none estab.

Section 3 - Physical and Chemical Properties

Physical State: Liquid

Appearance and Odor: Yellow to Amber, Mild

Vapor Pressure: 1 mm Hg at 68 °F

Vapor Density (Air=1): Not determined

Density: 7.06 lbs/gal

Specific Gravity (H₂O=1, at 4 °C): 0.846

Boiling Point: Not determined

Refractive Index: 1.4639

% Volatile: Not determined

Evaporation Rate: Not determined

Section 4 - Fire-Fighting Measures

Flash Point: 390-420 °F

Flash Point Method: TAG Open Cup

LEL: Not determined

Flammability Classification: Class IIIB

Extinguishing Media: Carbon dioxide, foam, dry chemicals, and water spray.

Unusual Fire or Explosion Hazards: Combustible liquid.

Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Wear self-contained breathing apparatus pressure demand, MSNA/OSHA (approved or equivalent) and full protective gear. Use water spray to keep fire-exposed containers cool.



Section 5 - Stability and Reactivity

Stability: Power Steering Fluid is stable at room temperature in closed containers under normal storage and handling conditions.

Polymerization: Hazardous polymerization cannot occur.

Chemical Incompatibilities & Conditions to Avoid: Isolate from oxidizers, heat, sparks, electric equipment and open flame.

Hazardous Decomposition Products: Thermal oxidative decomposition of Power Steering Fluid can produce carbon monoxide, carbon dioxide, nitrogen, hydrogen sulfide and phosphorous.

Section 6 - Health Hazard Information

Potential Health Effects

Primary Entry Routes: Skin, dermal, inhalation and ingestion.

Target Organs: Eyes, skin, respiratory system.

Acute Effects: May cause irritation to the eyes, skin, and respiratory system. Avoid breathing oil mists.

Carcinogenicity: IARC, NTP, and OSHA do not list Power Steering Fluid as a carcinogen.

Chronic Effects: May irritate mucous membranes and cause dermatitis.

Emergency and First Aid Procedures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. Get medical attention immediately.

Eye Contact: Immediately flush eyes with plenty of water. Get medical attention, if irritation persists.

Skin Contact: Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

Ingestion: Get medical attention. Do not induce vomiting.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Section 7 - Spill, Leak, and Disposal Procedures

Spill /Leak Procedures: Eliminate all sources of ignition. Stop spill at source. Wear appropriate personal protective equipment (Sec. 8). Contain the spill to facilitate cleanup with absorbent. Use non-sparking tools and equipment. Transfer to disposal containers.

Containment: For large spills, dike far ahead of liquid spill for later disposal. Do not release into sewers or waterways.

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state and local regulations.

Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 8 - Exposure Controls / Personal Protection

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.

Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Special Precautions and Comments

Handling Precautions: Wash thoroughly after handling. Avoid contact with eyes.

Storage Requirements: Keep container closed when not in use.

California Proposition 65: This product contains the following chemicals known to the state of California to cause cancer and/or reproductive toxicity: None.

DOT Transportation Data (49 CFR 172.101):

Part Number(s): 2812

Shipping Name: Not regulated

Hazard Class: N/A

ID No.: N/A

Packing Group: N/A

SARA Title III Section 313 Supplier Notification:

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the emergency Planning & Community Right-To-Know-Act of 1986 & of 40CFR 372: None.

Prepared By: Alicia L. Reed

Disclaimer: All information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the

Information is believed to be accurate, we make no representations as to its accuracy or sufficiency. Conditions of use are beyond our control, therefore users are responsible for verifying the data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling and disposal of the product. Users also assume all risks in regards to the publication of use of, or reliance upon information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or process.

US EPA ARCHIVE DOCUMENT



Material Safety Data Sheet

Rev. E - Revised March 1, 2007

Section 1 – Product Identification and Company Information

Trade Names:	Trademarks and product names include Badger Frac™, Badger Pac™, Badger Cast™, Badger Grind™, and Badger Enviromedia. Products also generally referred to as Taylor Silica, Fairwater Silica.
Common Names/Synonyms:	Silica Sand
Product Use:	Frac Sands, Gravel Pack Sands, Resin Coating Base Sands, Foundry Core and Molding Sands, Industrial Sands, Glass Sands, Filtration Media, Environmental Sands, Grinding Media, Industrial Fillers, Testing Sands, Recreational and Agricultural Sands. This product is not to be used for abrasive blasting. This material safety data sheet and the information contained herein were not developed for abrasive blasting.
Manufacturer's Name:	Badger Mining Corporation
Manufacturer's Address:	P.O. Box 328 409 South Church Street Berlin, WI 54923
Manufacturer's Telephone:	800-932-7263 (7:30 am – 5 pm Central Time Monday-Friday) 920-361-2388
Manufacturer's Fax:	920-361-2826
Emergency Number:	800-932-7263 (7:30 am – 5 pm Central Time Monday-Friday) 920-361-2388

Section 2 – Hazards Identification

Emergency Overview

Badger Mining Corporation Silica Sand is a light buff to white sand with no odor. It is not flammable, combustible, or explosive. It can cause irritation to the eyes. A single exposure will not result in serious adverse health effects. Crystalline silica is not known to be an environmental hazard.

Potential Health Effects

Inhalation:

- a. Silicosis: Respirable crystalline silica (quartz) can cause chronic silicosis, a fibrosis (scarring) of the lungs. Silicosis may be progressive; it may lead to disability and death. Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.
- b. Cancer: Crystalline silica (quartz) inhaled from occupational sources in sufficient concentrations is classified as carcinogenic to humans. In its Ninth Annual Report on Carcinogens, the National Toxicology Program (NTP) listed crystalline silica as a known human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust. The International Agency for Research on Cancer (IARC) has evaluated crystalline silica and determined that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)."
- c. Autoimmune Diseases: There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys.
- d. Tuberculosis: Silicosis increases the risk of tuberculosis.

e. Nephrotoxicity: There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease.

Eye Contact: Crystalline silica (quartz) may cause abrasion of the cornea.

Skin Contact: May cause abrasion to skin.

Ingestion: No known health effect.

Acute Effects: One form of silicosis, Acute Silicosis, can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

Chronic Effects: The adverse health effects -- lung disease, silicosis, cancer, autoimmune disease, tuberculosis, and nephrotoxicity -- are chronic effects.

Signs and Symptoms of Exposure: There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Medical Conditions Generally Aggravated by Exposure: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

See Section 11, Toxicological Information, for additional detail on potential adverse health effects.

Section 3 – Composition and Information on Ingredients

Hazardous Ingredients

Name:	Silica, Quartz, SiO ₂
CAS Number:	14808 - 60- 7
Concentration (%)	89.0-99.9%

Section 4 – First Aid Procedures

Inhalation – There is no specific treatment because the health effects associated with silica are chronic. If gross inhalation of silica occurs, remove the person to fresh air, perform artificial respiration as needed, and obtain medical attention as needed.

Eye – Wash the eye with water. If irritation persists, seek medical attention.

Skin – If abrasion occurs, seek medical attention.

Ingestion – If large amounts are ingested, seek medical attention.

Section 5 – Fire Fighting Measures

Flashpoint:	None
Upper/Lower Explosive Limit:	Not Combustible
Autoignition Temperature:	None
Unusual Fire and Explosion Habits:	None
Extinguishing Media:	Compatible with all media; use the medium appropriate to the surrounding fire.
Special Fire Fighting Procedures:	None with respect to this product.
Hazardous Combustion Products:	None

Section 6 – Accidental Release Measures

Wear appropriate personal protective equipment as described in Section 8 of this document. Collect the material using a method that does not produce dust [High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the silica]. Place the silica in a covered container appropriate for disposal. Dispose of the silica according to federal, state, and local regulations.

Section 7 – Handling and Storage

This product is **not** to be used for abrasive blasting. Do not breathe dust, which may be created during the handling of this product. Do not rely on vision to determine whether respirable silica is present in the air, as it may be present without a visible cloud. Use good housekeeping procedures to prevent the accumulation of silica dust in the workplace. Avoid the creation of respirable dust.

Use adequate ventilation and dust collection equipment. Ensure that the dust collection system is adequate to reduce airborne dust levels to below the appropriate occupational health limit. Use respiratory protection during the establishment of engineering controls. Refer to Section 8 - Exposure Controls/Personal Protection for further information.

In accordance with the U.S. Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard (29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state, and/or local right-to-know laws and regulations, familiarize your employees with this MSDS and the information contained herein. Warn your employees (and your customers in case of resale) of the potential health risks associated with the use of this product and train them in the appropriate use of personal protective equipment and engineering controls, which will reduce their risks of exposure.

See also ASTM International standard practice E 1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."

Crystalline silica is listed by the Governor of the State of California, under Proposition 65, as requiring the following warning: "Detectable amounts of chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm may be found in this product."

Section 8 – Exposure Controls/Personal Protection

Exposure Limits (respirable fraction) in Air:

OSHA - PEL	10 mg/m ³	(8-Hr. Time Weighted Average)
	% SiO ₂ +2	(8-Hr. Time Weighted Average)
ACGIH – TLV	0.025 mg/m ³	(10-Hr. Time Weighted Avg., 40-hr. work week)
NIOSH - REL	0.05 mg/m ³	

Exposure Limits refer to the respirable fraction

Silica is classified as hazardous under Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1910.1200).

CAUTION:

Crystalline silica exists in several forms, the most common of which is quartz. If crystalline silica (quartz) is heated to more than 870°C (1598°F) it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite. Crystalline silica as tridymite and cristobalite are more fibrogenic than crystalline silica as quartz. The OSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz); the ACGIH TLV for crystalline silica as cristobalite is equal to the TLV for crystalline silica as quartz. The ACGIH, in 2005, has withdrawn the TLV for crystalline silica as tridymite.

Ventilation: Use local exhaust as required to maintain exposures below the occupational exposure limits; see also ACGIH, Industrial Ventilation – Recommended Practice (latest edition).

Respiratory Protection:	This product is <u>not</u> to be used for abrasive blasting. Consult with OSHA regulations and NIOSH recommendations to determine the appropriate respiratory protection during use of this product. Use only NIOSH-approved respiratory protection equipment. Avoid breathing dust produced during the use and handling of this product. If the workplace airborne crystalline silica concentration is unknown for a given task, conduct air monitoring to determine the appropriate level of respiratory protection. Consult with a certified industrial hygienist, your insurance risk manager, or the OSHA Consultative Services group for detailed information. Ensure appropriate respirators are worn during and following the task, including clean up or whenever airborne dust is present, to ensure worker exposures remain below occupational health limits. Provisions should be made for a respiratory protection training program (see 29 CFR 1910.134 – Respiratory Protection for minimum program requirements). See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection," 29 CFR 1910.134 and 1926.103, and 42 CFR 84.
Gloves:	Recommended in situations where abrasion from sand may occur.
Eye:	Use protection as appropriate for the task at hand.
Other:	Use protective clothing as appropriate for the work environment.

Section 9 – Physical and Chemical Properties

Appearance:	Light Buff to White Sand
Odor:	None
Physical State:	Granular Solid
pH:	Not Applicable
Vapor Pressure:	Not Applicable
Vapor Density:	Not Applicable
Boiling Point or Range, °F:	2230°C (4046°F) for Quartz
Melting Point or Range, °F:	1710°C (3110°F) for Quartz
Solubility In Water:	Insoluble
Specific Gravity:	2.65 (Quartz)

Section 10 – Stability and Reactivity

Stability:	Stable
Materials to Avoid:	Strong Oxidizing Agents, such as fluorine, chlorine trifluoride, hydrogen fluoride, and oxygen difluoride.
Hazardous Decomposition Products:	Silica will dissolve in hydrofluoric acid and produce a corrosive gas – silicon tetrafluoride.
Hazardous Polymerization:	Will not occur

Section 11 – Toxicological Information

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute.

Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years of exposure to levels above the occupational exposure limits for airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF).

Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pulmonale) secondary to the lung disease.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that there was "sufficient evidence in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "sufficient evidence in experimental animals for the carcinogenicity of quartz and cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1)." The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated that "[C]arcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 68, "Silica, Some Silicates..." (1997).

NTP - The National Toxicology Program, in its Ninth Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSHA - Not regulated as a carcinogen.

There have been many articles published on the carcinogenicity of crystalline silica, which the reader should consult for additional information; the following are examples of recently published articles: (1) "Lung cancer among industrial sand workers exposed to crystalline silica", *Am J Epidemiol*, (153) 695-703 (2001); (2) "Crystalline Silica and the risk of lung cancer in the potteries", *Occup Environ Med*, (55) 779-785 (1998); (3) "Is Silicosis Required for Silica-Associated Lung Cancer?", *American Journal of Industrial Medicine*, (37) 252- 259 (2000); (4) "Silica, Silicosis, and Lung Cancer: A Risk Assessment", *American Journal of Industrial Medicine*, (38) 8-18 (2000); (5) "Silica, Silicosis, and Lung Cancer: A Response to a Recent Working Group Report", *Journal of Occupational and Environmental Medicine*, (42) 704-720 (2000).

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: "Occupational Exposure to Crystalline Silica and Autoimmune Disease", *Environmental Health Perspectives*, (107) Supplement 5, 793-802 (1999); "Occupational Scleroderma", *Current Opinion in Rheumatology*, (11) 490-494 (1999); "Connective tissue disease and silicosis", *Am J Ind Med*, (35), 375-381 (1999).

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: *Occupational Lung Disorders*, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994); "Risk of pulmonary tuberculosis relative to silicosis and exposure to silica dust in South African gold miners," *Occup Environ Med*, (55) 496-502 (1998); "Occupational risk factors for developing tuberculosis", *Am J Ind Med*, (30) 148-154 (1996).

E. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease. For additional information on the subject, the following may be consulted: "Kidney Disease and Silicosis", *Nephron*, (85) 14-19 (2000); "End stage renal disease among ceramic workers exposed to silica", *Occup Environ Med*, (56) 559-561 (1999); "Kidney disease and arthritis in a cohort study of workers exposed to silica", *Epidemiology*, (12) 405-412 (2001).

F. NON-MALIGNANT RESPIRATORY DISEASES

NIOSH has cited the results of studies that report an association between dusts found in various mining operations and non-malignant respiratory disease, particularly among smokers, including bronchitis, emphysema, and small airways disease. The results were not conclusive regarding an association among those with silicosis, only smokers, or the result of general mineral dust that does not contain silica. See *NIOSH Hazard Review – Health Effects of Occupational Exposure to Respirable Crystalline Silica*, published in April 2002, available from NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226, or at <http://www.cdc.gov/niosh/02-129A.html>.

Section 12 – Ecological Information

Crystalline silica is not known to be ecotoxic.

Section 13 – Disposal Considerations

General: Crystalline silica may be landfilled. Material should be placed in covered containers to minimize generation of airborne dust.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

The above information applies to Badger Mining Corporation Silica Sand only as sold. The product may be contaminated during use, and it is the responsibility of the user to assess the appropriate disposal method in this situation.

Section 14 – Transport Information

Crystalline silica (quartz) is not a hazardous material for purposes of transportation under the U. S. Department of Transportation Table of Hazardous Materials, 49 CFR §172.101.

Section 15 – Regulatory Information

UNITED STATES (FEDERAL AND STATE)

TSCA No.: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.

RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR §302.

Emergency Planning and Community Right to Know Act: Crystalline silica (quartz) is not an extremely hazardous substance under Section 302 and is not a toxic chemical subject to the requirements of Section 313.

Clean Air Act: Crystalline silica (quartz) mined and processed by Badger Mining Corporation was not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3)(xxvi).

NTP: Respirable crystalline silica (quartz) is classified as a known human carcinogen.

OSHA Carcinogen: Crystalline silica (quartz) is not listed.

California Proposition 65: Crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.

California Inhalation Reference Exposure Limit (REL): The California chronic REL for respirable crystalline silica is 3 ug/m³. A chronic REL is an airborne level of a substance at or below which no adverse health effects are anticipated in individuals indefinitely exposed to the substance at that level.

Massachusetts Toxic Use Reduction Act: Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act.

Pennsylvania Worker and Community Right to Know Act: Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.

CANADA

Domestic Substances List: Badger Mining Corporation products, as naturally occurring substances, are on the Canadian DSL.

WHMIS Classification: D-2A

OTHER

EINECS No.: 231-545-4

EEC Label (Risk/Safety Phrases): R 48/20, R 40/20, S22, S38

IARC: Crystalline silica (quartz) is classified in IARC Group 1.

National, state, provincial or local emergency planning, community right to know or other laws, regulations or ordinances may be applicable--consult applicable national, state, provincial or local laws.

Section 16 – Other Information

An electronic version of this MSDS is available at www.badgerminingcorp.com . More information on the effects of crystalline silica exposure may be obtained from the Occupational Safety and Health Administration (OSHA) (phone number: 1-800-321-OSHA; website: <http://www.osha.gov>) or from the National Institute for Occupational Safety and Health (NIOSH) (phone number: 1-800-35-NIOSH; website: <http://www.cdc.gov/niosh>).

HMIS:

Health:	See Section 2 and Section 11 of this MSDS.
Flammability:	0
Reactivity:	0
Protective Equipment:	E

NFPA

Health:	0
Flammability:	0
Reactivity:	0

Permatex, Inc.
 10 Columbus Blvd.
 Hartford, CT 06106 USA
 Telephone: 1-87-Permatex
 (877) 376-2839
 Emergency: 800-255-3924
 International Emergency: 813-248-0585

Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Product Name: FAST ORANGE WIPES 72 CT BUCKET
 Item No: 25072
 Product Type: Cleaning wipes

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component		ACGIH TLV: TWA	OSHA PEL:
WATER 7732-18-5	60-80	Not Listed	Not Listed
D-Limonene 5989-27-5	5-15	Not Listed	Not Listed
ETHOXYLATED ALCOHOLS (C12-15 PARETH-7) 68131-39-5	<5	Not Listed	Not Listed
FRAGRANCE MIXTURE	<5	Not Listed	Not Listed
SODIUM LAURYL SULFATE 151-21-3	<5	Not Listed	Not Listed

3. HAZARDS IDENTIFICATION

Toxicity: May irritate the eyes. May cause gastric disturbances if swallowed..
 Primary Routes of Entry: Eyes, Oral
 Signs and Symptoms of Exposure: Contact with eyes may cause tearing and redness. Ingestion may cause nausea and vomiting.

Component		NTP	ACGIH Carcinogens	IARC
D-Limonene 5989-27-5	5-15	male rat-clear evidence; female rat-no evidence; male mice-no evidence; female mice-no evidence		Group 3 Monograph 73, 1999

Medical Conditions Recognized as Being Aggravated by Exposure: None known.

4. FIRST AID MEASURES

Ingestion: If swallowed, DO NOT induce vomiting. Keep individual calm. Obtain medical attention.
 Inhalation: None reasonably foreseeable.
 Skin Contact: None under normal use.
 Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

5. FIRE FIGHTING MEASURES

Flash Point (°F/C): None
 Recommended Extinguishing Media: Water fog, carbon dioxide, foam, dry chemical.
 Special Fire-Fighting Procedures: No special procedures.
 Hazardous Products of Combustion: Carbon Monoxide and Carbon Dioxide., Hydrogen sulfide, Sulfur dioxide.
 Unusual Fire/Explosion Hazards: None.

Lower Explosive Limit: Not determined
 Upper Explosive Limit: Not determined

6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Pick up contaminated wipes and place in an appropriate waste container until disposal..

7. HANDLING AND STORAGE

Storage: Keep in cool and dark place. Avoid direct sunlight.
Handling: Follow all general safety precautions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eyes: Not required
Skin: Not required.
Ventilation: None under normal use.
Respiratory Protection: Not required under normal use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White liquid soaked into non-woven cloth
Odor: Orange
Boiling Point: >200°F
pH: 9.8
Solubility in Water: DISPERSIBLE
Specific Gravity: 0.98
VOC Content(Wt.%): 8% by weight; 78.97 g/l
Vapor Pressure: Not determined
Vapor Density (Air=1): >1
Evaporation Rate: Not determined

10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal conditions
Hazardous Polymerization: WILL NOT OCCUR.
Incompatibilities: Acids, Strong oxidizers
Conditions to Avoid: Heat
Hazardous Products of Combustion: Carbon Monoxide and Carbon Dioxide., Hydrogen sulfide, Sulfur dioxide.

11. TOXICOLOGICAL INFORMATION

See Section 3

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Recommended Method of Disposal: Dispose of in accordance with local, state and federal regulations.
US EPA Waste Number: NH - Not a RCRA Hazardous Waste Material

14. TRANSPORTATION INFORMATION

DOT (49CFR 172)

Domestic Ground Transport

DOT Shipping Name: Unrestricted
Hazard Class: None
UN/ID Number: None
Marine Pollutant: None

IATA

Proper Shipping Name: Not regulated
Class or Division: None
UN/NA Number: None

IMDG

Proper Shipping: Unrestricted
Hazard Class: None
UN Number: None

US EPA ARCHIVE DOCUMENT

Product Name: FAST ORANGE WIPES 72 CT BUCKET

Item No: 25072

15. REGULATORY INFORMATION

SARA 313 Chemicals: The following component(s) is listed as a SARA Section 313 Toxic Chemical.

None

CALIFORNIA PROP 65:

No California Prop 65 chemicals are known to be present.

TSCA Inventory Status:

Listed on Inventory: YES All components of this product are listed (or exempt) on the EPA TSCA inventory.

16. OTHER INFORMATION

Estimated NFPA Rating: HEALTH 1, FLAMMABILITY 1, REACTIVITY 0

Estimated HMIS Classification: HEALTH 1, FLAMMABILITY 1, PHYSICAL HAZARD 0

NFPA is a registered trademark of the National Fire Protection Assn.

HMIS is a registered trademark of the National Paint and Coatings Assn.

Prepared By: Denise Boyd, Health and Safety Manager
Company: Permatex, Inc. 10 Columbus Blvd. Hartford, CT USA 06106

Revision Date: March/14/2007
Revision Number: 2

Telephone No.: 1-87-Permatex (877) 376-2839

MSDS No.: FP-1
 Date: 6/89
 Revisions: 11/12/01



MATERIAL SAFETY DATA SHEET

SECTION I		GENERAL INFORMATION	
A.	Material Name:	<u>PVC Plastic Fittings / Valves</u>	
	Other Names:	<u>Vinyl fittings</u>	Chemical Family: <u>Polyvinyl chloride</u>
B.	Manufacturer:	NIBCO INC. 1516 Middlebury St. P.O. Box 1167 Elkhart, IN 46516	Telephone: 219-295-3000 For chemical emergency - spill, leak, fire exposure or accident, call: CHEMTEL 1-800-255-3924 day or night

SECTION II		Composition / Information on Ingredients			
Ingredient	CAS #	Weight %	ACGIH TLV	OSHA PEL	
Organic Tin Compound	7440-31-5	3	0.1 mg/m ³ -skin; (C) 0.2 mg/m ³	0.1 mg/m ³ - skin	
Polyvinyl Chloride Resin	9002-86-2	100	none established	none established	
Vinyl Chloride Monomer	75-01-4	<.0002	5 ppm ACGIH TLV TWA	2.56 mg/m ³	

KNOWN HAZARDS UNDER 29 CFR 1910.1200											
	Yes	No		Yes	No		Yes	No		Yes	No
Combustible Liquid		x	Skin Hazard		x	Oxidizer		x	Reproductive Toxin		x
Flammable Material		x	Eye Hazard		x	Organic Peroxide		x	Blood Toxin		x
Pyrophoric Material		x	Toxic Agent		x	Corrosive Material		x	Nervous Sys. Toxin		x
Explosive Material		x	Highly Toxic Agent		x	Compressed Gas		x	Lung Toxin		x
Unstable Material		x	Sensitizer		x	Irritant		x	Liver Toxin		x
Water Reactive Mat.		x	Carcinogen		x				Kidney Toxin		x

Comments: _____

US EPA ARCHIVE DOCUMENT

SECTION II Composition / Information on Ingredients (CONTINUED)			
SHIPPING INFORMATION	SPECIAL HAZARD DESIGNATIONS		
DOT HAZARD CLASS: N/A	HEALTH:	HMIS	NFPA HAZARD RATING
DOT SHIPPING NAME: N/A	FLAMMABILITY:	0	0 0 - MINIMAL
	REACTIVITY:	0	0 1 - SLIGHT
	PROTECTIVE EQUIPMENT:	0	0 2 - MODERATE
SHIPPING I.D. NUMBER: N/A		-	- 3 - SERIOUS
			4 - SEVERE

SECTION III PHYSICAL DATA	
Melting Point: <u>200 °F</u>	Vapor Pressure (mm Hg): <u>NA</u>
Boiling Point: <u>NA</u>	Vapor Density (AIR=1): <u>NA</u>
Specific Gravity (H ₂ O=1): <u>1.42</u>	Solubility in Water: <u>Insoluble</u>
Appearance and Odor: <u>white/gray and odorless solid</u>	

SECTION IV FIRE AND EXPLOSION HAZARD DATA	
Flash Point (method used): <u>735 °F</u>	
LEL: <u>N/A</u>	UEL: <u>N/A</u>
Extinguishing Media: <u>Water spray, ABC dry chemical, carbon dioxide</u>	
Special Fire fighting Procedures: Fire fighters should be equipped for protection against high heat, depletion of oxygen, heavy smoke and molten plastic.	
Unusual Fire and Explosion Hazards: Under burning conditions, PVC will release hydrogen chloride, carbon monoxide and carbon dioxide. Other gases released in small quantities are: benzene and aromatic and aliphatic hydrocarbons. The combustion products of PVC like those from other natural and synthetic products must be considered toxic.	

SECTION V REACTIVITY DATA	
A. Stability:	<input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable
Conditions to Avoid: <u>N/A</u>	
B. Hazardous Polymerization:	<input type="checkbox"/> May Occur <input checked="" type="checkbox"/> Will Not Occur
Conditions to Avoid: <u>N/A</u>	
C. Incompatible Materials:	None known
D. Hazardous Decomposition Products:	Hydrogen chloride, carbon monoxide, carbon dioxide and small amounts of benzene and aromatic and aliphatic hydrocarbons.

SECTION VI

HEALTH HAZARD DATA

Route(s) of Entry: Inhalation Ingestion Skin

Health Hazards (Acute and Chronic):

The fittings as received do not present an inhalation, skin contact or eye contact hazard. Listed hazards may result from remelting or combustion of the fittings.

A. **Metals:**

Organic Tin Compound: Organic tin compounds can affect the body if they are inhaled or if they come in contact with the eyes or skin. Organic tin compounds are primary skin irritants capable of penetrating intact skin, and can cause skin lesions on repeated contact.

B. **Other Constituents:**

Polyvinyl Chloride: Chronic inhalation of PVC dust has been reported to cause pulmonary damage, blood effects and abnormal liver function. Repeated skin contact can cause allergic dermatitis.

C. **Carcinogenicity:** NTP IARC OSHA

None of the constituents show carcinogenicity.

D. **Emergency First Aid:**

Not applicable to finished fittings.

SECTION VII SPILL OR LEAK PROCEDURES

- A. **Special Handling or Storage:**
Store fittings away from weather and sources of heat.
- B. **Spill or Leak Containment:**
For spills of broken fittings, sweep from floor for stable footing and to prevent slips by personnel.
- C. **Waste Disposal:**
Dispose of waste in a licensed landfill or incinerate in accordance with federal, state and local regulations.
- D. **Other Precautions:**
None.

SECTION VIII SPECIAL PROTECTION INFORMATION

- A. **Respiratory Protection (specify type):** NIOSH approved for organic vapor when solvent welding in poorly ventilated areas.
- B. **Ventilation:** Local Exhaust Mechanical (General)
Other (specify): N/A
- C. **Eye Protection:** Yes No Type: glasses or goggles when solvent welding
- D. **Protective Gloves:** Yes No Type: rubber or PVA coated when solvent welding
- E. **Other Protective Equipment or Clothing:** Yes No
Type: N/A
- F. **Special Precautions or Work Practices:** N/A

DISCLAIMER OF LIABILITY

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Aerove Survey Marking Paint - Aerosol



Material Safety Data Sheet

The information presented in these forms is believed to be correct and sufficient to meet the requirements of OSHA Hazard Communication standard (29 CFR 1910.1200) concerning worker's right to know.

The following material safety data sheet covers the hazardous ingredients associated with more than one color aerosol product. As per 29 CFR 1900.1200 paragraph (g); whenever the hazards associated with similar mixtures are the same, then one MSDS may be prepared to cover several products.

PRODUCT NAME: Aerosol Survey Marking Paint

Non-Fluorescent Colors		Fluorescent Colors	16 oz. I.A.C.		High Delivery	Metallic
201 Red	207 White	220 Red	261S Red	270S Fluorescent Red	281 Red	210 Silver
202 Yellow	208 Hi Visibility Yellow	222 Orange	262S Yellow	272S Fluorescent Orange	282 Yellow	
203 Blue	209 Light Blue	224 Green	263S Blue	274S Fluorescent Green	288 Fluorescent Orange	
204 Green	212 Purple	226 Yellow	265S Orange	275S Fluorescent Red/Orange		
205 Orange	213 Brown	227 Blue	267S White	279S Fluorescent Pink		
206 Black		229 Pink				
		230 Red/Orange				

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: Aerove Industries, Inc. **ADDRESS:** 1198 Mark Circle, Gardnersville, NV 89410
INFORMATION PHONE: 775-782-0100 **EMERGENCY PHONE:** 1-800-424-9300
DATE REVISED: 01-21-04 **REASON REVISED:** Updated

SECTION II: HAZARDOUS INGREDIENTS / SARA III INFORMATION / OCCUPATIONAL EXPOSURE LIMITS

Hazardous Component	Hydrocarbon Propellant	Hexane	Xylene	Aliphatic Petroleum Distillates	Ethyl Acetate	Acetone	Glycol Ether EB Acetate	VM&P Naphtha	Aliphatic Hydrocarbon	n-Butyl Acetate
CAS #	68476-86-8	110-54-3	1330-20-7	64742-88-7	141-78-6	67-64-1	112-07-2	64742-89-8	64742-47-8	123-86-4
OSHA PEL (TWA)	1000 ppm	500 ppm	100 ppm	100 ppm	400 ppm	1000 ppm	N / AV	300 ppm	N / AV	150 ppm
ACGIH TLV (TWA)	1000 ppm	50 ppm (skin)	100 ppm	100 ppm	400 ppm	500 ppm	N / AV	400 ppm	N / AV	150 ppm
LD50 Species & Route	N / AV	2870 mg/kg (Rat-Oral)	4300 mg/kg (Rat-Oral)	N / AV	N / AV	5800 mg/kg (Rat-Oral)	N / AV	N / AV	N / AV	N / AV
LC50 Species	N / AV	N / AV	6700 ppm 4 hr (Rat)	N / AV	N / AV	21,000 ppm 8 hr (Rat)	N / AV	N / AV	N / AV	N / AV
SARA 313 Listed	no	yes	yes	no	no	no	yes	no	no	no
	wt %	wt %	wt %	wt %	wt %	wt %	wt %	wt %	wt %	wt %

Non-Fluorescent Colors

10 - 30	7 - 13	5 - 10	1 - 5	1 - 5	3 - 7	1 - 5			
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Fluorescent Colors

10 - 30	7 - 13		1 - 5				7 - 13		
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Metallic, 210 Silver

15 - 40		7 - 13			30 - 60		5 - 10	5 - 10	1 - 5
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17A

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT: N / AP **SPECIFIC GRAVITY (H20=1):** 0.8 to 0.9
VAPOR DENSITY: Heavier than air **SOLUBILITY IN WATER:** Partially
EVAPORATION RATE: Faster than n-Butyl Acetate **APPEARANCE AND ODOR:** Opaque liquid with hydrocarbon odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: < 0° F (-18° C) **METHOD USED:** Estimated **FLAMMABLE LIMITS - LEL:** 0.9% **UEL:** 15.0%
EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, water spray.
SPECIAL FIRE FIGHTING PROCEDURES: Use water spray to cool containers exposed to heat or fire to prevent pressure build up. Self-contained breathing apparatus should be used if product is involved in fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Treat as cylinders of compressed gas. Closed containers may rupture due to pressure build up from extreme temperature.
FLAMMABILITY: Flammable aerosol under conditions of sparks, flame, or hot surfaces.
SENSITIVITY TO IMPACT: Do not puncture **SENSITIVITY TO STATIC DISCHARGE:** Primarily vapors

SECTION V - REACTIVITY DATA

STABILITY: Stable **CONDITIONS TO AVOID:** Open flames, sparks, electrical arcs.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents.
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Carbon Monoxide, Carbon Dioxide.
HAZARDOUS POLYMERIZATION: Will not occur

SECTION VI - HEALTH HAZARD DATA

INHALATION: Respiratory tract irritant. May cause dizziness, light-headedness and / or headaches.
SKIN CONTACT: Prolonged or repeated contact may cause irritation and dermatitis.
EYE CONTACT: Painful with slight to moderate irritation.
SKIN ABSORPTION: Not likely to be absorbed in toxic amounts under normal use.
INGESTION: Not likely to be harmful in small amounts but swallowing large amounts may be harmful.
CARCINOGENICITY: The ingredients are not listed as a human carcinogen by IARC, ACGIH, NTP, or OSHA.
TERATOGENICITY: Not established **MUTAGENICITY:** Not established
MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: Not established
EMERGENCY AND FIRST AID PROCEDURES: **INHALATION** - Remove from exposure, seek medical attention if signs/symptoms persist.
SKIN - Wash affected area with soap and water, remove contaminated clothing, seek medical attention if irritation persists.
EYES - Flush immediately with water for 15 minutes, seek medical attention if irritation persists.
INGESTION - Do NOT induce vomiting. Drink plenty of water, seek medical attention.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Ventilate area. Prevent from entering a watercourse. Use an inert absorbent material and non-sparking type tools.
WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations. Do not incinerate closed containers.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 120° F (49° C). Do not store or use near heat, sparks or flame.
OTHER PRECAUTIONS: Do not get in eyes or on skin. Do not breathe vapors, take internally or smoke while using this product.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: In areas with poor ventilation, use a NIOSH approved Organic Vapor Cartridge Respirator. For concentrations above the TLV (as defined in Section II), use a positive air supplied respirator.
VENTILATION: General ventilation to maintain exposure limits below TLV's as defined in Section II.
PROTECTIVE GLOVES: Chemical resistant gloves such as Neoprene or Nitrile rubber.
EYE PROTECTION: Safety glasses or goggles.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Not established.
WORK / HYGIENIC PRACTICES: Avoid prolonged or repeated contact. Do not breathe vapors. Wash contaminated clothing prior to reuse.

SECTION IX - DISCLAIMER

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE SO. NOTHING CONTAINED HEREIN CONSTITUTES A SPECIFICATION NOR IS IT INTENDED TO WARRANT SUITABILITY FOR THE INTENDED USE.

Aerove Survey Marking Paint (Fluorescent Colors) - Bulk



Material Safety Data Sheet

TO: MSDS USERS

Please find below the material safety data sheet as per your request.

The information presented in these forms is believed to be correct and sufficient to meet the requirements of OSHA Hazard Communication standard (29 CFR 1910.1200) concerning worker's right to know. In order for the information contained in the MSDS to be most helpful we recommend that these forms be made available to all those who handle or may otherwise be exposed to the product.

The following material safety data sheet covers the hazardous ingredients associated with more than one color bulk product. As per 29 CFR 1900.1200 paragraph (g); whenever the hazards associated with similar mixtures are the same, then one MSDS may be prepared to cover several products.

This MSDS covers the following Aerove-Pacific bulk products.

MARKING PAINT - FLUORESCENT COLORS

220 RED	224 GREEN	229 PINK
222 ORANGE	226 YELLOW	230 RED/ORANGE
	227 BLUE	

PRODUCT NAME: MARKING PAINT - ALL FLUORESCENT COLORS PRODUCT CODE: 17B2 HMIS CODES: H 2 F 3 R 0 P X

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: Aerove-Pacific Company, Inc. ADDRESS: 1198 Mark Circle, Gardnerville, NV 89410
 INFORMATION PHONE: 775-782-0100 EMERGENCY PHONE: 1-800-424-9300
 DATE REVISED: 03-14-02 REASON REVISED: Updated

**SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION
OCCUPATIONAL EXPOSURE LIMITS**

HAZARDOUS COMPONENTS	WEIGHT PERCENT	OSHA PEL	ACGIH TLV	OTHER	LD50 SPECIES & ROUTE	LC50 SPECIES & ROUTE
*XYLENE (CAS 1330 20 7)	23	100 PPM	100 PPM		4300 mg / kg RAT (ORAL)	6700 PPM; 4 hr RAT (INHA)
*ETHYL BENZENE (CAS 100 41 4)	4	100 PPM	100 PPM	N/A	3500 mg / kg RAT (ORAL)	N/A
PETROLEUM NAPHTHA (CAS 64742-89-8)	 16	 400 PPM	 400 PPM		 > 7.10 g / kg RAT (ORAL) > 2.84 g / kg RAT (DERMAL)	 15,000 PPM / 4 hr RAT (INHA)

*Indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.
 NOTE: N/A applies to not available or not applicable

PRODUCT CODE: 17B2

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT: 222° to 278°F / 106° to 137° C SPECIFIC GRAVITY (H2O=1): 1.2 COEFFICIENT OF WATER/OIL DIST: N/A
 ODOR THRESHOLD: N/A VAPOR DENSITY: Heavier than air SOLUBILITY IN WATER: Negligible
 EVAPORATION RATE: Slower than n-Butyl Acetate APPEARANCE AND ODOR: Opaque Liquid / Solvent Based Odor
 COATING V.O.C.: 5.08 lbs / Imp gal 4.23 lbs / US gal 507 gms / ltr FREEZING POINT: N/A pH: N/A

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 20° F / -7° C METHOD USED: Estimated FLAMMABLE LIMITS IN AIR BY VOLUME - LOWER: 1.0% UPPER: 8.0%
 EXTINGUISHING MEDIA: Foam, Alcohol Foam, CO2, Dry Chemical, Water Fog
 SPECIAL FIRE FIGHTING PROCEDURES: Water spray may be ineffective, but water spray may be used to cool containers exposed to heat or fire to prevent pressure build up. Self-contained breathing apparatus should be used if product is involved in fire.
 UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may rupture due to pressure build up from extreme heat or fire.
 FLAMMABILITY: Yes - Flammable liquid under conditions of sparks, flame, or hot surfaces.
 SENSITIVITY TO IMPACT: Do not puncture SENSITIVITY TO STATIC DISCHARGE: Primarily vapors

SECTION V - REACTIVITY DATA

STABILITY: Stable CONDITIONS TO AVOID: High temperatures
 INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents
 HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Carbon Monoxide and Carbon Dioxide
 HAZARDOUS POLYMERIZATION: Will not occur

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: May cause dizziness or nausea.
 SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: SKIN - May cause irritation or burning sensation.
 EYES - Primary irritation.
 SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: May cause irritation or burning sensation.
 INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: N/A
 HEALTH HAZARDS (ACUTE AND CHRONIC): INHALATION - Anesthetic. Irritation of the respiratory tract, or nervous system depression (characterized by headache, dizziness, nausea or possible unconsciousness). SKIN OR EYE CONTACT - Primary irritation. Prolonged or repeated contact to skin may cause dermatitis - exercise due care.
 CARCINOGENICITY: None known NTP? No IARC MONOGRAPHS? No OSHA REGULATED? No
 TERATOGENICITY: N/A MUTAGENICITY: N/A TOXICOLOGICALLY SYNERGISTIC PRODUCT: N/A
 MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: None known
 EMERGENCY AND FIRST AID PROCEDURES: VAPORS - Remove from exposure and restore breathing, seek medical attention.
 SPLASH - (SKIN) Wash affected area, remove contaminated clothing, see physician if any irritation persists.
 SPLASH - (EYES) Flush immediately with water for 15 minutes and take to a physician.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition - Flames, sparks, static electricity & electrical. Ventilate area, avoid run off into sewer by diking, and soak up with inert absorbent using non-sparking type tools.
 WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations. Do not incinerate closed containers.
 PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 120° F / 49° C. Do not store or use near heat, sparks or flame.
 OTHER PRECAUTIONS: Do not get in eyes. Do not breathe vapors. Avoid skin contact. Do not take internally. Smoking while using this product must be strictly prohibited. In addition to all other hazards and precautions - dust from sanding the dry paint films should be treated as a nuisance dust with a TLV of 10mg/cubic meter.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Outdoors - Recommend an approved mechanical particulate filter to remove any airborne overspray. In restricted areas with poor ventilation, use a NIOSH approved Organic Cartridge Respirator. For concentrations above the exposure limit, use a positive air supplied respirator.
 VENTILATION: All application areas should be adequately ventilated in order to keep the items in SECTION II below their exposure limits.
 PROTECTIVE GLOVES: Impervious gloves (natural rubber) are recommended to prevent skin contact.
 EYE PROTECTION: Safety glasses with side shields are recommended to prevent eye contact.
 OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Impervious apron (natural rubber) is recommended to prevent skin contact. Eye wash fountain and safety shower.
 WORK / HYGIENIC PRACTICES: Avoid prolonged or repeated contact. Do not breathe vapors. Wash contaminated clothing prior to reuse.

SECTION IX - DISCLAIMER

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE SO. NOTHING CONTAINED HEREIN CONSTITUTES A SPECIFICATION NOR IS IT INTENDED TO WARRANT SUITABILITY FOR THE INTENDED USE.

ExxonMobil

582924-00 MOBIL HYDRAULIC OIL 13
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL HYDRAULIC OIL 13
SUPPLIER: EXXONMOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency (Primary) CHEMTREC: 800-424-9300
(Secondary) 281-834-3296

Product and Technical Information:

Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: <http://www.exxon.com>, <http://www.mobil.com>

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

None.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Amber Liquid. Note: Pressurized mists may form a flammable mixture. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing.

Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Note: Pressurized mists may form a flammable mixture.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 176(349) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other

ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m³ (as oil mist) - ACGIH Threshold Limit Value (TLV), 10 mg/m³ (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m³ (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Amber
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): > 176(349) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: > 2.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.875
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 32.0
VISCOSITY AT 100 C, cSt: 6.1
POUR POINT C(F): < -39(-39)
FREEZING POINT C(F): NE
VOC: < 5.00 (Wt. %); 0.358 lbs/gal
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based

on testing of similar products and/or the components.

OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ecotoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA,

EINECS/ELINCS, AICS, and DSL.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains no chemicals subject to the supplier notification requirements of SARA (313) toxic release program.

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
ZINC (ELEMENTAL ANALYSIS) (<0.06%)	7440-66-6	22
ZINC DITHIOPHOSPHATE (0.46%)	68649-42-3	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: HYDRAULIC OIL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not

induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 582924-00,
CMCS97: 972810, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 30OCT2001

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APPENDIX J

Emergency Contacts

EMERGENCY CONTACTS

**Centredale Manor Restoration Project Superfund Site
2072/2074 Smith Street, North Providence, Rhode Island**

Contact	Name / Agency / Organization	Telephone Number	Emergency Number
Police	North Providence Police Department	401.231.1433	911
Fire/Emergency Management Agency	North Providence Fire Department	401.231.8505	911
Hospital	Our Lady of Fatima Hospital	401.456.3000	911
Ambulance	Roger Williams Mobile Care	401.456.2119	911
Poison Control	MA & RI Poison Control Center	1.800.222.1222	911
USEPA-OSC	Ted Bazenas	1.617.918.1230	1.800.424.8802
RIDEM	Lou Maccarone	1.401.222.2797	1.401.222.3070
HSM	Tim Williamson	860.747.6181	
HSS	David N. Scotti, P.G.	860.747.6181	
HSO	Steve J. Murdock	860.747.6181	
LEA Technical Coordinator	Jeffrey J. Loureiro, PE, L.E.P.	860.747.6181	
Site Contact	N/A	N/A	
Client Contact	Jerry C. Muys, Esq. – Sullivan & Worcester LLP	202.370.3920	

Directions to Hospital – 200 High Service Avenue

Total Distance = 2.1 miles Approximate Total Time = 5 minutes

Distance

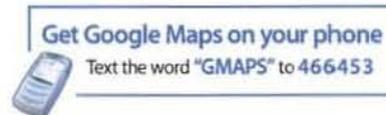
-
- START** 1. Exit Centredale Manor 0.0 miles
-
-  2. Turn **RIGHT** onto Route 44 (Smith Street) East toward Providence 1.8 miles
-
-  3. Turn **LEFT** onto High Service Avenue 0.3 miles
-
- END** 4. End at 200 High Service Avenue – Our Lady of Fatima Hospital



Start **2072 Smith St**
North Providence, RI 02911

End **Our Lady of Fatima Hospital**
High Service Avenue, Providence, RI 02911

Travel **2.1 mi – about 5 mins**



A **2072 Smith St**
North Providence, RI 02911
 Drive: 2.1 mi – about 5 mins

- | | |
|--|------------------|
| 1. Head southeast on Smith St/US-44 S toward RI-104 N/ Waterman Ave | 0.2 mi |
| 2. At the traffic circle, take the 2nd exit and stay on Smith St/US-44 S | 1.5 mi
4 mins |
| ← 3. Turn left at High Service Ave | 0.3 mi
1 min |

B **Our Lady of Fatima Hospital**
High Service Avenue, Providence, RI 02911

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

Map data ©2008 NAVTEQ™

Overview



Start



End



Map data ©2008 NAVTEQ™

APPENDIX K

Emergency Management Plan

1. EMERGENCY MANAGEMENT PLAN

1.1 Overview

An Emergency Management Plan (EMP) has been developed for the on-site activities to be implemented to complete the TCRA for the Groundwater Action Area. This EMP supplements the emergency procedures described in the HASP provided as Appendix B and applies to all spills, releases, fires, explosions, or other hazardous conditions regardless of size. The procedures outlined in this plan are to be carried out immediately whenever there is a fire, explosion, spill, or release of hazardous constituents that could threaten human health or the environment.

Vulnerable resources and populations that may be affected by an emergency incident exist both on-site and at surrounding off-site properties. This EMP is designed to protect these resources and populations from hazardous releases as well as from accidents that occur during the implementation of the TCRA. The plan describes the emergency management system and the procedures to respond to releases and emergencies. This plan also describes the countermeasures to minimize any adverse impact to the environment, and to reduce injuries from hazardous conditions resulting from accidents.

1.2 General Site and Contact Information

General site and key contact information is presented as follows to facilitate rapid identification of administrative information:

Site/Facility Name:	Centerdale Manor Restoration Superfund Site
Site/Facility Address:	2072 Smith Street (State Route 44), North Providence, Providence County, Rhode Island
	Latitude: 41 ⁰ 51'29.5" North
	Longitude: 71 ⁰ 30'28.5" West
	Directions: Site Phone/Fax
Contingency Plan Facilitator:	Jeff Loureiro, Loureiro Engineering Associates, Inc.
USEPA On-Scene Coordinator:	Ted Bzenas
USEPA ID Number:	

The physical characteristics of the site and surrounding area that are discussed in Section 1 of this Work Plan are presented below because this information may be critical to respond to an emergency. This discussion is designed to aid on-site personnel, off-site responders, and regulatory officials in performing response duties.

The Centredale Manor Restoration Superfund Site is located at 2072/2074 Smith Street (Route 44) in North Providence, Rhode Island. The Site includes sediment and floodplain areas of the Woonasquatucket River from Route 44 southerly to the breached Allendale Dam and further to an area just below the Lyman Mill Dam.

1.3 Incident Command

Emergency response at the site will be coordinated under an Incident Command System. The Incident Command System establishes the responsibilities of various response personnel, the chain of command, and the proper lines of communication. This response management system will enable a coordinated effort between on-site and off-site responders, and will allow this EMP to be integrated with Local Emergency Planning Committee (LEPC) plans, Regional Contingency Plans (RCPs), and Area Contingency Plans (ACPs). This unified command will allow all parties who have responsibility for the incident to jointly develop a common set of incident objectives and strategies. A general description of the various response personnel and their responsibilities is provided in the sections that follow.

1.3.1 Duties and Responsibilities

1.3.1.1 Initial Observer

An Initial Observer may be anyone on-site performing TCRA activities who witnesses an emergency. The Initial Observer of the spill or incident must respond as follows:

- Evaluate the level of risk associated with the spill, fire, explosion, or other hazard and assess whether or not emergency responders (i.e., fire department, police department, emergency medical technicians, etc.) are necessary to control the incident. In making this assessment, the Initial Observer must consider all factors that may affect the safety and health of those on site and in the surrounding community as well as the individuals whom may respond to the incident. The Initial Observer should identify the incident type, hazards involved, magnitude of the problem, and resources threatened in making this assessment.

- As is appropriate, notify the appropriate off-site response personnel by dialing 911 and by providing the following information:
 - i. the name of the person reporting the incident, and the number of the telephone from where the report is being made;
 - ii. the location where the incident occurred;
 - iii. the nature of the emergency, and whether or not there are any injuries; and
 - iv. the type and amount of material involved in the incident (if known).
- Notify the Incident Commander of the incident and the status of the response so that he/she may assume control of the response activities.

1.3.1.2 Incident Commander

Under the Incident Command System, the Health and Safety Officer (HSO), as defined in the HASP provided as Appendix B of the Work Plan, will serve as the Incident Commander (Emergency Coordinator). This individual is responsible for implementing this EMP and for directing all emergency response efforts in controlling a fire, explosion, spill, or other hazard. The Incident Commander will coordinate on-site and off-site emergency response personnel, and will be responsible for communicating with local emergency management officials, especially where the safety of the general public is concerned.

The Incident Commander will direct on-site and off-site response personnel. However, when off-site responders are needed, emergency response action will be directed under a unified command, such that once the off-site responders arrive at the scene of the incident, they will assume control of the response efforts. The Incident Commander will then provide technical support, including reference materials such as Material Safety Data Sheets (MSDS), to the off-site responders.

The general actions to be taken by the Incident Commander are summarized below. The Incident Commander may delegate responsibility to other response personnel who report to him/her.

- If applicable, activate internal facility alarms and on-site communication systems to evacuate any and all personnel who may be endangered by the incident.

- Identify the character, source, and extent of the fire, explosion, release, or other hazard, and notify emergency responders (i.e., fire department, police department, emergency medical technicians, etc.) if off-site support is necessary to control the incident.
- Coordinate all emergency response activities with off-site responders. Provide technical support, including available reference materials such as MSDS and response procedures, to all off-site responders, who will have jurisdictional and functional control of the emergency response efforts once on site.
- Where safety to the general public is a concern, notify the USEPA so that all necessary procedures outlined in the USEPA's Community Relations Plan may be followed.
- Perform ambient air monitoring to ensure that hazardous conditions resulting from the incident do not warrant the evacuation of on-site personnel or the population of the surrounding community.
- Coordinate containment and mitigation of the release. Contain the incident to limit the extent of hazards to human health and the environment and initiate appropriate mitigation measures and remedial action, within the capabilities of available trained personnel and equipment on site.
- Notify the appropriate federal, state, and local agencies if their assistance is needed to control the incident.
- Coordinate all security efforts with USEPA in accordance for crowd and traffic control measures.
- Identify the necessary spill control equipment and notify the appropriate clean-up personnel to respond to the incident.
- Identify and assess hazards to human health and the environment based on the location of the incident, the type of emergency, the nature and volume of the material involved, prevailing wind direction, sustained injuries, and the potential for further damage (fire, explosion, health effects, etc.).
- Notify the Site Health and Safety Supervisor (HSS), Site Health and Safety Manager (HSM), and the Project Coordinator.
- Ensure that all emergency response equipment is cleaned and fit for intended use before normal operations are resumed.
- Assess and implement the required level of protection.
- Coordinate and ensure appropriate treatment and disposal activities.
- Ensure that all required emergency notifications to regulatory and community agencies have been made.

- Participate in post-emergency assessments and preventative measures.

1.3.1.3 On-Site Responders

On-site responders include all site workers who have been trained in hazardous waste operations in accordance with 29 CFR 1910.120 as defined by the HASP provided as Appendix B of the Work Plan. On-site responders will report directly to the Incident Commander. The duties and responsibilities of on-site responders include the personnel-specific duties and responsibilities that are presented in the HASP. The responsibilities of on-site responders also include those responsibilities delegated by the Incident Commander.

1.3.1.4 Off-Site Responders

The contacts and emergency telephone numbers for the local off-site emergency responders is included in the following list of emergency contacts:

Fire Department	North Providence Fire Department	911
		Ph (401) 456-3000
Hospital	Saint Joseph's Hospital	Fax (401) 456-3000
Police Department	North Providence Police Department	911
Poison Control Center	Rhode Island Poison Control Center	(800) 682-9211
Project Coordinator	Jeffrey Loureiro, P.E.	(860)747-6181
Corporate Environmental HSM	Tim Williamson	(860)747-6181
USEPA On-Scene Coordinator	Ted Bzenas	(617) 918-1230
RIDEM Representative	Lou Maccarone	(401) 222-2797

Directions To Hospital: Exit Centredale Manor. Take Route 44 East for 1.8 miles towards Providence. Make a left onto High Service Avenue. The hospital is on the left, approximately 0.3 miles from the junction of Route 44 and High Service Area.

An off-site emergency responder may be contacted by dialing 911. Before any emergency response work begins on the site, the off-site responders will be briefed by the Incident Commander on the nature of the work and the contaminants of concern. The response management system integrates on-site and off-site emergency response efforts under a unified command. Under this unified command, once the off-site responders arrive at the scene of the incident, they will assume jurisdictional and functional responsibility for the incident. The off-site responders may rely on the Incident Commander to provide technical support, and to facilitate the coordination of other site activities.

The North Providence Fire Department HAZMAT team personnel have been trained in the proper handling of hazardous waste and in responding to emergencies that result in hazardous situations. This HAZMAT team will use their Standard Operating Procedures in responding to emergencies at the site. The appropriate off-site responder will be responsible for providing the necessary staff and emergency response equipment as is required in responding to the emergency.

1.3.2 Notification Procedures

1.3.2.1 “Internal” Notification Requirements

Once the Initial Observer assesses the incident and notifies the appropriate off-site emergency response personnel, as is necessary, the Incident Commander is to be notified of the emergency. In assuming control of the incident, the Incident Commander is responsible for notifying the Project Coordinator, HSM, and the HSS of the emergency. The Incident Commander is responsible for ensuring that the notifications are carried out in a timely manner. The Project Coordinator is responsible for informing the client about the emergency. In addition to these notification requirements, additional “external” notification procedures may need to be followed in the event of an emergency.

1.3.2.2 “External” Notification Requirements

If the incident results in the release of hazardous waste or hazardous waste constituents to the environment, then the Incident Commander is also responsible for assessing the need to report the incident to the appropriate agencies as may be required under federal or state regulations. These agencies include federal and state emergency management agencies, State Emergency Response Commissions (SERCs), and LEPCs. Notification to these agencies will be made as

early as possible to facilitate a concerted response amongst federal and state on-scene coordinators, on-site responders, and off-site responders.

In addition, the Incident Manager will notify the USEPA On-Scene Coordinator so that the USEPA may disseminate information about the emergency to the local community. If requested, LEA will provide a representative to aid the USEPA in reporting the incident to the local community. Notification to all affected residents, town officials, local environmental groups, and other interested parties will be made as early as possible so that they are well-informed about the emergency and any potential future hazards.

1.4 **Emergency Response Procedures**

1.4.1 Implementation

In many situations, the emergency or hazard required to be reported to the Incident Commander may be managed and controlled by on-site response personnel who follow the standard operating procedures presented in the HASP. In these situations, implementation of the procedures presented in this EMP will not be required. However, the discovery of an emergency or hazardous condition that requires support from off-site responders may necessitate the implementation of this plan. For example, the discovery of unexpected hazardous waste during excavation activities that results in the release of hazardous substances to the atmosphere or subsurface will require the implementation of the procedures presented in this plan.

In assessing the need to implement this EMP, a hierarchy of emergency response levels may be used to rapidly assess and classify the emergency or hazardous condition, according to the significance of the incident. The incident may be generally classified as: i) those that may be handled on site by personnel in accordance with standard operating procedures; ii) those that require off-site responders; and iii) those that require off-site responders including personnel trained in hazardous materials emergencies and evacuation procedures. The Incident Commander may implement the EMP if the following conditions exist:

- fire;
- explosion;
- imminent danger of a fire or explosion involving hazardous materials resulting in the igniting of hazardous wastes; and

- a spill that could result in the release of flammable liquids or vapors, thus causing a fire or explosion hazard.

Factors that should be considered prior to the implementation of this Contingency Plan include:

- the location of the incident;
- the inherent danger of the release;
- the ability to contain and mitigate the hazardous condition; and
- the potential hazards to human health and the environment.

The following sections discuss how this plan will be implemented from discovery, through initial response, mitigation, and post-emergency actions.

1.4.2 Discovery

The decision to initiate an emergency response is made by the Initial Observer upon immediate awareness or discovery of a spill, release, fire, explosion, or other hazard that may jeopardize human health or the environment. In making this decision, the Initial Observer must consider the seriousness of the incident by evaluating the likelihood that the incident will impact human health and safety or the environment. Upon recognition of an incident that requires immediate emergency response, the Initial Observer will notify the appropriate off-site responders and the Incident Commander.

1.4.3 Initial Response

1.4.3.1 Operational Procedures

The initial response to any emergency shall protect human health and may include evacuation. Limiting damage to the environment should be addressed as a secondary priority only after all measures have been taken to protect human health. This secondary priority may include containment and spill countermeasure procedures. The clean-up and disposal of spilled material shall be made after the Incident Commander has identified and assessed all of the hazards.

Upon arriving on the scene of the hazardous condition, the Incident Commander will assess the situation, don appropriate personal protection equipment (PPE), and institute the appropriate containment and response procedures as defined in this section. In assessing the situation, the Incident Commander should weigh all factors to appropriately match the emergency and its

potential impacts with appropriate resources and personnel. The Incident Commander should identify the appropriate response levels based on the need to initiate time-urgent response actions to minimize or prevent unacceptable consequences to the health and safety of workers, the public, or the environment, and the need to communicate critical information concerning the emergency to off-site authorities. A tactical plan should be established that defines specific objectives. These objectives should include immediate measures to protect the workers and the public, mitigating actions to control, contain, and recover any hazardous materials, and the identification of resources that are needed in responding to the hazardous condition. The Incident Commander will, as necessary, call in additional on-site and off-site response personnel to provide assistance in the response operation.

1.4.3.2 Identification of Hazardous Materials

The Incident Commander should immediately identify pertinent information about the hazardous material spill or release (e.g., character, source, amount, extent, etc.). This identification involves visual analysis and investigation of the location and nature of the spill. The Incident Commander should support the investigation of hazardous materials with information provided in MSDS, where appropriate.

1.4.3.3 Hazard Assessment

The Incident Commander will assess the potential direct or indirect hazards to human health and the environment. This assessment will involve an analysis of the likelihood of a fire or explosion by checking for nearby ignition sources. The Incident Commander may identify the composition of a substance, and thus its potential hazards, by the nature and location of the release. The Incident Commander should use his or her training and experience, a review of MSDSs or the Chemical Hazard Response Information System (CHRIS) manual, and support from other personnel in assessing all of the potential hazards of a spill or release. The Incident Commander should also use a common-sense approach to identify the type of emergency, whether an exclusion zone is necessary, whether the source is under control, and the type of response resources needed. In the hazard assessment, the Incident Commander should account for vulnerable receptors, including human populations (both workers and the general public), environmentally sensitive areas, and other site-specific concerns, such as resource protection areas.

1.4.4 Response Procedures for Fire and/or Explosion Involving Hazardous Waste

If a fire or explosion involving hazardous material occurs, the procedures described below shall be followed for rapid and safe response and control of the situation.

The Initial Observer of a fire or explosion contacts the appropriate off-site responder by dialing 911 at the earliest possible moment and provides the following information:

- the name of person reporting and the number of the telephone from which the report is being made;
- the incident location;
- the nature of the emergency;
- the nature and amount of the material involved;
- the corrective action taken, if any;
- the extent of personnel injuries, if any; and
- whether or not a spill or release has occurred or is threatening to occur.

In addition, if a fire or explosion has occurred, the following response actions are initiated:

- the on-site alarm system is sounded in accordance with this plan and the HASP; and
- evacuation procedures are implemented in accordance with Section 12.3.7 of this plan.

The Incident Commander will then assess the character, exact source, amount, and extent of the hazard associated with the fire or explosion. The appropriate authorities are notified as described in Section 1.3.1.4 – Off-site Responders. The Incident Commander will coordinate the on-site and off-site response activities, and will support the off-site responders who will assume direct command of the response once they arrive at the scene of the emergency.

1.4.5 Response Procedures for Spills or Releases of Hazardous Waste

In the event of a release of hazardous material to the environment, the following procedures should be implemented for rapid and safe response to contain, limit, and clean up the spill.

The Initial Observer of the spill must notify the appropriate off-site response personnel by dialing 911 and providing the following information:

- the name of the person reporting the incident, and the number of the telephone from where the report is being made;
- the location where the incident occurred;
- the nature of the emergency, and whether or not there are any injuries; and
- the type and amount of material involved in the incident (if known).

The Initial Observer must also notify the Incident Commander of the incident and report the status of the response so that he/she may assume control of the response activities. The Incident Commander then assesses the character, exact source, amount, and extent of any released materials or chemical spill. The Incident Commander also selects, in consultation with the HSM and HSS, the appropriate personal protective safety gear and equipment. The Incident Commander will take all reasonable measures to prevent a spill or other release of hazardous materials from spreading to other areas. If possible, action will be taken to contain, limit, and clean up a spill by qualified on-site personnel with care and good judgment to avoid risk or injury to personnel and minimize the impact on the environment.

1.4.6 Mitigation

Mitigation of the incident involves a transition from an emergency management system to a response management system, or a sustained action stage where more prolonged containment and recovery actions are implemented. Once the initial response to any emergency ensures the protection of human health, then containment and spill countermeasure procedures are implemented to limit the damage to the environment. These procedures include the clean-up and disposal of spilled material. These procedures may also include assessment monitoring after the Incident Commander has identified and assessed all of the hazards.

1.4.7 Evacuation Plan

1.4.7.1 General Responsibilities

In the event of a sudden and uncontrollable hazardous condition such as fire, explosion, or major uncontrollable chemical spill that poses a threat to the safety of personnel, the area of the hazardous condition shall be evacuated immediately in an orderly and efficient manner. The Incident Commander is responsible for implementing this evacuation plan when:

- (i) A hazard exists that threatens the health and/or safety of on-site personnel.

- (ii) Unreasonable exposure to the hazard for all on-site personnel is not preventable as long as they remain on-site.
- (iii) The time required for the notification and movement of on-site personnel from the hazardous area to a safe command post is not enough to permit a safe and orderly evacuation using verbal signals only.

During an evacuation, the Incident Commander is responsible for ensuring that all on-site personnel leave the hazardous area in a quickly and orderly manner. The Incident Commander must also instruct personnel to retreat to a designated command post, located upwind to the Site. Once all on-site personnel have retreated to this command post, the Incident Commander will immediately report any missing persons to the HSS and HSM.

Employee responsibilities during an evacuation are outlined as follows:

- (i) Immediately report any emergency or hazardous condition that may require evacuation to the Incident Commander.
- (ii) Proceed to the designated command post in an orderly manner when directed to evacuate a hazardous area.
- (iii) Rendezvous at the designate command post and report to the Incident Commander.

1.4.7.2 Emergency Precautions

During an emergency, the following precautions should be taken:

- Keep calm, think, and avoid panic and confusion.
- Know all exit routes. Be sure you know the primary and secondary exits out of the designated work area.
- Do not delay evacuation of the site for any reason.
- When evacuating the site, walk to the proper exit.
- DO NOT re-enter the site until instructed to do so.

1.4.7.3 Communication

As provided for in the HASP of this Work Plan (Appendix B), three short blasts from an air horn will designate the need to evacuate the site. Communication between the site and off-site

personnel will be by cell phones or installed telephones to coordinate emergency response efforts, notify appropriate authorities, and maintain contact with off-site personnel.

1.4.7.4 Procedure for Evacuation

Three short blasts from an air horn will be provided as a signal to evacuate the site. Immediately upon hearing the evacuation signal, all work must stop. The Incident Commander will coordinate the evacuation of all personnel to the designated command post. The Incident Commander will designate the command post based on the source and the extent of the hazardous condition. If the Incident Commander identifies a threat to neighboring properties and the evacuation of off-site areas, he/she will notify off-site responders and authorities about the hazardous condition and evacuation. Evacuation procedures will then be coordinated with local, state, and federal emergency planning officials, as is necessary. The EPA Program Coordinator will be contacted to assist efforts with public evacuation whenever necessary.

1.4.8 Post-Emergency Actions

The Incident Commander will terminate an emergency response when the emergency management system for the site is no longer needed to ensure safety to human health and the environment. The Incident Commander will terminate a response by recording the incident in the operating record.

Following all incidents to which off-site responders are involved, the Incident Commander must complete a written incident report. The Incident Commander will conduct a post-incident debriefing of involved supervisors and all response personnel including community responders for incidents involving implementation of this Contingency Plan, as deemed necessary. A formal incident critique and written report including recommended changes to the EMP will follow, as required.

1.4.9 Post-Emergency Equipment Maintenance and Waste Disposal

Immediately after an incident, the Incident Commander will make arrangements to store or dispose recovered hazardous waste or any other contaminated material. All emergency equipment that is utilized and potentially exposed to contamination will be decontaminated in accordance with this Work Plan. Any wastes that are generated as a result of the decontamination process will also be managed as described in this Work Plan.

1.5 **Emergency Equipment**

The appropriate off-site responder will provide the necessary emergency response equipment and resources to control and manage fires, explosions, and the release of hazardous wastes that may threaten human health or the environment. Emergency response equipment and resources to control and manage emergencies and hazardous conditions that do not require the implementation of this plan are stored in the equipment and material storage area. Generally, this equipment may be categorized as PPE, fire response equipment, medical response equipment, or spill control equipment. Descriptions of these emergency equipment and resources are presented in the HASP provided as Appendix B of this Work Plan.

1.6 **Incident Reporting Requirements**

1.6.1 General

This section contains a summary of the verbal and written notifications that must be made to federal, state, and local agencies in the event of a release. The Incident Commander will provide for a signed record of initial notifications to document compliance with the appropriate regulations. For further information or clarification of the reporting requirements, refer to the federal hazardous waste regulations provided in 40 CFR 264.56 and 265.56, and to the Rhode Island Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations).

1.6.2 Any Release/Incident

Any incident involving the discharge, spillage, uncontrolled loss or seepage of any chemical product (solid, liquid, or gas) or hazardous waste must be reported immediately to RIDEM and USEPA as soon as practical after an incident, but no later than the end of the next full work day. A written report documenting the nature of the incident shall be completed by the Incident Commander and shall be forwarded to the RIDEM and EPA representatives.

1.6.3 Releases Reportable Under CERCLA

In addition to the notifications made for any release or incident, a release or spill of a hazardous substance that exceeds the reportable quantity for the hazardous substance must be reported immediately to the National Response Center. The following information should be provided:

- the name and telephone number of the reporter;
- the name and address of the Site;
- the time that the incident occurred;
- the nature of the incident;
- the name and quantity of the materials involved, to the extent known;
- the extent of injuries, if any;
- the possible hazards to off-site populations and the surrounding environment; and
- the containment and mitigation actions taken to control the release.

1.6.4 Releases reportable under SARA Title III

In addition to the notifications made for any release or incident, a release or spill of a CERCLA hazardous substance or extremely hazardous substance, that exceeds the reportable quantity as listed in 40 CFR 302.4 or 355 Appendix A, must be reported immediately to the SERC and RIDEM. The following information should be provided:

- the name and telephone number of the reporter;
- the chemical name or identity of the substance involved in the release;
- an indication that the substance is an extremely hazardous substance;
- an estimate of the quantity released to the environment;
- the time and duration of the release;
- the environmental media into which the release occurred (air, surface, groundwater, or soil); and
- any known or anticipated health risks associated with the released substance.

As soon as practicable after a release reportable under the Emergency Planning and Community Right-to-Know Act (EPCRA), a written follow-up notice must be sent to the SERC and the LEPC. The written notice must contain:

- (i) The information provided during the oral notification.
- (ii) Precautions taken as a result of the release, including evacuation.
- (iii) Where appropriate, advice regarding medical attention necessary for exposed individuals.

1.6.5 Releases Requiring the Implementation of the Contingency Plan

The oral notification requirements of releases requiring the implementation of the EMP include the requirements presented in Sections 1.6.2, 1.6.3, and 1.6.4, as are applicable. Within 15 days after an incident requiring the implementation of the EMP, a written report on the incident must be submitted to RIDEM, USEPA and the LEA project file. The report must include:

- (i) the name, address, and telephone number of the contact of Performing Parties Group;
- (ii) the name, address, and telephone number of the Site;
- (iii) the date, time, and type of incident;
- (iv) the name and quantity of the materials involved;
- (v) the extent of injuries, if any;
- (vi) an assessment of actual or potential hazards to human health or the environment; and
- (vii) the estimated quantity and disposition of recovered material that resulted from the incident.

1.7 **Amendment and Distribution of the Plan**

The Incident Commander is responsible for performing an investigation or root-cause analysis to identify the cause(s) of the emergency or hazardous condition. This root-cause analysis includes a critique of this EMP, in general, as well as a critique of the emergency management system and incident command system employed to respond to the incident. The Incident Commander will prepare a written follow-up report that proposes procedures to modify the EMP based on the lessons learned through response to the incident.

In addition, this EMP will be reviewed and immediately amended, if necessary, whenever:

- (i) applicable regulations are revised;
- (ii) the plan fails in an emergency; or
- (iii) the activities to be performed at the site in fulfillment of the TCRA change in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or change the response necessary in an emergency.

Title: HASP
Revision No. 0
Revision Date: 9/10/2009

This EMP shall be distributed to key personnel involved in the TCRA. A copy of this plan is maintained on-site in the field office trailer.

APPENDIX L

Accident Investigation/Incident Report Form

COMPANY INCIDENT MANAGEMENT GUIDELINES

Incident – an unplanned event that could have or did result in an injury, property damage or loss, or a spill. It is the responsibility of every employee to immediately report all incidents to their supervisor. It is the supervisor's responsibility to report all incidents to the company.

1. PROVIDE MEDICAL TREATMENT

- Incidents involving life-threatening injury - contact Emergency Medical Services (911) first. Do not waste valuable time. Do not attempt to transport the seriously injured employee to the hospital in a private vehicle. A company representative must follow the ambulance to the hospital and must represent the injured employee and the company until a family member or alternative company representative arrives at the hospital.
- Incidents involving non-life-threatening injury (but beyond on-site first aid capabilities) - seek medical treatment at the closest Concentra Medical Center (see below). A company representative must accompany the injured employee to the medical center and must represent the injured worker and the company until he/she is released from the care of the medical center.
- Incidents involving outside parties (non-Loureiro employees, such as a motor vehicle accident) – provide medical treatment if necessary as outlined above. Contact the police. Attempt to obtain personal contact information and insurance information from all involved parties. Keep conversation with the outside parties to a minimum and do not comment on fault or liability.

In all incidents preserve evidence and document the incident scene with photographs when possible. Forward this type of information along with the incident report directly to the Company as noted below for processing.

Note: In all cases involving injury (beyond on-site first aid), property damage and/or a spill it is crucial that the company be made aware of the incident as soon as is feasible. It is preferred that direct contact be made with the Manager of Safety and the Office Manager or a member of the Administrative Staff. All can be reached by calling 860.747.6181 or faxing to 860.747.8822. The Administrative Staff in turn will notify the appropriate members of senior management.

2. FORMALLY REPORT THE INCIDENT

A Company First Report of Incident form must be submitted by the Supervisor to the Company within 24 hours of the incident. A Company Incident Investigation and Root Cause Analysis form must be submitted by the Supervisor to the Company within 5 working days of the incident. Submit all incident reports to the Office Manager or a member of the Administrative Staff. Hand deliver the report or fax it to 860.747.8822. The Administrative Staff in turn will forward it to the appropriate members of senior management.

3. INCIDENT REVIEW

Upon receipt of the incident reports the Manager of Safety will review them in their entirety. The Manager of Safety will contact the involved employees, the supervisor and the department vice president to discuss the incident, review the root cause analysis and confirm that corrective measures were implemented where feasible. Incomplete incident reports will be returned to the supervisor who submitted the report for additional action.

CONCENTRA MEDICAL CENTER LOCATIONS

8 South Commons Road, Waterbury, CT 06704 (203-759-1229)
701 Main Street, East Hartford, CT 06108 (860-289-5561)
333 Kennedy Drive, Suite 202, Torrington, CT (860-496-1033)
555 Lordship Boulevard, Stratford, CT 06615 (203-380-5953)
One Connecticut Avenue, Norwich, CT 06360 (860-859-5100)
972A West Main Street, New Britain, CT 06053 (860-827-0824)
900 Northrop Road, Wallingford, CT 06492 (203-949-9036)
15 Commerce Road, 3rd Floor, Stamford, CT 06902 (203-324-9100)
1080 Day Hill Road, Windsor, CT 06095 (860-298-9420)
370 James Street, New Haven, CT 06513 (203-503-0492)

COMPANY FIRST REPORT OF INCIDENT

Is this a significant incident that requires the immediate attention of the company? yes no

If yes, who should the company contact (name and phone #): _____

INSTRUCTION: This form must be submitted by the Supervisor to the Office Manager or the Administrative Staff within 24 hours of the incident.

Date and Time of Incident: <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	Location of Incident (include project/client name if applicable, street, city, state and zip code):
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Date and Time Reported to the Company: <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	Name of Supervisor:	Date Submitted by the Supervisor to the Company:
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Business Unit (check all that apply): Environmental SMEP LEA Services Health & Safety Work Waste Civil/Survey LCI

Type of Incident (check all that apply): Near Miss Injury Motor Vehicle Accident (MVA) Property Damage Spill Other

If "Other" please explain:

NEAR MISS INFORMATION (complete if applicable):

Submit an Incident Investigation & Root Cause Analysis form within 5 working days.

Name(s) of Involved Employees & Non-Employees:

Type(s) of Equipment Involved:

What would have been the result if this incident were not a near miss?:

INJURY INFORMATION (complete if applicable): On-site First Aid Off-site Clinic/ER 911 Called Fatality

Submit an Incident Investigation & Root Cause Analysis form within 5 working days.

Employee Name:	Date of Birth:	Date of Hire:	Job Title:
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Home Address (Street, City, State and Zip Code):	Home or Business Phone #::
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Type of injury, cause of injury and exact part of body injured:

Name, address and phone number of the medical facility or hospital (if applicable):

Name and title of the company representative who accompanied the injured employee to the medical facility or hospital:

Medical/work status of the injured worker (check one). Attach supporting medical documentation. Medical documentation is confidential and is provided on a need to know basis only without compromising the personal health information of the employee.

Released to work at full duty capacity. Released to work with restrictions. Released with no work capacity.

MVA/PROPERTY DAMAGE INFORMATION (complete if applicable): MVA with injury MVA w/o injury Property Damage

Submit an Incident Investigation & Root Cause Analysis form within 5 working days.

Type of damage, cause of damage and vehicle(s)/property/item(s) damaged:	Name of company driver (if applicable):
--	---

Name, address, phone number and insurance information of involved property owner(s) other than company:

- 1)
- 2)

Police contacted?: <input type="checkbox"/> yes <input type="checkbox"/> no	If yes, officer name, barrack phone # and case #:	Were any citations issued?: <input type="checkbox"/> yes <input type="checkbox"/> no
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SPILL/RELEASE INFORMATION (complete if applicable): Inside Outside Concrete Asphalt Soil

Submit an Incident Investigation & Root Cause Analysis form within 5 working days. Into storm drain Into body of water Contained

Material spilled, cause of spill and amount spilled:

How was the spill contained and cleaned up?:

If the DEP was contacted, provide the contact information and briefly explain their involvement:

OFFICE DATE STAMP

COMPANY INCIDENT INVESTIGATION AND ROOT CAUSE ANALYSIS

INSTRUCTION: This form must be submitted by the Supervisor to the Office Manager or the Administrative Staff within 5 working days of the injury.

Employee Name:	Date and Time of Incident: <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	Date Submitted by the Supervisor to the Company:
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EMPLOYEE STATEMENT OF INCIDENT - Be specific. Include information about the work you were performing just prior to and at the time of the incident, what happened, when did it happen, where did it happen, how did it happen, why did it happen, etc.? Also explain what the result of the incident was. Did anyone get hurt, was any property damaged, etc.? Please understand that many different people will be using your information to paint a mental picture of the events that lead up to and immediately followed this incident.

Employee's Signature:	Witness Name:
	Witness Name:

INCIDENT INVESTIGATION AND ROOT CAUSE ANALYSIS - To be completed by a team consisting of the involved worker, his/her supervisor and any witness to the incident. It is critical that a thorough incident investigation and root cause analysis be completed. In doing so address all contributing factors such as: unsafe conditions (poor housekeeping, inadequate lighting, etc.), unsafe acts (failure to use safety equipment, working off the top step of a stepladder, driving too fast, etc.), human factors (fatigue, inattentiveness, etc.), environmental factors (heat, cold, rain, ice, etc.) and whether or not the employee was properly trained. In the space below please provide the conclusions of the root cause analysis and the corrective action(s) taken or to be taken to prevent a recurrence.

Was a current Job Hazard Analysis (JHA) in place? <input type="checkbox"/> Yes <input type="checkbox"/> No	Was this a <input type="checkbox"/> routine or a <input type="checkbox"/> non-routine task?	Photos attached? <input type="checkbox"/> Yes <input type="checkbox"/> No
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OFFICE DATE STAMP

Corrective Action Taken (check all that apply):
 Initial Training
 Retraining
 Additional PPE
 Tool Substitution
 Chemical Substitution

Workplace Engineering Changes
 Process Changes
 Administrative Changes
 Verbal Warning
 Written Warning
 Termination
 Other

Person responsible for corrective action:	Corrective action was implemented on (provide date):	Corrective action will be implemented by (provide date):
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Employee's Signature:	Supervisor's Signature:	Witness' Signature:
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APPENDIX M

**Loureiro Engineering Associates, Inc.
Confined Space Entry Program**



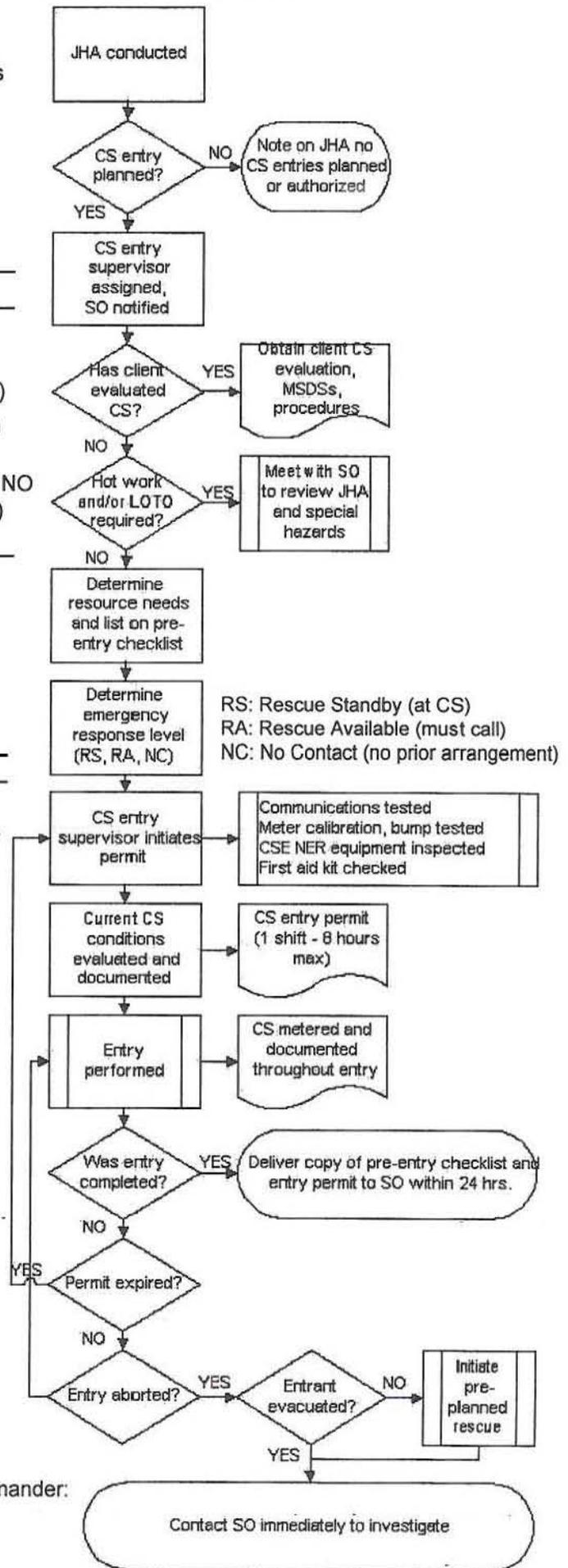
Client Confined Space Entry Planning Checklist



Complete and provide to Entry Supervisor for CSE Permit preparation

√ Completed

- JHA conducted and documented at time of bid.
- Scope of work analyzed to determine if alternate methods can be used to avoid confined space (CS) entry.
- Confined space entry required by scope of work.
- CS entry supervisor assigned (name): _____
- Safety Officer notified (phone or email date): _____
- Has CS been evaluated by client or owner? YES NO
(If YES, obtain copy of evaluation and client CS program.)
- Obtain MSDS for all potential substance exposures within CS and any substances introduced by company.
- Is hot work required in CS (welding, cutting, etc.)? YES NO
(If YES, obtain copy of evaluation and client CS program.)
- Safety Officer issued hot work permit (date): _____
- Entry crew selected and required training verified
(attendant or supervisor must be CPR/First Aid certified)
- Required equipment reserved and inspected
- Required metering equipment reserved and inspected
- Rescue level selected and arranged based on hazards:
RS: verified with (contact name): _____
RA: verified with (contact name): _____
- CS Entry Supervisor initiated permit on (date): _____
- Pre-entry meeting conducted with crew, JHA reviewed
- Meter(s) calibrated on-site prior to entry
- Entrant PPE and fall protection verified by supervisor
- All entry crew members agree on readiness and safety



- Entry completed as planned, without incident.
(Submit copy of permit and this checklist to SO)
- Entry aborted (reason): _____

- Entrant(s) evacuated or retrieved? YES NO
(If YES, SO must be contacted immediately, and incident report filed within 24 hours of evacuation.)
- Rescue service dispatched? YES NO
(If YES, SO must be contacted immediately.)
List contact information for Rescue Service Incident Commander:

US EPA ARCHIVE DOCUMENT

APPENDIX C

Construction Specifications

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.1 SCOPE

The work of this section shall include, but not necessarily be limited to, furnishing all materials and conducting all excavations, materials handling, grading, filling and backfilling activities necessary for consolidating waste and capping of the area as shown on the drawings and as specified herein.

PART 2 PRODUCTS

2.1 FILL AND BACKFILL MATERIALS

General: All fill and backfill materials supplied by the Contractor from off-site sources or vendors shall be virgin material free of pollutants, contamination or toxic or hazardous materials subject to approval by Engineer. Before taking delivery, all borrow materials shall be analytically tested or certified clean for use at the site.

- a. Unspecified Backfill: All excavated material which is free of organic materials and foreign substances shall be utilized whenever fill material is required. Material unsuitable for backfill or surplus to the work shall be managed as directed by the Engineer.
- b. Bank Run Gravel: Bankrun gravel shall be new, clean material free from elongated pieces and shall have properties that will permit compaction to a Modified Proctor Density of 95 percent. It shall be within the following gradation requirements.

Square Opening Sieve Size: 3 1/2" 1 1/2" 1/4" #10 #40 #100

Percent Passing By Weight: 100 55-100 25-60 15-45 5-25 0-10

Fraction of dry sample passing No. 100 mesh sieve shall not be greater than 8 percent by weight and shall not have sufficient plasticity to perform plastic limit test ASTM D-4318.

- c. Process: Process shall consist of sound, tough, durable particles of broken stone free from soft, thin, elongated or laminated pieces, lumps of clay, loam or other deleterious substances. It shall be within the following gradation requirements.

Square Opening Sieve Size: 2 1/2" 2" 3/4" 1/4" #40 #100

Percent Passing By Weight: 100 95-100 50-75 25-45 5-20 2-12

- d. Crushed Stone: Crushed stone shall be ¾” consisting of sound, tough, durable, angular shaped stones.
- e. Riprap: Riprap shall consist of sound, tough, durable, angular shaped stones within the following gradation requirements:

Stone Size:	18”	10-18”	6-10”	4-6”	2-4”	<2”
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Percent of the Weight:	0	30-50	30-50	20-30	10-20	0-10
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- f. Topsoil: Topsoil shall be natural, friable soil free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth.

PART 3 EXECUTION

3.1 SITE PREPARATION

- a. The Contractor shall coordinate with the Engineer to prepare the site prior to construction. It is the Engineer’s intent to maintain existing traffic patterns at the site.
- b. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- c. The Contractor shall clear from within the limits of the Work as shown on the drawings. Excessive clearing or clearing beyond reasonable limits as determined by the Engineer shall not be permitted.
- a. All trees within the project limits, as shown on the contract drawings, shall be cut and stockpiled onsite at a location approved by the Engineer. No tree trunks, stumps, branches, or other objectionable material shall be filled, side cast, or placed outside the limits of work unless approved by the Engineer. No open burning will be permitted.

3.2 EXCAVATION

- a. The Contractor shall excavate to depths and lineal dimensions as shown on the drawings.
- b. Where organic matter or unsuitable foreign material as determined by Engineer is encountered in excavations, such material shall be removed and space occupied by it shall be refilled to grade with compacted, bankrun gravel, subject to the approval of the Engineer.

- c. Side slopes of excavation shall be less than angle of repose of material excavated and shall be flat enough to prevent slides or cave-ins. Any excavation required as a result of slides or cave-ins shall be done by Contractor at his own expense.
- d. If bottom of any excavation has been removed below the grade shown on the drawings or as directed, it shall be brought to grade at Contractor's expense by refilling with suitable material and compacted and shall be subject to approval by the Engineer.

3.3 SHEETING, SHORING AND BRACING

The Contractor shall furnish, install in place, and maintain such sheeting, shoring and bracing as may be required to support sides of excavation and to prevent any movement which could in any way injure work, workmen, diminish necessary widths of excavations or otherwise delay work or endanger adjacent structures. Special precautions in using sheeting, shoring and bracing shall be taken to guard against any damage to or settlement of buildings, walls, utilities, roads, or other structures which are adjacent to work.

3.4 DEWATERING

Contractor shall remove by pumping, draining, bailing, or otherwise, any water which may accumulate or be found in excavations made under this contract. Contractor shall dispose of all water from excavations in accordance with applicable laws and in a manner that will not cause injury to health, Owner's property, adjacent property, work completed or in progress, surface of roadways, nor cause any interference with use of site nor shall any environmental impacts result from the discharge.

3.5 PLACING AND COMPACTING FILL AND BACKFILL

- a. The Contractor shall place and compact bankrun gravel, backfill and fill material as shown on the drawings. Contractor shall allow for subsequent construction in the placing and compacting of backfill. No backfilling shall be placed for new construction without obtaining approval from the Engineer.
- b. Material used for fill and backfill below the liner shall be excavated on site material, free from topsoil, organic material, and foreign substances, unless otherwise directed and approved by Engineer.
- c. The finished surface below the flexible membrane liner (FML) shall be free from abrupt changes in grade, water, loose earth, exposed rocks, rubble, protrusions, vegetation, and other foreign matter which may damage the FML.
- d. No equipment shall be allowed to drive directly over the geosynthetics. Backfill over the geosynthetics shall be placed in a manner as to not damage the geosynthetics.
- e. The Contractor shall deposit all fill and backfill in 9-inch lifts adequately compacting each lift to specified density using approved methods. In places close to walls, footing, utility lines, etc., where larger equipment cannot properly be

permitted to operate, hand tamping equipment, equivalent to Barco Rammers weighing at least 150 pounds, shall be used.

- f. Materials shall contain moisture content to achieve required compaction but no free water (puddling) shall be allowed during compaction. No material shall be placed if its moisture content is in excess of the optimum content as achieved in ASTM D1557. Density of each lift of fill and backfill shall be at least 95% Modified Proctor Density. Test density of each lift at two random locations per lift or as directed by Engineer by nuclear methods (ASTM D2922).

3.6 FINISH GRADING

All areas indicated as being re-graded on drawings are to be finished to grades shown. Other areas disturbed by the work shall be re-graded to blend with existing surfaces. All finish grading shall achieve suitable surface drainage and run-off.

3.7 EROSION CONTROL

All sedimentation and erosion controls as shown on the drawings shall be installed in all work areas prior to initiation of excavation to protect surface water bodies, wetlands and traffic routes from sedimentation during construction.

-- End of Section --

SECTION 02771

GEOSYNTHETICS

PART 1 GENERAL

1.1 SCOPE

The work of this section shall include, but not necessarily be limited to, providing all geosynthetics for constructing the cap system as shown on the drawings and specified herein. The work shall include furnishing all materials, materials handling and storage, installation and testing.

1.2 REFERENCES

- a. American Society for Testing and Materials (ASTM):
 1. D638 - Standard Test Method for Tensile Properties of Plastics.
 2. D1004 - Standard Test Method for Internal Tear Resistance of Plastic Film and Sheeting.
 3. D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.
 4. D4833- Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
 5. D5397 - Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes using Notched Constant Tensile Load Test.
 6. D5994 - Standard Test Method for measuring Core Thickness of Textured Geomembrane.
 7. D4491 - Standard Test Method for Water Permeability of Geotextiles by Permittivity.
 8. D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 9. D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 10. D5199 - Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.

11. D5261 - Standard Test Method for Measuring Mass Per Unit Area of Geotextiles.
12. D422 - Standard Test Method for Particle Size Analysis of Soils.
13. D3786 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics - Diaphragm Bursting Strength Tester Method.
14. D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
15. D5321 - Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method.

1.3 SUBMITTALS

- a. Submit, to the Engineer, product data sheets and representative samples of each geosynthetic specified herein no later than 10 days prior to installation.
- b. Submit, to the Engineer, manufacturer's material certification for each geosynthetic.

1.4 DELIVERY, STORAGE, AND HANDLING

- a. Each geosynthetic delivered to the site shall be wrapped and labeled by the manufacturer. The label shall identify the manufacturer's name, product identification, dimensions, lot number and unit/roll number.
- b. When transported to site, handle the geosynthetics by appropriate means so that no damage is caused, as recommended by the manufacturer.
- c. Protect the geosynthetics from direct sunlight and heat.
- d. Notify Engineer 3 days in advance of geosynthetics delivery to site. Perform joint inspection with Engineer upon delivery. Defects or damage from shipping and handling will be grounds for rejection at discretion of the Engineer.

1.5 ENVIRONMENTAL REQUIREMENTS

- a. Install geosynthetics in accordance with manufacturer's instructions and as specified herein.
- b. Weather conditions for flexible membrane liner (FML)/filter fabric placement:
 1. Comply with manufacturer's recommendations.

2. Do not unroll or place FML/filter fabric at an ambient temperature below 32 degrees F or above 104 degrees F, unless contractor obtains approval from FML/filter fabric manufacturer and Engineer.
 3. Suspend installation operations whenever climatic conditions as determined by Engineer's are unsatisfactory for placing FML/filter fabric to the requirements of this section.
 4. Install FML/filter fabric on dry ground.
 5. FML/filter fabric placement shall take into account site drainage, wind direction, site access and production schedule.
 6. Deployed FML/filter fabric should be ballasted at all times to limit the risk of wind damage.
- c. Weather conditions for FML seaming:
1. Comply with manufacturer's recommendations.
 2. Make no seam below 34 degrees F.
 3. In all cases, FML must be dry while being seamed.

PART 2 PRODUCTS

2.1 GEOTEXTILES

- a. The filter fabric shall be 6-ounce nonwoven product "4506" as manufactured by Amoco Fabrics and Fibers Company, Atlanta, Georgia, or equal as approved by the Engineer.
- b. The FML shall be 60-mil HDPE textured as manufactured by GSE, Houston, Texas, or equal as approved by the Engineer.
- c. The drainage net shall be GSE FabriNet UF (double sided) 8 oz./sy product F82080080T as manufactured by GSE, Houston, Texas, or equal as approved by the Engineer.
- d. The geogrid shall be product UX1400SB as manufactured by Tensar Corporation, Marrow Georgia, or equal as approved by the Engineer.
- e. The geocell shall be Slotted Geoweb System with TP93 polyester tendons and ATRA clip restraints as manufactured by Presto Geosystems, Appleton, WI, or equal as approved by the Engineer.

PART 3 EXECUTION

3.1 EXAMINATION

- a. Obtain approval from the Engineer prior to installing FML and prior to placing subsequent layers of the cap.
- b. Coordinate activities such that the Engineer can observe testing.

3.2 PREPARATION

- a. Do not begin installation of FML until a proper sub-base has been prepared and approved by the Engineer. The prepared surface shall be smooth and free from abrupt changes in grade, water, loose earth, exposed rocks, rubble, protrusions, vegetation, and other foreign matter which may damage the FML.
- b. Do not place FML in areas which have become softened by precipitation and will not support liner installation equipment without rutting.

3.3 INSTALLATION OF FILTER FABRIC

- a. Notify Engineer at least 24 hours in advance of intention to commence placement of filter fabric.
- b. Do not permit placement of materials until Engineer has inspected and approved installation.
- c. Place the filter fabric in accordance with manufacturer's specifications.
- d. Overlap dimensions and the method of adjoining adjacent sheets shall, as a minimum, be in conformance with manufacturer's instructions.
- e. During placement of filter fabric, do not entrap stones in the filter fabric.
- f. Position and deploy filter fabric to minimize handling. Lay smooth and free of tension, stress, folds, or creases. Protect properly placed filter fabric from displacement, contamination by surface runoff, or damage, until and during placement of overlaid materials.
- g. Place filter fabric on sloping surfaces in one continuous length.
- h. Do not permit passage of vehicular traffic directly on filter fabric at any time.
- i. Remove and replace damaged or deteriorated filter fabric as directed by Engineer.

3.4 INSTALLATION OF FLEXIBLE MEMBRANE LINER

a. Panel Placement:

1. Designate each roll with an individual panel number and correlate with manufacturer's identification number. Mark each designation in each roll as it is deployed. A panel is the unit area of in-place membrane which is to be seamed (i.e., 1 roll may be cut into several panels). Follow manufacturer's instructions on the wrapping containing FML materials to assure the panels are unrolled in the proper direction for seaming. Unroll the panels which are to be anchored or seamed together that day. Exercise care not to damage FML liner during this operation. Require workers to wear shoes which will not damage FML liner.
2. Minimize pulling of FML to reduce permanent tension.
3. Minimize dragging of FML to prevent damage to texturing.
4. Take the following precautions to minimize the risk of damage by wind during panel placement:
 - A. Orientate work according to the direction of prevailing winds if possible unless otherwise specified.
 - B. Adequately secure FML liner panels to prevent uplift by wind using sand bags, or any other means which will not damage FML liner. Along the edges, ensure loading is continuous, to avoid possible wind flow under panels.
5. Replace panels which, in the judgment of the Engineer, become seriously damaged (torn or twisted permanently).
6. Do not proceed with FML placement when raining.
7. Install FML roll so that there will be no corrugations or folds at the average expected temperature or the final use condition.

b. Installation Around Appurtenances:

1. Install FML liner around wells or other appurtenances protruding through the liner as shown on Drawings. Unless otherwise specified, initially install liner skirt around each appurtenance prior to the FML installation. After FML liner has been placed and seamed, complete the final field seam connection between the appurtenance skirt and the FML liner. Maintain a sufficient initial overlap of the appurtenance skirt so that the shifts in location of FML liner can be accommodated.

2. Obtain approval from the Engineer for materials to be used to seal gaps between the liner skirt and appurtenances.
 3. Ensure clamps, clips, bolts, nuts, or other fasteners used to secure FML liner around each appurtenance have a lifespan equal to or exceeding the FML liner.
- c. Field Seaming
1. Overlap the panels a minimum of 6 inches.
 2. Panel preparation: Prior to seaming, clean the seam area to ensure it is free of moisture, dust, dirt, debris of any kind, and foreign material.
 3. Seaming Equipment and Products: Seam FML liner using extrusion or hot wedge seaming equipment and installation methods recommended by manufacturer. Where extrusion seaming is used, the composition of the extrudate shall be identical to the liner material, or all panels shall be seamed together using the hot wedge seaming system. Extrusion seaming equipment shall include thermometers measuring the temperature of the extrudate in the machine extruder and at the nozzle. Wedge seaming equipment used shall be capable of continuously monitoring and controlling the wedge temperature.
 4. The direction of seaming on slopes shall be such that flow water over top of FML liner is not hindered. Orient seams downslope. Specifically, for hot seamed seams FML liner overlap shall be on downslope side of seam. Extend seaming to the outside edge of each panel.
 5. If supporting soil is yielding, provide a firm substrate by using a homogeneous board, a conveyor belt, or similar hard surface directly under the seam overlap to effect proper rolling pressure.
 6. Seaming Wrinkles: Cut wrinkles and corrugations so as to effect overlap. Seam the cuts or wrinkles as well as possible, and then install patch of the same generic FML liner extending a minimum of 6 inches beyond the cut in all directions.
 7. No cross-slope seam shall occur less than 5 feet from the toe of slope unless slope is less than 10 percent. Cross-slope seams may be utilized if cut at an angle of approximately 45 degrees.
 8. Label each seam with date, seamer, equipment seaming temperature and speed, and time seam started and completed.
 9. Seaming Tie-ins: Seaming of FML tie-ins shall not proceed unless all panels to be seamed are at a uniform temperature (i.e., early in the morning or late in the day) so as to avoid excessive distortion in the liner due to FML contraction and expansion.

d. Test Seams:

1. Perform test seams to verify that the seaming conditions are adequate. Conduct test seams at the discretion of Engineer and at least 2 times each day (at the beginning of the day and at least 4 hours thereafter) for each seaming equipment used that day. Perform test seaming under the same conditions as production seaming. Extrusion seam test seams shall be at least 4 feet long. Hot wedge test seams shall be at least 10 feet long. Perform test seams on scrap FML not to be incorporated into Works.
2. Cut 1-inch wide coupons from the test seam and assign to peel or shear test alternatively as they are cut across panel. Test coupons in shear and peel using a calibrated field tensionmeter.
 - A. Minimum strength of FML liner test seams when tested in shear shall be 90 percent of the specified tensile strength at yield of the unseamed FML liner.
 - B. Minimum strength of FML liner test seams when tested in peel shall be 60 percent of the specified tensile strength at yield of the unseamed FML.
 - C. In addition, the test coupons must not delaminate. Passing test results must be obtained from 4 of 5 coupons when tested in shear, and 4 of 5 when tested in peel. For FML liner seams performed using a hot wedge seamer, perform peel tests on both the inside and outside seams; both seams must pass the peel test. If a test seam fails, reject the seaming equipment for field seaming until the deficiencies are corrected and a successful test seam is produced.
 - D. A passing test seam will be an indicator of the adequacy of the seaming unit and the seamer working under prevailing site conditions, but not necessarily an indicator of field seam adequacy.

e. Non-destructive Seam Testing:

1. Non-destructively test field systems over their full length by vacuum box, Pressure testing, or approved equal. Pressure test results will be written on liner near seam. Number or otherwise designate each seam. Record location, date, test unit, name of tester, and outcome of all non-destructive testing.
2. Passing non-destructive test of field seams indicates the adequacy of field seams, subject to the results of destructive seam testing.
3. Coordinate activities such that Engineer can observe all testing. Non-destructive testing performed in absence of Engineer shall be repeated. Conduct testing as seaming work progresses, not at completion of all field seaming. Number and mark all defects found during testing immediately after detection. Repair, retest,

and remark all defects found to indicate completion of the repair and acceptability. If pressure testing is performed, following testing, the hole resulting from the pressure needle must be repaired.

4. Seams failing pressure testing and subsequently successfully vacuum tested are considered acceptable.
- f. Destructive Seam Testing: Collect FML field seam samples at a frequency requested by Engineer, at locations indicated by Engineer. Field test coupons in peel and 5 coupons in shear, using a calibrated field tensionmeter. Perform peel tests on the inside and outside of seam. Minimum shear strength of FML liner field seams when tested in shear shall be 90 percent of the specified tensile strength at yield of the unseamed FML liner for both the field and laboratory tests. Minimum strength of FML liner field seams when tested in peel shall be 60 percent of the specified tensile strength at yield of the unseamed FML liner for both the field and laboratory tests. If field tests fail, isolate the defective seam and re-test as follows:
1. Collect additional samples from the field seam for testing using a field tensionmeter, within 10 feet of each side of the failing sample as determined by Engineer, until passing test locations are identified. Collect additional 2-foot long sample from each passing field test location and provide to Engineer for laboratory shear and peel testing.
 2. Repair the field seam between the passing test locations (based on field tensionmeter results) by extrusion seaming or patching.
 3. Non-destructively test the patch or extrusion seam and repair, as required, until non-destructive test standards are achieved.
 4. If the additional laboratory shear or peel tests fail, then additional destructive seam field samples will be collected and field tested to isolate the failing seam, then laboratory tested.
 5. Repeat the above-noted procedure until passing field and laboratory test results are achieved, thereby delineating extent of defective seam.
- g. Verification of Seams in Special Locations:
1. Non-destructively test seams in special locations (i.e., appurtenances) if the seam is accessible to testing equipment. Engineer will observe all seam testing operations. If the seam cannot be tested in place, it will be observed by Engineer for uniformity and completeness.
 2. In case of visual inspections, record the seam number, date of inspection, name of tester, and outcome of inspection.

3. Promptly repair, retest, and re-mark defective seams to indicate completion of the repair.
- h. Defects and Repairs:
1. Identification: Inspect seams and non-seam areas of FML liner for identification of defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.
 2. Evaluation: Non-destructively test each suspect location, both in seam and non-seam, using the methods described in Paragraph 3.8 f. Mark and repair each location which fails the non-destructive testing.
 3. Verification of Repairs: Non-destructively test each repair using the method described in Paragraph 3.8 f. Tests which pass the non-destructively test standards will serve as an indication of an adequate repair. Re-repair and test failed tests locations until a passing test results. Record the number of each repair, date, location, repair personnel initials, and test outcome. Engineer will observe non-destructive testing of repairs.
- i. FML Liner Acceptance:
1. Documentation of installation is complete and submitted to Engineer.
 2. Verification of adequacy of field seams and repairs, and associated testing, is complete.

3.5 REPAIR PROCEDURES FOR FML

- a. Clean and dry surfaces at time of the repair.
- b. Repair pinholes by applying a patch, and repair defective seams by re-seaming, flap seaming, or applying a patch, as approved by Engineer.
- c. Repair, tears, blisters, larger holes, undispersed raw materials, and contamination by foreign matter, or corrugations determined by Engineer to be excessive, by patches.
- d. Patches:
 1. Abrade surfaces as appropriate.
 2. Label each patch with date, number, and seamer and equipment.
 3. Ensure patches are round or oval in shape.

4. Make of the same generic FML liner. Patches straddling textured and non-textured liners shall be textured.
5. Extend patch minimum of 4 inches beyond the edge of defects.

3.6 INSTALLATION OF DRAINAGE NET

- a. The drainage net roll should be installed in the direction of the slope and in the intended direction of flow unless otherwise specified by the ENGINEER.
- b. In the presence of wind, the drainage net shall be weighted down with sandbags or the equivalent. Such sandbags shall be used during placement and remain until replaced with cover material.
- c. In applying fill material, no equipment can drive directly across the drainage net.
- d. The cover soil shall be placed on the drainage net in a manner that prevents damage to the drainage net.
- e. Seams and overlaps:
 1. Each component of the drainage net shall be secured or seamed to the like component at overlaps.
 2. Adjacent edges along the length of the drainage net roll shall be placed with the edges of each and butted against each other.
 3. The overlaps shall be joined by tying the structure with cable ties spaced every 5 feet along the roll length.
 4. Adjoining drainage net rolls (end to end) across the roll width should be shingled down in the direction of the slope with a minimum of 12 inches of overlap across the roll width. No overlapping will be allowed on slopes greater than 20%, full panels only.
- f. Repair
 1. Prior to covering the deployed geocomposite, each roll shall be inspected for damage resulting from construction.
 2. Any rips, tears or damaged areas on the deployed drainage net shall be removed and patched. The patch shall be secured to the original drainage net tying every 6 inches with the approved tying devices. If the area to be repaired is more than 50 percent of the width of the panel, the damaged area shall be cut out and the two portions of the drainage net shall be cut out and the two portions of the drainage net shall be joined as specified above.

3.7 INSTALLATION OF GEOGRID

- a. Cut geogrid to the lengths shown on the construction drawings (from the first rib to the last rib). Make the cut next to the heavy transverse ribs that spans the width of the geogrid roll. Cut geogrids flush at the nearest transverse bar beyond the measured length.
- b. Place geogrid rolls on top of drainage net, extending from the slope face to the distance specified on the construction drawings, with the transverse bar end of the geogrid at the slope face.
- c. Keep speeds slow and avoid turns and stops on the geogrid.
- d. If needed, the geogrids can be secured into place to prevent movement during fill placement by using sandbags.
- e. Seams:
 1. Adjacent geogrid strips should be butted together side-by-side without overlap.
 2. Geogrid strips adjacent to each other in the direction of loading are to be connected using a Bodkin connection

3.8 INSTALLATION OF GEOCELL

- a. If the TerraCell is not prepared with holes for the tendons, drill the holes before expanding the sections, providing room for 8 tendons spread evenly per 8.4 foot section, or at the locations specified on the construction drawings.
- b. Cut the tendons to the specified lengths.
- c. Thread the tendons through the holes in the unexpanded TerraCell sections. The tendon must be tied to a restraint pin (4" long Number 4 Epoxy coated rebar) on the downhill side of the last cell wall.
- d. Measure and mark the perimeter of the area to be covered by the first section to be installed. Place the TerraCell on top of the geogrid and expand it into place as much as possible, starting at the highest elevation and expanding down gradient.
- e. Restraint pins (4" long Number 4 Epoxy coated rebar) must be installed along the tendon, on the downhill side of the tendon wall, every 5' to 8', or as specified on the construction drawings.
- f. Where adjacent sections of TerraCell abut, a connection is made by installing a restraint pin (4" long Number 4 Epoxy coated rebar) along the tendon within the cell on the downhill TerraCell section.

- g. Fill the cells with the specified backfill at the highest elevation first, continuing downhill. Never allow equipment to drive over unfilled cells. It is best to overfill the cells slightly to allow for reduction in volume of the granular material as it is compacted.

Compact the fill material using a vibratory roller until the fill is flush with the top of the geocell wall.

3.9 PROTECTION OF FINISHED WORK

- a. Protect finished work from damage.
- b. Do not permit traffic over unfinished geosynthetic installation.

-- End of Section --