ADMINISTRATIVE RECORD

CENTRAL STEEL AND DRUM SITE

NEWARK, ESSEX COUNTY, NJ

Prepared for:

Greg DeAngelis, On-Scene Coordinator
U. S. EPA Region II
Response and Prevention Branch
Edison, New Jersey 08837

Prepared by:

Region II Superfund Technical Assessment and Response Team
Roy F. Weston, Inc
Federal Programs Division
Edison, New Jersey 08837

DCN #: START-02-F-01484
TDD #: 02-97-09-0008-2119

December 1997

Administrative Records in Local Repositories

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For further information on the Administrative Record file, contact Greg DeAngelis, On-Scene Coordinator, U.S. EPA Region II, at (732) 906-6874.

CENTRAL STEEL AND DRUM SITE

ADMINISTRATIVE RECORD GUIDANCE

CONTENTS

CENTRAL STEEL AND DRUM SITE

ADMINISTRATIVE RECORD FILE

MODEL INDEX OF DOCUMENTS

The index of documents contains the following information about each document:

Document #:	Site Code (three letters of site name)-Section, First Page-Section - Last Page **EXAMPLE (AM 1.1001 - 1.1002)**
Title:	Abstract of Document Contents
Category:	Document Category/Section of Administrative Record File
Author:	Writer and Affiliation
Recipient:	Addressee or Public and Affiliation, if applicable
Date:	When Document was Created or Transmitted

Note: Items in the Administrative Record are for public access, and should be removed from the file only for copying. The cost of reproduction of the documents in the file is the responsibility of the person requesting the copy.

CENTRAL STEEL AND DRUM SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

Document #: CSD 1.3001-1.3006
Title: Expedited Removal Assessment Criteria
Category: Site Identification
Author: Margaret Chong, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Recipient: N/A
Date: May 9, 1997

Document #: CSD 2.1001-2.1054
Title: Sampling QA/QC Work Plan for Central Steel Drum Site, Newark, New Jersey
Category: Removal Response
Author: Ed Moyle, Project Manager, Roy F. Weston, START, Region II
Recipient: Margaret Chong, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Date: May 20, 1997

Document #: CSD 2.1055-2.1078
Title: Sampling, Analysis and Quality Assurance Plan for Central Steel Drum Site, Newark, New Jersey
Category: Removal Response
Author: Ronald B. Kenyon, Senior Project Chemist, OHM Remediation Services Corporation, Northern Region
Recipient: Greg DeAngelis, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Date: September 24, 1997

Document #: CSD 2.2001-2.2024
Title: Sampling Trip and Site Assessment Report and Drum Inventory - Central Steel Drum Site, Newark, New Jersey
Category: Removal Response
Author: Thomas O'Neill, Project Manager, Roy F. Weston, START, Region II
Recipient: Greg DeAngelis, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Date: June 13, 1997

Document #: CSD 2.5001-2.5010
Title: Action Memorandum, Request for Removal Action at the Central Steel and Drum Site, Newark, Essex County, New Jersey
Category: Removal Response
Author: Greg DeAngelis, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Recipient: Jeanne M. Fox, Regional Administrator, United States Environmental Protection Agency, Region II
Date: July 3,1997

Document #: CSD 2.7001-2.7008
Title: Work Plan For Central Steel Drum 704-738 Doremus Avenue, Newark, New Jersey
Category: Removal Response
Author: Stanford Gable, Response Manager, OHM Remediation Services Corp., Northeast Region
Recipient: Greg DeAngelis, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Date: September 25, 1997

Document #: CSD 2.8001-2.8106
Title: Site-Specific Health & Safety Plan For Remediation Activities - Central Steel Drum Site, Newark, Essex County, New Jersey
Category: Removal Response
Author: Paul A. Lawless, CIH, Regional Industrial Hygienist, OHM Remediation Services Corp., Northeast Region
Recipient: Greg DeAngelis, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Date: September 24, 1997

Document #: CSD 10.3001-10.3002
Title: Notice of Public Availability
Category: Public Participation
Author: United States Environmental Protection Agency, Region II
Recipient: General Public
Date: December 1, 1997

Document #: CSD 10.6001-10.6002
Title: Fact Sheet
Category: Public Participation
Author: Greg DeAngelis, On-Scene Coordinator, Response and Prevention Branch, United States Environmental Protection Agency, Region II
Recipient: General Public
Date: March, 1996

Document #: CSD 11.2001-11.2002
Title: EPA Regional Guidance Document
Category: Technical Source and Guidance Documents
Author: United States Environmental Protection Agency, Region II
Recipient: N/A
Date: N/A

EXPEDITED REMOVAL ASSESSMENT CRITERIA

Site Name: Central Steel & Drum
Address (Street; Block; Lot; City; County; State; Zip Code): 704 Doremus Avenue, Block 5074, Lot 1, Newark, Essex County, NJ 07105
NRC Case #: N/A State Case #:
State Referral Date: 5/97 State Response Date: 5/9/97
State Investigator/Phone #: Joe Hoyle, 201-669-3955
EPA Investigation Date: 5/14-15/97 EPA Investigator(s): Margaret Chong

Instruments Used/background readings: HNU, OVA, CGI, Jerome, XRF - No significant readings except for the XRF which showed high levels of lead. (10,000 ppm)
Pending Actions (HAZCAT, Sampling, etc):
Access Agreement: Yes/No; Verbal: Yes/No; Written: Yes/No
Accompanied State of NJ. Property owned by the City of Newark

I. STRIP MAP/DIRECTIONS TO SITE

NJ Turnpike to Exit 15E, make a right onto Doremus Avenue. Go all the way to Delancey Street, where Delancey and Doremus intersects. Facility is on the right after the RR tracks. Texaco is on the left opposite the facility.

II. SITE CHARACTERISTICS

A. Physical Location

1. Type of Facility: Drum Reconditioner
   i. current use: abandoned
   ii. previous use(s): drum recyling, container shipping operation
2. Nature of Neighborhood: industrial, residential area begins 1.5 miles from the site.

B. Size

1. Size of Property: 8.5 acres
2. Number and Size of Buildings: one building approx. 200 x 500 ft.original Structures interconnected or added onto at a later date.
3. Building Construction Type (e.g., cinder block, wood, etc; roof, flooring type, etc.): metal and cinder block
4. Building Drains (& where they flow): drains located inside bldg. Unable To determine direction of flow. Too much debris inside bldg.
5. Fire Protection Systems: none.

C. Site Conditions

1. Condition of Buildings: Deteriorated.
2. Types of Building(s) Construction:
   i. masonry w/ wood roof:
   ii. masonry w/metal roof: yes
   iii. wood:
   iv. other:
3. Containment Structure(s) Condition: none
4. Property Condition/Characteristics (asphalt, crops, wetlands,etc): Property located on filled marshland. Wetlands located on the south end of the property. Pistol range, propane facility & RR Tracks at borders.
5. Security:
   i. building: none
   ii. property: none
   iii. site occupancy: unoccupied
      a. hours of occupancy:
      b. abandoned (date): approx. 1994
   iv. fences: entire property is fenced, except for the entrance.
   v. condition of fences: fair
   vi. evidence of public entry: construction debris dumping, graffiti
   vii. Entry Access:
      a. locked (name & phone to unlock): no gates
      b. other means of access (open windows, etc): blocks of concrete Barricading entrance. Vehicles cannot enter facility.
6. Utilities (existing - on/off):
   i. electric: off
   ii. water: Off
   iii. other (e.g., gas, fire hydrants):
7. Underground Storage Tanks (Existing - On/Off/Unknown)
   i. fuel: two USTs, capacities unknown. Diesel/water and kerosene/water
   ii. chemical:
8. Migration Pathways:
   i. storm sewers (distance):
   ii. sanitary sewers (distance):
   iii. others (distance):

II. THREAT

A. Number and Type of Containers
1. Drums (>30 gal): approximately 500 drums, mostly incinerator ash
2. 5-30 gal containers: approximately 50
3. <5 gallon containers:
4. Tanks, Reactor Vessels, etc.: one hopper with paint material.
5. Other (ie, cylinders, explosives): 2 empty cylinders

B. Estimated Quantities
1. Suspected/estimated:
2. Verified:

C. Material Identification
1. Material Classification
   i. Oil: Diesel and kerosene in the two underground storage tanks
   ii. CERCLA hazardous substance(s): flammables, lead contamination, acid, Water reactives, paints
   iii. RCRA hazardous waste(s):
2. Method of Material Identification
   i. suspected:
      a. prior site information: yes
      b. container labels: yes
      c. other:
   ii. verified:
      a. field screening (method; e.g., DRI, hazcat): XRF, hazcatting
      b. analysis:
      c. other:

D. Condition of Containers and Materials
1. Stable: deteriorated
2. Discharge
   i. potential: yes
   ii. imminent:
   iii. actual: drums discovered in the wetlands located at the south end.

E. Potential Receptors
1. Human
   i. number of nearby residents & distances: 1.5 miles from site
   ii. number of nearby businesses & distances:
   iii. other (ie significant roadways/RR): RR tracks on west side of the Property
   iv. sensitive receptors: wetland on south end of property
2. Environmental
   i. Nearby Waterways
      a. name (& distance(s): onsite drainage feeds Newark Bay
      b. confluences (& distance(s)):
      c. water intakes (distance(s)):
   ii. Other (e.g., wetlands, etc.):

III. SITE LEGAL STATUS

A. Current Status of Site Ownership: City of Newark, foreclosed on property On 10/1/96

B. Current Status of Site Operations: abandoned

C. Status of Site Cleanup(s): incinerator was dismantled.
1. Previous: Unknown
2. Present: Unknown

D. Past/Present Enforcement:
1. Local: Unknown
2. State: when facility was operating, $66,000 was collected for air Compliance violations
3. EPA: EPA issued a Consent agreement and Final Compliance on 11/25/83 for A number of RCRA violations and also required the facility to conduct an investigation of contamination and develop a remediation program under the direction of NJDEP. Monitoring wells were installed and sampling data was produced, then the case became inactive in 1985.
4. Other:

E. Suspected PRPs:

	Name	Address	Phone
1.	Dore Realty		
2.			
3.			
4.			
5.			
6.			

F. Site Sketch:

Attached

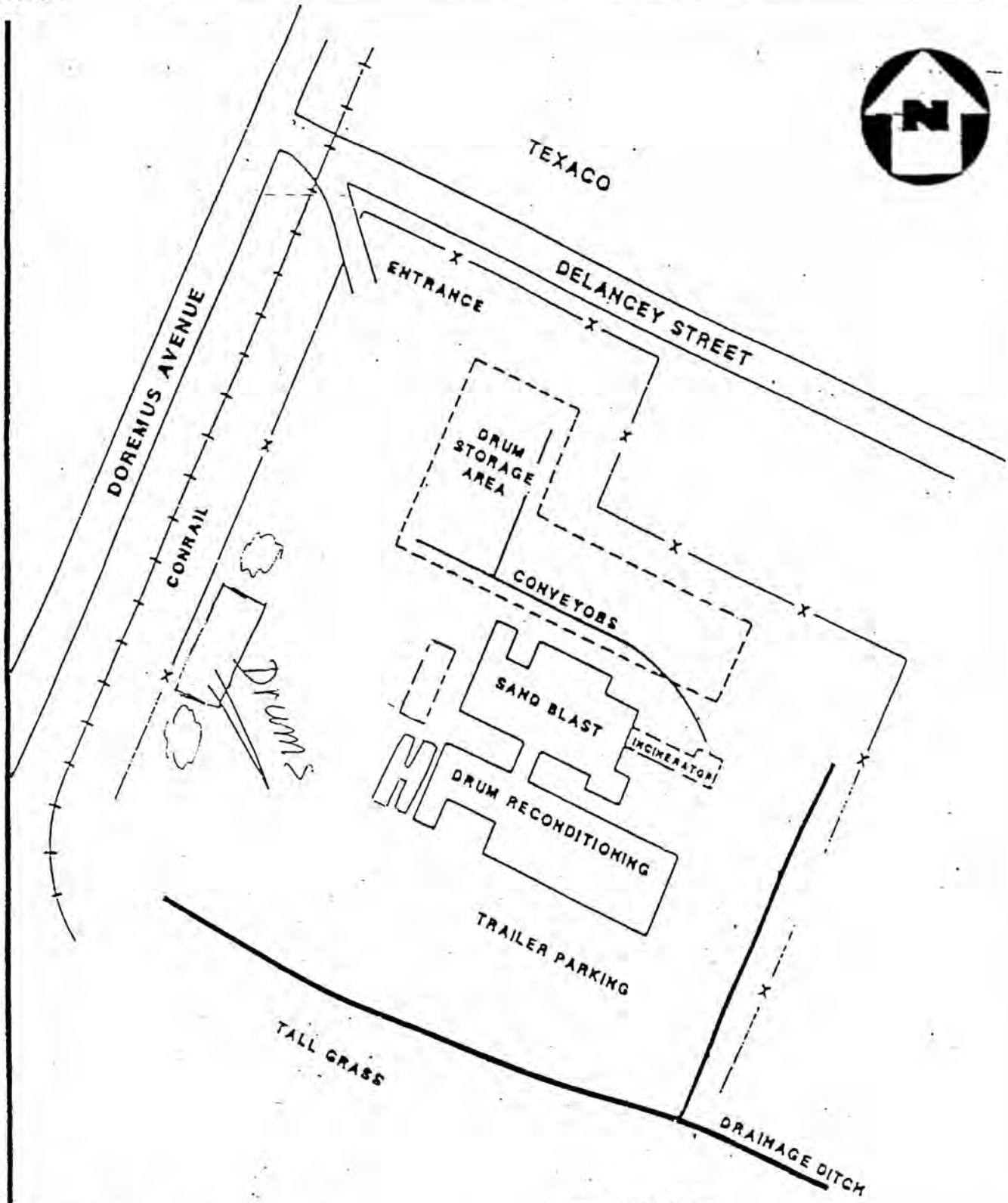
IV. Additional Information

Title search was done by Susie Becker. Shows that the current owner is the City of Newark. According to NJDEP, the most recent owners was Dore Realty. Two of the pricipals are dead. The third one lives in NYC. I believe from the title search the three were Emmanuel Sacks, Leon Rosen and Nathan Blumberg. Unknown as to who is still alive.

Facility has a long history of incompliance with NJDEP.

Records were observed on site which show generators sending material to this facilty. A site visit is planned with Susie Becker and Marissa Wiggett. There may be a connection with Container Drum located in Half Moon, NY. The name Greenburg appears at both sites.

SD - 1.3006



Source: Halliburton NUS

(NOT TO SCALE)

WESTON MANAGERS/DESIGNERS/CONSULTANTS — Roy F. Weston, Inc. FEDERAL PROGRAMS DIVISION	EPA PM: M. Chong	Central Steel Drum Newark, New Jersey
IN ASSOCIATION WITH RESOURCE APPLICATION, Inc. G.C. JOHNSON & MALHOTRA, P.C., R.E. SARPERIA ASSOCIATES, PRC ENVIRONMENTAL MANAGEMENT, AND ORS ENVIRONMENTAL SERVICES, INC.	START PM: P. Mc[illegible]	Figure 2: Site Layout and Sampling Locations

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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM
EPA CONTRACT 68-W5-0019

20 May 1997

Mr. Margaret Chong
U.S. Environmental Protection Agency
Removal Action Branch
2890 Woodbridge Avenue
Edison, N.J. 08837

EPA CONTRACT NO: 68-W5-0019
TDD NO: 02-97-51-0010
DOCUMENT CONTROL NO: START-02-F-001073

SUBJECT: SAMPLING QA/QC WORK PLAN

Dear Miss Chong:

Attached please find the Sampling QA/QC Work Plan for the Central Steel and Drum Assessment located at 704 Doremus Avenue, Newark, New Jersey. (Essex County) The attached sampling plan is an exact copy of the "working draft" copy used for site work on 5/14/97 and 5/15/97 that was not formally approved at that time.
If you have any further questions, do not hesitate to call me at (908) 225-6116.

Very Truly Yours,

ROY F. WESTON.INC.

Ed Moyle
Project Manager

SAMPLING QA/QC WORK PLAN

Central Steel and Drum
NEWARK, ESSEX COUNTY, NEW JERSEY

Prepared by

Superfund Technical Assessment and Response Team
Roy F. Weston, Inc.
Federal Programs Division
Edison, New Jersey 08837

Prepared for

U.S. Environmental Protection Agency
Region II - Removal Action Branch
Edison, New Jersey 08837

DCN #: START-02-F-001073
TDD #: 97-02-05-0010
PCS #: 1916
EPA Contract No.: 68-W5-0019

Approved by:

START

_____ Date: 5/27/97

Ed Moyle
START Project Manager

START

_____ Date: 5/15/97

Joseph Soroka
START QA Officer

EPA

_____ Date: 5/27/97

Margaret Chong
On-Scene Coordinator

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

1.0 BACKGROUND

The Central Steel and Drum Site is an inactive and abandoned drum recycling and processing facility located at 704 Doremus Avenue in Newark, N.J. The facility consists of several buildings on 8.5 acres. The Site recycled used drums by cleaning, sandblasting of metals, incineration of residual drum contents, and repainting of restored drums for reuse. START has not had any previous work history at this site however the NJ DEP referral defines 1000 tires, 200 drums that may or may not have contents and an oil slick on nearby water surfaceses as possible areas for further investigation(Note that the site is near a petroleum refinery and would therefore not represent EPA regulated contaminants.) The DEP site history notes high levels of volitile compounds, heavy metals, and chlordane from previous analysis during the years of operation until 1985. No recent DEP site information is listed since Nov 1994. The well documented site history and the established analytical results defined in the past will be used to confirm continuing conditions of contamination of the soils and ground water to the high levels of heavy metals at the site. The unknown currant site conditions may not demonstrate continuing contamination with Field Characterization testing (Hazcatting) of organic wastes as normally done during assesments but will be included as an additional form of site characterization if conditions permit.

2.0 DATA USE OBJECTIVES

The objective of this sampling event is to select sample locations for "in situ" XRF Lead analysis that may demonstrate the previously reported contamination levels found at the site.

3.0 QUALITY ASSURANCE OBJECTIVES

The overall Quality Assurance (QA) Objective is to identify contaminants on site and to determine the type of contaminants using the SPECTRACE 9000 Field Portable X-Ray Flourescence Instrument and the HAZCAT field compatibility kit.

The U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) has specified a Level 1 QA Objective (QA-1). Details of this Assurance Level are provided in Section 6.0.

The QA-1 objective may be applied to these site specific activities:

1. Physical and/or Chemical properties of samples;

2. Waste Compatibility;

3. Hazard Characterization.

There will be no QA data collected for this objective.

The objective of this project/event applies to the following parameters:

TABLE 1 Quality Assurance Objectives			
QA Parameters	Matrix	Intended use of data	QA Objective
Field Compatibility	Drum Liquids and/or Solids (if contaminants are found) Contaminated Soils and Ash	Hazard Characterization	QA-1

TABLE 2 QA/QC Analysis and Objectives Summary				
MATRIX	ANALYTICAL PARAMETER	CONTAINER (SAMPLE) VOLUME	Analytical Method Reference	QA/QC Quantitation Limits
Various	Field Compatibility	One 4-oz. wide-mouth glass jar	HAZCAT Manual & XRF SOP 1713	N/A

4.0 APPROACH AND SAMPLING METHODOLOGIES

As stated above, START will perform the following tasks:

1. Drum ,Soil and Water inspection/visual observations and logging information;

2. Field compatibility tests.

4.1 Sampling Equipment

XRF Sampling locations will be identified by the OSC for Lead "in situ" Analysis. EPA/ERT SOP #2009, Drum Sampling, will be used if drumed waste is found.

4.2 Sampling Design

It is anticipated that no more than fifteen (15) sample locations will be tested. The drums of waste if found to be present to be sampled will be chosen by the OSC.

4.3 Standard Operating Procedures (SOPs)

4.3.1 Sample Documentation

All sample documents will be legibly completed using waterproof ink. Any corrections or revisions will be made by lining once through the incorrect entry and initialing the error.

FIELD LOGBOOK

The field logbook is essentially a descriptive notebook detailing site activities and observations so that an accurate account of field procedures can be reconstructed in the writer's absence. Logbook entries should record (at a minimum) the following:

1. Site name, code, and project number;

2. Project start and end dates;

3. Dates and times of all entries (military time) and the name of the individual making the entry;

4. Name(s) of personnel on site and sampling team members;

5. Descriptions of all site activities, including site and exclusion zone entry and exit times, and level of PPE used by team members;

6. Noteworthy events and discussions;

7. Weather conditions;

8. Site observations;

9. Identification and detailed description of each sample and station location including: the sample type (grab or composite); preservation; sampling depth (if applicable); type of sampling equipment used; compass and distance measurements (as applicable); and the name of the sampling team member.

10. Identification number(s) and calibration date(s) of portable monitoring and/or field analytical equipment used to obtain measurements;

11. Subcontractor information and names of on-site personnel;

12. Date and time of sample collections, along with chain of custody and air courier service information;

13. Record of photographs; and

14. Sketches, including site layout and sample station locations.

DRUM INVENTORY LOG

See Attachment B for a copy of the drum inventory log sheet to be used for this project.

4.3.2 Sampling SOPs

DRUM SAMPLING

Drum sampling activities will be conducted in accordance with guidelines outlined in EPA/ERT Drum Sampling SOP #2009 (Attachment C).

4.3.3 Sample Handling and Shipment

All field testing will be done on site. Samples will not be collected for additional analysis.

4.4 Analytical Methods/Test Procedures

All field testing for RCRA characeristics and additional parameters will be performed using a HAZCAT kit. All testing will be conducted in accordance with the HazCat field directional manual.

4.5 Schedule of Activities

TABLE 3
PROPOSED SCHEDULE OF WORK

Start Date	Activity	End Date
14 May 1997	Field Compatibility	14 May 1997

4.6 Disposal of PPE and contaminated sampling materials

Because the site is not secure, all PPE and sampling material will be placed in plastic garbage bags and transported from the site.

5.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The OSC, Margaret Chong, will provide overall direction to the staff concerning project sampling needs, objectives and schedule. The START PM, Ed Moyle, will be the primary point of contact with the OSC. The START PM is responsible for the development and completion of the Sampling QA/QC Plan, project team organization, and supervision of all project tasks, including reporting and deliverables. The START PM will act as the Site QC Coordinator and will be responsible for ensuring field adherence to the Sampling QA/QC Plan and recording of any deviations.

The following personnel will conduct work on the Assessment and Removal phases of this project:

Personnel	Affiliation	Responsibility
Ed Moyle	Region II START	Project Manager/QAQC
Brian McGinn	Region II START	Sampler
Michael Mahnkoph	Region II START	Sampler
Christoph Stannik	Region II START	Field Screening
Donielle Perri	Region II START	XRF Analysis
Joesph Soroka	Region II START	XRF Analysis
Tom Oneal (1/2 day)	Region II START	Consultant (as a former DEP inspector at this site when it was in operation)

6.0 QA REQUIREMENTS

The following QA Protocols for a Level 1 QA data are applicable to all sample matrices and include:

1. Documentation in the form of field logbooks, appropriate field data sheets and appropriate drum log inventory sheets:

2. Performance check of the appropriate test method (i.e. test strips) will be summarized and documented in the field logbook.

7.0 DELIVERABLES

Drum inventory logs will be filled out for every sample taken. A copy of the logs will be provided to the OSC. A Trip Report will be prepared to provide a detailed accounting of what occurred during the sampling event.

Maps/Figures

A map depicting the site layout and areas will be included in the Trip Report as appropriate.

8.0 DATA VALIDATION

QA Level 1

No data validation is required under QA level 1

9.0 SYSTEM AUDIT

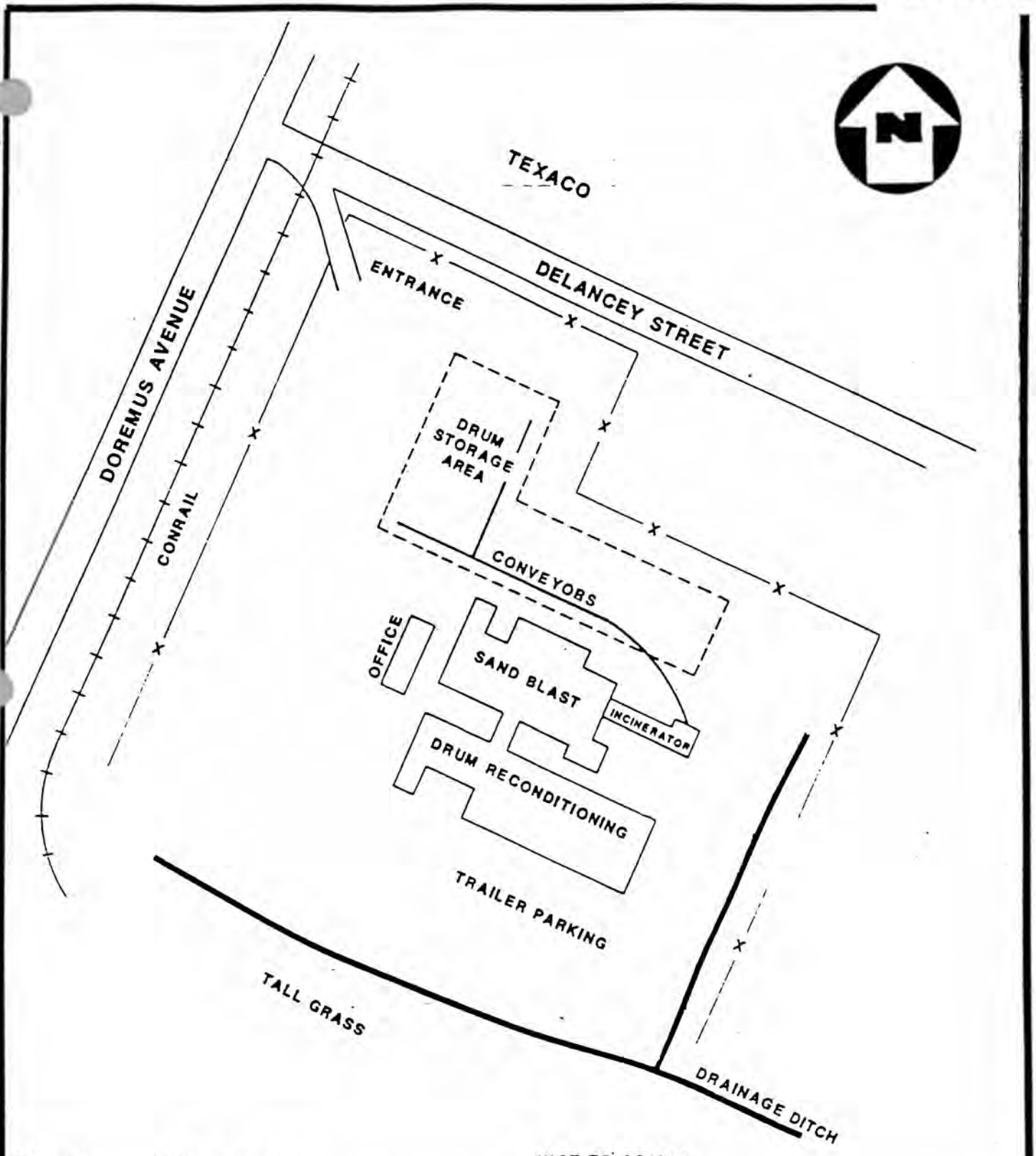
The field QA/QC officer will observe sampling and hazcating operations to ensure compliance with the QA/QC requirements.

10.0 CORRECTIVE ACTION

All provisions will be taken in the field to ensure that any problems that may develop will be dealt with as quickly as possible to ensure the continuity of the project/sampling event. Any deviations from this plan will be noted in the site/field log book.

ATTACHMENT A

SITE MAP



Source: Halliburton NUS

(NOT TO SCALE)

Roy F. Weston, Inc. FEDERAL PROGRAMS DIVISION MANAGERS DESIGNERS/CONSULTANTS	EPA PM M. Chong	Central Steel Drum Newark, New Jersey
IN ASSOCIATION WITH RESOURCE APPLICATION, Inc. C.C. JOHNSON & MALHOTRA, P.C., R.E. SARRIERA ASSOCIATES, PRC ENVIRONMENTAL MANAGEMENT, AND GRB ENVIRONMENTAL SERVICES, INC.	START PM E. Moyle	Figure 2: Site Layout and Sampling Locations

ATTACHMENT B

DRUM INVENTORY LOG

CSD - 2.1015

SITE NAME: _____ SAMPLE NO: _____ DRUM NUMBER

GRID LOCATION FOUND: _____ STAGING LOCATION: _____

LOGGER: _____ SAMPLER: _____

PROJECT NO: _____ DATE/TIME: _____

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☐	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
Steel ☐	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☐
Stainless Steel ☐	Other ☐	Closed Top ☐		other _____		

DRUM SIZE (Gallons): 85 ☐ 55 ☐ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☐ Other _____

MFG NAME

CHEMICAL NAME

DRUM MARKINGS

DRUM LABELS

FIELD AIR MONITORING INSTRUMENT READINGS: HNu ___ OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top													
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top										
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS:

ATTACHMENT C

DRUM SAMPLING SOP #2009

2.0 DRUM SAMPLING: SOP #2009

2.1 SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to provide technical guidance on safe and cost-effective response actions at hazardous waste sites containing drums with unknown contents. Container contents are sampled and characterized for disposal, bulking, recycling, grouping, and/or classification purposes.

2.2 METHOD SUMMARY

Prior to sampling, drums must be inventoried, staged, and opened. An inventory entails recording visual qualities of each drum and any characteristics pertinent to the contents' classification. Staging involves the organization, and sometimes consolidation of drums which have similar wastes or characteristics. Opening of closed drums can be performed manually or remotely. Remote drum opening is recommended for worker safety. The most widely used method of sampling a drum involves the use of a glass thief. This method is quick, simple, relatively inexpensive, and requires no decontamination.

2.3 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Samples collected from drums are considered waste samples. No preservatives should be added since there is a potential reaction of the sample with the preservative. Samples should, however, be cooled to 4°C and protected from sunlight in order to minimize any potential reaction due to the light sensitivity of the sample.

Sample bottles for collection of waste liquids, sludges, or solids are typically wide-mouth amber jars with Teflon-lined screw caps. Actual volume required for analysis should be determined in conjunction with the laboratory performing the analysis.

Follow these waste sample handling procedures:

1. Place sample container in two Ziploc plastic bags.
2. Place each bagged container in a 1-gallon covered can containing absorbent packing material. Place the lid on the can.
3. Mark the sample identification number on the outside of the can.
4. Place the marked cans in a cooler, and fill remaining space with absorbent packing material.
5. Fill out chain of custody form for each cooler, place in plastic, and affix to inside lid of cooler.
6. Secure and custody seal the lid of cooler.
7. Arrange for the appropriate transportation mode consistent with the type of hazardous waste involved.

2.4 INTERFERENCES AND POTENTIAL PROBLEMS

The practice of tapping drums to determine their contents is neither safe nor effective and should not be used if the drums are visually overpressurized or if shock-sensitive materials are suspected. A laser thermometer may be used instead.

Drums that have been overpressurized, to the extent that the head is swollen several inches above the level of the chime, should not be moved. A number of devices have been developed for venting critically swollen drums. One method that has proven to be effective is a tube and spear device. A light aluminum tube (3 meters long) is positioned at the vapor space of the drum. A rigid, hooking device attached to the tube goes over the chime and holds the tube securely in place. The spear is inserted in the tube and positioned against the drum wall. A sharp blow on the end of the spear drives the sharpened tip through the drum and the gas vents along the grooves. The venting should be done from behind a wall or barricade. This device can be cheaply and easily designed and constructed where needed. Once the pressure has been relieved, the bung can be removed and the drum sampled.

2.5 EQUIPMENT/APPARATUS

The following are standard materials and equipment required for sampling:

- personal protection equipment
- wide-mouth glass jars with Teflon cap liner, approximately 500 mL volume
- uniquely numbered sample identification labels with corresponding data sheets
- 1-gallon covered cans half-filled with absorbent (vermiculite)
- chain of custody forms
- decontamination materials
- glass thief tubes or Composite Liquid Waste Samplers (COLIWASA)
- laser thermometer
- drum opening devices

Drum opening devices include the following:

2.5.1 Bung Wrench

A common method for opening drums manually is using a universal bung wrench. These wrenches have fittings made to remove nearly all commonly encountered bungs. They are usually constructed of cast iron, brass, or a bronze-beryllium, non-sparking alloy formulated to reduce the likelihood of sparks. The use of a non-sparking bung wrench does not completely eliminate the possibility of a spark being produced. (See Figure 1, Appendix B.)

2.5.2 Drum Deheader

When a bung is not removable with a bung wrench, a drum can be opened manually by using a drum deheader. This tool is constructed of forged steel with an alloy steel blade and is designed to cut the lid of a drum off or part way off by means of a scissors-like cutting action. A limitation of this device is that it can be attached only to closed head drums. Drums with removable heads must be opened by other means. (See Figure 2, Appendix B.)

2.5.3 Hand Pick, Pickaxe, and Hand Spike

These tools are usually constructed of brass or a non-sparking alloy with a sharpened point that can penetrate the drum lid or head when the tool is swung. The hand picks or pickaxes that are most commonly used are commercially available; whereas the spikes are generally uniquely fabricated 4-foot long poles with a pointed end. (See Figure 3, Appendix B.)

2.5.4 Backhoe Spike

The most common means used to open drums remotely for sampling is the use of a metal spike attached or welded to a backhoe bucket. In addition to being very efficient, this method can greatly reduce the likelihood of personal exposure. (See Figure 4, Appendix B.)

2.5.5 Hydraulic Drum Opener

Another remote method for opening drums is with remotely operated hydraulic devices. One such device uses hydraulic pressure to pierce through the wall of a drum. It consists of a manually operated pump which pressurizes soil through a length of hydraulic line. (See Figure 5, Appendix B.)

2.5.6 Pneumatic Devices

A pneumatic bung remover consists of a compressed air supply that is controlled by a heavy-duty, two-stage regulator. A high-pressure air line of desired length delivers compressed air to a pneumatic drill, which is adapted to turn a bung fitting selected to fit the bung to be removed. An adjustable bracketing system has been designed to position and align the pneumatic drill over the bung. This bracketing system must be attached to the drum before the drill can be operated. Once the bung has been loosened, the bracketing system must be removed before the drum can be sampled. This remote bung opener does not permit the slow venting of the container, and therefore appropriate precautions must be taken. It also requires the container to be upright and relatively level. Bungs that are rusted shut cannot be removed with this device. (See Figure 6, Appendix B.)

2.6 REAGENTS

Reagents are not typically required for preserving drum samples. However, reagents are used for decontaminating sampling equipment. Decontamination solutions are specified in ERT SOP #2006, Sampling Equipment Decontamination.

2.7 PROCEDURES

2.7.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are needed.

2. Obtain necessary sampling and monitoring equipment.

3. Decontaminate or preclean equipment, and ensure that it is in working order.

4. Prepare scheduling and coordinate with staff, clients, and regulatory agency, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.

6. Use stakes, flagging, or buoys to identify and mark all sampling locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.

2.7.2 Drum Inspection

Appropriate procedures for handling drums depend on the contents. Thus, prior to any handling, drums should be visually inspected to gain as much information as possible about their contents. Those in charge of inspections should be on the look-out for:

- drum condition, corrosion, rust, and leaking contents
- symbols, words, or other markings on the drum indicating hazards (i.e., explosive, radioactive, toxic, flammable)
- signs that the drum is under pressure
- shock sensitivity

Monitor around the drums with radiation instruments, organic vapor monitors (OVA) and combustible gas indicators (CGI).

Classify the drums into categories, for instance:

- radioactive
- leaking/deteriorating
- bulging
- drums containing lab packs
- explosive/shock sensitive

All personnel should assume that unmarked drums contain hazardous materials until their contents have been categorized, and that labels on drums may not accurately describe their contents.

If it is presumed that there are buried drums on-site, geophysical investigation techniques such as magnetometry, ground penetrating radar, and metal detection can be employed in an attempt to determine depth and location of the drums. See ERT SOP #2159, General Surface Geophysics.

2.7.3 Drum Staging

Prior to sampling, the drums should be staged to allow easy access. Ideally, the staging area should be located just far enough from the drum opening area to prevent a chain reaction if one drum should explode or catch fire when opened.

While staging, physically separate the drums into the following categories: those containing liquids, those containing solids, lab packs, or gas cylinders, and those which are empty. This is done because the strategy for sampling and handling drums/containers in each of these categories will be different. This may be achieved by:

- Visual inspection of the drum and its labels, codes, etc. Solids and sludges are typically disposed of in open-top drums. Closed-head drums with a bung opening generally contain liquid.

- Visual inspection of the contents of the drum during sampling followed by restaging, if needed.

Once a drum has been excavated and any immediate hazard has been eliminated by overpacking or transferring the drum's contents, affix a numbered tag to the drum and transfer it to a staging area. Color-coded tags, labels, or bands should be used to mark similar waste types. Record a description of each drum, its condition, any unusual markings, and the location where it was buried or stored, on a drum data sheet (Appendix A). This data sheet becomes the principal

recordkeeping tool for tracking the drum onsite.

Where there is good reason to suspect that some drums contain radioactive, explosive, and shock-sensitive materials, these drums should be staged in a separate, isolated area. Placement of explosives and shock-sensitive materials in diked and fenced areas will minimize the hazard and the adverse effects of any premature detonation of explosives.

Where space allows, the drum opening area should be physically separated from the drum removal and drum staging operations. Drums are moved from the staging area to the drum opening area one at a time using forklift trucks equipped with drum grabbers or a barrel grappler. In a large-scale drum handling operation, drums may be conveyed to the drum opening area using a roller conveyor.

2.7.4 Drum Opening

There are three basic techniques available for opening drums at hazardous waste sites:

- Manual opening with non-sparking bung wrenches,
- Drum deheading, and
- Remote drum puncturing or bung removal.

The choice of drum opening techniques and accessories depends on the number of drums to be opened, their waste contents, and physical condition. Remote drum opening equipment should always be considered in order to protect worker safety. Under OSHA 1910.120, manual drum opening with bung wrenches or deheaders should be performed only with structurally sound drums having contents that are known to be (1) not shock sensitive, (2) non-reactive, (3) non-explosive, and (4) non-flammable.

Manual Drum Opening with a Bung Wrench

Manual drum opening with bung wrenches (Figure 1, Appendix B) should not be performed unless the drums are structurally sound (no evidence of bulging or deformation) and their contents are known to be non-explosive. If opening the drum with bung wrenches is deemed reasonably cost-effective and safe, then follow these procedures to minimize the hazard:

1. Fully outfit field personnel with protective gear.
2. Position drum upright with the bung up, or, for drums with bungs on the side, lay the drum on its side with the bung plug up.
3. Wrench the bung with a slow, steady pulling motion across the drum. If the length of the bung wrench handle provides inadequate leverage for unscrewing the plug, attach a "cheater bar" to the handle to improve leverage.

Manual Drum Opening with a Drum Deheader

Drums are opened with a drum deheader (Figure 2, Appendix B) by first positioning the cutting edge just inside the top chime and then tightening the adjustment screw so that the deheader is held against the side of the drum. Moving the handle of the deheader up and down while sliding the deheader along the chime will cut off the entire top. If the top chime of a drum has been damaged or badly dented, it may not be possible to cut off the entire top. Since there is always the possibility that a drum may be under pressure, make the initial cut very slowly to allow for the gradual release of any built-up pressure. A safer technique would be to use a remote method to puncture the drum prior to using the deheader.

Self-propelled drum openers which are either electrically or pneumatically driven can be used for quicker and more efficient deheading.

Manual Drum Opening with a Hand Pick, Pickaxe, or Spike

When a drum must be opened and neither a bung wrench nor a drum deheader is suitable, the drum can be opened for sampling by using a hand pick, pickaxe, or spike (Figure 3, Appendix B). Often the drum lid or head must be hit with a great deal of force in order to penetrate it. The potential for splash or spraying is greater than with other opening methods and, therefore, this method of drum opening is not recommended, particularly when opening drums containing liquids. Some spikes used have been modified by the addition of a circular splash plate near the penetrating end. This plate acts as a shield and reduces the amount of splash in the direction of the person using the spike. Even with this shield, good splash gear is essential.

Since drums cannot be opened slowly with these tools, spray from drums is common requiring appropriate safety measures. Decontaminate the pick or spike after each drum is opened to avoid cross-contamination and/or adverse chemical reaction from incompatible materials.

Remote Drum Opening with a Backhoe Spike

Remotely operated drum opening tools are the safest available means of drum opening. Remote drum opening is slow, but is much safer compared to manual methods of opening.

Drums should be "staged" or placed in rows with adequate aisle space to allow ease in backhoe maneuvering. Once staged, the drums can be quickly opened by punching a hole in the drum head or lid with the spike.

The spike (Figure 4, Appendix B) should be decontaminated after each drum is opened to prevent cross-contamination. Even though some splash or spray may occur when this method is used, the operator of the backhoe can be protected by mounting a large shatter-resistant shield in front of the operator's cage. This, combined with the required level of personal protection gear, should be sufficient to protect the operator. Additional respiratory protection can be afforded by providing the operator with an on-board airline system.

Remote Drum Opening with Hydraulic Devices

A piercing device with a metal point is attached to the end of a hydraulic line and is pushed into the drum by hydraulic pressure (Figure 5, Appendix B). The piercing device can be attached so that the sampling hole can be made on either the side or the head of the drum. Some of the metal piercers are hollow or tube-like so that they can be left in place if desired and serve as a permanent tap or sampling port. The piercer is designed to establish a tight seal after penetrating the container.

Remote Drum Opening with Pneumatic Devices

Pneumatically-operated devices utilizing compressed air have been designed to remove drum bungs remotely (Figure 6, Appendix B).

2.7.5 Drum Sampling

After the drum has been opened, monitor headspace gases using an explosimeter and organic vapor analyzer. In most cases it is impossible to observe the contents of these sealed or partially sealed vessels. Since some layering or stratification is likely in any solution left undisturbed over time, take a sample that represents the entire depth of the vessel.

When sampling a previously sealed vessel, check for the presence of a bottom sludge. This is easily accomplished by measuring the depth to the apparent bottom, then comparing it to the known interior depth.

Glass Thief Sampler

The most widely used implement for sampling is a glass tube commonly referred to as a glass thief (Figure 7, Appendix B). This tool is simple, cost effective, quick, and collects a sample without having to decontaminate. Glass thieves are typically 6mm to 16mm I.D. and 48 inches long.

Procedures for using a glass thief are as follows:

1. Remove cover from sample container.

2. Insert glass tubing almost to the bottom of the drum or until a solid layer is encountered. About one foot of tubing should extend above the drum.

3. Allow the waste in the drum to reach its natural level in the tube.

4. Cap the top of the sampling tube with a tapered stopper or thumb, ensuring liquid does not come into contact with stopper.

5. Carefully remove the capped tube from the drum and insert the uncapped end in the sample container.

6. Release stopper and allow the glass thief to drain until the container is approximately 2/3 full.

7. Remove tube from the sample container, break it into pieces and place the pieces in the drum.

8. Cap the sample container tightly and place prelabeled sample container in a carrier.

9. Replace the bung or place plastic over the drum.

10. Log all samples in the site logbook and on field data sheets.

11. Package samples and complete necessary paperwork.

12. Transport sample to decontamination zone to prepare it for transport to the analytical laboratory.

In many instances a drum containing waste material will have a sludge layer on the bottom. Slow insertion of the sample tube down into this layer and then a gradual withdrawal will allow the sludge to act as a bottom plug to maintain the fluid in the tube. The plug can be gently removed and placed into the sample container by the use of a stainless steel lab spoon.

It should be noted that in some instances disposal of the tube by breaking it into the drum may interfere with eventual plans for the removal of its contents. This practice should be cleared with the project officer or other disposal techniques evaluated.

COLIWASA Sampler

Some equipment is designed to collect a sample from the full depth of a drum and maintain it in the transfer tube until delivery to the sample bottle. These designs include primarily the Composite Liquid Waste Sampler (COLIWASA) and modifications thereof. The COLIWASA (Figure 8, Appendix B) is a much cited sampler designed to permit representative sampling of multiphase wastes from drums and other containerized wastes. One configuration consists of a 152 cm by 4 cm I.D. section of tubing with a neoprene stopper at one end attached by a rod running the length of the tube to a locking mechanism at the other end.

Manipulation of the locking mechanism opens and closes the sampler by raising and lowering the neoprene stopper. One model of the COLIWASA is shown in Appendix B: however, the design can be modified and/or adapted somewhat to meet the needs of the sampler.

The major drawbacks associated with using a COLIWASA concern decontamination and costs. The sampler is difficult, if not impossible to decontaminate in the field and its high cost in relation to alternative procedures (glass tubes) make it an impractical throwaway item. It still has applications, however, especially in instances where a true representation of a multiphase waste is absolutely necessary.

Follow these procedures for using the COLIWASA:

1. Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.

2. Slowly lower the sampler into the liquid waste. Lower the sampler at a rate that permits the levels of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sample tube is lower than that outside the sampler, the sampling rate is too fast and will result in a non-representative sample.

3. When the sampler stopper hits the bottom of the waste container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.

4. Slowly withdraw the sample from the waste container with one hand while wiping the sampler tube with a disposable cloth or rag with the other hand.

5. Carefully discharge the sample into a suitable sample container by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in a sample container.

6. Cap the sample container tightly and place prelabeled sample container in a carrier.

7. Replace the bung or place plastic over the drum.

8. Log all samples in the site logbook and on field data sheets.

9. Package samples and complete necessary paperwork.

10. Transport sample to decontamination zone to prepare it for transport to the analytical laboratory.

2.8 CALCULATIONS

This section is not applicable to this SOP.

2.9 QUALITY ASSURANCE/ QUALITY CONTROL

The following general quality assurance procedures apply:

- Document all data on standard chain of custody forms, field data sheets, or within site logbooks.

- Operate all instrumentation in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

2.10 DATA VALIDATION

This section is not applicable to this SOP.

2.11 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, and specific health and safety procedures.

The opening of closed containers is one of the most hazardous site activities. Maximum efforts should be made to ensure the safety of the sampling team. Proper protective equipment and a general awareness of the possible dangers will minimize the risk inherent in sampling operations. Employing proper drum-opening techniques and equipment will also safeguard personnel. Use remote sampling equipment whenever feasible.

U.S. EPA ENVIRONMENTAL RESPONSE TEAM

RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
STANDARD OPERATING PROCEDURES
SPECTRACE 9000 FIELD PORTABLE X-RAY FLOURESCENCE OPERATING PROCEDURE

U.S.EPA CONTRACT 68-C4-0022

CONTENTS

CONTENTS (Cont'd)

CONTENTS (Cont'd)

* These sections affected by Revision 0.0

SUPERCEDES: SOP #1713, Revision 1.0; 08/31/92; U.S. EPA Contract 68-03-3482.

1.0 SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to serve as a guide to the start-up, check out, operation, calibration, and routine use of the Spectrace 9000 field portable x-ray fluorescence instrument for field use in screening hazardous or potentially hazardous inorganic materials. It is not intended to replace or diminish the use of the Spectrace 9000 Operating Instructions. The Operating Instructions contain additional information for optimizing instrument performance and for utilizing different applications.

The procedures contained herein are general operating guidelines which may be changed as required, depending on site conditions, equipment limitations, limitations imposed by Quality Assurance\Quality Control (QA\QC) procedure or other protocol limitations. In all instances, the procedures finally employed should be documented and included in any or all final reports. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

1.1 Principles of Operation

X-ray Fluorescence (XRF) spectroscopy is a non destructive qualitative and quantitative analytical technique used to determine the chemical composition of samples. In a source excited XRF analysis, primary X-rays emitted from a sealed radioisotope source are utilized to irradiate samples. During interaction with samples, source X-rays may either undergo scattering (dominating process) or absorption by sample atoms in a process known as the photoelectric effect (absorption coefficient). This phenomenon originates when incident radiation knocks out an electron from the innermost shell of an atom creating a vacancy. The atom is excited and releases its surplus energy almost instantly by filling the vacancy with an electron from one of the higher energy shells. This rearrangement of electrons is associated with the emission of X-rays characteristic (in terms of energy) of the given atom. This process is referred to as emission of fluorescent X-rays (fluorescent yield). The overall efficiency of the fluorescence process is referred to as excitation efficiency and is proportional to the product of the absorption coefficient and the fluorescent yield.

1.1.1 Characteristic X-rays

The Spectrace 9000 utilizes characteristic X-ray lines originating from the innermost shells of the atoms: K, L, and occasionally M. The characteristic X-ray lines of the K series are the most energetic lines for any element and, therefore, are the preferred analytical lines. The K lines are always accompanied by the L and M lines of the same element. However, with energies much lower than those of the K lines, they can usually be neglected for those elements for which the K lines are analytically useful. For heavy elements such as cerium (Ce) (atomic number [Z]=58), to uranium (U, Z=92), the L lines are the preferred lines for analysis. The L_α and L_β lines have almost equal intensities, and the choice of one or the other depends on what interfering lines might be present. A source just energetic enough to excite the L lines will not excite the K lines of the same element. The M lines will appear together with the L lines.

The Spectrace 9000 Operating Instructions contain a table that identifies the X-rays (K or L) and elements measured for each excitation source.

An X-ray source can excite characteristic X-rays from an element only if the source energy is greater than the absorption edge energy for the particular line group of the element (e.g., K absorption edge, L absorption edge, M absorption edge). The absorption edge energy is somewhat greater than the corresponding line energy. Actually, the K absorption edge energy is approximately the sum of the K, L, and M line energies, and the L absorption edge energy is approximately the sum of the L and M line energies of the particular element.

Energies of the characteristic fluorescent X-rays are converted (within the detector) into a train of electric pulses, the amplitudes of which are linearly proportional to the energy. An electronic multichannel analyzer (electronic unit) measures the pulse amplitudes, which is the basis of a qualitative X-ray analysis. The number of counts at a given energy is representative of element concentration in a sample and is the basis for quantitative analysis.

1.1.2 Scattered X-rays

The source radiation is scattered from the sample by two physical processes: coherent or elastic scattering (no energy loss), and Compton or inelastic scattering (small energy loss). Thus, source backscatter (background signal) actually consists of two components with X-ray lines close together. The higher energy line is equal to the source energy. Since the whole sample takes part in scattering, the scattered X-rays usually yield the most intense lines in the spectrum. Furthermore, the scattered X-rays have the highest energies in the spectrum and, therefore, contribute most of the total measured intensity signal.

1.2 Sample Types

Solid and liquid samples can be analyzed for elements aluminum (Al) through uranium (U) with proper X-ray source selection and instrument calibration. Typical environmental applications are:

- Heavy metals in soil (in-situ or samples collected from the surface or from bore hole drillings, etc.), sludges, and liquids (e.g., lead (Pb) in gasoline)
- Light elements in liquids (e.g., phosphorus [P], sulphur [S], and chlorine [Cl] in organic solutions)
- Heavy metals in industrial waste stream effluents
- PCB in transformer oil by Cl analysis
- Heavy metal air particulates collected on membrane filters, either from personnel samplers or from high volume samplers.
- Lead (Pb) in paint

2.0 METHOD SUMMARY

The Spectrace 9000 Portable XRF Analyzer employs three radioactive isotope sources: iron-55 (Fe-55), cadmium-109 (Cd-109), and americium-241 (Am-241) for the production of primary X-rays. Each source emits a specific set of primary X-rays which excite a corresponding range of elements in a sample. When more than one source can excite the element of interest, the appropriate source is selected according to its excitation efficiency for the element of interest. See page 1-2 of the Spectrace 9000 Operating Instructions for a chart of source type versus element range.

The sample is positioned in front of the source-detector window and sample measurement is initiated which exposes the sample to primary radiation from the source. Fluorescent and backscattered X-rays from the sample enter through the beryllium (Be) detector window and are counted in the high resolution mercuric iodide (HgI_2) detector.

Elemental concentrations are computed using a Fundamental Parameter (FP) algorithm of the form:

$$\text{Concentration} = R \times S \times (1 + \text{SUM}\{A_n \times C_n\})$$

"R" is the measured analyte X-ray intensity relative to the pure element; "S" is a calculated sensitivity coefficient. The quantity SUM{} is a summation of "n"-element absorption-enhancement terms containing calculated alpha-coefficients and iteratively computed element concentrations. The Spectrace 9000 utilizes FP XRF calibrations derived from theoretical considerations (as opposed to empirical data). The menu-driven software in the Spectrace 9000 supports multiple XRF calibrations called "applications." Each application is a complete analysis configuration including elements to be measured, interfering elements in the sample, and a set of FP calibration coefficients.

The measurement time of each source is user-selectable. The shorter source measurement times (15 -30s) are generally used for initial screening and hot spot delineation, while longer measurement times (30 - 500s) are typically used for higher precision and accuracy requirements.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING AND STORAGE

This SOP specifically describes equipment operating procedures for the Spectrace 9000; hence, this section is not applicable to this SOP.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

The total method error for XRF analysis is defined as the square root of the sum of squares of both instrument precision and user or application related error. Generally, the instrument precision is the least significant source of error in XRF analysis. User- or application-related error is generally more significant and will vary with each site and method used. The components of the user or application related error are the following.

4.1 Sample Placement

This is a potential source of error because the X-ray signal decreases as the distance from the radioactive source is increased. However, this error is minimized by maintaining the same distance for each sample.

4.2 Sample Representivity

In order to accurately characterize site conditions, samples collected must be representative of the site or area under investigation. Representative soil sampling ensures that a sample or group of samples accurately reflects the concentration of the contaminant(s) of concern at a given time and location. Analytical results from representative samples reflect the variation in pollutant presence and concentration range throughout a site. Variables affecting sample representativeness include: (1) geologic variability, (2) contaminant concentration variability, (3) collection and preparation variability, and (4) analytical variability. Attempts should be made to minimize these sources of variability. For additional information on representative sampling, refer to the "Removal Program Representative Sampling Guidance, Volume 1 - Soil."[1]

4.3 Reference Analysis

Soil chemical and physical matrix effects may be corrected by using site-specific soil samples which have been analyzed by Inductively-Coupled Plasma (ICP) or Atomic Absorption (AA) spectroscopy as calibration samples. A major source of error can result if these samples are not representative of the site and/or if the analytical error is large. Additionally, when comparing XRF results with reference analyses results, the efficiency of the sample digestion reference analysis should be considered. Some digestion methods may breakdown different sample matrices more efficiently than others.

4.4 Chemical Matrix Effects (Due to the Chemical Composition of the Sample)

Chemical matrix effects result from differences in concentrations of interfering elements. These effects appear as either spectral interferences (peak overlaps) or as X-ray absorption/enhancement phenomena. Both effects are common in soils contaminated with heavy metals. For example, iron (Fe) tends to absorb copper (Cu) X-rays, reducing the intensity of Cu measured by the detector. This effect can be corrected mathematically through the use of FP coefficients.

4.5 Physical Matrix Effects (Due to Sample Morphology)

Physical matrix effects are the result of variations in the physical character of the sample. They may include such parameters as particle size, uniformity, homogeneity, and surface condition. For example, consider a sample in which the analyte exists in the form of very fine particles within a matrix composed of much courser material. If two separate aliquots of the sample are prepared in such a way that the matrix particles in one are much larger than in the other, then the relative volume of analyte occupied by the analyte-containing particles will be different in each. When measured, a larger amount of the analyte will be exposed to the source X-rays in the sample containing finer matrix particles; this results in a higher intensity reading for that sample and,

consequently, an apparently higher measured concentration for that element.

4.6 Application Error

Generally, the error in the application calibration model is insignificant (relative to the other sources of error) PROVIDED the instrument's operating instructions are followed correctly. However, if the sample matrix varies significantly from the design of the application, the error may become significant (e.g., using the soils application to analyze a 50 percent iron mine tailing sample).

4.7 Moisture Content

Sample moisture content will affect the analytical accuracy of soils or sludges. The overall error may be secondary when the moisture range is small (5-20 percent), or it may be a major source of error when measuring the surface of soils that are saturated with water.

4.8 Cases of Severe X-ray Spectrum Overlaps

When present in the sample, certain X-ray lines from different elements can be very close in energy and, therefore, can interfere by producing a severely overlapped spectrum.

The typical spectral overlaps are caused by the K_β line of element Z-1 (or as with heavier elements, Z-2 or Z-3) overlapping with the K_α line of element Z. This is the so-called K_α/K_β interference. Since the K_α:K_β intensity ratio for the given element usually varies from 5:1 to 7:1, the interfering element, Z-1, must be present in large concentrations in order to disturb the measurement of analyte Z. The presence of large concentrations of vanadium (V) could disturb the measurement of chromium (Cr). The V K_α and K_β energies are 4.951 and 5.427 Kev, respectively. The Cr K_α energy is 5.41 Kev. The resolution of the detector is approximately 270 eV. Therefore, large amounts of V in a sample will result in spectral overlap of the V K_β with the Cr K_α peak (see Figure 1, Appendix A) and the measured X-ray spectrum will include TOTAL counts for Cr plus V lines.

Other interferences arise from K/L, K/M, and L/M line overlaps. While these are less common, the following are examples of severe overlap:

As K_α/Pb L_α, S K_α/Pb M_α

In the arsenic (As)/lead case, Pb can be measured from the Pb L_β line, and arsenic from either the As K_α or the As K_β line; this way the unwanted interference can be corrected. However, due to the limits of mathematical corrections, measurement sensitivity is reduced. Generally, arsenic concentrations can not be efficiently calculated in samples with Pb:As ratios of 10:1 or more. This may result in zero arsenic being reported regardless of what the actual concentration is.

The Spectrace 9000 uses overlap factors to correct for X-ray spectral overlaps for the elements of interest for a given application.

5.0 EQUIPMENT / APPARATUS

5.1 Description of the Spectrace 9000 System

The analyzer utilizes the method of Energy Dispersive X-Ray Fluorescence (EDXRF) spectrometry to determine the elemental composition of soils, sludges, aqueous solutions, oils, and other waste materials.

The Spectrace 9000 analyzer includes three compact, sealed radiation sources contained in a measuring probe: Fe-55, Cd-109, and Am-241. The analyzer software automatically selects which sources to use as well as measurement time for each source based on stored information for each application. The probe is equipped with a high resolution HgI_2 detector, which is connected by cable to an environmentally sealed electronic module.

The electronic unit provides internal non volatile memory for storage of 120 spectra and 300 multi-element analysis reports. An RS-232 serial port is provided for downloading data and spectra to a peripheral device. The multi-element analysis reports and the 2000-channel spectra can be displayed on the instrument's LCD panel. The replaceable and rechargeable internal battery provides for field-portable operation.

The Spectrace 9000 is supplied with three factory-installed FP-based applications (calibrations). The "Soil Samples" application is for analysis of soils where the balance of the sample (that portion not directly measured by the instrument) is silica (SiO_2). The "Thin Film" application is for analysis of thin films such as air monitoring filters or wipes. Finally, the "PbK in Paint" application is for analyzing Pb in paint films and is reasonably independent of the type of substrate. Spectrace Instruments will also develop calibrations to meet new user application requirements (e.g., adding elements to the present "Soil Samples" application). The PC-based Spectrace 9000 Application Generator software may also be used to develop new applications.

The Spectrace 9000 can be powered from a 115-volt (or 220-volt) wall outlet or from its 4-hour capacity battery. It can be operated in temperatures ranging from 32 to 120° Fahrenheit (F). Furthermore, the probe and electronic unit may be exposed to a light rain. However, additional protection is provided when the system (electronic unit and probe) is contained in the optional water repellant carrying case.

5.2 Equipment and Apparatus List

5.2.1 Spectrace 9000 Analyzer System

The complete Spectrace 9000 Analyzer System includes:

- Analyzer unit for data acquisition, processing, and display
- Hand-held probe including:
  - High-resolution HgI_2 detector
  - Three excitation sources (^{55}Fe, ^{109}Cd, ^{241}Am)

- Safety cover

- Probe laboratory stand with the following:
  - Base for table top use
  - Safety shield over sample
  - Positioning fixtures for standard 30-mm and 40-mm X-ray sample cups

- Interconnecting cable

- RS-232C Serial I/O Interface cable

- Two blank check samples

- Pure element check samples

- Battery charger

- Battery pack

- System carrying/shipping case

- Spectrace 9000 Operating Instructions, application software, and utilities software. The application software is specific to each unit and cannot be interchanged between different units. The software is identified by the serial number of the unit.

5.2.2 Optional Items

- 31-mm diameter sample cups

- XRF polypropylene film, 0.2 mil thick

- Field carrying case

- Peripheral devices such as a printer and IBM compatible Personal Computer (PC)

- Spare probe window assembly

- Spare battery pack, charger, and charger adaptor (required to charge spare battery outside of electronic unit)

See the Spectrace 9000 Accessories Price List for additional options.

For mobile lab or laboratory X-ray sample preparation accessories (such as drying ovens, grinders, sieves, etc.), consult general laboratory equipment suppliers.

5.2.3 Limits and Precautions

The probes should be handled in accordance with the following radiological control practices.

1. The probe should always be in contact with the surface of the material being analyzed, and that material should completely cover the probe opening (aperture) when the sources are exposed. Do not remove a sample or move the probe while the indicators show SOURCE ON.

   SOURCE ON indicators are:

   - the message on the screen "SOURCE ON"
   - the flashing light at the base of the probe.

2. When the sources are exposed, under no circumstances should the probe be pointed at the operator or surrounding personnel.

3. Do not place any part of the operator's or co-worker's bodies in line of exposure when the sources are exposed or partially covered.

4. The probe must be covered with the safety cover or laboratory safety shield when not in use.

5. Spectrace Instruments must be notified immediately of any condition or concern relative to the probe's structural integrity, source shielding, source switching condition, or operability.

6. The appropriate state agency or the Nuclear Regulatory Commission (NRC) office must be notified immediately of any damage to the radioactive source, or any loss or theft of the device (see factory supplied data on radiological safety).

7. Labels or instructions on the probe(s) must not be altered or removed.

8. The user must not attempt to open the probe.

9. The source(s) in the probe must be leak-tested every 6 months as described in the Spectrace 9000 Operating Instructions. The leak test certificates must be kept on file, and a copy must accompany the instrument at all times.

10. The probe laboratory safety shield assembly must be used when the probe is inverted for measuring samples contained in cups.

11. During operation, the probe must be kept at least 10 feet from computer monitors and any other source of radio frequency (RF). Some monitors have very poor RF shielding and will affect measurement results.

12. The Spectrace 9000 should not be dropped or exposed to conditions of excessive shock or vibration.

13. The electronic unit should be left on whenever the battery charger is connected to it. If the electronic unit is shut off with the battery charger plugged in, the battery may be damaged due to overcharging.

Additional precautions include:

1. The probe cable must never be pulled while unplugging the probe. The probe plug should be grasped at the ribbed metal connector and squeezed and pulled gently while the connector is unplugged. The connector must never be forced when plugging in the connector.

2. The handle of the electronic unit must not be rotated unless the release buttons on each side of the handle are depressed.

3. The Spectrace 9000 should not be stored at an ambient temperature below -4°F or above 110°F.

4. The battery charging unit should only be used indoors in dry conditions.

5. Battery packs should be changed only in dry conditions.

5.3 Peripheral Devices

The Spectrace 9000 may be used with a wide range of peripheral devices for electronic data capture or printed readout as long as they are compatible with the RS-232 serial I/O protocol. Such devices include terminals, printers, electronic data loggers, personal computers, etc.

5.3.1 Communication Cable Connection

Plug the 25-pin connector of the RS-232 Serial I/O cable into the Spectrace 9000 25-pin connector (the connection just below the display screen on the electronic unit) and the 9-pin connector of the cable into the serial port of the receiving device.

5.3.2 Communication Port Setup

To communicate with an external device, the Spectrace 9000 MUST be set at the same baud rate, word length, and parity as the receiving device. The Spectrace 9000 allows you to select various configurations for these parameters in the communication (Comm.) port setup portion of the More submenu (which can be accessed from the main menu).

The default COM setup for application and utilities software is 9600,N,8,1.

5.3.3 User Software

Refer to your PC software manual for details on additional settings that may be required for proper interfacing between the Spectrace 9000 and your particular software.

5.4 Instrument Maintenance

5.4.1 Probe Window

Should the probe window become damaged or punctured, it should be replaced as soon as possible to prevent dust and moisture from entering the probe. Replacement window assemblies can be ordered from Spectrace Instruments. Note the location of the window aperture: it is closer to one end of the window plate. Simply unscrew the old window plate, press any corner of it, and remove it. Stretch the O-ring for 10 seconds, and lay it back in the groove. The O-ring must lie flat in the groove in order for the new window plate to be installed. Install the new window assembly in the same manner as the old. If the surface of the window plat is not flush with the face of the probe, the O-ring has probably come out of the grove. Remove the assembly, and try the same procedure again.

5.4.2 Further Information and Troubleshooting

Refer to the Spectrace 9000 Operating Instructions for additional detailed operational and/or maintenance and troubleshooting instructions. If no solution is found in the manual, contact Spectrace Instruments for assistance.

An instrument log should be maintained to document specific corrective actions taken to alleviate any instrumental problems, or for recording any service that has been performed.

6.0 REAGENTS

Generally, calibration standards are not necessary for site screening and extent of contamination analyses with the Spectrace 9000. Optionally, an application (only the Soil Sample application will be discussed here) can be optimized or verified to be 1:1 proportional to another analytical (reference) method (see Section 9.3 and 10.1). This can be done by analyzing a suitable set of Site-Specific Calibration Standards (SSCS) or Standard Reference Materials (SRMs) and performing a regression analysis on the reference (dependent) and the Spectrace 9000 results (independent) for each element of concern. SCSS and SRMs must be representative of the sample matrix to be analyzed by XRF, for example, National Institute of Standards and Technology (NIST) SRMs 2709, 2710, and 2711 for the soil application. In an application, any element's calibration can be adjusted by entering the desired slope and offset (intercept) in the Adjust Calibration menu. If any element's calibration has been adjusted in an application, "adj" will appear on the results screen. An adjusted element calibration can always be changed back to the initial slope and offset values of 1 and 0, respectively.

7.0 PROCEDURE

7.1 Prerequisites

If the Spectrace 9000 will be used in a location where AC power outlets are conveniently accessible, connect the battery charger to the electronic unit and plug the charger cord into the outlet. The probe cable must be connected before switching on the power. Plugging and unplugging this cable with the power on can damage the detector.

To connect the battery, set the electronics unit on its face and use a flat blade screwdriver to loosen the two one-quarter turn fasteners on the back. Remove the battery pack. Inside, find the cord with the red cap covering the three-pronged plug. Remove the cap and plug it into the battery pack. Put the battery pack into the unit and tighten the fasteners.

Apply power to the Spectrace 9000 by pressing the <ON> button. The electronic unit may not come on with the battery charger hooked up if the battery has been totally drained. The drained battery may require a 10 minute charge prior to startup. In a few seconds the display shows the version of software. If necessary, adjust the contrast knob located on the underside of the front display. This knob can be turned so far that the display appears blank.

The initial screen displays for about 10 seconds and then a prompt will ask if the time and date are set correctly. The date MUST be set correctly otherwise serious errors in source-decay compensation can result. Additionally, results tables include the time and date of analysis. The main menu appears after the time and date screens.

If a "battery low" message appears, recharge or change the battery before proceeding, or operate the unit using line voltage.

Allow the Spectrace 9000 to warm up for approximately 30 minutes after it has been turned on before performing analysis.

7.1.1 Gain Control

Automatic gain compensation is a feature of both Soil and Thin Samples applications, which allows operation of the instrument over a wide range of ambient temperatures and from one day to another without standardization. To maintain gain control compensation, it is necessary to occasionally operate with a minimum acquisition time of 50 seconds on the Cd-109 source. If the automatic gain control fails or is out of range, an error message will appear on the screen. If the error message continues to appear after repeat analyses, then the Cd-109 measurement time should be checked and/or an energy calibration should be performed. If the problem continues, contact Spectrace Instruments for help.

7.1.2 Setting Data and Spectrum Store/Send Mode

The Set store/send modes option is located in the More screen which can be accessed from the main menu. Data and/or Spectrum storage must be enabled for automatic on-

board storing to occur. Sufficient memory is available to store up to 300 sets of analysis results and up to 120 spectra (40 samples since each sample has three spectra). When the available memory is full, the respective spectra or results storage mode is automatically disabled. The spectra or results memory must be cleared (deleted) and the respective store mode enabled before results and/or spectra can be stored again.

7.2 General Keys and Menu Software

This section outlines the general keys and basic menu software. Flow charts which describe the menu structure in detail are located on pages 4-13 through 4-17 in the Spectrace 9000 Operating Instructions.

7.2.1 The Keyboard

The row of numeric keys under the LCD screen performs functions defined by labels (a menu) written to the bottom line of the display by the Spectrace 9000 software. As the operator moves through the various menus, the keys are redefined to provide an efficient user interface.
The keypad to the right of the screen is used for numeric entry. The <Cont/Pause> key (referred to as the <Cont>) is used:

- to enter information as an <Enter> key
- to begin an analysis
- to pause an analysis in progress

The left arrow <←> key is used to edit entries before pressing <Cont>.

7.2.2 The Measure (Ready) Screen

This main menu selection displays the application name, revision date, measurement time for each source, and accesses other options (see flow diagrams in Spectrace 9000 Operating Instructions).

7.2.3 The Choose an Application Screen

This main menu selection lists the applications currently loaded in the unit. Applications are selected and source measurement times may be modified in this screen (see flow diagrams in Spectrace 9000 Operating Instructions).

7.2.4 The Review Stored Results Screen

This main menu selection lists the stored results. *Up* and *Down* scroll are used on many screens. When *Up* and *Down* are displayed, pressing the <0> (zero) key will toggle to *PgUP* and *PgDN* for rapid movement through long lists. Stored results may be reviewed.

deleted or downloaded to the COM port (see flow diagrams in Spectrace 9000 Operating Instructions).

7.2.5 The Review Stored Spectra Screen

This main menu selection lists the stored spectra which may be deleted or transmitted to the COM port (see flow diagrams in Spectrace 9000 Operating Instructions). You cannot display spectra under this screen. Spectra may be displayed in the *Examine Spectrum* portion of the More screen (accessed from the main menu) or in the *Examine Spectrum* selection from the Results screen under the *More Options* menu selection.

7.2.6 The More (Other Functions) Screen

This main menu selection lists the following functions:

- *Set clock/calendar*
- *Comm. port setup*
- *Set store/send modes*
- *Application maintenance*
- *Examine spectrum*

7.2.7 The Results Screen

The Results screen is displayed at the end of the analysis. If the automatic *Store Results* mode is enabled, you will be prompted for sample identification (*ID*) before the Results screen is displayed. *Up* or *Down* scrolls the screen to view more results. When *Up* and *Down* are displayed, pressing the <0> (zero) key will toggle to *PgUP* and *PgDN* for rapid movement through long lists. *Send* transmits results to the COM port. *Store* prompts for an ID and then stores results in memory. *Measr* will immediately begin another analysis cycle. *Optn* displays the first of two screens listing special options under the Results screen (the second screen is located under *More Optn* of the first screen. See flow diagrams in Spectrace 9000 Operating Instructions). The most frequently used functions are the *Examine Spectrum* and *Enable/Disable Display Thresholds* located on the second screen of options.

7.3 Preoperational Checks

7.3.1 Energy Calibration Check

An energy calibration should be performed after an instrument is shipped and periodically (approximately 2 weeks) to ensure proper energy calibration. The *Energy Calibration* function is located in the *Options* section of the Measure Screen. You will be prompted to place the safety shield on the probe and then initiate a 600- second analysis that will update the X-ray energy calibration.

The energy calibration check is performed in the field daily and after an energy calibration to verify proper energy calibration. To perform an energy calibration check place the safety shield on the probe. Select the *Soil Samples* application and measure the safety shield using a minimum acquisition time of 60 seconds for each source. Save the results and spectra for documentation. Select *Opts*, *More Options*, and then *Examine Spectrum*. Examine the spectrum of each source. Locate and record the centroid KeV (using the x12 horizontal magnification) for each of the following peaks:

Source	Peak	Theoretical (KeV)	Specification (KeV)
Cd-109	Pb L-alpha	10.54	± 0.040
	Pb L-beta	12.61	± 0.040
	Pb L-gamma	14.76	± 0.040
	Source line	22.10	± 0.040
Fe-55	S K-alpha	2.31	± 0.020
	Source line	5.89	± 0.020
Am-241	Pb L-alpha	10.54	± 0.050
	Pb L-beta	12.61	± 0.050
	Source line	59.5	± 0.200

Perform an *Energy calibration* (see Spectrace 9000 Operating Instructions) and then do another energy calibration check if any of the peaks fail to meet specification. The energy calibration check should be performed once at the beginning of the day, after an energy calibration, after loading an application, and whenever the instrument exhibits a persistent drift.

7.3.2 Resolution Check 2nd

The resolution check examines the detector's ability to resolve X-ray energies. This should be performed once at the beginning of the day. Select the *Soil Samples* application, and measure a sample of iron using a minimum acquisition time of 60 seconds for the Cd-109 source. Save the results and spectra for documentation. Select *Examine spectrum* under the More Options section of the Results screen. Examine the Cd-109 spectrum. Locate and record the maximum peak counts (must be >1000 counts) of the iron K-alpha peak (6.4 KeV) using the x12 horizontal magnification (see Figure 2, Appendix A). Divide the maximum peak counts by two. Examine the right (high energy) side of the peak and record the counts and KeV of the channel with counts less than or equal to one-half the maximum peak count value (channel B, Figure 2). Examine the left (low energy) side of the peak and record the counts and KeV of the channel with counts less than or equal to one-half the maximum peak count value (channel A, Figure 2). Subtract the left-side KeV from the right-side KeV (KeV at B - Kev at A, Figure 2). The difference should be less than 0.300 KeV. If the unit fails to meet this specification, call Spectrace Instruments for assistance.

7.3.3 Blank (Zero) Sample Check

The blank (Zero) sample check is performed to monitor the instrument's zero drift in the selected application. The blank sample check and the *Aquire Background Data* operation (discussed below) only apply to the application currently selected. This should be done once at the beginning of the day, after an energy calibration, after loading an application, and whenever the instrument exhibits a persistent drift on a blank or low-level sample.

Mount the probe in the laboratory stand and select the *Soil Samples* application. Disable the display thresholds. This will permit results less than one standard deviation (STD) to be displayed (even negatives). Measure the quartz blank provided with the unit (or a "clean" sand sample) using a minimum acquisition time of 60 seconds for each source. Review the results table. All elemental results for target elements with atomic number 24 (Cr) and higher in the periodic table should be within 3 standard deviations of zero ($0 \pm 3 \cdot |STD|$); all non-target element results should be within 5 standard deviations ($0 \pm 5 \cdot |STD|$). Repeat the measurement if the unit fails to meet these specifications. If several elements continue to be significantly out of these specifications, check the probe window and the blank sample for contamination or perform the *Acquire background data* operation located in the Measure (Ready) screen option. Perform the blank (Zero) sample check again. Save the results and spectra for documentation. Enable the display thresholds prior to sample analysis after the blank sample check procedure is completed.

7.3.4 Target Element Response Check

The purpose of the target element response check is to ensure that the instrument and the selected application are working properly prior to performing sample analysis. This check should be performed at the beginning of the day. Use low, mid, and high samples, or standards with known concentrations for some or all of the target elements to be checked. Select a low sample near the quantitation limit of the target elements. Select a mid sample near the site action level and a high sample near the maximum concentration of the target elements expected on site.

These samples should be measured using the same source acquisition times that will be used for sample analysis. Save the sample check results and spectra for documentation.

7.4 Selecting Source Measuring Time

The source measuring time may be modified under the Measure screen. Zero (seconds) measuring time should never be selected for any source for any application. Generally, the element detection limit is reduced by 50 percent for every four-fold (x4) increase in source measuring time. Although counting statistics improve as measurement time increases, the practical limit for typical applications is 600 to 800 seconds. The elements are grouped together according to the radioisotope used for their excitation with typical minimum detection limits shown in Sections 7.4.2 and 7.4.3.

Automatic gain compensation is a feature of both the Soil and Thin Samples applications which allows operation of the instrument over a wide range of ambient temperatures and from one day to another without standardization. To maintain this gain control compensation, it is necessary to occasionally operate with a minimum acquisition time of 50 seconds on the Cd-109 source.

The *Real/live* option toggles between real time (true clock time) and live time (total time the instrument is counting). The latter adds time to the analysis to correct for the time the system is busy processing pulses.

7.4.1 Minimum Source Measuring Times

A minimum measuring time (real or live) of 15 seconds for the Fe-55 source, 30 seconds for the Cd-109 source, and 10 seconds for the Am-241 source is recommended when using the Soil Samples application. Measuring times for a source that excites a target element can be increased if lower detection limits are required.

When using the Thin Samples application, the measuring time for any source may be reduced to 10 seconds if the source does not excite a target element since this application does not correct for interelement effects. If a source excites a target element, a minimum measuring time (real or live) of 60 seconds for the Fe-55 source, 60 seconds for the Cd-109 source, and 120 seconds for the Am-241 source is recommended.

A minimum of 60 seconds is recommended for the Cd-109 source when using the PbK in Paint application.

7.4.2 Typical Minimum Detection Limits (MDLs) for the Soil Samples Application

For source measuring times of 60 seconds, typical element MDLs (in milligram per kilogram, mg/kg) for the Soil Samples application are:

Source	Element	MDL (mg/kg)
Fe-55	Potassium (K)	325
	Calcium (Ca)	150
	Titanium (Ti)	110
	Chromium (CrLo)	180
Cd-109	Chromium (CrHi)	525
	Manganese (Mn)	410
	Iron (Fe)	225
	Cobalt (Co)	205
	Nickel (Ni)	125
	Copper (Cu)	90
	Zinc (Zn)	[illegible]
	Mercury (Hg)	60

	Arsenic (As)	50
	Selenium (Se)	35
	Lead (Pb)	30
	Rubidium (Rb)	10
	Strontium (Sr)	10
	Zirconium (Zr)	10
	Molybdenum (Mo)	10
Am-241	Cadmium (Cd)	180
	Tin (Sn)	100
	Antimony (Sb)	65
	Barium (Ba)	20

NOTE: These typical MDLs are provided as an aid for selecting source measurement times; observed values for a given situation may vary depending on the matrix of the soil standard used to calculate MDLs, age of sources, moisture content, and other factors discussed in Section 4.

Generally, the detection limit is reduced by 50 percent for every four-fold (x4) increase in source measuring time. Additionally, more elements may be added to the Soil Samples application. Contact Spectrace Instruments for information about modifications to applications.

7.4.3 Typical Minimum Detection Limits (MDLs) for the Thin Samples Application

For source measuring times of 200 seconds for the Fe-55 and Cd-109 sources, and 800 seconds for the Am-241 source, typical element MDLs (in microgram per square centimeter, $\mu g/cm^2$) for the Thin Samples application are:

Source	Element	MDL ($\mu g/cm^2$)
Fe-55	Potassium (K)	0.40
	Calcium (Ca)	0.20
	Titanium (Ti)	0.15
	Chromium (CrLo)	0.40
Cd-109	Chromium (CrHi)	0.90
	Manganese (Mn)	0.65
	Iron (Fe)	0.65
	Cobalt (Co)	0.50
	Nickel (Ni)	0.30
	Copper (Cu)	0.65
	Zinc (Zn)	0.40
	Mercury (Hg)	0.45
	Arsenic (As)	0.40
	Selenium (Se)	[illegible]
	Lead (Pb)	0.50
	Rubidium (Rb)	0.10

	Strontium (Sr)	0.10
	Zirconium (Zr)	0.15
	Molybdenum (Mo)	0.10
Am-241	Cadmium (Cd)	2.5
	Tin (Sn)	2.5
	Antimony (Sb)	1.5
	Barium (Ba)	0.70

NOTE: These typical MDLs are provided as an aid for selecting source measurement times; observed values for a given situation may vary depending on the thin sample standard used to calculate MDLs, age of sources, and other factors discussed in Section 4.

Generally, the detection limit is reduced by 50 percent for every four-fold (x4) increase in source measuring time. Use of thick filters or filters with high background or contamination will result in higher MDLs and require a background subtraction. Additionally, more elements may be added to the Thin Samples application. Contact Spectrace Instruments for information about modifications to applications.

7.5 Sample Handling and Presentation

When making XRF measurements, be sure to maintain constant measurement geometry in order to minimize variations in analysis results. Document any anomalies in measurement geometry, sample surface morphology, moisture content, sample grain size, and matrix (see Section 4.0).

7.5.1 Soil Samples

Soil samples may be analyzed either in-situ or in prepared X-ray sample cups. The Soil Samples application assumes the sample to be infinitely thick. For in-situ measurements this is almost always the case. However, for sample cup measurements it is advisable to fill the cup nearly full and tap it on the bench to compact the soil. This ensures that the sample is as uniformly thick as possible from analysis to analysis. The Spectrace 9000 laboratory stand and safety shield should be used when analyzing sample cups.

An area for in-situ analysis should be prepared by removing large rocks and debris. The soil surface should be rendered flat and compact prior to analysis. The Spectrace 9000 probe should be held firmly on the ground to maximize instrument contact with the ground. The probe should not be moved during analysis. Analysis of water saturated soils should be avoided. A thin layer of 0.2-mil polypropylene XRF film may be mounted on the surface probe to minimize contamination. Use of varying thicknesses of plastic (bags) have been shown to interfere in the light element (low atomic number) measurement and may affect the FP calibration of the other element concentrations.[3] Additionally, plastic may contain significant levels of target element contamination.

Course-grained soil conditions or nuggets of contaminated material may preclude a truly representative sample and adversely affect the analysis results (typically by under reporting the target element). Such samples should be prepared before analysis. Preparation consistency is important to minimize variation in analytical results.

This application is specifically designed for soil with the assumption that the balance of the material is silica. If samples with a much lighter (lower atomic number) balance are analyzed, the results will typically be elevated by a factor of two to four. Contact Spectrace Instruments for help in analysis of different matrices.

7.5.2 Thin (Filter) Samples

The Thin Samples application is for analysis of thin samples such as filters or wipes. The detection limits are affected by the thickness of the substrate. Best results are obtained on the thinnest substrates. Always use the probe safety cover when measuring thin samples. This is not only for user safety, but also ensures a controlled background environment and provides a reference signal for the automatic gain control. Probe safety covers should never be interchanged between instruments.

Filters and wipes should be prescreened before use to establish background and contamination levels. Care should be used to prevent zinc oxide contamination from disposable gloves. Small 37-mm filters can be mounted between two layers of 0.2-mil thick polypropylene XRF film on 40-mm XRF cups for analysis. Larger filters can be placed on the probe with a sheet of 0.2- mil thick polypropylene XRF film between the filter and probe to prevent the window from being contaminated. Then the probe safety cover may be placed over the filter prior to analysis. Filters should be presented loaded side down and wrinkle free.

7.5.3 Lead in Paint

The area selected for analysis should be smooth, representative and free of surface dirt. The Spectrace 9000 probe should be held firmly on the surface to maximize instrument contact. The probe should not be moved during analysis.

When used for specimen application (e.g., on paint chips or nonbacked films) remember to use the probe safety cover. In the PbK Application, you should also position a thick neutral sample, such as the quartz disk (blank), behind the specimen before closing the safety lid. Otherwise, the PbK X-rays excited in the safety cover will be sensed by the detector. In this application, do not perform the *Acquire background data* option from the list of options under the Ready screen.

8.0 CALCULATIONS

The Spectrace 9000 is a direct readout instrument that does not require any calculations.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

9.1 Precision

The precision of the method is monitored by reading a low- or mid-target element concentration sample (or SSCS or SRMs selected as described in Sections 6.0) at the start and end of sample analysis and after approximately every tenth sample. (A daily total of seven measurements is recommended.) Determining the precision around the site action level can be extremely important if the XRF results are to be used in an enforcement action. Therefore, selection of a sample with a target element concentration at or near the site action level or level of concern is recommended. The sample is analyzed by the instrument for the normal field analysis time, and the results are recorded. The standard deviation for each target element is calculated. The relative standard deviation (RSD) of the sample mean can be used to calculate precision. The RSD should be within ± 20 percent for the data to be considered adequately precise.[2]

9.1.1 The Method Detection Limit (MDL) and Method Quantitation Limit (MQL)

The MDL and MQL may be calculated from the measurement of either a low or blank sample, (or a SSCS or SRMs selected as described in section 6.0), at the start and end of sample analysis, and after approximately every tenth sample (a daily total of seven measurements is recommended). Alternatively, the quartz blank or "clean" sand may be used if a blank soil or sediment sample is unavailable.

Disable the display thresholds. This will permit results less then one standard deviation (STD) to be displayed (even negatives). Measure the sample using the same application and measuring time used for the samples. Enable the display thresholds prior to analyzing the next sample.

The sample standard deviation of the mean for each target element is calculated. If the standard deviation has a fractional component, round up to the next whole number prior to calculating the MDL and MQL.

The definition of the MDL is three times the calculated standard deviation value.

The definition of the MQL is 10 times the calculated standard deviation value.

9.2 Reporting Results

All raw XRF data should be reported including the individual results of multiple analyses of samples and sampling points. The average and concentration range of each multiple analysis should also be reported.

A "reported" value for each analysis or average of multiple analyses should be processed in the following manner.

1. Round the value to the same degree of significance contained in the SSCS or SRM sample assay values (usually two) if the element's calibration has been adjusted (see Section 6.0). Round to 2 significant figures for sample results. DO NOT round results for standards used to determine MDL or RSD values (use raw data).

2. Report all values less than the MMDL as not detected (ND).

3. Flag and note all values greater than or equal to the MMDL and less than the MQL (usually with a "J" next to the reported value).

4. Report all values equal to or greater than the MQL and within the linear calibration range (if the element's calibration has been adjusted [see section 6.0]).

5. Flag and note all values above the linear calibration range (greater than the highest SSCS used in the calibration adjustment procedure) if SSCS were used and the calibration was adjusted.

9.3 Accuracy

Accuracy, relative to a specific digestion method and elemental analysis procedure, is determined by submitting an XRF analyzed sample (prepared sample cups may be submitted) for AA or ICP analysis at a laboratory.

The on-site analysis of soils by XRF instrumentation should be considered a screening effort only (QA1 data). Data derived from the instrument should be used with discretion. Confirmatory analyses on a subset of the screening samples (minimum 10 percent) can be used to determine if the XRF data meets QA2 data objectives. The confirmation samples should ideally be selected randomly from the sample set and include a number of samples at or near the critical level. The results of the metal analysis (dependent) and the XRF analysis (independent) are evaluated with a regression analysis. The correlation factor (R^2) should be 0.7 or greater.[a)]

XRF results may be multiplied by the slope prior to substitution for metal analysis results in contouring, kriging programs, or removal volume estimates. Correcting the XRF results based on confirmatory analyses should only be undertaken after careful consideration. It must be understood that the confirmatory analysis (AA or ICP) is an estimate of the concentration of metal contamination and is dependent upon the specific instrumentation and sampling methodology used. Since XRF is a total elemental technique, any comparison with referee results must account for the possibility of variable extraction, dependent upon the digestion method used and its ability to dissolve the waste or mineral form in question.

9.3.1 Matrix Considerations

Other types of QA/QC verification should include verification that the instrument calibration is appropriate for the specific [illegible] be assessed. This includes verification of potential multiple soil matrix types that may exist at a site. Matrix differences which affect the XRF measurement include large variations in calcium content, which may be

encountered when going from siliceous to calcareous soils, as well as large variations in iron content.

10.0 DATA VALIDATION

10.1 Confirmation Samples

Confirmation samples are recommended at a minimum rate of 10 percent and are required if QA2 data objectives have been established for site activities.[2] Ideally, the sample cup that was analyzed by XRF should be the same sample that is submitted for AA/ICP analysis. When confirming an in-situ analysis, collect a sample from a 6-inch by 6-inch area for both an XRF measurement and confirmation analysis.

The XRF and metals results are analyzed with a regression analysis using a statistical program such as SAS® or Statgraphics® with the intercept calculated in the regression. The correlation factor between XRF and AA/ICP data must be 0.7 or greater for QA2 data objectives.[2]

10.2 Recording Results

Record all results and monitoring activities in a laboratory or field notebook. Alternatively, record results electronically on a hard drive or floppy disk.

10.3 Downloading Stored Results and Spectra

Results (analytical reports) and spectra which have been stored in the Spectrace 9000 internal memory should be downloaded and captured in disk files on a PC (see section 5). Spectrace Instruments provides software for this purpose. Additionally, they provide software to prepare results or spectra for importing into a spreadsheet. Refer to the instructions provided with the programs for details on their operation.

Alternatively, other software with terminal data logging capabilities may be used to capture results and spectra to disk files.

After capturing results to a file, print a copy and save both the disk files and the printout for future reference and documentation purposes.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, corporate and/or any other applicable health and safety practices.

12.0 REFERENCES

(1) U.S. EPA/ERT, "Representative Sampling Guidance, Volume I - Soil," November, 1991 (OSWER Directive 9360.4-10).

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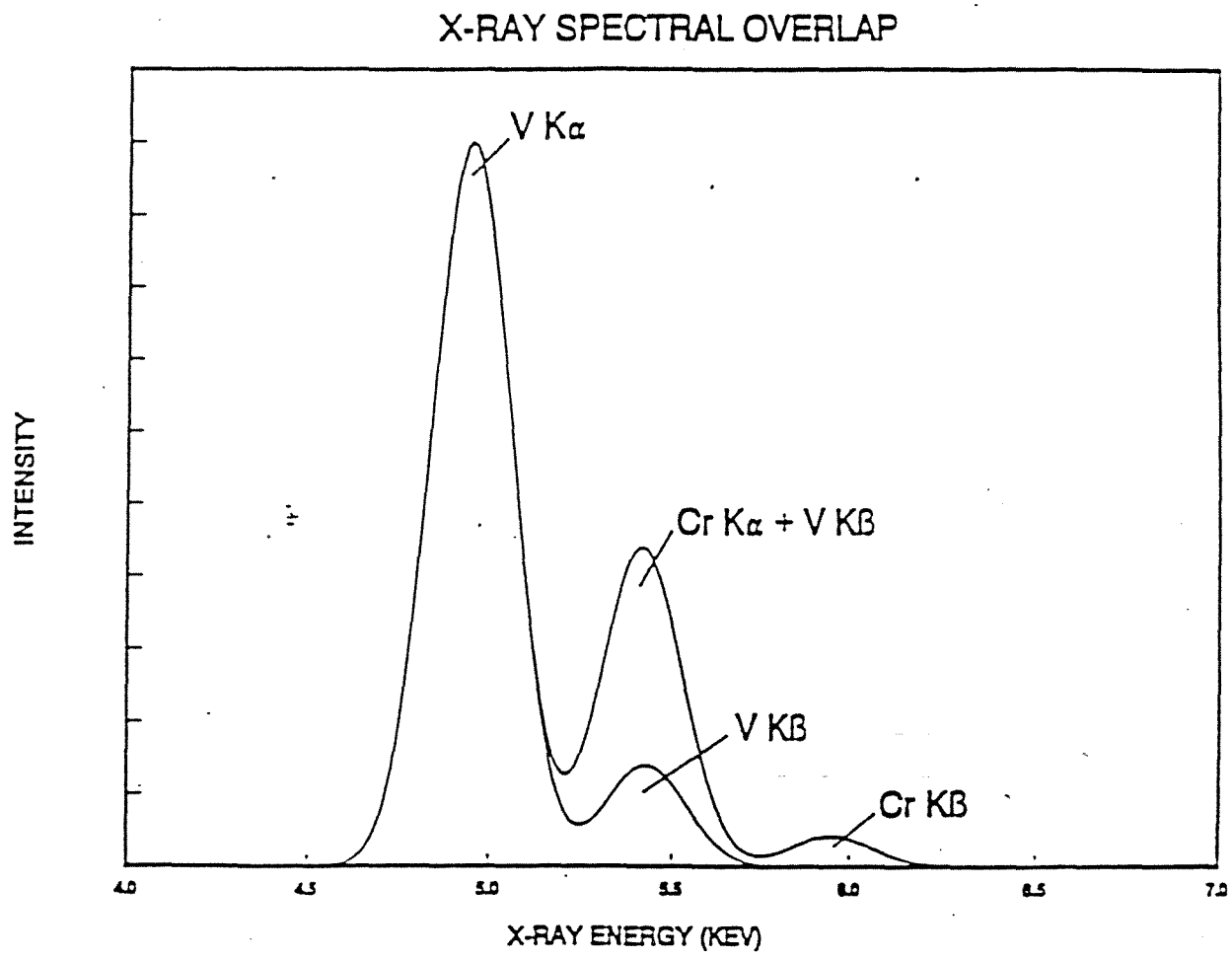
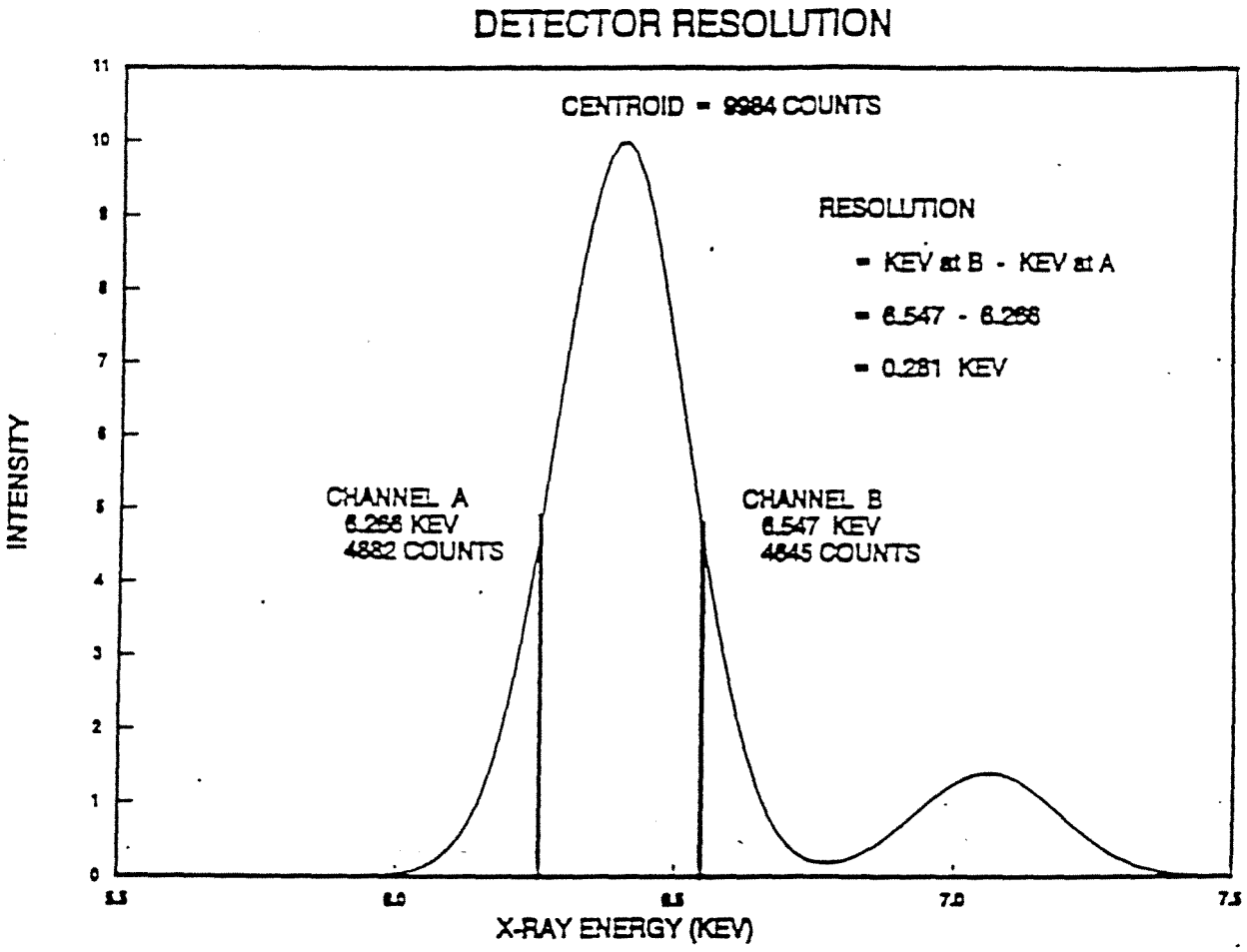
APPENDIX A
Figures
SOP #1713
January 1995

FIGURE 1. X-Ray Spectral Plot Showing Overlap of Vanadium K_α X-Rays in the Chromium K_β Measurement Region.



APPENDIX A
Figures
SOP #1713
January 1995

FIGURE 2. Iron X-Ray Spectrum Illustrating Detector Resolution Measurement



OHM Remediation
Services Corp.
A Subsidiary of OHM Corporation

SAMPLING, ANALYSIS AND QUALITY ASSURANCE PLAN FOR CENTRAL STEEL DRUM SITE NEWARK, NEW JERSEY

Prepared for:

U.S. Environmental Protection Agency
Region II
Edison, New Jersey

Prepared by:

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Northern Region
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Howard Perlmutter
Deputy Program Manager

September 24, 1997
OHM Project 20163

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONTINUATION)

1.0 INTRODUCTION

This Sampling, Analysis and Quality Assurance Plan (SAQAP) has been prepared to guide the sampling and analytical tasks necessary for the sampling, field classification, analysis and documentation needed to complete the removal of certain containerized wastes present at the Central Steel Drum Site, 704-738 Doremus Avenue, Newark, New Jersey. This work is being conducted for the U.S. Environmental Protection Agency, Region II.

A total of approximately 50,000 gallons of hazardous wastes are estimated to have abandoned throughout the building/site, of which approximately 35 % are believed to be solid wastes.

This document is comprised of two distinct discussions. Sections 2.0 through 5.0 are devoted to on-site personnel organization, sampling procedures, and documentation required to assure that representative and accurate preliminary classification of the materials is occurring. Sections 6.0 through 9.0 present the analytical methods and the quality assurance and quality control (QA/QC) procedures to be used, including sample management and custody, and off-site laboratory QA/QC methods which assure the project data ultimately generated is accurate and legally defensible according to appropriate State and Federal requirements.

All field sampling, documentation, field analysis and sample management for this project will be conducted by OHM's field analytical group based in Trenton, New Jersey. In preparing this Sampling and Analysis Plan (SAP), OHM has utilized the following documents:

Action Memorandum, U.S.E.P.A, Region II, CERCLA ID No. NJD011482577

U.S.E.P.A. August 1987-Compendium of Field Operations Methods Oswer No. 9335.0-14

U.S.E.P.A.-Sampling for Hazardous Materials

U.S.E.P.A. May 1989-RCRA Facility Investigation Guidance

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

2.1 DATA ACQUISITION ACTIVITIES

Data acquisition activities for the project will be accomplished using personnel from both OHM and the subcontracted analytical laboratories.

For this project, OHM personnel will be responsible for the following activities:

- Development and/or revisions to all project submittals and plans.
- Collection, documentation, and off-site shipment of all site samples.
- Maintaining project communication with the subcontract laboratory.
- Review and/or validation of all subcontract generated data.

A discussion of OHM personnel titles and duties is presented in the subsection below.

2.2 PROJECT PERSONNEL WITH SAMPLING/ANALYSIS RESPONSIBILITIES

Project personnel with sampling and analytical responsibilities include:

- Response Manager - Mr. Stan Gable will serve as the Response Manager for this project. He is responsible for all financial, safety and quality concerns on the job. He will maintain project status interactions with the Group as needed.

- Senior Project Chemist - Mr. Ronald Kenyon, Regional Technical Manager, will serve as Senior Project Chemist for the project. He is responsible for oversight of all facets of analytical data generation, including oversight of field sampling personnel, analytical laboratory procurement, analytical data review and communication with the laboratory.

- Project Chemist - The on-site project chemist is responsible for direct oversight of the field sampling crews, on-site field characterization (HAZCAT) of materials, management of the site database system, and interaction with the subcontract analytical laboratory.

- Senior Technician - The senior technicians implement all field sampling according to the Sampling Plan and complete all field documentation, ensuring all corporate, contract and project procedures are followed. The senior technician is also responsible for sample management and transportation to the off-site analytical laboratory.

3.0 SAMPLING AND ANALYSIS OBJECTIVES

The following sections present an overview of the sampling, documentation, field characterization, and laboratory analysis tasks required for a timely removal and proper off site disposal of Group drums from the Site. Detailed discussion regarding the execution of the objectives presented here can be found in the appropriate subsequent sections.

3.1 WASTEPILES

Numerous piles and areas containing incinerator ash, slag or shot blasting compound ("black beauty") exist about the site. These piles will be composited for disposal analysis as shown in Figure 6-1. Like wastes will be composited based on visual determination.

3.2 DRUMS

It is estimated that approximately 500 drums containing flammable, corrosive, possible water reactive, incinerator ash and sand blasting materials have been abandoned on the Site. Containers which are intact and unopened containers of unused or off-spec product which have intact manufacturer's labels or similar markings identifying the contents of the drum will be opened at a representative frequency and a visual check of the contents will be made. A Drum Log will be generated for each individual container, but no additional field testing or laboratory analysis is anticipated for these drums.

Drums containing illegible markings, no markings, or that appear to have been refilled will be assumed to contain unknown materials. These drums will be accessed for sampling after all safety concerns have been addressed such as pressurization or visual observation of crystallization as discussed in section 4.0. Each drum will be documented on an OHM Drum Log and receive a limited on site field characterization (HAZCAT).

3.3 FIELD CHARACTERIZATION

To the extent the drum is an orphan drum, the characterization will be limited to that which is necessary for site segregation and stabilization. The results of the field analysis are recorded onto the Drum Log and entered into the site database. Ultimately containers of like chemical and physical characteristics are sorted together and assigned a proper hazard class (i.e. flammable liquid, oxidizing solid) to guide future material management on site until disposal. A complete discussion of the HAZCAT procedures is presented in section 6.0.

3.4 LABORATORY ANALYSIS

Samples from all unknown materials identified as group drums requiring additional analysis for accurate disposal characterization will be shipped to the off site subcontract laboratory as required. The lab will be competitively procured once and approximate number of samples requiring analysis has been determined by the project chemist. The selected lab will perform all analyses according to accepted EPA methods and will maintain a current NJDEP certification.

4.0 FIELD SAMPLING PROCEDURES

4.1 SAMPLING PROCEDURES

All field sampling procedures to be employed by the field sampling teams are techniques readily accepted by both the USEPA and NJDEP and based on OHM's internal Standard Operating Procedures (SOPs) and this SAQAP which will be present on site during all sampling activities. Details of these procedures are presented below.

4.2 CONTAINERIZED MATERIAL SAMPLING

Sampling of containerized materials will occur only after the container has been evaluated from a health and safety perspective. Containers which appear bulged or under pressure will be remotely opened. Any previous records, container content labels or manufacturer's labels will be consulted before opening any container.

4.2.1 Liquid Materials

Liquids in a container will be sampled using 4-foot sections of glass tubing or pipette (12 to 18 mm ID). The pipette is slowly lowered into the drum. When the bottom of the drum is reached, the sampler places a thumb over the end of the pipette and retrieves it. Any liquid or sludge layering in the container should now be apparent as the tube is brought up. The contents of the tube are then released into a 16-ounce sample bottle. The process is repeated until sufficient sample has been collected. Sludge or solids underneath a liquid may be sampled by forcing the pipette into it. If the sludge does not run out into the jar, shaking the pipette or tapping it against the side of the bottle may loosen the sample. If this fails, one may break the pipette and put the pieces containing the solid in the bottle.

4.2.2 Solid and Semi-Solid Materials

Solids in a container will be sampled with a single use disposable inert sample scoop. The sample will then be transferred to a pre-cleaned clear glass 16-ounce wide mouth sample container. If the material must be broken up prior to sampling, a brass hammer and chisel will be used. If the material is too elastic, a piece will be cut off with a razor knife. Reusable sampling tools used will be decontaminated between drums, as listed in Section 4.4.

4.3 RINSEWATERS/DECONTAMINATION WATERS

Containerized rinse waters generated during site activities will be sampled at the appropriate times during the project. Depending upon physical characteristics of rinse waters and the available sampling mechanics of the tanks, one of the following sampling methods will be employed when sampling rinse waters:

- Grab sampling directly from a valve or sample port on the holding tank
- Use of a stainless steel bacon bomb sampler
- Use of a chemically-inert, bottom-filling bailer

4.4 SMALL QUANTITY CONTAINERS

Small quantity containerized materials are typically sampled by pouring directly from the container or by obtaining a sample aliquot for testing using a transfer pipette. These materials are testing for their general lab packing classification and are not compromised.

4.5 DECONTAMINATION PROCEDURES

All non-disposable sampling equipment (augers, stainless steel trowels) will be decontaminated prior to, and between, sampling events by the following procedure:

- Detergent/tap water wash
- Distilled/de-ionized (DI) water rinse
- 10% nitric acid rinse
- DI water rinse
- Acetone rinse
- Air dry

Use of these procedures will ensure that material transfer between sampling points is minimized; that is, cross-contamination will not occur. This will be verified by the use of equipment rinsate samples.

4.6 SAMPLE CONTAINERS

The following table presents the sample container and preservation requirements anticipated for the project.

TABLE 4.1
CONTAINER AND PRESERVATIVE REQUIREMENTS

Analytes	Matrix	Sample Container	Preservatives
TCL Volatiles	Water	40 ml glass vials with Teflon-faced silicon septa and hole-top cap	4 deg. C 1:1 HCl to pH<2 0.008% $Na_2S_2O_3$ if residual Cl
TCL Semivolatiles	Water	1,000 ml amber glass	4 deg. C
TCL Pesticides/PCBs	Water	1,000 ml amber glass	4 deg. C
TAL Metals Mercury Cyanide	Water	1,000 ml polyethylene 500 ml glass	4 deg. C, HNO_3 to pH<2 4 deg. C, NaOH to pH>12
TCLP/Total Volatiles	Solid	500 ml VOA, no headspace	4 deg. C
TCLP/Total Semivolatiles	Solid	1000 ml glass	4 deg. C
TCLP/Total Metals	Solid	1000 ml glass	4 deg. C
Dioxin	Solid	1000 ml glass	4 deg. C

5.0 DOCUMENTATION

All inventory of known drums and sampling of unknown drums will be documented on the OHM Drum Log and entered into a project-specific database.

5.1 FIELD SAMPLING DOCUMENTATION

Each sampling team will enter the required documentation into the OHM Drum Log as presented in Figure 5-1. All applicable label and visual observation information will be added to the Drum Log for this project, as well as client names, client contacts, and product names.

5.2 FIELD CHEMISTRY DOCUMENTATION

Once the Project Chemist has completed a field HAZCAT analysis for a Group drum, the results are entered into the compatibility section of the Drum Log as shown in Figure 5-1. From here, the drums will be sorted into similar hazard classes or "bulk groups" based on the physical and chemical attributes. The chemist will then utilize the Material Blending Log, Figure 5-2, to complete and document a bench scale test blending of the materials. If successful, this same scenario will be used by the operations crew to actually bulk together the drum quantities for off-site disposal.

FIGURE 5-1

DRUM INVENTORY LOG

OHM Remediation Services Corporation	DRUM INVENTORY LOG	Drum No : D000003 Project Number : 20100

Project Location : Morgan Materials | Logger : Mr. Observant | Date: 3/25/96
Project Contact : Rick Wolfson | Sampler : D. Stick | Time : 14:28:37
Phone : 800-537-9540 | Weather : Overcast 70

Drum Type: ☐ Fiber ☒ Poly-Lined ☐ Steel ☐ Poly ☐ Stainless Steel ☐ Nickel
Lid Type: ☐ Ringtop ☒ Closed Top
Drum Condition: ☐ Met DOT Spec. ☐ Good ☒ Fair ☐ Poor
Drum Size: ☐ 110 ☐ 85 ☒ 55 ☐ 42 ☐ 30 ☐ 16 ☐ 10 ☐ 5 Other Size : 55.00
Drum Contents: ☐ Full ☒ 3/4 ☐ 1/2 ☐ 1/4 ☐ < 1/4 ☐ Empty
Over Packed ☐ Yes ☒ No OverPack Type: ☐ Fiber ☐ Steel ☐ Poly OverPack Size: ☐ 110 ☐ 85 ☐ 30 ☐ 35 ☐ 55

LAYER	PHYS. STATE	COLOR	CLARITY	LAYER THICKNESS
BOTTOM	Liquid	Colorless	Clear	6.00
TOP	Liquid	Brown	Opaque	19.00

FIELD ANALYSIS
pH : PID : ppm
Dosimeter : Other :

DRUMS LABELS/MARKINGS
DOT HAZ :None UN/NA :None

MFG Name : None
Chemical Name ; None
Additional Information : None

DRUM COMPATABILITY DATA

☒ OK MARK IF THE PHYSICAL STATE AND COLOR MATCHES THE ABOVE INFORMATION. IF NOT, STOP ANALYSIS AND NOTIFY PROJECT CONTACT. FURTHER WORK WILL NOT BE PAID FOR.

DRUM CAT ; OrgLiq,OxAqLiq.
ANALYSTS : Joe Chemist
DATE PERFORMED : 3/25/96

LAYER	PHYS. STATE	COLOR	CLAR	W. SOL	DEN SITY	REACT	pH	HEX. SOL	PER	OXID	CN	SUL	BLSTN	FP	PCBs	LAYER CLASS
BOTTOM	Liquid	Colorless	Clear	S		-	7.00	I	-	+	-	-	-	-	-	OxAqLiq
TOP	Liquid	Brown	Opaque	I	L	-	7.00	S	-	-	-	-	-	-	-	OrgLiq

COMMENTS :

PCB CONC. : | FLASH PT. : | COMPAT. COMP.BULK# : BG04 | BULKED IN :

DATA REVIEWER : DATA REVIEW DATE :
FIELD REVIEWER : FIELD REVIEW DATE :

TRANSFER NUMBER	TRANSFERS RELINQUISHED BY	TRANSFER ACCEPTED BY	DATE	TIME
1				

FIGURE 5-2

COMPOSITE BLENDING TEST LOG

OHM REMEDIATION SERVICES CORP.

SAMPLE COMPOSITE BLENDING TEST LOG

1 of 1 Pages

WASTE STREAM NUMBER : BG03

WASTE STREAM : OrgLiq.

PROJECT NUMBER :20100

PROJECT NAME :Morgan Materials

PROJECT CHEMIST : Joe Chemist, Sr.

SUPERVISOR : JD Bottle

DATE BLENDING TEST PERFORMED :_____

BLENDER : P. Lucky

SEQ. NO.	Drum No	DRUM CAT	TEMPERATURE RISE DEGREE C	GAS EVOLVED YES	GAS EVOLVED NO	HAZARDOUS REACTION YES	HAZARDOUS REACTION NO	APPROVED TO BLEND
1.00	D000002	OrgLiq.		☐	☐	☐	☐	
2.00	D000004	OrgLiq.		☐	☐	☐	☐	
3.00	D000007	OrgLiq.		☐	☐	☐	☐	
4.00	D000009	OrgLiq.		☐	☐	☐	☐	

TO THE BEST OF MY KNOWLEDGE THE INFORMATION GIVEN ON THIS FORM IS CORRECT AND ERROR FREE EXCEPT WHERE NOTED IN THE COMMENTS SECTION.

SIGNATURE (PROJECT CHEMIST)_____ DATE:_____

6.0 ANALYTICAL PROCEDURES

This section represents the details of the analytical methods that will be employed on-site by the project chemist as well as the anticipated off-site laboratory analyses required for complete disposal characterization under RCRA and DOT regulations.

6.1 FIELD HAZARD- CHARACTERIZATION (HAZ CAT) ANALYSIS

Subsequent to the collection of discreet samples form each unknown container, field haz-cat analysis for the initial waste hazards will occur, followed by a bench scale bulking exercise for Group drums containing chemically similar materials. Following is an overview of OHM's compatibility procedures.

OHM will perform haz-cat analysis on each layer of every sample obtained. Haz-cat analysis will be performed for Group drums to separate and classify the material into compatible groups.

Following is an overview of the field analysis procedures OHM will employ for preliminary hazard identification of the unknown materials and the site segregation and stabilization of orphan drums.

Water solubility The solubility of the sample in water is determined by adding 1-ml distilled/de-ionized (DI) water to a1-gram sample, in a 12-mm x 100-mm culture tube. The contents are stirred using a vortex mixer.

- The results are recorded as positive (water soluble), partially soluble, slightly soluble, or negative (water soluble).

pH The pH of the aqueous layer is determined using Baxter (or similar manufacturer) pH test strips.

- The color change on the strip is compared to a color-chart supplied by Baxter.
- The pH is determined to an accuracy of +/- one pH unit.
- Samples with a pH less than 4 are classified as acidic.
- Samples with a pH greater than 10 are classified as basic.

Hexane solubility The solubility of the sample in hexane/dichloromethane (50/50) is determined in an analogous method as described for water solubility. The hexane/DCM is prepared prior to the initiation of hazcatting.

- The sample is classified as organic with just the slightest solubility in hexane/DCM. This is to avoid organic material from containing an aqueous wastestream.

Flash point is determined for samples by the use of seta-flash apparatus or qualitative method.

- The apparatus is calibrated to determine those samples which have a flash point less than or equal to 60 C° (140°F).
- Samples which are positive are classified as flammable.

Chlorinated compounds are determined by the use of a flame test. Sample is placed within a loop of sterilized copper wire, and immersed into a flame.

- A green flame is positive for chlorine.
- A blue flame is indicative of bromine.

Peroxide The organic layer is tested for peroxides by placing a few drops of the organic layer on a peroxide test strip (commercially available from EMQuant).

- A drop of water is then added to the strip after 30 seconds.
- A color change to blue is an indicator of peroxide.

- The concentration of peroxide can be quantitated by comparison of the blue color to a color scale which accompanies the test strips.

Oxidizing material The presence of an oxidizer is determined by the following tests.

- Acidifying a strip of potassium iodide-starch test paper (commercially available from EM Quant) with a glacial acetic acid.
- Then a few drops of the sample are placed on a potassium iodide-starch test paper strip.
- A dark blue-black color formed within a few seconds is indicative of a strong oxidizer.
- A light-blue color, or color formation which requires up to 5-minutes, is indicative of a weak oxidizer.

Sulfide material The presence of sulfides in a sample is determined using a buffered lead acetate test strip.

- A few drops of 2M sodium acetate buffer solution (pH5) is added to the test strip prior to the sample.
- A dark-brown color, formed within a few seconds (lead sulfide) is a positive test for sulfides.
- Confirmation of sulfides can be made with a cadmium carbonate solution. A yellow precipitate (cadmium sulfide) is a positive result.

Cyanide material The presence of cyanide in a sample is detected by the use of commercially available cyanide test kits (EM Quant).

- 1-gram of sample is diluted to 5-ml with DI water.
- The pH is adjusted to 7-8 by the addition of a measured quantity of phosphate buffer. Dissolution of the buffer is enhanced by stirring on a Vortex mixer.
- 5-drops of pyridine-barbituric acid is added.
- A test strip is immediately immersed into the solution for 30-seconds.
- A positive test for cyanides is indicated by a color change to red on the test strip reaction zone.
- The concentration of cyanide can be approximated upon comparison of the color of the reaction zone to color chart which accompanies the test strip kit.

6.2 BENCHSCALE MATERIAL BLENDING

Following characterization of the samples from the drums, a benchscale bulking test of chemically like samples will be conducted. The samples are bulk tested by slowly adding a small proportional aliquot from each sample in the same classification group. Samples from the same compatible group will be bulked in not more than 25 samples per "bulk sample". This bulked composite sample from compatible samples will be submitted for disposal analysis. A five minute waiting period follows each addition, during which the

bulked samples are monitored for any gas evolution or exothermic reaction. If a reaction occurs, the bulking test is repeated without the addition of the reactive sample. Upon completion of the benchscale bulk test, the compatible groups are identified. The blending procedure is documented by the chemist using the form presented in Figure 5-2.

By performing compatibility analysis and benchscale bulking tests, OHM reduces the amount of samples that require disposal analysis. This significantly lowers costs while providing an effective means of identifying Group drums for disposal. These tests also provide information for performing on site bulking of Group drums for disposal if this method is found to be more cost-effective than individual drum disposal.

6.3 MATERIAL DISPOSAL ANALYSIS

The data received from the compatibility analysis will be reviewed by OHM's treatability and disposal manager who will, with individual members of the Group, determine the most suitable disposal analysis to be performed. This determination will be based on the most cost-effective and feasible method of disposal for Group drums. Table 6-1 presents the standard lab analyses OHM utilizes for materials based on the proposed disposal option.

All samples are prepared and analyzed according to SW-846 methods, where available. If no SW-846 methods may be applied, another EPA-approved method will be used. If no EPA methods are available, a suitable ASTM or APHA method will be used.

TABLE 6.1
OHM - GUIDELINES FOR DISPOSAL ANALYSES

PACKAGE A [ALL SAMPLES]	
Analysis	Method(s)
Total Solids	160.3
Corrosivity, pH	150.1, 9040, 9045
Flash Pt. Ignitability	1010, 1020
Reactive Sulfide	Sec. 7.3.4.1
Reactive Cyanide	Sec 7.3.3.2
TCLP Volatile Organics	1311 - 8240, 8260
TCLP Semi-Volatile Organics	1311 - 8270
TCLP Metals	1311 - 6010, 7000's
TCLP Pesticide/Herbicides	1311 - 8080/8150
TCL Volatile Organics	8240, 8260
TCL Semi-Volatile Organics	8270
TCL Pesticide/PCBs	8080
TCL Herbicides	8150
PACKAGE B [INCINERATION DISPOSAL] Package A plus the following:	
% Ash	160.4
BTU	ASTM
Total Halides	9020
Total Sulfur	ASTM
Total Cyanide	9010
TAL Metals and Molybdenum	6010, 7000's
PACKAGE C [LANDFILL DISPOSAL] Package A plus the following:	
Paint Filter Test	9095
Total Cyanide	9010
Total Organic Halogens (TOX)	9020
PACKAGE D [WASTEWATER TREATMENT] Package A plus the following:	
Total Sulfide	3762, 9030
Total Cyanide	9010
Total Phenols	420.1, 9065
TAL Metals and Molybdenum	6010, 7000's

7.0 SAMPLE CUSTODY AND SHIPMENT

Documentation of sample custody following collection is accomplished using a standard Chain-of-Custody Record. This document traces possession of every sample from the time of collection through sample analysis.

In general, chain of custody protocols follow those outlined in USEPA guidelines. This documentation begins immediately following sample collection and proper labeling. The chain-of-custody record provides information on the sealing of samples, the sample number, sample description, date and time of collection, number of containers for the sample, type of analysis requested, and any pertinent remarks are entered onto the chain of custody record form, an example of which is shown in Figure 6.1. The chain-of-custody record form also documents the condition of sample containers upon their receipt from the support laboratory. This form is completed using indelible black ink.

7.1 INSTRUCTIONS FOR COMPLETING CHAINOF-CUSTODY RECORD

1. Project Name - None assigned by USEPA Central Steel Drum site
2. Project Location - City and state in which the project is located; 704-738 Doremus Ave., Newark, New Jersey
3. Project Number - Number assigned by OHM (20136)
4. Project Contact - TBD
5. Project Telephone Number - Telephone number of OHM onsite office trailer
6. Client Representative - GregDeAngelis is the EPA representatives
7. Project Manager/Supervisor - HowardPerlmutter is OHM's Deputy Program Manager
8. Sample Number - Number assigned in the field during collection of samples.
9. Date - Date of sample collection.
10. Time - Time of sample collection (24hour time).
11. Composite/Grab - Checkmark the appropriate column to indicate whether sample is composite or grab.
12. Sample Description (Include Matrix and Point of Sample) - Indicate whether sample is soil, liquid, air, oil, etc., along with any useful description, such as appearance (color, density, odor, etc.) Includes the location, designation, such as monitoring well number, soil sample coordinates, or EPA description number. This information must be the same as the sample label information.
13. Number of Containers - Number, size (volume), and types of containers that are sealed and labeled for transfer to another location.

14. Analysis Desired (Indicate Separate Containers) - The name of the test (i.e., PCBs) or series of tests (VOAs) with method numbers is to be entered on the diagonal lines. For each sample container designated in the number of containers, a checkmark (√) should appear in the column for the desired analysis.

15. Remarks - Enter sample specific instructions, cautions, or priorities (i.e., "do cyanide test first on this sample" or "caution may contain hydrofluoric acid;" also indicate preservation of sample (i.e., "sulfuric acid added"). Enter a sample specific comment (i.e., "sample lost in shipping").

16. Item Number - Each sample number is considered a separate item. Use sequential number (1,2,3...). Item numbers begin with No. 1 on each form. Do not carry item numbers from one form to another. List items 1,2,3... that you accepted.

17. Transfers Relinquished By - Name of person and affiliation transferring or surrendering the sample to another person, (do not use only the name of an organization).

18. Transfers/Accepted By - Person signing this part is responsible for the sample(s). In addition to the person's name, he should include his company name or agency(s) initial. Person accepting sample(s) is also responsible for making sure that all samples are accounted for when he signs an acceptance. If a common carrier is used, include the carrier name and bilbf-lading number or airbill number.

19. Date - Date on which sample is released to next person.

20. Time - Time at which sample is released to next person.

21. Remarks - Enter general instruction or requests, such as, fax report and turnaround times requested, preservatives added.

22. Sampler's Signature - The signature of the individual performing, or having immediate oversight of the sampling should appear in this section.

23. Laboratory name, telephone number, and contact.

7.2 FIELD CUSTODY PROCEDURES

In collecting samples for evidence, collect only that number which provides a fair representation of the media being sampled. To the extent possible, the quantities and types of samples and sample locations are determined prior to the actual field work. Minimization of sample transfers is always considered.

The field sampler is personally responsible for the care and custody of the samples collected until they are transferred or properly dispatched.

Sample labels shall be completed for each sample using indelible ink unless prohibited by weather conditions.

Throughout the course and at the end of the field work, the project chemist/scientist determines whether these procedures have been followed and whether additional samples are required.

Custody Seals will be placed over the cap of each sample container and the lids of shipping containers prior to the samples and containers leaving the custody of the shipping personnel. The Custody Seals will be preprinted adhesive-backed labels with perforations designed to break if the containers are opened.

7.3 TRANSFER OF CUSTODY AND SHIPMENT

Samples are accompanied by a COC record. When transferring the possession of samples, the individuals relinquishing and receiving sign, date, and note the time on the record. The person receiving the samples should always inspect for correct sample description and sample count. This record documents transfer of custody of samples from the sampler to another person, a mobile laboratory, or an analytical laboratory. The original record will accompany the shipment, and a copy will be retained in the project files.

Samples will be properly packaged in accordance with DOT regulations for shipment and dispatched to the selected laboratory for analysis with a separate custody record prepared for each laboratory. COC records will be placed in a gallon Ziploc™ bag and taped inside the cooler lid. All glass sample containers will be placed in Ziploc™-type bags for shipment. Also, Ziploc™-type bags will be filled with ice and placed between and around the samples in the cooler. Sufficient ice will be used to maintain sample temperature at $4° C \pm 2° C$.

Airbills from the courier will be retained as part of the permanent documentation. The person relinquishing the sample signs off his custody and enters the courier company's name and the bill-of-lading number or airbill number.

When samples are split with the facility or another government agency, a separate custody record is labeled to indicate this. In addition, the sample numbers from all the labels are recorded on the custody record. The person relinquishing the samples to the facility or agency should request the signature of a representative of the appropriate party, acknowledging receipt of the samples. If a representative is unavailable or refuses to sign, this is noted in the "received by" space. When appropriate (i.e., the representative is unavailable), the COC should contain a statement that the samples were delivered to the designation location at the designated time. The copy of the COC record may be given to the facility or agency upon request.

7.4 LABORATORY CUSTODY PROCEDURES

Once the sample arrives at the laboratory, custodial responsibility of the sample is transferred to that facility. The minimum requirements for a laboratory custodial system are:

- Designation of a sample custodian whose duties include:
  - Receiving samples
  - Initiating paperwork within the laboratory
  - Inspecting and documenting sample conditions, e.g. temperature, pH, leakage, breakage, seals
  - Verifying and recording agreement of information on the sample documents
  - Marking/labeling of samples for laboratory use
  - Distributing samples to appropriate analysts
  - Placing samples and extracts into the appropriate storage and/or secure areas
  - Controlling access to samples and extracts
  - Monitoring storage conditions for proper temperature and prevention of cross-contamination
  - Proper disposal of samples and extracts

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

SAMPLE CUSTODY AND SHIPMENT

- Secure appropriate storage for samples and extracts
- Sample tracking system
- Controlled access to storage areas
- Monitoring procedures for storage areas

LAB COPY

OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev 06/89

136200

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME		PROJECT LOCATION	
PROJ. NO.	PROJECT CONTACT	PROJECT TELEPHONE NO	
CLIENT'S REPRESENTATIVE		PROJECT MANAGER/SUPERVISOR	

ITEM NO.	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)	REMARKS
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1						
2						
3						
4						SAMPLER'S SIGNATURE

FIGURE 7.1

8.0 DATA REPORTING AND VALIDATION

8.1 DATA REDUCTION AND TABULATION

Data generated from the site activities can be grouped into two broad categories:

- Field data, such as data collected during VOC screening; and
- Chemical data for environmental samples generated by the project laboratory and accompanying QA/QC data package deliverables as required for DQO Level II and Level III.

These data will be compiled and managed using a central project filing system. The field and laboratory data filing system will be a manual storage system established at the OHM's field office at the Site. Field and laboratory data will be filed chronologically. Field log books, sample logs, sample data sheets, chain-of-custody records, laboratory log books, and laboratory calculation sheets shall be labeled with a task number and date.

8.2 DATA REPORTING

The project laboratory will report the data in a certificate of analysis format. Sample analytical results and accompanying QA/QC sample results can then be transferred to computer diskette files suitable for transfer to the spreadsheet data base.

Analytical data will be identified according to the project laboratory's procedures for establishing sample lots, so that sample analysis data can be matched to corresponding QA/QC samples, control charts, and calibration data.

8.3 GENERAL PROCEDURES FOR DATA REVIEW/VALIDATION

8.3.1 Field Data

Level I data (e.g., screening for VOCs) will be validated by reviewing calibration and maintenance records for field instruments and field logbook information associated with individual data sets to ensure that appropriate SOPs were followed. Data validation, therefore, will be qualitative, and will focus on whether field screening data are of acceptable quality based upon supporting documentation. Acceptance or rejection of data will be determined by the judgment of experienced field personnel familiar with the SOPs.

8.3.2 Laboratory Data

Generation of the off-site laboratory data will include the analysis of QA/QC samples, including blanks, calibration and reference standards, and possibly spiked samples in some instances; however, a complete CLP QA/QC analysis program will not be performed for these samples. Items that will be reviewed to validate the data include:

1. Integrity and completeness of the data package,

2. Holding times from sample receipt at the laboratory to sample extraction and analysis or holding times from sample receipt to analysis, as appropriate,

3. Trip blank and laboratory method blank sample results,

4. Matrix spike, matrix spike duplicate, and replicate analyses,

5. Surrogate recoveries,

6. Field blank sample results, and

7. Field duplicate results.

Data validation will be a qualitative process. Review of precision, accuracy, representativeness, completeness and comparability criteria will be included whenever measurement data are reviewed. The analytical laboratory will provide numerical precision and accuracy data that will be compared to the acceptance criteria. Precision and accuracy values for project data sets that are within the ranges for the type of sample and analytical method used will be considered acceptable. In some cases, data of apparently poor precision and/or accuracy may be somewhat useful. The judgment to accept such data, with appropriate qualifications, will be made by a data validator with appropriate technical expertise.

9.0 CORRECTIVE ACTION

Corrective actions may be required anytime an out of control situation occurs. This type of situation can occur in either the field/sampling or the laboratory and may adversely effect data quality or quantity. Each of these areas is addressed below. All corrective actions will be noted and the notation will be provided to the appropriate OHM and/or client management.

9.1 FIELD/SAMPLING

Field/sampling situations which may require corrective actions include, but are not limited to:

1. Unavailability of predetermined sample locations
2. Improperly packaged samples
3. Mislabeled samples
4. FSQAP execution deficiencies

These situations will be corrected through discussions with the sampler, Project Chemist, Project Manager and laboratory, if required. If necessary, the client representative will also be notified. Part of the corrective action will be to ensure that procedures are written/amended to alleviate the problem, if possible. Corrective actions will be implemented at the lowest possible management level to speed resolution.

9.2 LABORATORY

No analytical corrective actions will be performed by OHM. Laboratory corrective action(s) may be required if:

1. Any QC data is outside of the acceptable limits for precision and accuracy as defined in the laboratory QA Plan.

2. Any blanks or laboratory control samples contain contaminants above acceptable limits.

3. Undesirable trends are detected in spike and/or surrogate recoveries, or duplicate sample RPD.

4. There are unusual changes in the method detection limits.

5. Deficiencies are detected by the QA department during internal or external audits or from the results of performance evaluation samples.

6. Inquiries concerning data quality are received from the Contracting Officer.

9.2.1 Corrective Action Procedures

Corrective action procedures for out of control events in the following areas are found in the contract laboratories Quality Assurance Plan.

1. Incoming samples
2. Sample holding times
3. Instrument calibrations
4. Practical quantitation limits
5. Method QC
6. Calculation errors
7. Laboratory audits

9.2.1.1 Short Term Corrective Actions

Short term corrective actions are initiated and performed by the analyst during sample analysis procedures. These corrective actions are necessary for analyses to be completed successfully. Examples of the situations requiring corrective actions are listed below:

- Instrument performance does not meet acceptable criteria
- Standard degradation/volatilization during storage
- Calibration check standard results outside of acceptable range
- Contamination identified in blanks, QC samples or the instrument
- Quality Control data is outside of acceptable limits

9.2.1.2 Long Term Corrective Actions

Long term corrective actions may be initiated to correct repetitive problems, unusual occurrences or trends, or as a result of internal/external audits. A long term corrective action will include some/all of the following points, depending upon the type of irregularity:

- Review of relevant data
- Evaluation of detection limit(s)
- Standards validation
- Instrument and equipment performance
- Reanalysis of sample
- Contamination and matrix interference effects
- Training
- Operating procedure review/revision.

9.2.1.3 Other Causes for Corrective Actions

- Client identified errors in analysis/reporting
- Data review corrective actions - Errors, deviations and omissions from standard laboratory protocols identified during a review for QC data quality and compliance with overall quality objectives may result in corrective action(s).
- Client recommended corrective actions

WESTON®
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Federal Programs Division
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SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM
EPA CONTRACT 68-W5-0019

13 June 1997

Mr. Greg DeAngelis, Task Monitor
U.S. Environmental Protection Agency
Response and Prevention Branch
2890 Woodbridge Avenue
Edison, NJ 08837

EPA CONTRACT NO: 68-W5-0019
TDD NO: 02-97-05-0010
DOCUMENT CONTROL NO: START-02-F-01068
SUBJECT: SAMPLING TRIP AND SITE ASSESSMENT REPORT AND DRUM INVENTORY - CENTRAL STEEL DRUM

Dear Mr. DeAngelis:

Enclosed please find the Sampling Trip Report and Site Assessment, and Drum Inventory conducted by Region II START on 11 June 1997, at the Central Steel Drum Site, Newark, New Jersey.

If you have any questions, please do not hesitate to contact me.

Very Truly yours,

ROY F. WESTON, INC.

Thomas O'Neill
Project Manager

Enclosure

cc: TDD File

SAMPLING TRIP REPORT AND SITE ASSESSMENT

SITE NAME: Central Steel And Drum Site
DCN: START-02-F-001068
TDD #: 02-97-05-0010

SAMPLING DATE: 14, 15 and 23 May 1997

EPA I.D. NO.: No EPA I.D. number assigned at this time

1. Site Location: 704 Doremus Avenue, Newark, Essex County, NJ (corner of Doremus and Delancy). Refer to Figure 1.

2. Sample Descriptions: Sampling during the two day assessment included: Hazardous categorization (HazCat) field testing for RCRA characteristics, X-Ray Fluorescence (XRF) field analysis for lead and barium by the Spectrace 9000, and mercury vapor analysis using the Jerome Mercury Vapor Analyzer.

a) Drummed waste characterization by HazCat field testing

Twelve drum samples were collected for RCRA characterization analysis as outlined in the site-specific sampling plan. Refer to Table 1 for additional information. The HazCat field data sheets are included as Attachment A. Of the twelve samples tested:

- Five samples were RCRA flammable.
- One sample was RCRA corrosive with a pH greater than 12.
- One sample was RCRA water reactive

b) Site characterization for mercury vapors with the Jerome Mercury Vapor Analyzer

The Jerome 431-X Mercury Vapor Analyzer was used during the initial air monitoring survey of the buildings at the site. There were no readings above 0.000 mg/m^3.

c) Site characterization for heavy metals by the Spectrace 9000 XRF.

Fifteen soil sample points were analyzed "in situ" (analysis in place) for a range of inorganic metals. Lead (Pb) and barium (Ba) were the analytes of concern at this site as identified in the Sampling Plan. The precision of the XRF was estimated by 10 replicate sample determinations (repetitive instrumental analysis of the same sample and specimen of that sample as a measure of instrumental error) and 2 duplicate sample determinations (duplicate analysis of the same sample, but a different specimen of that sample as a means to measure instrumental error and sampling homogeneity error). The complete XRF results, including draft results for the additional analytes are included as Attachment B.

- Lead was found to exceed the NJDEP Non-Residential Soil Cleanup Criteria of 1,000 mg/kg in nine of the fifteen samples.

- Barium was not found to exceed the NJDEP nonresidential soil cleanup criteria of 47,000 mg/kg in any of the samples analyzed.

d) Underground storage tanks

The site was revisited on May 23, 1997 to evaluate contents of the underground storage tanks at the site. There were two underground storage tanks noted. One tank is near the main building. The tank depth was measured as 100 inches. It was identified to contain 9 in. of liquid of which 6.5 inches is water and 2.5 inches appears to be gasoline. The gasoline layer tested positive for flammability. The second tank is located at the island west of the building. The tank was determined to contain 99 inches of liquid of which the bottom 59 inches was water (as indicated by water paste). Forty inches appeared to be diesel fuel.

3. Laboratories Receiving Samples:

No samples were taken at the site for laboratory analysis. All sample materials were returned to the appropriate containers and left at the site.

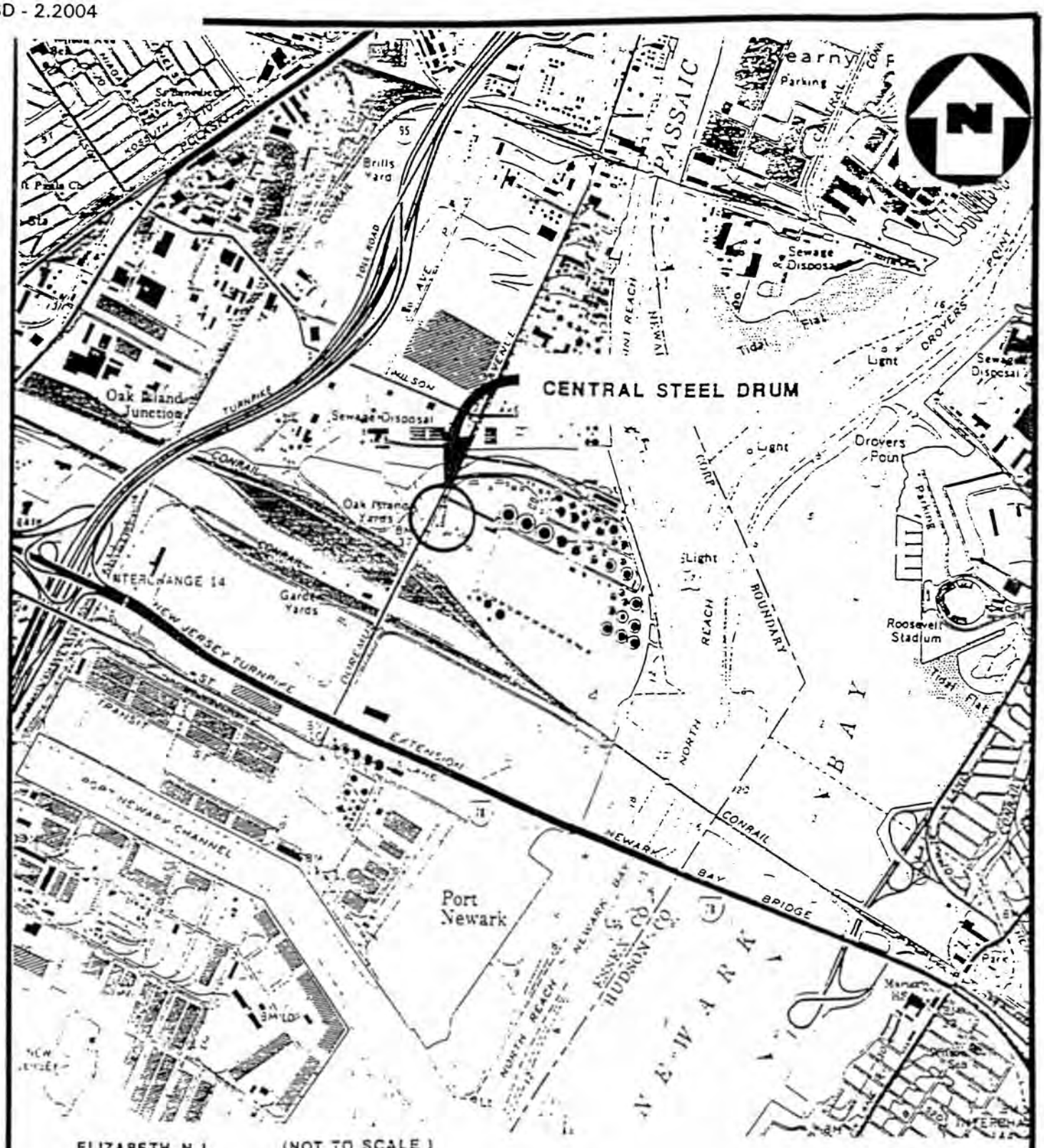
4. On-Site Personnel:

Name	Company	Duties on Site
Margaret Chong	EPA	On-Scene Coordinator
Jim Daloia	EPA	On-Scene Coordinator
Ed Moyle	Region II START	Site Project Manager/QAQC
Christoph Stannik	Region II START	HazCat Chemist
Joseph Soroka	Region II START	XRF Chemist
Michael Mahnkopf	Region II START	Sampler
Brian McGinn	Region II START	Sampler
Donielle Perri	Region II START	XRF Chemist
Tom O'Neill	Region II START	Site identification

5. Additional Comments:

None

6. Report Prepared by: Thomas O'Neill Date: June 13, 1997
Report Reviewed by: Joseph Soroka Date: June 13, 1997



Source: Halliburton NUS

WESTON MANAGERS DESIGNERS/CONSULTANTS Roy F. Weston, Inc. FEDERAL PROGRAMS DIVISION	EPA PM M. Chang	Central Steel Drum Newark, New Jersey
IN ASSOCIATION WITH RESOURCE APPLICATION, Inc. C.C. JOHNSON & MALHOTRA, P.C., R.E. SARRIERA ASSOCIATES, PRC ENVIRONMENTAL MANAGEMENT, AND GRB ENVIRONMENTAL SERVICES, INC.	START PM E. Moyle	Figure 1: Site Location

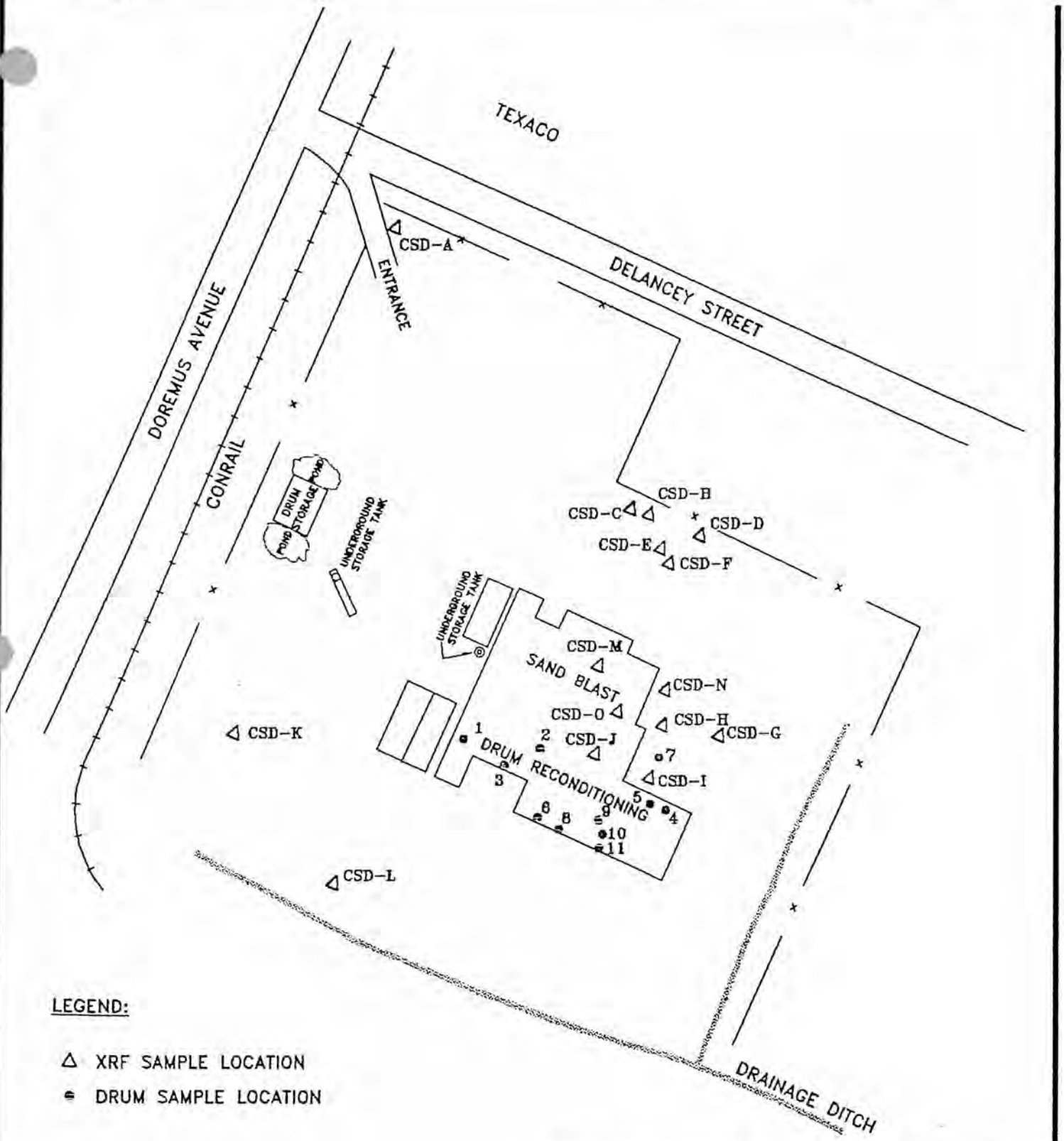


FIGURE 2 – SITE LAYOUT AND SAMPLING LOCATIONS
CENTRAL STEEL DRUM
NEWARK, NEW JERSEY
JUNE 1997

US EPA REMOVAL ACTION BRANCH
SUPER FUND TECHNICAL ASSESSMENT AND RESPONSE TEAM
CONTRACT# 68-W5-0019

DRAWN BY : J. HAMPTON JR.

EPA TASK MONITOR: C. DeANGELIS

START PROJECT MANAGER: E. MOYLE

WESTON
Roy F. Weston, Inc.
FEDERAL PROGRAMS DIVISION

IN ASSOCIATION WITH PRC ENVIRONMENTAL MANAGEMENT, INC., C.C. JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC., [illegible] ASSOCIATES AND GRB ENVIRONMENTAL SERVICES, INC.

C:\BITMAP\8000.DWG

TABLE 1: FIELD TESTING RESULTS
CENTRAL STEEL DRUM
NEWARK, ESSEX COUNTY, NEW JERSEY

Sample #	Solubility		Reaction		pH	Flamm.	Cl⁻ hot wire	Oxidi.	Peroxide	Description	Comments
	H_2O	Hex.	Air	H_2O							
CSD-001	N	Y	N	N	NA	N	N	NA	NA	Black oily liquid, 55-gal., 50% full, HNu 5 units	5W-40 engine oil, Arthur Peta [illegible] Passaic St., Newark, NJ
CSD-002	Y	N	N	N	10-11	N	NA	N	-	White sludge, 55-gal., 25% full, HNu 0 units	Grace Corporation, Cmpd 1-14 dis 1189 negative for Cn, Hg, sulfide, chloride, flammable vapors in char test
CSD-003	Y	N	N	N	11	N	NA	N	-	Yellow watery liquid, foaming when agitated, 5-gal. poly, HNu 0 units	Prosoc, Inc. Sure-clean 600 detergent, corrosive, poison; negative for chloride, cyanide & sulfide: NA
CSD-004	Y	N	N	N	12	N	NA	N	-	White sludge, 55-gal. poly, 33% full, HNu 0 units	Oakite Paint-i-cide F-130, contains water, sodium silicate, di-ethylene glycol; flammable vapors in char test
CSD-005	N	Y	N	N	NA	Y	N	NA	-	Black watery liquid, gasoline-like smell, 30-gal. poly, 33% full, HNu 100 units	
CSD-006	N	Y	N	N	NA	Y	N	NA	-	Black watery liquid, gasoline-like smell, 30-gal. poly, full, HNu 110 units	
CSD-007	Y	N	N	N	7	N	NA	N	-	Rusty watery liquid, 55-gal. drum, 50% full, HNu 0 units	Negative for chloride & sulfide
CSD-008	N	Y	N	N	NA	Y	N	NA	NA	Syrup-like beige sludge, 55-gal. drum, 50% full	
CSD-009	N	N**	N	Y*	-	Y	N	-	-	Syrup-like white liquid, 5-gal. poly, full, HNu 150 units	The Valspar Company, Ft. Wayne, Il, isocyanate solution, product# 64-ctc0066. *water-reactive: forms globules in water; **soluble in hot methanol (milky solution)

NA: this [illegible]s not applicable to this matrix

Sample #	Solubility		Reaction		pH	Flamm.	Cl⁻ hot wire	Oxidi.	Peroxide	Description	Comm
	H_2O	Hex.	Air	H_2O							
CSD-010	Y	N	N	N	8	N	NA	N	-	Gray pasty sludge, 5-gal. poly, full, HNu 12 units	Production Car Products Heavy Duty Cleaner "Slam", corrosive negative for chloride & sulfide, not corrosive
CSD-011	N	Y	N	N	NA	Y	N	-	-	Black sludge, 55-gal drum, HNu 300 units	Akzo Black Gloss Fast Dry Enamel
CSD-012	Y	N	N	N	7	N	NA	N	-	Clear watery liquid, 55-gal. drum, full, HNu 0 units	

NA: this test is not applicable to this matrix

ATTACHMENT A

HAZCAT FIELD DATA SHEETS

NAME: Central Office

D LOCATION FOUND: _____ STAGING LOCATION: Inside W.

ER: _____ SAMPLER: Mike M.

NEET NO: _____ DATE/TIME: 5/14/97 1035

DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☐	Poly Lined ☐	Overpack ☐	rusted ☒	leaking ☐	dented ☐
Steel ☒	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☒
Stainless Steel ☐	Other ☐	Closed Top ☒		other Needs 5S01F		

DRUM SIZE (Gallons): 85 ☐ 55 ☒ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☐ Other _____

MFG NAME ~~Auth~~ Arthur Petr. 126 Passic St, Newark, NJ

CHEMICAL NAME SW-30 engine oil

DRUM MARKINGS None

DRUM LABELS

50% full

FIELD AIR MONITORING INSTRUMENT READINGS: HNu 5 OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top		X				Oil, BLACK			X	N	Y	N	N
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	NA	N	N	—	—	—	—	—	—	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS:

Prepared by: CS Date 5/14/97

CSD - 2.2009

CSD - 2.2010

TRAL SIEET + DRUM SAMPLE NO: _____ DRUM NUMBER: CSU-002

D: _____ STAGING LOCATION: _____

LOGGER: BM SAMPLER: M + M

PROJECT NO: _____ DATE/TIME: 5/14

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☐	Poly Liner ✓	Overpack ☐	rusted ☒	leaking ☐	dented ☐
Steel ☒	Nickel ☐	Open Top ☐	Ring Top ☒	bulging ☐	perforated ☐	good ☒
Stainless Steel ☐	Other ☐	Closed Top ☐		other Needs O/D		

DRUM SIZE (Gallons): 85 ☐ 55 ☐ 42 ☐ 30 ☐ 15 ☒ 10 ☐ 5 ☐ Other _____

MFG NAME Grace Corp.

CHEMICAL NAME

DRUM MARKINGS dated drum ~~CMPD~~ CMPD 1-14 DTS 1189

DRUM LABELS

25% Filled

FIELD AIR MONITORING INSTRUMENT READINGS: HNu 0 OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top				X		WHITE			X	Y	N	N	N
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	10-11	NA	N	N	N	N	NA	N	N	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

FLAME TEST: COLOR VARIATIONS, ZONE LATE, ORANGE

TEST COMPATABILITY RESULTS: FLAME, SPIDERWEBS CHARS, METALLIC COATING ON METHANOL CUBBIES

Prepared by: C Date: 5/14/97

SITE NAME: CENTRAL STEEL + DRUM SAMPLE NO: _____ DRUM NUMBER: _____ CSD - 2.2011

GRID LOCATION FOUND: _____ STAGING LOCATION: _____

LOGGER: _____ SAMPLER: CJ

PROJECT NO: _____ DATE/TIME: 5/14/97

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☒	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
Steel ☐	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☒
Stainless Steel ☐	Other ☐	Closed Top ☐		other Bolden (screw top)		

DRUM SIZE (Gallons): 85 ☐ 55 ☐ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☐ Other Raul

MFG NAME Posic, Inc

CHEMICAL NAME (HCL) Sure clean 600 det

DRUM MARKINGS Corrosive, poison

DRUM LABELS

Found an MSDS on table label

FIELD AIR MONITORING INSTRUMENT READINGS: HNu 0 OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top		X				YELLOW, FOAMING	X			Y	N	N	N
Middle						WATERY							
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	1	NA	N	NA	N	N	NA	—	—	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS:

Prepared by: CJ Date: 5-14-97

CSD - 2.2012

TRAL STEEL + DRUM SAMPLE NO: _____ DRUM NUMBER: D-004

ND: _____ STAGING LOCATION: _____

LOGGER: _____ SAMPLER: _____

PROJECT NO: _____ DATE/TIME: 5/14

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☑	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
Steel ☐	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☑
Stainless Steel ☐	Other ☐	Closed Top ☑		other Needs Lid		

DRUM SIZE (Gallons): 85 ☐ 55 ☒ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☐ Other _____

MFG NAME Oaklite

CHEMICAL NAME Paint-T-CINE F-131 WATER Cadmium < 1% Di-ethylene glycol

DRUM MARKINGS

DRUM LABELS Alkaline Ind. Toxic. Product

V-1/3 Full

FIELD AIR MONITORING INSTRUMENT READINGS: HNu 0 OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soapilke, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top				X		WHITE			X	Y	N	N	N
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	12	NA	N	N	N	N	NA	—	N	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

CHAR TEST WHITE VAPORS FLAMMABLE LATE

TEST COMPATABILITY RESULTS: WHITE WHITE

Prepared by: CS Date: 5-14-97

SITE NAME: CENTRAL STEEL + DRUM SAMPLE NO: _____ DRUM NUMBER: CSD - 2.2013

GRID LOCATION FOUND: _____ STAGING LOCATION: _____

LOGGER: _____ SAMPLER: _____

PROJECT NO: _____ DATE-TIME: 5/14/97

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☒	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
Steel ☐	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☒
Stainless Steel ☐	Other ☐	Closed Top ☒		other ~½ full w/ liq.		

DRUM SIZE (Gallons): 85 ☐ 55 ☐ 42 ☐ 30 ☒ 15 ☐ 10 ☐ 5 ☐ Other _____

MFG NAME

CHEMICAL NAME

DRUM MARKINGS Do not reuse for food or drink

DRUM LABELS

FIELD AIR MONITORING INSTRUMENT READINGS: HNu 100 OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top		X				Red/gray			X	N	Y	N	N
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	NA	N	Y	—	—	—	—	—	—	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS: LITMUS TEST: VAPORS FLAMMABLE!

SPIDERWEBS (?)

Prepared by: CJ Date: 5-14-97

CSD - 2.2014

TRIAL STEEL + DRUM SAMPLE NO: _____ DRUM NUMBER: CSD-002

ND: _____ STAGING LOCATION: _____

LOGGER: _____ SAMPLER: _____

PROJECT NO: _____ DATE/TIME: 5/14/97

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☒	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
Steel ☐	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☒
Stainless Steel ☐	Other ☐	Closed Top ☒		other Full w/ lip.		

DRUM SIZE (Gallons): 85 ☐ 55 ☐ 42 ☐ 30 ☒ 15 ☐ 10 ☐ 5 ☐ Other _____

MFG NAME

CHEMICAL NAME

DRUM MARKINGS Do not reuse for food or drink

DRUM LABELS

FIELD AIR MONITORING INSTRUMENT READINGS: HNu 110 OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top		X				BLACK			X	N	Y	N	N
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	NA	N	Y	—	—	—	—	—	—	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS: CHAL TEST : VAPORS NONE

Prepared by: CS Date: 5-14-97

SITE NAME: CENTRAL STEEL DRUM SAMPLE NO: _____ DRUM NU

CSD - 2.2015

GRID LOCATION FOUND: _____ STAGING LOCATION: ____

LOGGER: _____ SAMPLER: _____

PROJECT NO: _____ DATE/TIME: 5-14-97

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☐	Poly Lined ☐	Overpack ☐	rusted ☒	leaking ☐	dented ☒
Steel ☒	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☐
Stainless Steel ☐	Other ☐	Closed Top ☒		other _____		

DRUM SIZE (Gallons): 85 ☐ 55 ☒ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☐ Other _____

MFG NAME

CHEMICAL NAME Labels painted over

DRUM MARKINGS

DRUM LABELS

FIELD AIR MONITORING INSTRUMENT READINGS: HNu ___ OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soapilke, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top		X				YELLOW-BROWN	X			Y	N	N	N
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	7	NA	N	N	N	N	—	—	N	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS: CHAR - COMPLETE EVAPORATION

Prepared by: CS Date: 5-14-97

CSD - 2.2016

1 STEEL DRUM SAMPLE NO: _____ DRUM NUMBER: _____

: _____ STAGING LOCATION: _____

LOGGER: _____ SAMPLER: _____

PROJECT NO: _____ DATE/TIME: 5-14-97

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☐	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
Steel ☒	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☒
Stainless Steel ☐	Other ☐	Closed Top ☒		other _____		

DRUM SIZE (Gallons): 85 ☐ 55 ☒ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☐ Other _____

MFG NAME

CHEMICAL NAME None seen

DRUM MARKINGS

DRUM LABELS

¼ Full

FIELD AIR MONITORING INSTRUMENT READINGS: HNu ___ OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top				X		SYRUP-LIKE			X	N	Y	N	N
Middle						CARAMEL-COLORED							
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	NA	N	Y	NA	—	—	—	—	—	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS:

Prepared by: CS Date: 5-14-97

SITE NAME: CENTRAL STEEL DRUM SAMPLE NO: _____ DRUM NUMBER: _____ CSD - 2.2017

GRID LOCATION FOUND: _____ STAGING LOCATION: _____

LOGGER: _____ SAMPLER: _____

PROJECT NO: _____ DATE/TIME: 5/14/97 ≈ 1600

DRUM DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
Fiber ☐	Poly ☐	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
Steel ☒	Nickel ☐	Open Top ☐	Ring Top ☐	bulging ☐	perforated ☐	good ☒
Stainless Steel ☐	Other ☐	Closed Top ☒		other _____		

DRUM SIZE (Gallons): 85 ☐ 55 ☐ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☒ Other _____

MFG NAME The Valspar Corp. Fort Wayne, IN

CHEMICAL NAME Isocyanate Solution

DRUM MARKINGS Product # 64-CTC00066 Part A

DRUM LABELS

FIELD AIR MONITORING INSTRUMENT READINGS: HNu 150 OVA ___ CGI ___ RAD METER ___ OTHER ___

PHYSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility (X)		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top		X				Syrupy-viscous	X			N	N	N	Y
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	NA	N	Y	—	—	—	—	—	—	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

WATER REACTIVE - FORMS GLOBULES (SINK) / FORMS MILKY SOLUTION

TEST COMPATABILITY RESULTS: IN HEXANE - SINKS & HOT - NO DISCERNIBLE SOLUBILITY

(X) HEATED IN METHANOL ~~SINKS~~

Prepared by: CS Date: 5-14-97

CSD - 2.2018 STEEL DRUM SAMPLE NO: _____ DRUM NUMBER: [illegible]

[illegible] _____ STAGING LOCATION: _____

[illegible]GER: _____ SAMPLER: _____

[illegible]ECT NO: _____ DATE/TIME: 5-14-97

M DESCRIPTION:

CONSTRUCTION		TYPE		CONDITION:		
[illegible]ber ☐	Poly ☑	Poly Lined ☐	Overpack ☐	rusted ☐	leaking ☐	dented ☐
[illegible]el ☐	Nickel ☐	Open Top ☒	Ring Top ☐	bulging ☐	perforated ☐	good ☑
[illegible]ainless Steel ☐	Other ☐	Closed Top ☐		other _____		

[illegible]RUM SIZE (Gallons): 85 ☐ 55 ☐ 42 ☐ 30 ☐ 15 ☐ 10 ☐ 5 ☐ Other _____

[illegible]FG NAME Production Car Product

CHEMICAL NAME

DRUM MARKINGS Heavy Duty Cleaning + Deg. - "Slam!"

DRUM LABELS Carrier

[illegible]ELD AIR MONITORING INSTRUMENT READINGS: HNu 12 OVA ___ CGI ___ RAD METER ___ OTHER ___

[illegible]YSICAL DESCRIPTION:

Layers			Physical			Color/Description[1]	Clarity			Solubility		Reaction	
PHASE	INCHES	LIQUID	SOLID	SLUDGE	GEL	[1] - Oil, Syrup, Viscuous, Watery, Paste, Chunks, Gel, Spongy, Soaplike, Soft, Hard Powder Crystal Granular, Rubbery	CLEAR	CLOUDY	OPAQUE	WATER	HEXANE	AIR	WATER
Top				X		GRAY PASTE			X	Y	N	N	N
Middle													
Bottom													

HAZCAT RESULTS:

Layers	pH	Chlorine not wire	Flammable	Cyanide	Oxidizer	Chloride	Peroxide	Mercury	Sulfide	PCB
Top	~8	NA	N	N	N	N	NA	—	N	—
Middle										
Bottom										

ASSIGNED WASTE STREAM - BASED ON INITIAL RCRA HAZARD

TEST COMPATABILITY RESULTS: NOT CORROSIVE AS STATED ON PAIL

Prepared by: CS Date: 5-14-97

ATTACHMENT B

XRF DATA

CENTRAL STEEL AND DRUM DATA IN PPM - 14 MAY 1997

"ID"		"Pb"		"Ba"	
"CSD-A"		690		370	
"CSD-AR"		760		340	
	average:	725		360	
"CSD-B"		340		730	
"CSD-BR"		180	J	800	
	average:	260		765	
"CSD-C"		3000		710	
"CSD-CR"		4200		730	
	average:	3600		720	
"CSD-D"		980		2900	
"CSD-DR"		1100		2900	
	average:	1040		2900	
"CSD-E"		3000		1400	
"CSD-ER"		3800		1600	
	average:	3400		1500	
"CSD-F"		1400		940	
"CSD-FR"		1500		1100	
	average:	1450		1020	
"CSD-G"		12000		2200	
"CSD-GR"		13000		2300	
	average:	12500		2250	
"CSD-H"		9800		3600	
"CSD-HR"		9500		3700	
	average:	9650		3650	
"CSD-I"		1900		650	
"CSD-IR"		1900		660	
	average:	1900		655	
"CSD-J"		8200		590	
"CSD-JR"		6400		570	
	average:	7300		580	
"CSD-K"		1600		990	
"CSD-KDup"		1500		810	
	average:	1550		900	
"CSD-L"		400		140	
"CSD-M"		120	J	2600	
"CSD-MDup"		110	J	2800	
	average:	115		2700	
"CSD-N"		7300		1700	
"CSD-O"		250		50	J

Dup = duplicate
R = replicate

CSD - 2.2021

"ID"	"TIME"	"CrHI"	"K"	"Ca"	"Ti"	"CrLO"	"Mn"	"Fe"	"Co"	"Ni"	"Cu"	"Zn"	"As"
"CSD-A"	15.5	141	2807	24843	4187	198	2391	75984	909	-242	305	348	-31
"CSD-AR"	15.5	961	3919	28183	5523	690	1088	81448	607	-169	375	465	-18
"CSD-B"	15.8	-298	1175	4361	6688	673	2708	271654	575	-673	409	1580	87
"CSD-BR"	15.8	756	882	4525	6651	362	2587	273441	1562	-1202	1042	1064	95
"CSD-C"	15.9	1867	755	26953	20540	832	1802	363117	-798	-535	661	1236	128
"CSD-CR"	15.9	625	817	26373	21285	657	82	394448	210	162	1291	823	-692
"CSD-D"	16.0	945	524	6861	8359	468	1513	391739	-199	364	-152	780	-287
"CSD-DR"	16.0	1076	756	7206	8398	631	3223	418668	1136	-458	20	716	-118
"CSD-E"	16.1	3003	2324	14348	10932	1900	2376	262748	1154	263	6201	3049	-267
"CSD-ER"	16.2	2337	2412	13891	11252	1820	1168	267121	-1771	561	6706	2736	-762
"CSD-F"	16.2	968	1396	46808	36066	657	1317	320342	2862	-642	191	5032	421
"CSD-FR"	16.3	503	1436	53379	37219	569	451	350431	-3830	223	495	4208	254
"CSD-G"	16.4	4282	1956	100392	45065	2005	1042	38590	366	109	903	3382	-1199
"CSD-GR"	16.4	4146	1429	101298	47168	2998	1436	40107	923	295	1147	3977	-1688
"CSD-H"	16.5	3939	597	96493	48226	1796	-146	31885	27	461	1316	3090	-677
"CSD-HR"	16.5	2623	821	94979	46875	1885	-669	33986	-356	204	1085	2963	8
"CSD-I"	16.6	1616	1977	26151	15952	912	246	61087	-396	266	97	1493	-112
"CSD-IR"	16.7	810	1410	25764	16372	799	1626	63559	251	-182	424	1458	-187
"CSD-J"	16.8	4893	1632	32985	23177	1721	1429	201881	-453	13	855	3768	-684
"CSD-JR"	16.8	2942	1439	31533	21310	1112	-723	188420	-661	162	646	3804	-48
"CSD-K"	17.2	-166	1471	51142	12670	269	1435	177447	251	-491	77	1831	-393
"CSD-KD"	17.3	1184	1227	43724	13248	420	441	201123	-2257	72	118	1541	-508
"CSD-L"	17.4	-418	1798	42396	846	50	723	9934	436	40	121	90	-65
"CSD-M"	17.4	122	12199	25961	3465	47	1629	101328	-1926	382	-117	891	-1
"CSD-MDUP"	17.5	997	10027	23854	4418	-267	162	94391	-1827	596	12	1568	-44
"CSD-N"	17.7	1753	1384	156775	23547	1521	1016	26884	-968	325	580	3028	-804
"CSD-O"	17.7	-229	1084	3947	2470	280	3552	333798	-2328	589	-118	1701	-75

"ID"	"TIME"	"Se"	"Sr"	"Zr"	"Mo"	"Hg"	"Pb"	"Rb"	"Cd"	"Sn"	"Sb"	"Ba"
"CSD-A"	15.5	-46	151	88	40	25	685	24	-160	-60	116	370
"CSD-AR"	15.5	-47	49	136	38	149	755	20	-303	-63	120	339
"CSD-B"	15.8	-75	118	23	73	58	341	3	-279	-50	25	732
"CSD-BR"	15.8	-53	29	32	55	171	179	-14	4	-66	68	805
"CSD-C"	15.9	-1	133	198	105	80	3045	50	210	19	78	708
"CSD-CR"	15.9	29	51	278	104	47	4195	-38	-142	-38	-10	733
"CSD-D"	16.0	-34	91	735	19	153	980	-13	5	59	29	2862
"CSD-DR"	16.0	-9	64	852	37	222	1059	-48	567	13	23	2906
"CSD-E"	16.1	-48	55	55	67	124	3036	-17	645	283	259	1392
"CSD-ER"	16.2	-22	92	39	91	198	3781	-1	181	155	279	1553
"CSD-F"	16.2	-43	122	36	68	14	1384	-3	232	158	62	943
"CSD-FR"	16.3	-48	23	31	69	95	1467	26	102	-7	86	1080
"CSD-G"	16.4	-9	670	813	251	44	11913	101	84	174	148	2240
"CSD-GR"	16.4	20	821	949	315	-24	12920	45	321	237	124	2336
"CSD-H"	16.5	-6	1126	755	340	28	9805	7	76	108	217	3634
"CSD-HR"	16.5	-50	1019	687	375	182	9470	32	-39	55	289	3713
"CSD-I"	16.6	-23	170	160	84	47	1937	37	-418	74	102	654
"CSD-IR"	16.7	-28	137	148	100	-16	1890	27	-348	-40	112	656
"CSD-J"	16.8	-0	128	215	479	75	8196	61	-123	-144	16	589
"CSD-JR"	16.8	-92	115	236	441	-22	6358	-11	-53	83	91	573
"CSD-K"	17.2	-55	760	101	78	45	1615	-2	-56	-229	-5	994
"CSD-KD"	17.3	6	834	82	112	73	1515	83	-122	-101	112	808
"CSD-L"	17.4	107	237	56	34	3	404	17	109	334	106	141
"CSD-M"	17.4	-22	989	113	11	84	118	81	328	17	29	2637
"CSD-MDUP"	17.5	-42	755	119	20	142	107	135	185	224	127	2834
"CSD-N"	17.7	-73	1883	216	180	82	7297	26	163	61	186	1749
"CSD-O"	17.7	-34	-18	-3	33	78	248	-9	180	-65	11	50

SITE INVENTORY
CENTRAL STEEL DRUM
704 DOREMUS AVENUE, NEWARK, NJ
11 JUNE 1997

INSIDE BUILDINGS

There are approximately 130 drums scattered throughout the buildings. Many of these drums have open tops and contain trash/debris and solids. Drum labels noted are as follows:

- Arthur Peto, 126 Passaic St., Newark, NJ, 5W-40 engine oil
- Grace Corp., Darex CMPD 1-14 DIS 1189
- Prosic Inc., (HCL) Sure Clean 600 det, corrosive, poison
- Oaklite, Paint-I-cide, F130, Di-ethyleneglycol, alkaline liquid
- Unknown material, indicating the drum not be reused for food or drink.
- The Valspar Corp., Fort Wayne IN , isodyanatel solution, Product No. 64-CTC-0066
- Production Car Products, heavy duty cleaning and detergent, corrosive

CEMENT DRUM PAD

There are approximately 205 drums at this location. Most of the drums are unlabeled or rusted. All of the drums are closed top or open top with contents. Several drums were observed to be leaking paint and oil from the bottoms. The southwest corner of the pad is oil stained. Drum labels noted were as follows:

- Apple Juice Concentrate, BJI, 16425 SR42 East, Weirsdale, FL 32195
- Rotella Multigrade, 5W-40 with XLA
- Rising Star (illegible) of America, Manufacturers of Chemical Coatings, Brooklyn, NY, Flammable liquid
- SAE 10W-40
- Tar (handwritten)
- Hydrocarbon resin, alkyd resin, calcium carbonate (partial label)
- Benjamin Moore, Center St, Nutley, NJ. Stenciled on drum lid, and lid place loosely over what appeared to be trash/debris.
- MSDS label (most illegible), Health 1, Flammability 3, Reactivity 1
- Calcium (illegible), titanium (illegible), toluene.

FORMER INCINERATOR AREA

There are approximately 88 drums in the room behind the building and in the area of the former incinerator. Most of the drums are rusted and unlabeled. Drum labels noted were:

- Two 55-gallon metal drums - Warning flammable vapor, harmful causes eye irritation, contains toluene, and/or xylene and oxygenated solvents (esters, alcohols, ketones or ethers). Contains ethylene glycol monoethyl ether.

NORTH SIDE OF PROPERTY

There are drums stored along the fence on the northern boundary of the site at two locations. There are approximately 77 drums containing debris, solids and sand blast grit. Almost all of the drums are open top and unlabeled. Labels noted were:

- Metgrain Abrasives, Chesapeake Specialty Products, Baltimore, MD
- Ashland Chemical, Columbus, OH, Lino Cure ABG, combustible liquid, harmful or fatal if swallowed, vapor harmful, causes irritation.

Immediately west of this area there are approximately 250 drums stacked two high on pallets. Approximately 200 of the drums are closed top. Labels include:

- Flammable solid
- Polyarome Mfg. Co., Polarlide 50
- Vista Chemical, Houston, TX
- Metgrain Abrasives
- Ceres Fruit Growers

Closer to the building there is a group of approximately 37 drums. All are open top and contain debris/trash and solids.

SOUTH OF BUILDING

Two compressed gas cylinders were noted. One is a 20 lb. propane tank. The other is a 3 ft long blue metal cylinder with no valve and no label.

EAST OF BUILDING

Eleven open top drums containing what appears to be C and D (construction and demolition) waste.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY - REGION II
290 BROADWAY
NEW YORK, NEW YORK 10007-1866

JUL - 3 1997

SUBJECT: Request to Conduct a CERCLA Removal Action at the Central Steel Drum Site, Newark, Essex County, New Jersey - ACTION MEMORANDUM

FROM: Gregory B. DeAngelis, On-Scene Coordinator
Response and Prevention Branch

TO: Jeanne M. Fox
Regional Administrator

THRU: Richard L. Caspe, Director
Emergency and Remedial Response Division

Site ID No.: JR

CERCLIS ID No.: NJD011482577

I. PURPOSE

The purpose of this Action Memorandum is to request approval for a removal action to be initiated at the Central Steel Drum Site, 704-738 Doremus Avenue, Block 5074, Lot 1, Newark, New Jersey, 07105. On March 9, 1997, the New Jersey Department of Environmental Protection (NJDEP), requested the United States Environmental Protection Agency (EPA), to conduct a removal assessment to determine the removal action eligibility for this Site under provisions of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by 42 U.S.C. § 9601 et. seq. NJDEP referred this Site because of the abandoned flammable and corrosive drums. On March 14-15, 1997, an Expedited Removal Assessment (ERA) was conducted to determine the removal action eligibility for this Site under the provisions of CERCLA. The Site consists of an abandoned drum reconditioning/recycling facility located in Newark. This Action Memorandum provides for site security, stabilization, sampling, analysis, transport and proper disposal of all hazardous materials identified to be present at this Site.

This Site is not on the National Priorities List (NPL) and there are no nationally significant or precedent-setting issues associated with this Site.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

1. Removal Site Evaluation

The Site is located at 704-738 Doremus Avenue, Newark, New Jersey, 07105. The Site is situated in an industrial area in the Iron Bound section of Newark and consists of a large manufacturing building located on 8.5 acres. Before 1952, an ink manufacturer occupied this Site (International Printing Ink, Division of Interchemical Corporation, now part of Inmont Corp.). From 1952 to approximately 1991, Central Steel and Drum operated a drum reconditioning business. After vacating the property, a container shipping operation leased the property. According to NJDEP, the property has been abandoned since 1994.

The Site is situated on filled wetland. On the south end of the property, bordering one side of the property, is an existing wetland where drums have been observed. To the west, along Doremus Avenue, are railroad tracks. The Site, other than the main building, is gravel/weed covered filled vacant land.

An ERA performed by EPA on March 14-15, 1997, determined that approximately 500 drums of flammable, corrosive, possible water reactive, incinerator ash and sand blasting materials are abandoned on the Site. In total, approximately 50,000 gallons of hazardous wastes are estimated to be abandoned throughout the building/site (approximately 35% are solid wastes). Information regarding hazardous wastes at the Site are based upon container labels, hazcatting and historical documents identified during the ERA.

The Site consists of one main building (previously several buildings that are now interconnected). It has been used as a commercial dumping ground (evidenced by truck tires, construction debris, etc.). The property is partially fenced and there are no gates at the entrance. However, vehicles cannot enter the property, since there are four large concrete blocks (approximately 3 feet high) barring entry.

The production building is 200ft x 500ft of masonry construction with a metal truss roof. The building is in deteriorated condition and the roof leaks. All utilities have been turned off, so there is no fire suppression system available in the building. The building was found to be unsecured and there is evidence of vandalism, dumping and public entry. In a trailer on the property, it appears that someone is using this as shelter.

2. Physical Location

The Site is located at 704-738 Doremus Avenue, Newark, Essex County, New Jersey, 07105. The Site consists of a large production building on a site occupying 8.5 acres and is situated in a highly industrialized area.

The Site is adjacent to other industrial facilities. Within 1.5 miles of the Site are residential areas, industry, commercial properties, commuter/freight railroad lines and major city arterials.

Due to the industrial nature of the area around the Site, the 1990 population census statistics within a 1.0 mile radius of the Site are as follows: population is 26 persons comprised of 30.8% white, 23.1% Hispanic, 30.8% African American and 19.2% other. However, due to the residential areas bordering the industrial area within 1.5 miles, the 1990 population census statistics jump rather significantly. The census statistics within a 1.5 mile radius of the site are as follows: population is 7,023 persons comprised of 77.2% white, 29.5% Hispanic, 17.9% African American and 4.5% other. Adding racial populations, statistics provided above will produce a sum in excess of 100%. This may be due to individuals reporting themselves as belonging to two or more backgrounds. The majority (4,078) of the population in the 1.5 mile radius is in the age group of 20-49 years; median household income is $12,467. The 1,851 households are comprised of 38.7% owner occupied and 61.3% renter occupied.

3. Site Characteristics

The Site's production building is one story (30ft to trusses) and consists of external masonry walls with a metal roof. The building is in poor shape and the roof leaks. The building is approximately 200ft x 500ft in size. The building has no fire suppression system, since all the utilities in the buildings have been disconnected.

The building was found to be unsecured and there is evidence of vandalism, dumping and public entry. There are drains in the buildings, but they are hidden under the debris. An estimated 50,000 gallons of hazardous wastes are abandoned throughout the various

containers on-site. Central Steel & Drum received drums from various industries ranging from food to paint manufacturing. It's reconditioning operations involved incineration, sandblasting and repainting. There are approximately 750 drums of waste on the property. Approximately 50 percent contain acids, flammables, water reactive, paints and other waste materials. The remaining 50 percent contain incinerator ash. Incinerator ash was used as fill on the property. The main hazardous constituent in the ash is lead. Random XRF screenings indicate lead contamination above the 10,000 ppm range at certain locations throughout the property.

4. Environmental Release/Threatened Release of a Hazardous Substance, or Pollutant or Contaminant

The following compounds have been identified at the Site:

Substances Identified	Statutory Source for Designation as a Hazardous Substance
Waste Corrosive Liq NOS	RCRA § 3001
Paint Related Materials	RCRA § 3001
Heavy metals (lead most prevalent)	RCRA § 3001
Waste Flammable Liq NOS	RCRA § 3001

These hazardous substances are acutely and chronically toxic, corrosive, and/or flammable.

The potential health effects from these compounds are identified below:

Potential Health and Toxicological Effects

Material	1	2	3	4
Incinerator Ash	x			x
Water Reactive			x	
Lead Contaminated Soil/Sand	x			x
Acids/Caustics NOS		x	x	x
Paint Related/Flam NOS Materials	x		x	x

1 - Liver Damage
2 - Respiratory Damage
3 - Eye, Skin, or Respiratory irritant
4 - Toxic by inhalation, skin absorption or ingestion

In addition, there are other substances that meet the RCRA definition for the characteristics of corrositivity and flammability as outlined in 40 CFR 261. The following is a partial list of the RCRA corrosive and flammable substances.

Substances Identified
Thinners
Anti-Freeze
Solvents
Adhesives/Resins

5. NPL Status

At the present time, the Site is not on the NPL and there are no efforts to include this Site on the NPL.

B. Other Actions to Date

1. Previous Actions

EPA issued a Consent Agreement and Final Compliance on November 15, 1983, for a number of RCRA violations and also required the facility to conduct an investigation of contamination and develop a remediation program under the direction of NJDEP. Monitoring wells were installed and sampling data was produced. This case became inactive in 1985. Preliminary Assessment was conducted by NJDEP on March 5, 1985. The FIT Team conducted a site inspection report on February 14, 1986. The Site was referred on May 9, 1997, to EPA by NJDEP almost immediately following notification by the City of Newark.

2. Current Actions

On March 14-15, 1997, the EPA, NJDEP and Newark Office of Emergency Management (OEM) conducted an ERA and confirmed the presence of the materials described earlier in this memorandum.

During the week of June 2, 1997, EPA conducted a more detailed inventory of the materials abandoned at the Site. This action included mapping, chemical label identification and the numbering of drums.

C. State and Local Authorities' Roles

1. State and Local Actions to Date

State actions on the Site date back to 1981-82, when a series of NJDEP field investigations prompted Central Steel Drum to receive a notice of prosecution for illegal disposition of hazardous chemical waste on the premises. The Site was reinspected by NJDEP in September 1983 and November 1984, revealing that no significant progress had been made in clean-up operations.

On October 1, 1996, the City of Newark foreclosed on the 704 Doremus Avenue property. On March 9, 1997, the City of Newark notified the NJDEP of the abandoned nature of the Site and the presence of hazardous materials. On March 9, 1997, NJDEP verbally referred the Site to EPA.

2. Potential for Continued State/Local Response

Neither NJDEP or local government have the resources available to do the necessary removal action at the Site. These organizations will act in a supporting role throughout the removal action.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

Hazardous substances, pollutants or contaminants presently stored at the Site present a threat to the public health and welfare as defined by Section 300.415(b)(2) of the National Contingency Plan (NCP), in that there is a high potential for releases to occur. Many of the materials on the Site are toxic, flammable and/or corrosive and present a risk for direct human contact. Some of the materials are incompatible if mixed and present the threat of a runaway chemical reaction. The Site is located in an industrial area and is directly adjacent to railroad commuter and freight lines, as well as major traffic arterials and within 1.5 miles of residential areas.

An estimated 50,000 gallons of hazardous wastes are abandoned throughout the Site and are stored in an unsafe manner. The areas where these materials are stored are not maintained in a temperature controlled environment, which only heightens the number of drums that rupture, leak and continue to release vapor emissions. Some of these drums are leaking, while most are currently in marginal to fair condition and they will continue to deteriorate. Additionally, these containers are being stored without regard to compatibility, which will only heighten the chance of accidental release. Direct contact with the materials

abandoned at the Site, as a result of fire or vandalism, would present an immediate threat to the individuals involved, as well as nearby residents and businesses. The condition of materials at the Site and proximity of other commercial, industrial and residential areas, as well as to major traffic arterials, contribute to the possibility of direct human contact.

Due to the presence of flammable liquids and waste corrosives, the threat of fire at the facility does exist. This fire threat is enhanced by vagrants who live at the facility. Should a fire occur, it could spread across the facility and involve most of the material found at the Site. The toxic fumes created by the uncontrolled combustion of these materials could impact the surrounding population, possibly necessitating the evacuation of the surrounding population and the closure of city roads, rail lines and arterials. Many of the materials present are unknowns. Therefore, the complete effects of acute or chronic exposure from the fumes released in an uncontrolled release, cannot be predicted.

B. Threats to the Environment

Waste material has the potential of flowing directly into ditches which empty into the Newark Bay. Run-off from rain or fire fighting efforts could allow waste material to flow directly into Newark Bay. Due to the presence of flammable liquids and other flammable/combustible materials such as oil, grease, paints, lacquers and solvents, the threat of fire at the facility does exist which may result in further destruction of the wetlands.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare and the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

The objective of the removal action is to eliminate the threat of exposure through direct human contact caused by a release of the hazardous materials at the Site. To date, the City of Newark has secured entrance to the facility. However, the Site is

not secured from vagrants looking for entry into the building, heightening the need for an expedited response action. The proposed removal actions will include:

i. Stabilize and stage containers on the Site.
ii. Remove areas of obvious contaminated soils/ash piles.
iii. Sample and conduct analysis of wastes.
iv. Preparation of waste streams for shipment.
v. Removal of asbestos contaminated materials/debris as required to search for buried CERCLA hazardous waste.
vi. Transportation and disposal of all hazardous wastes in accordance with EPA's CERCLA Off-Site Disposal Policy.
vii. Conduct thorough soil sampling to determine the extent of contaminated soil for the possibility of removal under an additional removal action.

The selected mode of transportation and method of disposal will be based on the analytical data.

2. Contribution to Remedial Performance

The proposed action will contribute effectively to any long term remedial action with respect to the release or threatened release of hazardous substances. This removal action is consistent with any future long-term remedial action undertaken at the Site.

3. Description of Alternative Technologies

Alternative technologies will be considered so long as they prove to be cost effective and efficient.

4. Engineering Evaluation/Cost Analysis (EE/CA)

Due to the time-critical nature of this removal action, an EE/CA will not be prepared.

5. Applicable/Relevant & Appropriate Requirements (ARARs)

ARARs within the scope of the project, including RCRA and CERCLA regulations that pertain to the disposal of hazardous wastes, will be met to the extent practicable.

6. Project Schedule

Once funding is approved through this Action Memorandum, the removal action can be initiated immediately. Stabilization, inventory, sampling, analysis and waste categorization of materials could begin immediately. Transportation and disposal would occur shortly thereafter, with sampling for soil contamination to follow.

B. Estimated Costs

1. Extramural Costs

Regional Allowance Costs: (Total clean-up contractor costs include labor, equipment, materials, and laboratory disposal analysis)	$650,000
Other Extramural Costs not Funded From the Regional Allowance:	
Total; START, including multiplier costs	$ 50,000
Subtotal, extramural costs	$700,000
Extramural Costs Contingency (20% of subtotal, extramural costs)	$140,000
TOTAL, EXTRAMURAL COSTS (rounded to nearest $1,000)	$840,000
Intramural Costs	
Direct	$ 36,000
Indirect	$ 52,000
TOTAL, INTRAMURAL COSTS	$ 88,000
TOTAL, REMOVAL PROJECT CEILING	$928,000

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action or no action could result in the release of hazardous substances into the environment, thereby exposing the nearby residents and employees of the surrounding industries to hazardous substances and causing contamination of the soil, groundwater and nearby waterways. Due to the lack of lighting and inadequate security on the Site, the potential for unrestricted access to the property, due to vandalism or transients, could expose individuals by direct contact.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

Efforts will be made to identify any viable Potentially Responsible Parties (PRPs) to assume responsibility for the cost of the clean-up. The On-Scene Coordinator will work with the Program Support Branch, the Office of Regional Counsel and the NJDEP in an attempt to locate viable PRPs to recover clean-up costs.

IX. RECOMMENDATION

This decision document represents a selected Removal Action for the Central Steel Drum Site, 704 Doremus Avenue, Newark, New Jersey, 07105. It was developed in accordance with CERCLA as amended and is consistent with the National Contingency Plan (NCP). This decision is based on the Administrative Record for the Site. Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for a removal action.

This Action Memorandum, if approved, will authorize a total project ceiling of $928,000, with a mitigation ceiling of $840,000. The estimated costs for this project are within the FY-97 Regional Advice of Allowance. Please indicate your approval for the Central Steel Drum Site removal action,
pursuant to your authority delegated by Assistant Administrator J. Winston Portor, May 25, 1988, Redelegation Memorandum R-14-1-A.

Approved: _____ Date: 7/8/97
Jeanne M. Fox
Regional Administrator

Disapproved: _____ Date: _____
Jeanne M. Fox
Regional Administrator

cc: (after approval is obtained)

J. Fox, 2RA
W. Muszynski, 2DRA
R. Caspe, 2ERRD
B. Sprague, 2ERRD-RPB
J. Higgins, 2ERRD-RPB-TSS
J. Daloia, 2ERRD-RPB-ERT
R. Gherardi, 2OPM-FINB
S. Murphy, 2OPM-GCMB
M. Wiggett, 2ERRD-RAB
C. Moyik, 2ERRD-SPB
J. Witkowski, 2ERRD-RAB
R. Swales, Newark OEM
C. Peterson, 2ERRD-NJRB
D. Karlen, 2ORC-NJSFB
B. Bellow, 2CD
R. Cahill, 2CD-PAT
S. Becker, 2ERRD-RAB
P. McKechnie, 2OIG
T. Johnson, 5202G
C. Kelley, START
A. Varlay, 2ORC-NJSFB
A. Raddant, USDOI

OHM Remediation
Services Corp.
A Subsidiary of OHM Corporation

WORK PLAN
FOR
CENTRAL STEEL DRUM
704-738 DOREMUS AVENUE
NEWARK, NEW JERSEY

Prepared for:

U.S. Environmental Protection Agency
Region II
Edison, New Jersey

Prepared by:

OHM Remediation Services Corp.
Trenton, New Jersey

Stanford Gable
Response Manager

September 25, 1997
OHM Project 20163

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 SITE HISTORY

The site is located at 704-738 Doremus Avenue, Newark, New Jersey. The site was originally occupied by an ink manufacturer (International Printing Ink, Division of Interchemical Corporation, now part of Inmont Corp.). In 1952, Central Steel and Drum began operating a drum reconditioning facility which operated until 1991. After the closing of Central Steel and Drum, the property was leased to another party. According to NJDEP, the property has been abandoned since 1994.

The site consists of one main building (previously several buildings which are now interconnected). It has been used as a commercial dumping ground (evidenced by truck tires, construction debris, etc.). There is a chain link fence along the perimeter of the property. The main gate is missing, however, concrete barriers have been placed to impede entry onto the property.

The EPA performed an Emergency Response Action on March 14-15, 1997 and discovered approximately 500 drums of unknown waste were abandoned throughout the building/site. There are also several incinerator ash piles and areas where incinerator ash has apparently been spread out along the ground.

1.2 PROJECT WORK PLAN ORGANIZATION

Contained within the project work plan are the following:

- Work Plan (WP) - The work plan discusses the specific task required by the scope of services. It identifies key personnel and equipment used to complete the cleanup.
- Site Safety and Health Plan (SSHP) - This plan has been prepared and reviewed by an OHM Certified Industrial Hygienist.
- Sampling, Analysis and Quality Assurance Plan (SAQAP) - This plan has been prepared by OHM's field analytical department.

2.0 SCOPE OF WORK

OHM understands the scope of work for the Central Steel project to include:

- Set up support facilities
- Sample tanks, drummed wastes and ash piles
- Secure deteriorated containers
- Perform field hazardous categorization testing (hazcat)
- Develop test bulking scheme and generate composite samples for disposal analysis
- Analyze composite samples to characterize wastes for disposal
- Bulk composite wastes
- Labpack small containers as necessary
- Dispose of wastes
- Remove, clean and dispose of two (2) underground storage tanks (UST's)

3.0 TECHNICAL APPROACH

3.1 MOBILIZATION

Personnel and equipment required to perform the scope of work will be obtained from the nearest available resources. The following information outlines the proposed personnel and major equipment which will be mobilized for the execution of the project.

Personnel	Equipment
1-Response Manager	1-60' Double Office, Trailer
1-Chemist (as needed)	1-Mini Laboratory Trailer
1-Project Accountant	1-Pick-up Truck
2-Equipment Operators	2-Passenger Vans
4-Recovery Technicians	1-Track Loader
1-T&D Coordinator (as needed)	1-Excavator with Grappler Attachment
1-Electrician (as needed)	1-Bobcat or backhoe
	1-Computer with scanner and zip drive
	1-LEL/0_2
	1-PID
	1-Logger Note Pad

3.2 SITE PREPARATION

Upon completion of mobilization, OHM will begin site preparation activities. OHM will conduct a site safety meeting prior to commencement of any site activities. Once the safety meeting is completed, site setup shall begin.

Site preparation will include the delineation of work and support zones and preparation of container staging areas. High visibility fence will be used to establish the boundary for the exclusion zone. Support zone activity will include the set-up of an office trailer, a mini lab, portable sanitary facilities, and utility hook-ups.

Several areas within the main building will be cleared of debris for use as staging or bulking areas. This will require the relocation of solid waste to an area designated by the OSC. Any small containers encountered during this waste relocation will be staged in close proximity to the buildings main entrance. Areas designated as staging areas will be swept clean and floor sweepings will be stockpiled elsewhere within the building for later disposal.

The entire building will be inspected for empty containers which will be staged within the building. All empty containers will be crushed, stockpiled, and loaded into rolloff containers or dump trailers for future disposal. Containers which are not empty inside the building will be numbered and their location will be logged prior to moving them to designated staging areas.

3.3 DRUM STAGING

All containers will be staged in rows in a designated area near an entrance of the building. While every effort will be made by OHM to prevent the release of material during the drum handling operations, there is an increased risk of release due to the extreme, deteriorated condition of the drums. A drum containing spill control materials and equipment shall be staged in close proximity to the staging activities.

Prior to handling, each drum will be inspected to determine its integrity and proper handling technique to be utilized. Each drum will be monitored with a photoionization detector (PID) and readings will be recorded in a log for future reference. Additionally, any markings found on the drum will be recorded as discussed in the sampling, analysis and quality assurance plan (SAQAP). Drums which require on-site waste categorization or additional analytical will be numbered prior to being moved to the designated staging areas within the main building.

OHM technicians will inspect all drums to insure integrity. Any drums that fail visual inspection will be sampled in place, placed into the trackloader bucket and transported to the designated staging area. If the integrity of the drum is determined to be sound, technicians will transport the drum to a designated row in the staging area using a drum cart/or excavator with drum grapplers.

3.4 CONTAINER INVENTORY

EPA has identified several containers of five gallons or greater and additional small containers of labpack quantity. OHM sample technicians shall inspect each container to determine their physical integrity. Containers determined to be in poor physical condition shall be overpacked prior to moving to the staging area. Once in the staging area, each container receives a unique ID number and is inventoried.

3.5 EMPTY CONTAINERS DISPOSAL

Drums and containers that are found to be empty or RCRA empty are to be staged in an area away from sampling activities. Containers will be crushed and stockpiled for later disposal. Empty containers will not be inventoried by the OHM sampling team.

3.6 MATERIAL BULKING

At the completion of hazcat analysis, the containerized waste materials will be separated into categories of similar chemical characteristics. At this time, a decision shall be made if consolidation of containers within each waste stream is warranted based upon the volume of material in the containers. Individual drum logs shall serve as documentation for any on site laboratory data. In the event that drum bulking is to be performed, the following procedures are to be followed.

Bench scale bulk testing of materials in the same waste stream shall be conducted to determine waste compatibility as described in the SAQAP. Drum bulking can then be commenced after approval by the OHM chemist and the site supervisor. For liquid waste streams, a manually operated guzzler pump shall be used to transfer the material from the drums into the receiving bulk drum. Drums containing solids shall be emptied out using the excavator with grappler attachment into piles for loading into dump trailers. All material bulking shall occur in an area separate from the staging area. The OHM Chemist will oversee the bulking operation and properly document the sequence of containers consolidated as determined by benchscale testing.

In addition to the containerized waste, several suspected ash piles, areas with heavy soil discoloration and areas affected by incinerator ash will be sampled for disposal characteristics. Upon receipt of analytical results, these areas will be bulked according to waste stream and loaded for disposal into appropriate containers.

3.7 LABPACKING

OHM sample technicians shall inventory each small quantity labpack container and segregate them according to waste class. Unknown or unlabeled containers are inventoried, sampled and sent to the on site mobile lab for hazcat analysis. Those that exhibit signs of reacting or are potentially shock sensitive shall be carefully placed in a five gallon container with vermiculite and staged separately from the other containers. Containers tested to be of similar chemical characteristics are grouped together and packaged in the appropriate size drum. The containers shall be placed evenly within the labpack with enough vermiculite to ensure no contact between containers.

3.8 UNDERGROUND STORAGE TANKS

EPA has identified two underground storage tanks (UST) on the site. Tank contents shall be evaluated by retrieving a sample through the fill pipe with a sludge judge. These samples will be sent off site for disposal analysis. OHM will transport and dispose of tank contents upon receipt of the appropriate facility approvals. OHM will provide a task specific amendment for this effort upon further evaluation and discussion with the EPA.

3.9 TEARDOWN/DEMOBILIZATION

Upon completion of the scope of work, OHM will decontaminate equipment used during the performance of the scope of work. A temporary equipment decontamination station will be constructed with multi layered 1 mil polyethylene sheeting. Equipment requiring decontamination will be hand cleaned or pressure washed as necessary. The water generated will be collected and placed in DOT shippable containers. All disposable protective clothing utilized during site operations along with the material from the decontamination stations will be collected in D.O.T. shippable containers and staged for disposal. All work areas will be policed and secured. Personnel and equipment will then be demobilized to their respective place of origin.

3.10 TRANSPORTATION AND DISPOSAL

Prior to removal of waste from the site, OHM will adhere to all applicable local, state and federal requirements. OHM will utilize only those transporters and disposal facilities that are fully licensed and/or permitted. All waste will be properly stored on site pending analytical data and acceptance approval.

Once the disposal analytical reports are received, the T&D Coordinator will evaluate the results and make recommendations on the appropriate disposal facility. Following OSC approval of the facility, the T&D Coordinator will prepare the waste profile sheets for USEPA review and signature, then forward each to the disposal facility for acceptance approval.

The Response Manager will coordinate the loadout of the waste with the OSC after notice of acceptance approval is received from the facility. The majority of waste should be sent to disposal facilities prior to the demobilization of site personnel. If not, OHM will make every effort to schedule the removal of remaining drums at the same time to minimize re-mobilization costs.

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Services Corp.
A Subsidiary of OHM Corporation

SITE-SPECIFIC HEALTH & SAFETY PLAN FOR REMEDIATON ACTIVITIES CENTRAL STEEL DRUM SITE NEWARK, ESSEX COUNTY, NEW JERSEY

Prepared for:

U.S. Environmental Protection Agency
Region II - Removal Action Branch
Edison, New Jersey

Prepared by:

OHM Remediation Services Corp.
Northeast Region
200 Horizon Center Boulevard
Trenton, New Jersey 08691-1904

Paul A. Lawless, CIH
Regional Industrial Hygienist

Reviewed by:

Robert A. Brooks, CSP
Health and Safety Manager

September 24, 1997
Revision 00
OHM Project 20163HS

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONTINUATION)

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed for the U.S. Environmental Protection Agency Region II.

This HASP documents the policies and procedures which protect workers and the public from potential hazards posed by work at this site and is a key component in the *OHM Safety Improvement Process*. OHM considers safety the highest priority during work at a site containing potentially hazardous materials and has established a goal of **zero incidents** for all projects. All projects will be conducted in a manner which minimizes the probability of injury, accident, or incident occurrence. This HASP is a key element in the proper planning of project work which is necessary to assure the goal of **zero incidents** is achieved. The HASP Certification (Appendix A) will be signed by all who actively participate at this project.

The procedures and guidelines contained herein are based upon the best available information at the time of the plan's preparation. Specific requirements will be revised by the On-Scene Coordinator (OSC) when new information is received or conditions change.

All personnel entering the site shall read and sign this safety plan. Protocol set forth herein will remain in effect until the OSC certifies that activity is terminated. It does not supersede any Federal, OSHA, state, or local regulations, but is in addition to them. In the event of a conflict between this protocol and a regulation, the more stringent of the two will be enforced.

The protocol is in accordance with, and refers to, the terminology used in the Office of Emergency and Remedial Response (OERR) Standard Operating Safety Guides.

1.1 SITE HISTORY

The site is located at 704-738 Doremus Avenue, Newark, New Jersey, 07105. The site is situated in an industrial area in the Iron Bound section of Newark and consists of a large manufacturing building located on 8.5 acres. The census statistics within a 1.5 mile radius of the site shows a population of 7,023 persons. Before 1952, an ink manufacturer occupied this site (International Printing Ink, Division of Interchemical Corporation, now part of Inmont Corp.). From 1952 to approximately 1991, Central Steel and Drum operated a drum reconditioning business. After vacating the property, a container shipping operation leased the property. According to NJDEP, the property has been abandoned since 1994.

The site is situated on filled wetland. On the south end of the property, bordering one side of the property, is an existing wetland where drums have been observed. To the west, along Doremus Avenue, are railroad tracks. The site, other than the main building, is gravel/weed covered, filled vacant land.

EPA on March 14-15, 1997, determined that approximately 500 drums of flammable, corrosive, possible water reactive, incinerator ash and sand blasting materials are abandoned on the site. In total, approximately 50,000 gallons of hazardous wastes are estimated to be abandoned throughout the building/site (approximately 35% are solid wastes). Information regarding hazardous wastes at the site are based upon container labels, hazcatting and historical documents identified.

The site consists of one main building. It has been used as a commercial dumping ground (evidenced by truck tires, construction debris, etc.). The property is partially fenced and there are no gates at the entrance. However, vehicles cannot enter the property, since there are four large concrete blocks (approximately 3 feet high) barring entry.

The building is 200 ft. X 500 ft., masonry construction with a metal truss roof. The building is in deteriorated condition and the roof leaks. All utilities have been turned off. There is no fire suppression system available in the building. The building was found to be unsecured and there is evidence of vandalism, dumping and public entry. In a trailer on the property, it appears that some is using this as shelter.

Central Steel Drum received drums from various industries ranging from food to paint manufacturing. Its reconditioning operations involved incineration, sandblasting and repainting. There are approximately 750 drums of waste on the property. Approximately 50 percent contain acids, flammables, water reactive, paints and other waste materials. The remaining 50 percent contain incinerator ash. Incinerator ash was used as fill on the property. The main hazardous constituent in the ash is lead. Random XRF screenings indicate lead contamination above the 10,000 ppm range at certain locations throughout the property.

1.2 SCOPE OF WORK

The principal tasks to be conducted are listed below.

- Mobilization, site setup
- Drum and container handling, overpacking
- Drum and container sampling
- UST removal, clean and scrap
- On-site HAZ-CAT testing
- Equipment decontamination

These activities have been analyzed for potential hazards for which control measures are provided in Section 3.4 Job Safety Analysis.

This HASP has been prepared for the above scope of work. Any changes to the scope of work will require amendment of the plan to remain approved.

FIGURE 1.1
AREA MAP

2.0 KEY PERSONNEL

The USEPA On-Scene Coordinator (OSC), ERCS Program Manager (PM), Response Manager (RM), Certified Industrial Hygienist (CIH), Health and Safety Manager (HSM), Project Safety Officer (PSO) and START representatives share responsibilities for formulating and enforcing health and safety requirements, and implementing the HASP.

2.1 ON-SCENE COORDINATOR (OSC)

The OSC, as the representative of the U.S. Environmental Protection Agency (EPA), is responsible for the overall project administration and coordinating health and safety standards for all individuals on site at all times. All applicable Occupational Health and Safety Administration standards shall be observed. However, each contractor (as an employer under OSHA) is responsible for the health and safety of its employees.

2.2 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM (START)

The Superfund Technical Assessment and Response Team is responsible for providing the OSC with assistance and support in regard to all technical, regulatory, and safety aspects, of site activity. START is also available to advise the OSC on matters related to sampling, treating, packaging, labeling, transporting, and disposing of hazardous materials, but is not limited to that mentioned above.

2.3 PROGRAM MANAGER (PM)

The PM has the overall responsibility for the project and to assure that the requirements of the contract are attained in a manner consistent with the HASP requirements. The PM will coordinate with the SS and the SSO to assure that the work is completed in a manner consistent with the HASP. The PM will conduct a periodic health and safety audit of the project using the Management Safety Improvement Report form as required in the Standard Operating Procedure. The PM reports to the Director of Operations. Specific Key Requirement Areas (KRA's) for safety performance include:

- Implement Site Specific Safety Awareness/ Recognition program
- Conduct periodic site audit (Management Safety Improvement Report) one report within 30 days of mobilization; one report within 60 days of mobilization
- Investigate and report findings for any OSHA recordable cases; assure corrective actions are taken

2.4 RESPONSE MANAGER (RM)

The RM is responsible for field implementation of the HASP and Site Emergency Response and Contingency Plan. The RM is responsible for field implementation of the HASP and will act as the PSO in the absence of the assigned PSO. The RM will establish and ensure compliance with site control areas and procedures and coordinate these supervisory responsibilities with the site PSO. Specific Key Requirement Areas (KRA's) for safety performance include:

- Complete Job Safety Analyses for all principle tasks
- Implement Safety Awareness/ Recognition program
- Conduct weekly safety inspections of job sites

- Correct all deficiencies as noted on Management Safety Improvement Reports and safety department audits, within recommended time frames
- Investigate and report findings for All OSHA recordable cases; assure corrective actions are taken

2.5 HEALTH AND SAFETY MANAGER (HSM)

The OHM HSM is responsible for staffing health and safety personnel and monitoring projects for compliance with regulatory and OHM health and safety policies and procedures. This position reports to the Regional Health and Safety Director and may visit the site periodically to ensure compliance with this HASP.

2.6 PROGRAM CERTIFIED INDUSTRIAL HYGIENIST (CIH)

The Program CIH shall be responsible for reviewing the HASP and ensuring that the HASP is complete and accurate. The Program CIH provides technical and administrative support for the ERCS Health and Safety Program. If necessary, the CIH can modify specific aspect of the HASP to adjust for on-site changes that affect safety. The CIH will coordinate with the PSO on necessary modifications to the HASP and will be available for consultation when required. The CIH may make periodic site visits to determine compliance.

2.7 PROJECT SAFETY OFFICER (ERCS)

The PSO's primary responsibilities will be monitoring, including personal and environmental monitoring, conduct safety orientation, and review site safety practices and documentation. The PSO will make periodic visits to the site to fulfill these duties. Specific Key Requirement Areas (KRA's) for SSO performance include:

- Monitor workers for signs of stress, such as cold exposure, heat stress, and fatigue
- Reevaluate site conditions on an on-going basis. Coordinate protective measures including engineering controls, work practices and personal protective equipment
- Assist the RM in the preparation, presentation and documentation of daily safety meetings
- Conduct and prepare reports of daily safety inspections of work processes, site conditions, equipment conditions and submit to RM. Discuss any necessary corrective actions with the RM and review new procedures
- Initiate revisions of the HASP as necessary for new tasks or modifications of existing operations and submit to the Project CIH for approval
- Perform air monitoring as required
- Assist the PM and RM in accident investigations
- Prepare permits for special operations, e.g., hot work, confined spaces, line breaking, etc.
- Maintain site safety records
- Conduct weekly inspections of all fire extinguishers, supplied air respirators, first-aid kits, and eye washes/emergency showers
- Ensure that project management/ purchasing has pre-qualified sub contractors during the bidding stage. Inform subcontractors of the elements of the HASP/contractor pre-job checklist
- Coordinate the preparation of Job Safety Analyses with the RM, team leader, and work crew
- Coordinate the daily Safety Observer Program
- Coordinate the Safety and Health Awareness and Recognition Program (SHARP) with Project Manager and Response Manager

2.8 EMPLOYEE SAFETY RESPONSIBILITY

Each employee is responsible for personal safety as well as the safety of others in the area and is expected to participate fully in the *Safety Improvement Process*, particularly the Safety Observation Program. The employee will use all equipment provided in a safe and responsible manner as directed by the RM. All OHM personnel will follow the policies set forth in the OHM Health and Safety Procedures Manual, with particular emphasis on the OHM "Cardinal Safety Rules." Employees that knowingly disregard safety policies/procedures may be subject to disciplinary actions.

2.9 RESPONSIBILITIES

2.9.1 On-Scene Coordinator (OSC)

The National Oil and Hazardous Substance Pollution Contingency Plan (NCP) authorizes the OSC to coordinate and direct federally financed response or clean-up activities at the site. The NCP also makes the OSC responsible for addressing worker safety concerns at the response scene (see 40 CFR 300.135 and .150).

At this hazardous waste site, the primary responsibilities of the OSC relative to safety include the following:

a. To ensure that all personnel allowed to enter the site (i.e., EPA, START, contractors, State, visitors) are aware of the potential hazards associated with substances known or suspected to be on-site;

b. To ensure that said personnel are aware of the provisions of this plan and are instructed in the safety practices defined in the plan, including its emergency procedures;

c. To ensure that the appropriate safety equipment is available and properly utilized by all personnel on-site;

d. To direct the safety monitoring efforts of the Site Safety Monitor; and

e. To correct any work practices or conditions under his control that may result in exposure to hazardous substances or injury to personnel

The OSC may alter this Health and Safety Plan in writing as warranted by site conditions.

2.9.2 Emergency Response Cleanup Service (ERCS)

The Response Manager (RM), as the field representative for the ERCS cleanup contractor, has the responsibility for fulfilling the terms of the Delivery Order. The RM must oversee the project and ensure that all technical, regulatory, and safety requirements are met. It is the RM's responsibility to communicate with the OSC as frequently as dictated by the OSC, but at least daily, regarding site cleanup progress and any problems encountered.

2.9.3 Superfund Technical Assessment and Response Team (START)

The Superfund Technical Assessment and Response Team is responsible for providing the OSC with assistance and support in regard to all technical, regulatory and safety aspects of site activity, and acting as the Site Health and Safety Monitor as directed by the OSC. START is also available to advise the OSC on matters

relating to sampling, treating, packaging, labeling, transporting, and disposing of hazardous materials, but is not limited to the above-mentioned activities.

2.10 KEY SAFETY PERSONNEL - PHONE NUMBERS

The following individuals share responsibility for health and safety at the site.

USEPA On-Scene Coordinator (OSC)	Gregory B. DeAngelis USEPA Region II 2890 Woodbridge Aveuue Edison, NJ 08837 732-906-6874
ERCS Response Manager	Stan Gable 800-670-3079 (pager)
ERCS Project Safety Officer	TBD
START Representatives	Roy F. Weston, Inc. 1090 King Georges Post Road Suite 201 Edison, NJ 08837 (908) 225-6116
Health and Safety Manager	Robert A. Brooks, CSP 609-588-6423 (office) 800-818-2185 (pager)
ERCS Director, Health and Safety/ Project CIH	Kevin McMahon, M.S., CIH 609-588-6375 (office) 609-421-7523 (pager)
ERCS Vice President, Health and Safety	Fred Halvorsen, Ph.D., PE, CIH 800-231-7031

3.0 JOB SAFETY ANALYSIS

This section outlines the potential chemical and physical hazards which workers may be exposed to during work on this project. This is a representative list of hazardous materials present at this site. Other chemicals may be present at the site which have not yet been identified. Unless a material is identified by a valid label, it shall be considered as unknown, and handled as such.

3.1 CHEMICAL HAZARDS

The primary routes of exposure for corrosives, flammables and paints (toluene) are inhalation and skin contact with liquids mist and/or vapor. The primary routes of exposure for incinerator ash (lead) are inhalation of dust and particulates. Exposure to these substances may occur during drum handling, overpacking, drum sampling and related HAZ-CAT activities.

CHEMICAL	EXPOSURE ROUTES	PEL/ TLV	HEALTH HAZARDS/ PHYSICAL HAZARDS
Lead	Inhalation, ingestion	0.050 mg/m^3	Weakness, insomnia; loss of appetite, loss of weight, abdominal pain; anemia; tremors; weakness of wrists/ ankles; kidney damage; low blood pressure
			Incompatable with strong oxidizers, hydrogen peroxide and acids
Corrosive Alkali, e.g., Sodium Hydroxide	Skin, eye, inhalation, ingestion	0.5 mg/m^3	A strong corrosive agent to all body tissues; permanent blindness can result from eye contact; deep ulcer formation on skin
			Releases large quantities of heat in contact with water; reacts violently with acids; releases toxic gases in contact with metals, arsenic; can cause fires, explosions in contact with organic peroxides and toxic gases
Corrosive Acid, e.g., Sulfuric Acid	Skin, eye, inhalation, ingestion	1mg/m^3	A severe corrosive agent to all body tissues; permanent blindness can result from eye contact; inhalation produces pulmonary edema, bronchitis, and dental erosion
			Releases hydrogen gas, heat in contact with metals; reacts violently with bases; violent exothermic (heat releasing) reaction with water; produces sufficient heat to ignite combustable materials; chemical decomposition releases toxic gases
Paint solvent e.g., Toluene	Skin, eye, inhalation, ingestion	50 ppm SKIN	Fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, insomnia, numbness/tingling in hands, feet, dermatitis
			Reacts with strong oxidizers; flammable liquid; releases toxic gases during combustion

3.1.1 Lead Contamination/Federal Lead Standard

The Federal lead standard 29 CFR 1910.1025, requires the following worker protection programs be in place if airborne lead exposure exceeds the "action level" 30 micrograms per cubic meter: A biological monitoring program which tests workers for blood lead and zinc protoporphryn of workers exposed above the "action level." Provide clean change facilities with separate lockers for work and street clothing, the means to shower before leaving the workplace and a clean area for breaks and lunch. A laundry (on-site) is required, to treat contaminated water from the washing of uniforms or a commercial facility that is capable of handling lead contaminated uniforms and clothing. Lead contaminated clothing going off site must be bagged and properly labeled as lead contaminated clothing; "CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED LEAD WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS". A written respiratory protection program (also required under HAZWOPER 29 CFR 1910.120, See Section 5.14.1 of this HASP).

Personnel will be removed from the work site and placed under observation immediately if the following initial symptoms occur:

- Dizziness or stupor
- Nausea, headaches, or cramps
- Irritation of the eyes, nose, or throat
- Euphoria
- Chest pains and coughing
- Rashes or burns

3.2 PHYSICAL HAZARDS

To minimize physical hazards, standard safety protocols will be followed at all times. Failure to follow safety protocols will result in expulsion of the employee from the site. All personnel shall be familiar with the physical hazards presented by each of the tasks they perform. Task specific hazard analyses are provided in Section 3.4. These hazard analysis shall be reviewed prior to beginning each task and periodically throughout the task. It must be noted that these activity hazard analyses are general in nature. It is the responsibility of the RM to revise and adapt them as necessary to reflect site specific conditions.

The RM and PSO will observe the general work practices of each crew member and equipment operator, and enforce safe procedures to minimize physical hazards. Hard hats, safety glasses, and steel-toe safety boots are required in all active work areas of the site.

3.3 ENVIRONMENTAL HAZARDS

Environmental factors such as weather, wild animals, insects, and irritant plants may pose a hazard when performing outdoor tasks. The PSO and RM will take necessary actions to alleviate these hazards should they arise.

3.3.1 Heat Stress

The combination of warm ambient temperature and protective clothing increases the potential for heat stress. Heat stress disorders include:

- Heat rash
- Heat cramps
- Heat exhaustion
- Heat stroke

Heat stress prevention is outlined in procedure 3-4 of the OHM Corporation Health and Safety Procedures Manual. This information will be reviewed during safety meetings. Workers are encouraged to increase consumption of water and electrolyte-containing beverages; e.g. Gatorade. Heat stress can be prevented by assuring an adequate work/rest schedule. Guidelines are presented below.

It is recommended that workers break a minimum of every 2 hours for 10-15 minute rest periods ambient when temperatures exceed 65 degrees F and protective clothing is worn. More frequent breaks are necessary as the temperatures and level of protection are increased (see table below).

AMBIENT TEMPERATURE	NO CHEMICAL PROTECTIVE CLOTHING (LEVEL D)	PROTECTION LEVELS C/B/A
90° F or above	After 45 minutes of work	After 15 minutes of work
87.5 F-90 F	After 60 minutes of work	After 30 minutes of work
82.5-87.5 F	After 90 minutes of work	After 60 minutes of work
77.5-82.5 F	After 120 minutes of work	After 90 minutes of work
72.5-77.5 F	After 150 minutes of work	After 120 minutes of work

A work/rest schedule can be calculated based on heat stress monitoring results. Monitoring consists of taking the radial pulse of a worker for 30 seconds immediately after exiting the work area. The frequency of monitoring is provided herein.

If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by 1/3 and keep the rest period the same. If the heart rate still exceeds 110 beats per minute at the next rest period, increase the following rest period by 1/3. The initial rest period should be at least 5 minutes.

Body temperature measured orally or through the ear canal may also be monitored to assess heat stress. Workers should not be permitted to continue work when their body temperature exceeds 100.4 F (38C). Monitoring should be conducted at the intervals given above.

Monitoring for heat stress will begin when the ambient temperature reaches or exceeds 65 degrees Fahrenheit, when wearing Level C PPE, or 80 degrees Fahrenheit for site activities performed in Level D.

Poison Ivy may be found at the site. It is highly recommended that all personnel entering into an area with poison ivy wear a minimum of a tyvek coverall, to avoid skin contact.

The majority of skin reactions following contact with offending plants are allergic in nature and characterized by:

- General symptoms of headache and fever
- Itching
- Redness
- A rash

Some of the most common and most severe allergic reactions result from contact with plants of the poison ivy group, including poison oak and poison sumac. Such plants produce severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim may develop a high fever and feel very ill. Ordinarily, the rash begins within a few hours after exposure, but may be delayed 24 to 48 hours.

Distinguishing Features of Poison Ivy Group Plants

The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each. Both plants have greenish-white flowers and berries that grow in clusters.

First Aid

a. Remove contaminated clothing; wash all exposed areas thoroughly with soap and water, followed by rubbing alcohol. 1% hydrocortisone cream (over-the-counter) will aid in healing and reducing itch.

b. Apply calamine or other soothing lotion if rash is mild.

c. Seek medical advice if a severe reaction occurs, or if there is a known history of previous sensitivity.

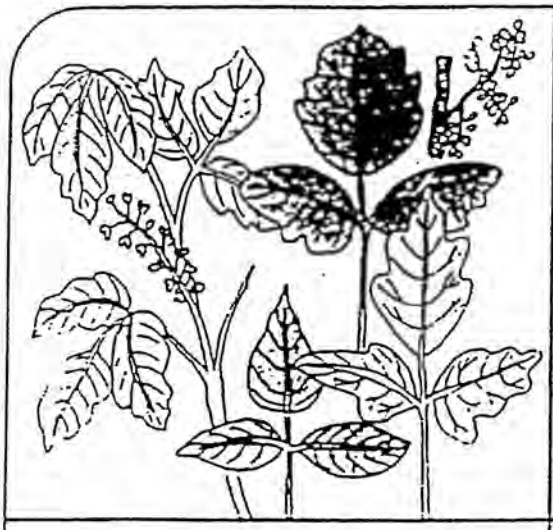
Contaminated Clothing

The irritating substances emitted by poison ivy group plants will remain on clothing for prolonged periods of time - up to weeks or months, if not washed thoroughly. It may be necessary to wash contaminated clothing separately and more than once before reusing.

- TICKS

Heavily vegetated areas of a site may have ticks. It is highly recommended that all personnel walking through such areas wear a minimum of a tyvek and latex boot covers. The ticks will stand out against the light colors. A tick repellent or insect containing DEET is also recommended.

FIGURE 3.1
POISONOUS PLANTS



COMMON POISON IVY
(RHUS RADICANS)

- Grows as a small plant, a vine, and a shrub.
- Grows everywhere in the United States except California and parts of adjacent states. Eastern oak leaf poison ivy is one of its varieties.
- Leaves always consist of three glossy leaflets.
- Also known as three-leaf ivy, poison creeper, climbing sumac, poison oak, markweed, picry, and mercury.

WESTERN POISON OAK
(RHUS DIVERSILOBA)

- Grows in shrub and sometimes vine form.
- Grows in California and parts of adjacent states.
- Sometimes called poison ivy, or yeara.
- Leaves always consist of three leaflets.

POISON SUMAC
(RHUS VERNIX)

- Grows as a woody shrub or small tree from 5 to 25 feet tall.
- Grows in most of eastern third of United States.
- Also known as swamp sumac, poison elder, poison ash, poison dogwood, and thunderwood.

Ticks can transmit several diseases, including Rocky Mountain spotted fever, a disease that occurs in the eastern portion of the United States as well as the western portion, and Lyme disease. Ticks adhere tenaciously to the skin or scalp . There is some evidence that the longer an infected tick remains attached, the greater is the chance that it will transmit disease.

First Aid

a. Carefully (slowly and gently) remove the tick with tweezers, taking care that all parts are removed.

b. With soap and water, thoroughly, but gently, scrub the area from which the tick has been removed, because disease germs may be present on the skin; also wipe the bite area with an antiseptic.

c. If you have been bitten, place the tick in a jar labeled with the date, location of the bite, and the location acquired. If any symptom appears, such as an expanding red rash, contact a physician immediately.

- LYME DISEASE

Lyme disease may cause a number of medical conditions, including arthritis, that can be treated if you recognize the symptoms early and see your doctor. Early signs may include a flu-like illness, an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve and heart problems as well as a disabling type of arthritis.

You are more likely to spot early signs of Lyme disease rather than see the tick or its bite. This is because the tick is so small (about the size of the head of a common pin or a period on this page and a little larger after they fill with blood), you may miss it or signs of a bite. However, it is also easy to miss the early symptoms of Lyme disease.

In its early stage, Lyme disease may be a mild illness with symptoms like the flu. It can include a stiff neck, chills, fever, sore throat, headache, fatigue, and joint pain. But this flu-like illness is usually out of season, commonly happening between May and October when ticks bite.

Most people develop a large, expanding skin rash around the area of the bite. Some people may get more than one rash. The rash may feel hot to the touch and may be painful. Rashes vary in size, shape, and color, but often look like a red ring with a clear center. The outer edges expand in size. Its easy to miss the rash and the connection between the rash and the tick bite. The rash develops from three days to as long as a month after the tick bite. Almost one third of those with Lyme disease never get the rash.

Joint or muscle pain may be another early sign of Lime disease. These aches and pains may be easy to confuse with the pain that comes from other types of arthritis. However, unlike many other types of arthritis, this pain seems to move or travel from joint to joint.

In later stages, Lyme disease may be confused with other medical problems. These problems can develop months to years after the first tick bite.

Early treatment of Lyme disease symptoms with antibiotics can prevent the more serious medical problems of later stages. If you suspect that you have symptoms of Lime disease, contact your doctor.

Lyme disease can cause problems with the nervous system that look like other diseases. These include symptoms of stiff neck, severe headache, and fatigue usually linked to meningitis. They may also include pain and drooping of the muscles on the face, called Bell's Palsy. Lyme disease can also mimic symptoms of multiple sclerosis or other types of paralysis.

Lyme disease can also cause serious but reversible heart problems, such as irregular heart beat. Finally, Lyme disease can result in a disabling, chronic type of arthritis that most often affects the knees. Treatment is more difficult and less successful in later stages. Researchers think these more serious problems may be linked to how the body's defense or immune system responds to the infection.

3.3.3 Noise

Hearing protection is required for workers operating or working near heavy equipment, where the noise level is greater than 85 dbA (Time Weighted Average) as well as personnel working around heavy equipment. The PSO will determine the need and appropriate testing procedures, (i.e., sound level meter and/or dosimeter) for noise measurement.

3.4 VEHICLE SAFETY MANAGEMENT

Motor vehicle incidents are the number one cause of occupational fatalities. OHM employees involved in the operation and use of OHM and/or leased or rented vehicles will comply with the OHM Vehicle Management Policy. OHM requires employees to use seat belts at all times when traveling in OHM owned or leased/rented vehicles. The SS and/or SSO will develop a parking area plan, including backing vehicles into parking spaces, using spotters for backing vehicles and policy mandated vehicle inspections.

OHM employees are expected to incorporate safe actions and preparations to avoid vehicle accidents and personal injury during work and off hours. Breaks should be planned into lengthy job mobilizations and demobilizations, including rotation of drivers at regular intervals. If parking areas are busy or crowded and more than one worker is traveling in the same vehicle, one worker should remain outside the vehicle as it leaves the parking space to assist the driver with traffic observation. Vehicles traveling before dawn and at dusk in rural or wooded areas should be prepared for wild life, e.g. deer, crossing roadways.

OHM employees arriving at work areas should park vehicles away from delivery, heavy equipment and vehicle loading, unloading locations to prevent parked vehicles from damage by various deliveries. Heavy equipment operators should inspect areas and request vehicles to be moved or spotters used if necessary, to maneuver equipment in tight areas. Employees who observe near misses or potential risks to parked or moving vehicles must report these to the SS or SSO immediately.

OHM employees are expected to use the vehicle inspection form and check/test the safety systems on the vehicle on a daily basis. Check the following: brakes, mirrors, seat belts, tires, leakage from the undercarriage, lights and turn signals. Vehicles with safety deficiencies must be reported immediately and not driven until properly repaired. Vehicles running errands from different project sites should have telephone numbers of the job site in the vehicle in case calls for assistance are required.

Because of the different ways alcohol can affect behavior, even in very small amounts, the best and safest course is not to drink before driving. At OHM, a driver with blood alcohol concentration (BAC) over 0.04% is considered to be under the influence and subject to disciplinary action. Personnel involved in motor vehicle incidents are subject to drug and alcohol testing.

Weather conditions can have a profound effect on driving. On slippery roads, drive more slowly. Stop and turn with care. Keep several car lengths from other vehicles. At speeds in excess of 35 mph, the chances of hydroplaning increase with speed. In general, keep back 1 car length for every 10 mph to prevent striking the car ahead.

In the event of a vehicle incident, notify your Site Supervisor ***immediately*** and complete all required reports.

3.5 TASK-SPECIFIC JOB SAFETY ANALYSES (JSA)

This section of the Site-Specific HASP provides a breakdown of the hazards and control measures for each principal task. These Job Safety Analyses are general in nature and must be made project specific by the Response Manager prior to each task. The JSAs will be field checked by the supervisor on an ongoing basis and revised as necessary. All revisions will be communicated to the work crew.

3.5.1	JOB SAFETY ANALYSIS FOR SITE PREPARATION			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Equipment/ Facility Set-up	Slips, Trips, Falls	• Clear walkways work areas of equipment, tools, vegetation, excavated material and debris • Mark, identify, or barricade other obstructions		
	Electrical Shock	• De-energize or shut off utility lines at their source before work begins • Use double insulated or properly grounded electric power-operated tools • Maintain tools in a safe condition • Provide an equipment-grounding conductor program or employ ground-fault circuit interrupters • Use qualified electricians to hook up electrical circuits • Inspect all extension cords daily for structural integrity, ground continuity, and damaged insulation • Cover or elevate electric wire or flexible cord passing through work areas to protect from damage • Keep all plugs and receptacles out of water • Use approved water-proof, weather-proof type if exposure to moisture is likely • Inspect all electrical power circuits prior to commencing work • Follow Lockout-Tagout procedures in accordance with OHM Health and Safety Procedures # 6-4		
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		

CSD - 2.8019

3.5.1	JOB SAFETY ANALYSIS FOR SITE PREPARATION			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Equipment/ Facility Set-up (Continued)	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Ear plugs	
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures # 3-4, 3-5 • Provide fluids to prevent worker dehydration		

3.5.2	JOB SAFETY ANALYSIS FOR DRUM AND CONTAINER HANDLING/OVERPACKING			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
Staging/ Overpacking Drums and Containers	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Caught In/ Between Moving Parts	• Identify and understand parts of equipment which may cause crushing, pinching, rotating or similar motions • Assure guards are in place to protect from these parts of equipment during operation • Provide and use proper work gloves when the possibility of pinching, or other injury may be caused by moving/ handling large or heavy objects • Maintain all equipment in a safe condition • Keep all guards in place during use • De-energize and locked-out machinery before maintenance or service		
	Slips, Trips, Falls	• Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris • Mark, identify, or barricade other obstructions		

3.5.2	JOB SAFETY ANALYSIS FOR DRUM AND CONTAINER HANDLING/OVERPACKING			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Staging/ Overpacking Drums and Containers (Continued)	Fire/ Explosion	• Eliminate sources of ignition from the work area • Prohibit smoking in work areas • Provide ABC (or equivalent) fire extinguishers for all work, flammable storage areas; fuel powered generators and compressors • Store flammable liquids in well ventilated areas • Prohibit storage, transfer of flammable liquids in plastic containers • Post "NO SMOKING" signs • Store combustible materials away from flammables • Store, all compressed gas cylinders upright, caps in place when not in use • Separate Flammables and Oxidizers by 20 feet minimum		
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	
	Struck by/ Against Heavy Equipment, Protruding Objects	• Use reflective warning vests worn when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals	Warning vests, Hard hat, Safety glasses	
	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin	Tyvek coveralls, nitrile gloves, neoprene boots (see Section 5.0 HASP)	PID, MiniRAM, Air Sample Pump

3.5.2	JOB SAFETY ANALYSIS FOR DRUM AND CONTAINER HANDLING/OVERPACKING			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M^3 LEVEL D; ≥ 1.25 MG/M^3 <5.0 MG/M^3, LEVEL C; >5.0 MG/M^3, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M^3 LEVEL D, >0.03MG/M^3 ≤ 2.5MG/M^3, LEVEL C, >2.5MG/M^3, LEVEL B LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
Staging/ Overpacking Drums and Containers (Continued)	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures #3-4, 3-5 • Provide fluids to prevent worker dehydration		

3.5.3	JOB SAFETY ANALYSIS FOR DRUM AND CONTAINER SAMPLING			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Drum and Container Sampling	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Wizard gloves or equivalent	
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Slips, Trips, Falls	• Clear walkways, work areas of equipment, tools, vegetation, excavated material, and debris • Mark, identify, or barricade other obstructions		
	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin	Tyvek coveralls, neoprene boots, nitrile gloves (see Section 5.0 HASP)	PID, Mini-RAM, Air Sample Pump
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures # 3-4, 3-5 • Provide fluids to prevent worker dehydration		

3.5.4	JOB SAFETY ANALYSIS FOR TANK REMOVAL, CLEAN AND SCRAP			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥10% LEL, STOP WORK; EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Excavation of Tank	Underground Utilities	• Identify all underground utilities around the excavation site before work commences • Cease work immediately if unknown utility markers are uncovered		
	Struck By/ Against Heavy Equipment	• Use reflective warning vests worn when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review hand signals	Warning vest, Hard hat, Safety glasses	
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Wizard or similar cut resistant gloves	
	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Ear plugs	

CSD - 2.8025

3.5.4	JOB SAFETY ANALYSIS FOR TANK REMOVAL, CLEAN AND SCRAP			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Excavation of Tank (Continued)	Excavation Wall Collapse	• Construct diversion ditches or dikes to prevent surface water from entering excavation • Provide good drainage of area adjacent to excavation • Collect ground water/rain water from excavation and dispose of properly • Store excavated material at least 2 feet from the edge of the excavation; prevent excessive loading of the excavation face • Provide sufficient stairs, ladders, or ramps when workers enter excavations over 4 feet in depth • Place ladders no more than 25 feet apart laterally • Treat excavations over 4 feet deep as confined spaces • Complete confined space permit entry procedure • Monitor atmosphere for flammable/toxic vapors, and oxygen deficiency • Slope, bench, shore, or sheet excavations over 5 feet deep if worker entry is required • Assign a competent person to inspect, decide soil classification, proper sloping, the correct shoring, or sheeting • Inspect excavations (when personnel entry is required) daily, whenever conditions change • Provide at least two means of exit for personnel working in excavations.	Hard hat, Safety glasses	
	Slips, Trips, Falls	• Clear, walkways of equipment, vegetation, excavated material, tools and debris • Mark, identify, or barricade other obstructions		
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		

3.5.4	JOB SAFETY ANALYSIS FOR TANK REMOVAL, CLEAN AND SCRAP			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Excavation of Tank (Continued)	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin	Tyvek coveralls, nitrile gloves, neoprene boots (see Section 5.0 HASP)	LEL/O_2, PID, Mini-RAM, Air Sample Pump
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures # 3-4, 3-5 • Provide fluids to prevent worker dehydration		
Tank Clean/Scrap	Fire/ Explosion	• Eliminate sources of ignition from the work area • Prohibit smoking • Provide ABC (or equivalent) fire extinguishers in all work, flammable storage areas and with fuel powered generators and compressors • Store flammable liquids in well ventilated areas • Prohibit storage, transfer of flammable liquids in plastic containers • Post "NO SMOKING" signs • Store combustible materials away from flammables • Store all compressed gas cylinders upright, caps in place when not in use • Separate Flammables and Oxidizers by 20 feet minimum		

CSD - 2.8027

3.5.4	JOB SAFETY ANALYSIS FOR TANK REMOVAL, CLEAN AND SCRAP			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Tank Clean/Scrap (Continued)	Flammable, Toxic, Oxygen deficient Atmospheres	• Test vessel atmosphere for flammable/toxic vapors, and oxygen deficiency • Obtain Confined Space Entry Permit signed by Supervisor/Safety Officer • De-energize, lock-out and tag all energized equipment • Provide written rescue plan • Review hazardous properties of site contaminants with entrants and safety observer • Review emergency procedures before work commences • Provide safety observer outside vessel • Wear proper level of PPE for the type of atmospheric contaminants • Use body harness, safety belt with tripod winch for possible rescue		LEL/O_2
	Burns	• Use proper work gloves, face shield/safety goggles, and leather apron to protect workers from skin burns when welding, cutting, and burning	Face shield, Safety goggles	
	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin	Tyvek coveralls, nitrile gloves, neoprene boots (see Section 5.0 HASP)	LEL/O_2, PID
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Wizard or similar cut resistant gloves	

3.5.4	JOB SAFETY ANALYSIS FOR TANK REMOVAL, CLEAN AND SCRAP			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Backfilling	Struck By/ Against Heavy Equipment	• Use reflective warning vests worn when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Understand and review posted hand signals	Warning vest, hard hat, safety glasses	
	Slips, Trips, Falls	• Clear, walkways of equipment, vegetation, excavated material, tools and debris • Mark, identify, or barricade other obstructions		
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures # 3-4, 3-5 • Provide fluids to prevent worker dehydration		

3.5.5	JOB SAFETY ANALYSIS FOR HAZCAT ACTIVITIES			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M^3 LEVEL D; ≥ 1.25 MG/M^3 <5.0 MG/M^3, LEVEL C; >5.0 MG/M^3, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M^3 LEVEL D, >0.03MG/M^3 ≤ 2.5MG/M^3, LEVEL C, >2.5MG/M^3, LEVEL B LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
HAZCAT Testing	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Provide workers an isolated work area, operating fume hood ventelation system • Review contaminant chemical MSDSs with workers before operations begin	Face shield and goggles, sample gloves, lab coat or apron (Section 5.0 HASP)	PID
	Fire/ Explosion	• Follow all procedures as provided in the current edition of OHM Compatibility Testing Manual • Use required equipment for testing materials as required by the current edition of OHM Compatibility Testing Manual • Use only 5g sample for compatibility testing • Oxidizer and metals compounds are very reactive materials; it is recommended that these materials not be compatibility tested when field analytical data is not available • Keep samples and drums out of direct sunlight and heat • Conduct hazcat testing within lab fume hood • Test atmosphere with combustible gas meter • Eliminate sources of ignition from the work area • Prohibit smoking in HAZCAT work area • Provide ABC (or equivalent) fire extinguishers in all work areas • Store flammable liquids in well ventilated areas • Prohibit storage, transfer of flammable liquids in plastic containers • Post "NO SMOKING" signs • Store combustible materials away from flammables • Separate Hazard class materials by compatible groups		
	Slips, Trips, Falls	• Clear walkways of equipment, tools, and stored materials • Maintain housekeeping in HAZCAT work area		

3.5.5	JOB SAFETY ANALYSIS FOR HAZCAT ACTIVITIES			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M³ LEVEL D; ≥ 1.25 MG/M³ <5.0 MG/M³, LEVEL C; >5.0 MG/M³, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M³ LEVEL D, >0.03MG/M³ ≤ 2.5MG/M³, LEVEL C, >2.5MG/M³, LEVEL B LEL/O_2: ≥10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
HAZCAT Testing (Continued)	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain lab equipment and testing materials in a safe condition	Wizard or similar cut resistant gloves	

CSD - 2.8031

3.5.6	JOB SAFETY ANALYSIS FOR EQUIPMENT DECONTAMINATION			
AIR MONITORING: "ACTION LEVELS" PID: <1 PPM, LEVEL D; ≥ 1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B MINI-RAM: <1.25 MG/M^3 LEVEL D; ≥ 1.25 MG/M^3 <5.0 MG/M^3, LEVEL C; >5.0 MG/M^3, LEVEL B INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M^3 LEVEL D, >0.03MG/M^3 ≤ 2.5MG/M^3, LEVEL C, >2.5MG/M^3, LEVEL B LEL/O_2: ≥10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING				
Task Breakdown	**Potential Hazards**	**Hazard Control Measures**	**Personal Protective Equipment**	**Air Monitoring Devices**
Heavy Equipment & Vehicles	Slips, Trips, Falls	• Clear walkways, work areas of equipment, vegetation, tools and debris • Mark, identify, or barricade other obstructions		
	Struck by/Against Heavy Equipment, Protruding Objects, & Splashes	• Use reflective warning vests when exposed to vehicular traffic • Isolate equipment swing areas • Make eye contact with operators before approaching equipment • Wear hard hats, safety glasses with side shields, or goggles with splash shields and steel-toe safety boots • Understand and review hand signals	Warning vests hard hat safety glasses, goggles and face shield	
	Inhalation and Contact with Hazardous Substances	• Provide workers proper skin, eye and respiratory protection based on the exposure hazards present • Review hazardous properties of site contaminants with workers before operations begin	PVC rain suit or Tyvek coveralls, latex gloves, latex boots (See Section 5.0 HASP)	
	Burns	• Use proper gloves, face shield/safety goggles, shin and toe guards, and splash suits to protect workers from skin burns and injury when operating laser (high pressure washers)	Goggles and face shield, shin and toe guards	
	Handling Heavy Objects	• Observe proper lifting techniques • Obey sensible lifting limits (60 lb. maximum per person manual lifting) • Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads		
	Sharp Objects	• Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects • Maintain all hand and power tools in a safe condition • Keep guards in place during use	Leather gloves	

3.5.6	JOB SAFETY ANALYSIS FOR EQUIPMENT DECONTAMINATION

AIR MONITORING: "ACTION LEVELS"
PID: <1 PPM, LEVEL D; ≥1 PPM <5 PPM, LEVEL C; >5 PPM LEVEL B
MINI-RAM: <1.25 MG/M^3 LEVEL D; ≥ 1.25 MG/M^3 <5.0 MG/M^3, LEVEL C; >5.0 MG/M^3, LEVEL B
INTEGRATED AIR SAMPLING: (LEAD) <0.03MG/M^3 LEVEL D, >0.03MG/M^3 ≤ 2.5MG/M^3, LEVEL C, >2.5MG/M^3, LEVEL B
LEL/O_2: ≥ 10% LEL, STOP WORK, EVACUATE; <20.9% O_2, LEVEL B; <19.5% O_2, MECHANICAL VENTELATION, CONSTANT MONITORING

Task Breakdown	Potential Hazards	Hazard Control Measures	Personal Protective Equipment	Air Monitoring Devices
Heavy Equipment & Vehicles (Continued)	High Noise Levels	• Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period)	Ear plugs	
	High/Low Ambient Temperature	• Monitor for Heat/Cold stress in accordance with OHM Health and Safety Procedures # 3-4, 3-5 • Provide fluids to prevent worker dehydration		

CSD - 2.8033

4.0 WORK AND SUPPORT AREAS

To prevent migration of contamination from personnel and equipment work areas will be clearly specified prior to beginning operations. Each work area will be divided as suggested by the NIOSH/OSHA/USCG/EPA'S document titled, "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities."

- An Exclusion or "hot" Zone (EZ)
- A Contamination-Reduction Zone (CRZ)
- A Support Zone (SZ)

4.1 EXCLUSION ZONE

The EZ is the area suspected of contamination and presents the greatest potential for worker exposure. Personnel entering the area must wear the mandated level of protection for that area. In certain instances, different levels of protection will be required depending on the tasks and monitoring performed within that zone. The EZ for this project will be interior of the CSD building, all interior/exterior drum and ash locations, the interior of UST excavations and tank interiors unless otherwise stipulated by the PSO.

4.2 CONTAMINATION-REDUCTION ZONE

The CRZ or transition zone will be established between the EZ and SZ. In this area, personnel will begin the sequential decontamination process required to exit the EZ. To prevent off-site migration of contamination and for personnel accountability, all personnel will enter and exit the EZ through the CRZ. The CRZ for this project will be the access/egress routes to/from the EZ and the personnel and equipment decontamination stations.

4.3 SUPPORT ZONE

The SZ serves as a clean, control area. Operational support facilities are located within the SZ. Normal work clothing and support equipment are appropriate in this zone. Contaminated equipment, or clothing will not be allowed in the SZ. The support facilities should be located upwind of site activities. There will be a clearly marked controlled access point from the SZ into the CRZ and EZ that is monitored closely by the PSO and the RM to ensure proper safety protocols are followed. The SZ will be the crew trailer, office trailers and the parking and visitor accessways to the project site.

4.4 SITE CONTROL LOG

A log of all personnel visiting, entering or working on the site shall be maintained in the main office trailer location. The log will record the date, name, company or agency, and time entering or exiting the site.

No visitor will be allowed in the EZ without showing proof of training and medical certification, per 29 CFR 1910.120(e), (f). Visitors will supply their own boots and respiratory equipment, if required. Visitors will attend a site orientation given by the PSO and sign the HASP.

4.5 GENERAL

The following items are requirements to protect the health and safety of workers and will be discussed in the safety briefing prior to initiating work on the site.

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand to mouth transfer and ingestion of contamination is prohibited in the EZ and CRZs.
- Hands and face must be washed upon leaving the EZ and before eating, drinking, chewing gum or tobacco and smoking or other activities which may result in ingestion of contamination.
- A buddy system will be used. Hand signals will be established to maintain communication.
- During site operations, each worker will consider himself as a safety backup to his partner. Off-site personnel provide emergency assistance. All personnel will be aware of dangerous situations that may develop.
- Visual contact will be maintained between buddies on site when performing hazardous duties.
- No personnel will be admitted to the site without the proper safety equipment, training, and medical surveillance certification.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the PSO or the RM, will be immediately dismissed from the site.
- Proper decontamination procedures must be followed before leaving the site.
- All employees and visitors must sign in and out of the site.

5.0 PROTECTIVE EQUIPMENT

This section addresses the various levels of personal protective equipment (PPE) to be used at this job site.

5.1 ANTICIPATED PROTECTION LEVELS

TASK	PROTECTION LEVEL	COMMENTS/MODIFICATIONS
Site Setup	Level D	Hardhat, steel-toe work boots, safety eye wear (safety glasses with side shields or goggles and face shield if splash or flying particles are likely) and hearing protection >85 dBA
Drum/ Container Handling, Overpacking, Staging	Level B	Saranex-coated Tyvek coveralls, nitrile gloves, neoprene boots and hearing protection >85 dBA
Drum/ Container Sampling	Level B	Saranex-coated Tyvek coveralls, nitrile gloves, neoprene boots and hearing protection >85 dBA
Drum/ Container Sampling, Solids	Level C	Tyvek coveralls, nitrile gloves, neoprene boots and hearing protection >85 dBA; upgrade to level B if air monitoring action levels are exceeded and/or other level B work is occurring in the same work area
UST Excavation, Scrap, Cleaning	Level C	Tyvek coveralls, nitrile gloves, neoprene boots and hearing protection >85 dBA; upgrade to level B if air monitoring action levels are exceeded and/or other level B work is occurring in the same work area
UST Cleaning (personnel entry)	Level B	Saranex-coated Tyvek coveralls, nitrile gloves, neoprene boots and hearing protection >85 dBA; continuous air monitoring
HAZ-CAT Activities	Level D	Lab coat and/or apron, latex gloves, working fume hood
Decontamination	Level D+	PVC rain suit or Tyvek coveralls, latex gloves, latex boots
SZ Activities not otherwise Classified	Level D	

5.2 PROTECTION LEVEL DESCRIPTIONS

This sections lists the minimum requirements for each protection level. Modification to these requirements will be noted above.

5.2.1 Level D

Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Work clothing as prescribed by weather

5.2.2 Modified Level D

Modified Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, PVC, or latex booties
- Outer nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)
- Tyvek coverall [Saranex Tyveks (Sarans) for handling liquids; PVC overalls will be required when workers have a potential to be exposed to acid contaminated liquids or sludges.]

5.2.3 Level C

Level C consists of the following:

- Full-face, air-purifying respirator with appropriate cartridges
- Hooded Tyvek coveralls and Saranex Tyveks (Sarans) (PVC overalls will be required when workers have a potential to be exposed to acid contaminated liquids or sludges.)
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, or latex overboots
- Nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)

5.2.4 Level B

Level B protection consists of the items required for Level C protection with the exception that a supplied air respirator is used in place of the air-purifying respirator.

5.2.5 Level A

Level A protection consists of the items required for Level B protection with the addition of a fully-encapsulating, vapor-proof suit capable of maintaining positive pressure.

5.3 SUPPLIED-AIR RESPIRATORS

If air monitoring shows that Level B protection is needed, personnel will wear Airline respirators with 5-minute egress bottles. Personnel requiring Level "B" protection and high mobility will wear SCBA units.

5.4 BREATHING-AIR QUALITY

Code of Federal Regulations 29 CFR 1910.134 states breathing air will meet the requirement for Grade D breathing air as described in the ANSI/CGA Specification G-7.1-1989. A certificate of analysis from vendors of breathing air shall be obtained in order to show that the air meets this standard.

5.5 AIR-PURIFYING RESPIRATORS

A NIOSH approved full face respirator with appropriate air purifying cartridges will be used for level C work.

5.6 RESPIRATOR CARTRIDGES

The crew members working in Level C will wear respirators equipped with approval for the following contaminants:

- Organic vapors <1,000 ppm
- Chlorine gas <10 ppm
- Hydrogen chloride <50 ppm
- Sulfur dioxide <50 ppm
- Dusts, fumes and mists with a TWA <0.05 mg/m^3
- Asbestos-containing dusts and mists
- Radionuclides

5.7 CARTRIDGE CHANGES

All cartridges will be changed a minimum of once daily or more frequently if personnel begin to experience increased inhalation resistance or breakthrough of a chemical warning property.

5.8 INSPECTION AND CLEANING

Respirators will be checked periodically by a qualified individual and inspected before each use by the wearer. All respirators and associated equipment will be decontaminated and hygienically cleaned after use.

5.9 FIT TESTING

Annual respirator fit tests are required of all personnel wearing negative-pressure respirators. The test will use isoamyl acetate or irritant smoke. The fit test must be for the style and size of the respirator to be used.

5.10 FACIAL HAIR

No personnel who have facial hair which interferes with the respirator's sealing surface will be permitted to wear a respirator and will not be permitted to work in areas requiring respirator use.

5.11 CORRECTIVE LENSES

Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere with the respirator's sealing surfaces. For workers requiring corrective lenses, special spectacles designed for use with respirators will be provided.

5.12 CONTACT LENSES

Contact lenses will not be worn with any type of respirator.

5.13 MEDICAL CERTIFICATION

Only workers who have been certified by a physician as being physically capable of respirator usage will be issued a respirator. Personnel unable to pass a respiratory fit test or without medical clearance for respirator use will not be permitted to enter or work in areas on site that require respiratory protection. Employees shall receive a written physicians opinion that they are fit for general hazardous waste operations as per 29 CFR 1910.120(f)(7).

5.14 SITE SPECIFIC PERSONAL PROTECTIVE EQUIPMENT (PPE) PROGRAM

The primary objective of the PPE program is to ensure employee protection and to prevent employee exposure to site contaminants during site operations. Engineering controls are not feasible for many tasks and, therefore, require the use of PPE.

The RM will be responsible for implementing all aspects of the PPE program. This includes donning and doffing, temperature related stress monitoring, inspection, and decontamination (see Section 6.0). PPE selection is identified in Table 5.1 for each specified task. The RM in consultation with the PSO, if assigned, Health and Safety Manager, project CIH and the OSC will direct changes in PPE based on changing conditions. The site specific HASP will serve as written certification that the workplace was evaluated concerning PPE requirements. OHM Corporation's comprehensive PPE Program is described in Appendix D.

5.14.1 Site-Specific Respiratory Protection Program

The primary objective of respiratory protection is to prevent employee exposure to atmospheric contamination. When engineering measures to control contamination are not feasible, or while they are being implemented, personal respiratory protective devices will be used.

The criteria for determining respirator need have been evaluated based on the site contaminants; expected levels of protection are outlined in Section 5.1. Air monitoring will be conducted to confirm that respiratory protection levels are adequate (Section 7.0). All respirator users are OSHA trained in proper respirator use and maintenance. The RM and PSO will observe workers during respirator use for signs of stress. The RM, CIH, HSM, and PSO will also evaluate this HASP periodically to determine its continued effectiveness with regard to respiratory protection. All persons assigned to use respirators will have medical clearance to do so.

6.0 DECONTAMINATION PROCEDURES

This section describes the procedures necessary to ensure that both personnel and equipment are free from contamination when they leave the work site.

6.1 PERSONNEL DECONTAMINATION

Decontamination procedures will ensure that material which workers may have contacted in the EZ does not result in personal exposure and is not spread to clean areas of the site. This sequence describes the general decontamination procedures for Level C, Level B/Egress, and Level B/SCBA. The specific stages will vary depending on the site, the task, the protection level, etc. Dry decontamination may be used if appropriate and there is insufficient space to support a full decontamination station as delineated with the steps below. The RM, or the PSO will ensure that the decontamination procedures are adequate.

Level C Decontamination

1. Go to end of EZ
2. a. Wash outer boots (Tingley or Robars) and stage to let dry; or
   b. Remove and discard latex booties
3. Remove outer gloves and discard
4. Remove outer suit (Saranex/polycoated/regular tyvek)
5. Remove outer sample gloves and discard
6. Cross into CRZ (dirty side of respirator wash area)
7. Remove inner suit and discard, (if applicable)
8. Remove and wash respirator (4 stages)
   a. Soap and water solution
   b. First rinse
   c. Disinfect respirator (1 cap full of bleach to 1 gallon of water)
   d. Final rinse
9. Hang respirator to dry
10. Remove inner sample gloves and discard
11. Wash face and hands

Level B Decontamination (Airline/Egress)

1. Go to end of EZ
2. a. Wash outer boots (Tingley or Robars) and stage to let dry; or
   b. Remove and discard latex booties
3. Remove outer gloves and discard
4. Cross into CRZ
5. Disconnect airline, remove egress system, and disconnect egress from mask
6. Stage egress bottle for cleaning
7. Remove outer suit
8. Remove outer sample gloves and discard
9. Move to respirator wash area, and wash egress mask and related hose line
   a. Soap and water solution
   b. First rinse

c. Disinfect respirator (1 cap full of bleach to 1 gallon of water)
d. Final rinse

10. Hang egress mask (upside down) and line to dry
11. Remove inner sample gloves and discard.
12. Wash face and hands

Level B Decontamination (SCBA)

1. Move to edge of EZ
2. Bottle change only
   a. Wash boots and gloves
   b. Move to edge of EZ and CRZ
   c. Remove face mask airline from regulator assembly
   d. Allow assistant to change bottle and reconnect face mask airline
   e. Return to EZ
3. a. Wash outer boots and stage to let dry (Tingley or Robars only); or
   b. Remove and discard latex booties
4. Remove and discard outer gloves
5. Disconnect from SCBA bottle and stage SCBA (NOTE: SCBA mask remains on)
6. Remove outer suit (Saranex/polycoated/regular tyvek)
7. Remove outer sample gloves and discard
8. Cross into CRZ
9. Remove inner suit (if applicable)
10. Move to respirator wash area and wash SCBA facepiece and hose line
    a. Soap and water solution
    b. First rinse
    c. Disinfect respirator (1 cap full of bleach to 1 gallon of water)
    d. Final rinse
11. Hang mask to dry
12. Remove inner sample gloves and discard
13. Wash face and hands

6.1.1 Suspected Contamination

Any employee suspected of sustaining skin contact with chemical materials will first use the emergency shower. Following a thorough drenching, the worker will proceed to the decontamination facility. Here the worker will remove clothing, shower, don clean clothing, and immediately be taken to the first-aid station. Medical attention will be provided as determined by the degree of injury.

6.1.2 Lead Exposure

OHM personnel are required to shower at the end of the work shift before leaving site. All visitors entering the EZ will be required to shower before leaving the site.

All OHM personnel and any visitors entering the EZ are prohibited from leaving the site at any time during the day without doffing site dedicated coveralls.

6.1.3 Personal Hygiene

Before any eating, smoking, or drinking, personnel will wash hands, arms, neck and face.

6.2 EQUIPMENT DECONTAMINATION

All contaminated equipment will be decontaminated before leaving the site. Decontamination procedures will vary depending upon the contaminant involved, but may include sweeping, wiping, scraping, hosing, or steaming the exterior of the equipment. Personnel performing this task will wear the proper PPE as prescribed by the PSO.

6.3 DISPOSAL

All decontamination liquids and disposable clothing will be treated as contaminated waste unless determined otherwise by accepted testing methods. Wastes will be disposed according to state and federal regulations.

7.0 AIR MONITORING

Air monitoring will be conducted in order to characterize personnel exposures and fugitive emissions from site contaminants. Principal contaminants of concern are listed in Section 3.0 of this HASP. The target compounds selected for air monitoring purposes for this site include VOCs and lead. Results of air monitoring will be used to ensure the proper selection of protective clothing and equipment, including respiratory protection, to protect on-site personnel and off-site receptors from exposure to unacceptable levels of site contaminants. Descriptions of air monitoring strategies, procedures and equipment are provided below. Modification of this plan, including additional monitoring, may be considered as judged necessary by the Project CIH, in conjunction with the HSM and PSO.

7.1 PERSONNEL AIR MONITORING

Personnel air monitoring at site will include direct reading methods as well as integrated sampling strategies. Air monitoring will be conducted during drum handling, overpacking and sampling activities.

7.1.1 Direct Reading Air Monitoring

During drum handling, overpacking and sampling activities and UST excavation, clean and scrap activities direct reading air monitoring will be performed in the EZ to determine exposure to workers. A Mini-RAM will be used to determine levels of airborne particulates. An particulate action level for lead in total particulates, will be established using the USEPA equation for calculating Particulate Action Levels. A PID will be used to determine airborneVOC levels. An LEL/0_2 will be required during excavation of 2 USTs to ensure that flammable vapors are not present. A summary of air monitoring information is provided in the table below.

Monitoring Device	Monitoring Location/ Personnel	Monitoring Frequency	Action Level	Action
PID	EZ Equipment Operator, Recovery Tech, Sample Tech, Chemist	Continuous during drum handling, overpacking and sampling activities and UST excavation, clean and scrap activities	< 1 ppm unknowns* 1-5 ppm unknowns* 5-500 ppm unknowns* >500 ppm unknowns*	Continue PID sampling Level C Level B Level A
LEL/O_2	Exclusion Zone (EZ) Equipment Operator, Recovery Tech, Sample Tech, Chemist	Continuous during drum handling, overpacking and sampling activities and UST excavation, clean and scrap activities	>10% LEL <20.8% O_2	Evacuate area, ventilate, upgrade to Level B if necessary, continue to monitor

Monitoring Device	Monitoring Location/ Personnel	Monitoring Frequency	Action Level	Action
Mini-Ram (total dust)	EZ area – Equipment Operator, Recovery Tech, Sample Tech, Chemist	Continuous during drum handling, overpacking and sampling activities and UST excavation, clean and scrap activities	< 1.25 mg/m³(TWA) ≥ 1.25 mg/m³ - ≤ 5.0 mg/m³ (TWA) > 5.0 mg/m³ (TWA)	Level D Level C Level B

*Sustained levels above background for 5 minutes

7.1.2 Integrated Air Monitoring

Integrated air sampling for personnel exposure characterization will be performed during drum handling, overpacking and sampling activities. Samples will be collected on the most at risk Recovery Technician, Sample Technician and/or Chemist and Equipment Operator and/or Foreman. Sampling will be conducted for lead using NIOSH Method7300. A summary of air monitoring information is given in the Table below.

Monitoring Device	Monitoring Location/ Personnel	Monitoring Frequency	Action Level	Action
Air Sampling Pump NIOSH 7300	Breathing Zone/ Equipment Operator, Recovery Tech, Sample Tech, Chemist	1 Sample each worker; first 3 days of drum handling / sampling activities 1 Sample each worker; 1 day per week of additional drum handling / sampling activities	<.03mg/m³ ≥ .03 mg/m³ < 2.5 mg/m³ ≥ 2.5 mg/m³	LevelD Level C Level B

7.2 INSTRUMENTATION

The following is a description of the air monitoring equipment to be used at this site.

7.2.1 Photoionization Detector (PID)

7.2.1.1 Type and Operational Aspects

- PID Model PI 101 or equivalent
  - Principle of Operation
    - Ionization potential (IP) - The energy required to remove the outermost electron from a molecule; measured in electron volts (eV); characteristic property of a specific chemical.

- Photoionization - Using ultraviolet (UV) light to remove the outermost electron from a molecule.
- Energy of UV light (10.2, 9.5, 11.7 eV) must be equal to or greater than the IP to photoionize the molecule.
- Fan or pump is used to draw air into the detector where the contaminants are exposed to a UV light source (lamp).
- Ions are collected on a charged plate and produce a current directly proportional to the number of ionized molecules; current is amplified and displayed on the meter.

7.2.1.2 Calibration Method/Frequencies

The PID Model PI 101 is designed for trace gas analysis in ambient air and is calibrated at HNU with certified standards of benzene, vinyl chloride, and isobutylene. Other optional calibrations are available (e.g., ammonia, ethylene oxide, H_2S, etc.).

OHM will use a PID with a 10.2 eV lamp. This lamp has been determined to be most responsive to the contaminants on site. Optional probes containing lamps of 9.5 and 11.7 eV are interchangeable in use within individual read-out assemblies for different applications.

The approximate span settings for the probe that would give different readings of the amounts of trace gas of a particular species in a sample are based upon the relative photoionization sensitivities of various gases twice daily (beginning and end of shift).

It is recommended that calibration be checked twice each day (beginning and end of shift). The PSO will record and log such calibration information into an air monitoring notebook.

7.2.1.3 Preventative Maintenance

Maintenance of the PID Model PI 101 consists of cleaning the lamp and ion chamber, and replacement of the lamp or other component parts or sub-assemblies.

7.2.2 Lower Explosive Limit/Oxygen (LEL/O_2)

7.2.2.1 Types and Operational Aspects

- MSA Watchman LEL/O2 Meter or equivalent
  - Principle of Operation
    - Oxygen detector uses an electrochemical sensor; produces a minute electric current proportional to the oxygen content.
    - Combustible gas indicators use a combustion chamber containing a filament that ignites flammable vapors; filament is heated or coated with a catalyst (platinum) to facilitate combustion.

- Filament is part of a balanced resistor circuit; combustion in the chamber causes the filament temperature to increase; results in increased filament resistance.

- Change in the filament's resistance causes an imbalance in the circuit proportional to the percent of the lower explosive limit (% LEL).

- Concentrations greater than the LEL and lower than the upper explosive limit (UEL) will read 100% LEL; combustible atmosphere present.

- Concentrations greater than the UEL will read above 100% LEL then return to zero. (NOTE: Some devices have catchment mechanisms which will cause the needle to remain at 100% until the meter is reset.) This type of response indicates the gas mixture is too rich to burn and is not combustible. The danger is that the addition of air to the gas mixture could bring it into the flammable range (less than the UEL).

- Oxygen meter set at the factory to alarm at 19.5% (oxygen deficient atmosphere) combustible gas meter set by the user to alarm at 10% LEL.

7.2.2.2 Calibration Methods/Frequencies

Before the calibration of the combustible gas indicator can be checked, the unit must be in operating condition. The combustible gas indicator (LEL) is normally calibrated on pentane as being representative of the flammability characteristics of most commonly encountered combustible gases. The meter scale is calibrated from zero to 100% LEL, which corresponds in actual volume concentrations of 0 to approximately 14% pentane in air. A booklet of response curves is supplied with the Watchman Meter. These curves may be used to interpret meter readings when sampling combustible gases other than pentane.

It is recommended that calibration be checked before and after using each time. The SSO will record and log such calibration information into an air monitoring notebook. The O_2 meter is calibrated by adjusting the O_2 control knob to 20.8% while the meter is operated in a fresh air atmosphere.

7.2.2.3 Preventative Maintenance

The primary maintenance of unit is the rechargeable 2.4 volt nickel cadmium battery. Recommended charging time is 16 hours. It may be left on charge for longer periods without damaging the battery. The battery sometimes will not supply full power capacity after repeated partial use between charging. Therefore, it is recommended that the battery be exercised at least once a month by running for eight to 10 hours and recharged. If the instrument has not been used for 30 days, the battery should be charged prior to use.

7.2.3 Portable Total Dust Monitor

7.2.3.1 Type and Operational Aspects

- Real-Time Aerosol Monitor (Mini Ram Model PDM-3 and Model Pr100 Data Ram)

  - Principle of Operation

    - Detection of light in the near infrared region back-scattered to a sensor (photovoltaic detector) by airborne particulate in a sensing volume

- The higher the dust concentration the more back-scattering of light to the sensor, resulting in increased readings

- Device calibrated at the factory against an air sampling filter/gravimetric analysis reference method

7.2.3.2 Calibration Methods/Frequencies

There is no calibration method or procedure for calibrating the mini-ram monitor. However, it is recommended that the mini-ram monitor be re-zeroed once a week. During a zero check, the sampled air passes through the purge air filter and dryer to effect a self-cleaning of the optical chamber.

7.2.3.3 Preventative Maintenance

Maintenance of the mini-ran consists of replacement of filters and desiccant; battery replacement; and cleaning of the optical detection assembly.

7.2.4 Integrated Air Monitoring Program

7.2.4.1 Type and Operational Aspects

- Gilian Air Sampling Pump (or equivalent)

  - Principle of Operation

    - Air sampling pump is calibrated to draw a specified air flow rate (liters per minute) for a designated period of time. DDVP and Parathion will be drawn for 10 hours and Malithion will be drawn for 5 hours.

    - Volume of air sampled is then calculated as follows:

      Flow rate (liter/min.) x sample time (min.) = sample volume (liters)

- Use a bubble meter to calibrate air sampling pump; pump equipped with a rotameter that shows the flow rate during the sampling period.

- Equipped with a rechargeable battery for 8-hour average sampling times; must be recharged for at least 16 hours.

  - Collection Media: 37 mm MCE cassette

7.2.4.2 Calibration Methods/Frequencies

Flow rate calibration can be accomplished by using primary standard soap and the Gilibrator Calibrator (or equivalent). The Gilibrator calibrator allows rapid flow rate determination with direct read-out on the built-in display.

Connect the sampler to the calibrator, press the ON push button, and then push the plunger to start a bubble up the flow cell. The flow rate is automatically calculated and shown on the display. Subsequent readings are averaged with the previous readings. It is recommended that calibration of the sampler be checked prior to the start of and after each sampling period.

7.2.4.3 Preventative Maintenance

The Gilian air sampling pump should not require special maintenance or adjustments under normal conditions. However, as with all instruments, the sampling pump does require some basic care. Basic maintenance of the consists of filter replacement, installing and removing battery packs, storage conditions, and electronic control assembly.

7.3 AIR MONITORING LOG

The PSO will ensure that all air-monitoring data is logged into a monitoring notebook. Data will include instrument used, wind direction, work process, etc. The OHM Project CIH and/or HSM may periodically review this data.

7.4 CALIBRATION REQUIREMENTS

The PID, LEL/O_2 meter and sampling pumps required with fixed-media air sampling will be calibrated daily before and after use. A separate log will be kept detailing date, time, span gas, or other standard, and name of person performing the calibration.

7.5 AIR MONITORING RESULTS

Air monitoring results will be posted for personnel inspection, and will be discussed during morning safety meetings.

8.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

8.1 PRE-EMERGENCY PLANNING

Prior to engaging in construction/remediation activities at the site, the RM will plan for possible emergency situations and have available adequate supplies and manpower to respond. In addition site personnel will receive training during the site orientation concerning proper emergency response procedures.

The following situations would warrant implementation of the emergency plan:

Fire/Explosion	• The potential for human injury exists. • Toxic fumes or vapors are released. • The fire could spread on site or off site and possibly ignite other flammable materials or cause heat-induced explosions. • The use of water and/or chemical fire suppressants could result in contaminated run-off. • An imminent danger of explosion exists.
Spill or Release of Hazardous Materials	• The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard. • The spill could cause the release of toxic liquids or fumes in sufficient quantities or in a manner that is hazardous to or could endanger human health.
Natural Disaster	• A rain storm exceeds the flash flood level. • The facility is in a projected tornado path or a tornado has damaged facility property. • Severe wind gusts are forecasted or have occurred and have caused damage to the facility.
Medical Emergency	• Overexposure to hazardous materials. • Trauma injuries (broken bones, severe lacerations/bleeding, burns). • Eye/skin contact with hazardous materials. • Loss of consciousness. • Heat stress (Heat stroke). • Cold stress (Hypothermia). • Heart attack. • Respiratory failure. • Allergic reaction.

The following measures will be taken to assure the availability of adequate equipment and manpower resources:

- Sufficient equipment and materials will be kept on site and dedicated for emergencies only. The inventory will be replenished after each use.

- On-site emergency responders will be current in regards to training and medical surveillance programs. Copies of all applicable certificates will be kept on file for on-site personnel required to respond.

- It will be the responsibility of the emergency coordinator to brief the on-site response team on anticipated hazards at the site. The emergency coordinator shall also be responsible for anticipating and requesting equipment that will be needed for response activities.

- Emergency response activities will be coordinated with the Local Emergency Management Agency (EMA) in compliance with SARA Title III requirements.

Communications will be established prior to commencement of any activities at the remediation site. Communication will be established so that all responders on site have availability to all pertinent information to allow them to conduct their activities in a safe and healthful manner. The primary communication device will be two-way radios. Air horns may be used to alert personnel of emergency conditions. A telephone will be located at the command post to summon assistance in an emergency.

Primary communication with local responders in the event of an emergency will be accomplished using commercial telephone lines.

8.2 EMERGENCY RECOGNITION AND PREVENTION

Because unrecognized hazards may result in emergency incidents, it will be the responsibility of the RM and Project Safety Officer (PSO), through daily site inspections and employee feedback (Safety Observation Program, daily safety meetings, and job safety analyses) to recognize and identify all hazards that are found at the site. These may include:

Chemical Hazards	• Materials at the site • Materials brought to the site
Physical Hazards	• Fire/explosion • Slip/trip/fall • Electrocution • Confined space • IDLH atmospheres • Excessive noise
Mechanical Hazards	• Heavy equipment • Stored energy system • Pinch points • Electrical equipment • Vehicle traffic
Environmental Hazards	• Electrical Storms • High winds • Heavy Rain/Snow • Temperature Extremes (Heat/Cold Stress) • Poisonous Plants/Animals

Once a hazard has been recognized, the RM and/or the PSO will take immediate action to prevent the hazard from becoming an emergency. This may be accomplished by the following:

- Daily safety meeting
- Task-specific training prior to commencement of activity
- Lock-out/tag-out

- Personal Protective Equipment (PPE) selection/use
- Written and approved permits for hot work, confined space
- Trenching/shoring procedure
- Air monitoring
- Following all OHM standard operating procedures
- Practice drills for fire, medical emergency, and hazardous substances spills

TABLE 8.1
EMERGENCY TELEPHONE NUMBERS

Local Agencies -- Newark, New Jersey	9-1-1
Fire Department	201-733-7491
Police	201-733-6245
Hospital - St James Hospital *Directions*: From site follow Doremus Ave., north and turn Left on Roanoke Ave., at the 'T' turn Left on Avenue P and follow to Foundry Rd., turn Right on Foundry Rd to Raymond Blvd., turn Left on Raymond Blvd., follow to Market St and turn Left on Market St, four blocks to Jackson St and turn Right on Jackson St., follow Jackson Street to Lafayette St., Hospital entrance is on the left	201-589-1300
Regional Poison Control Center	800-962-1253
State Agencies	
NJDEPE Emergency Response	609-727-7172
Federal Agencies	
EPA Region Branch Response Center, Edison, NJ	732-548-8730
EPA OSC - Greg DeAngelis	732-9066874
Agency for Toxic Substances and Disease Registry	404-639-0615 (24 HR)
National Response Center	800-424-8802
OHM Personnel	
Project Manager - Howard Perlmutter	609-588-6442
District Health and Safety Manager - Bob Brooks	609-588-6423
Director, Health and Safety - Kevin McMahon	609-588-6375
OHM Corporation (24 hour)	800-537-9540

Additional Phone #'s in Section 2 this HASP

8.3 PERSONNEL ROLES, LINES OF AUTHORITY, AND COMMUNICATIONS

This section of the ERCP describes the various roles, responsibilities, and communication procedures that will be followed by personnel involved in emergency responses.

The primary emergency coordinator for this site is the OSC. In the event an emergency occurs and the emergency coordinator is not on site, the RM will serve as the emergency coordinator until he arrives. The emergency coordinator will determine the nature of the emergency and take appropriate action as defined by this ERCP.

The emergency coordinator will implement the ERCP immediately as required. The decision to implement the plan will depend upon whether the actual incident threatens human health or the environment.

Immediately after being notified of an emergency incident, the emergency coordinator or his designee will evaluate the situation to determine the appropriate action.

8.3.1 Responsibilities and Duties

This section describes the responsibilities and duties assigned to the emergency coordinator.

It is recognized that the structure of the "Incident Command System" will change as additional response organizations are added. Personnel will follow procedures as directed by the fire department, LEPC, State and Federal Agencies as required. The OSC, in coordination with the local Fire Department chief will assume the role of Incident Commander. Additional on-site personnel may be added to the Site Emergency Response Team as required to respond effectively.

8.3.2 On-Site Emergency Coordinator Duties

The on-site emergency coordinator is responsible for implementing and directing the emergency procedures. All emergency personnel and their communications will be coordinated through the emergency coordinator. Specific duties are as follows:

- Identify the source and character of the incident, type and quantity of any release. Assess possible hazards to human health or the environment that may result directly from the problem or its control.
- Discontinue operations in the vicinity of the incident if necessary to ensure that fires, explosions, or spills do not recur or spread to other parts of the site. While operations are dormant, monitor for leaks, pressure build-up, gas generation, or ruptures in valves, pipes, or other equipment, where appropriate.
- Notify local Emergency Response Teams if their help is necessary to control the incident. Table 8.1 provides telephone numbers for emergency assistance.
- Direct on-site personnel to control the incident until, if necessary, outside help arrives. Specifically:
- Ensure that the building or area where the incident occurred and the surrounding area are evacuated and shut off possible ignition sources, if appropriate. The Emergency Response Team is responsible for directing site personnel such that they avoid the area of the incident and leave emergency control procedures unobstructed.
- If fire or explosion is involved, notify local Fire Department.
- Have protected personnel, in appropriate PPE, on standby for rescue.

If the incident may threaten human health or the environment outside of the site, the emergency coordinator should immediately determine whether evacuation of area outside of the site may be necessary and, if so, notify the Police Department and the Office of Emergency Management.

When required, notify the National Response Center. The following information should be provided to the National Response Center:

- Name and telephone number
- Name and address of facility
- Time and type of incident
- Name and quantity of materials involved, if known
- Extent of injuries
- Possible hazards to human health or the environment outside of the facility.

The emergency telephone number for the National Response Center is 800-424-8802.

If hazardous waste has been released or produced through control of the incident, ensure that:

- Waste is collected and contained.
- Containers of waste are removed or isolated from the immediate site of the emergency.
- Treatment or storage of the recovered waste, contaminated soil or surface water, or any other material that results from the incident or its control is provided.
- Ensure that no waste that is incompatible with released material is treated or stored in the facility until cleanup procedures are completed.
- Ensure that all emergency equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed.
- Record time, date, and details of the incident, and submit a written report to the USEPA Regional Administrator. Report is due to USEPA within 15 days of the incident.

8.4 SAFE DISTANCES AND PLACES OF REFUGE

The emergency coordinator for all activities will be the OSC. No single recommendation can be made for evacuation or safe distances because of the wide variety of emergencies which could occur. Safe distances can only be determined at the time of an emergency based on a combination of site and incident-specific criteria. However, the following measures are established to serve as general guidelines.

In the event of minor hazardous materials releases (small spills of low toxicity), workers in the affected area will report initially to the contamination reduction zone. Small spills or leaks (generally less than 55 gallons) will require initial evacuation of at least 50 feet in all directions to allow for cleanup and to prevent exposure. After initial assessment of the extent of the release and potential hazards, the emergency coordinator or his designee will determine the specific boundaries for evacuation. Appropriate steps such as caution tape, rope, traffic cones, barricades, or personal monitors will be used to secure the boundaries.

In the event of a major hazardous material release (large spills of high toxicity/greater than 55 gallons), workers will be evacuated from the building/site. Workers will assemble at the entrance to the site for a head count by their foremen and to await further instruction.

If an incident may threaten the health or safety of the surrounding community, the public will be informed and, if necessary, evacuated from the area. The emergency coordinator, or his designee will inform the proper agencies in the event that this is necessary. Telephone numbers are listed in Table 8.1.

Places of refuge will be established prior to the commencement of activities. These areas must be identified for the following incidents:

- Chemical release
- Fire/explosion
- Power loss
- Medical emergency
- Hazardous weather

In general, evacuation will be made to the crew trailers, unless the emergency coordinator determines otherwise. It is the responsibility of the emergency coordinator to determine when it is necessary to evacuate personnel to off-site locations.

In the event of an emergency evacuation, all the employees will gather at the entrance to the site until a head count establishes that all are present and accounted for. No one is to leave the site without notifying the emergency coordinator.

8.5 EVACUATION ROUTES AND PROCEDURES

All emergencies require prompt and deliberate action. In the event of an emergency, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible. However, in specific emergency situations, the emergency coordinator may deviate from the procedures to provide a more effective plan for bringing the situation under control. The emergency coordinator is responsible for determining which situations require site evacuation.

8.5.1 Evacuation Signals and Routes

Two-way radio communication and an air horn will be used to notify employees of the necessity to evacuate an area or building involved in a release/spill of a hazardous material. Each crew supervisor will have a two way radio. A base station will be installed in the OHM office trailer to monitor for emergencies. Total site evacuation will be initiated only by the emergency coordinator, however, in his absence, decision to preserve the health and safety of employees will take precedence. Evacuation routes will be posted in each outside work area. Signs inside buildings will be posted on walls or other structural element of a building. Periodic drills will be conducted to familiarize each employee with the proper routes and procedures.

8.5.2 Evacuation Procedures

In the event evacuation is necessary, the following actions will be taken:

- The emergency signal will be activated.
- No further entry of visitors, contractors, or trucks will be permitted. Vehicle traffic within the site will cease in order to allow safe exit of personnel and movement of emergency equipment.
- Shut off all machinery if safe to do so.

- ALL on-site personnel, visitors, and contractors in the support zone will assemble at the entrance to the site for a head count and await further instruction from the emergency coordinator.

- ALL persons in the exclusion zone and contamination reduction zone will be accounted for by their immediate crew leaders (e.g., foreman). Leaders will determine the safest exits for employees and will also choose an alternate exit if the first choice is inaccessible.

- During exit, the crew leader should try to keep the group together. Immediately upon exit, the crew leader will account for all employees in his crew.

- Upon completion of the head count, the crew leader will provide the information to the emergency coordinator.

- Contract personnel and visitors will also be accounted for.

- The names of emergency response team members involved will be reported to the emergency spill control coordinator.

- A final tally of persons will be made by the emergency coordinator or designee. No attempt to find persons not accounted for will involve endangering lives of OHM or other employees by re-entry into emergency areas.

- In all questions of accountability, immediate crew leaders will be held responsible for those persons reporting to them. Visitors will be the responsibility of those employees they are seeing. Contractors and truck drivers are the responsibility of the Response Manager. The security guard will aid in accounting for visitors, contractors, and truckers by reference to sign-in sheets available from the guard shack.

- Personnel will be assigned by the emergency coordinator to be available at the main gate to direct and brief emergency responders.

- Re-entry into the site will be made only after clearance is given by the emergency coordinator. At his direction, a signal or other notification will be given for re-entry into the facility.

- Drills will be held periodically to practice all of these procedures and will be treated with the same seriousness as an actual emergency.

8.6 EMERGENCY SPILL RESPONSE PROCEDURES AND EQUIPMENT

In the event of an emergency involving a hazardous material spill or release, the following general procedures will be used for rapid and safe response and control of the situation. Emergency contacts found in Table 8.1 provide a quick reference guide to follow in the event of a major spill.

8.6.1 Notification Procedures

If an employee discovers a chemical spill or process upset resulting in a vapor or material release, he or she will immediately notify the on-site emergency coordinator.

On-site Emergency Coordinator will obtain information pertaining to the following:

- The material spilled or released.
- Location of the release or spillage of hazardous material.
- An estimate of quantity released and the rate at which it is being released.
- The direction in which the spill, vapor or smoke release is heading.
- Any injuries involved.
- Fire and/or explosion or possibility of these events.
- The area and materials involved and the intensity of the fire or explosion.

This information will help the on-site emergency coordinator to assess the magnitude and potential seriousness of the spill or release.

8.6.2 Procedure for Containing/Collecting Spills

The initial response to any spill or discharge will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

If for some reason a chemical spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large (greater than 55 gallons) and involves a tank or a pipeline rupture, an initial isolation of at least 100 ft. in all directions will be used. Small spills (less than or equal to 55 gallons) or leaks from a tank or pipe will require evacuation of at least 50 ft. in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible the area will be roped or otherwise blocked off.

If the spill results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire) and its release (due to high vapor pressures under ambient conditions), further evacuation will be enforced. In general an area at least 500 feet wide and 1,000 feet long will be evacuated downwind if volatile materials are spilled. (Consult the DOT Emergency Response Guide for isolation distances for listed hazardous materials.)

If an incident may threaten the health or safety of the surrounding community, the public will be informed and possibly evacuated from the area. The on-site emergency coordinator will inform the proper agencies in the event this is necessary. (Refer to Table 8.1)

As called for in regulations developed under the Comprehensive Environmental Response Compensation Liability Act of 1980 (Superfund), a spill of a pound or more of any hazardous material for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or TSCA shall be reported.

Clean up personnel will take the following measures:

- Make sure all unnecessary persons are removed from the hazard area.
- Put on protective clothing and equipment.
- If a flammable material is involved, remove all ignition sources, and use spark and explosion proof equipment for recovery of material.

- Remove all surrounding materials that could be especially reactive with materials in the waste. Determine the major components in the waste at the time of the spill.

- If wastes reach a storm sewer, try to dam the outfall by using sand, earth, sandbags, etc. If this is done, pump this material out into a temporary holding tank or drums as soon as possible.

- Place all small quantities of recovered liquid wastes (55 gallons or less) and contaminated soil into drums for incineration or removal to an approved disposal site.

- Spray the spill area with foam, if available, if volatile emissions may occur.

- Apply appropriate spill control media (e.g. clay, sand, lime, etc.) to absorb discharged liquids.

- For large spills, establish diking around leading edge of spill using booms, sand, clay or other appropriate material. If possible, use diaphragm pump to transfer discharged liquid to drums or holding tank.

8.6.3 Emergency Response Equipment

The following equipment will be staged in the support zone and throughout the site, as needed, to provide for safety and first aid during emergency responses.

- ABC-type fire extinguisher
- First-aid kit, industrial size
- Eyewash/safety shower
- Emergency signal horn
- Self contained breathing apparatus (two)
- Stretcher/backboard

In addition to the equipment listed above, OHM maintains direct reading instrumentation that may be used in emergency situations to assess the degree of environmental hazard. This equipment will only be used by the Project Safety Officer or other specially trained personnel. This equipment will be stored, charged and ready for immediate use in evaluating hazardous chemical concentrations. The equipment will be located at the OHM office trailer.

EQUIPMENT NAME	APPLICATION
Portable H-NU Photoionization Meter	Measures selected inorganic and organic chemical concentrations
MSA Oxygen and Combustible Gas Meter	Measures oxygen and combustible gas levels

8.6.4 Personal Protective Equipment

A supply of two (minimum) SCBAs will be located in the support zone for use in emergency response to hazardous materials releases. They will be inspected at least monthly, according to OSHA requirements. In addition, all emergency response personnel will have respirators available for use with cartridge selection determined by the Project Safety Officer based on the results of direct reading instruments. Emergency response

personnel will also be provided with protective clothing as warranted by the nature of the hazardous material and as directed by the Project Safety Officer.

8.6.5 Emergency Spill Response Clean-Up Materials and Equipment

A sufficient supply of appropriate emergency response clean-up and personal protective equipment will be inventoried and inspected, visually, on a weekly basis.

The materials listed below may be kept on site for spill control, depending on the types of hazardous materials present on site. The majority of this material will be located in the support zone, in a supply trailer or storage area. Small amounts will be placed on pallets and located in the active work areas.

- Sand or clay to solidify/absorb liquid spills.
- Appropriate solvents e.g. CITRIKLEEN, for decontamination of structures or equipment.

The following equipment will be kept on site and dedicated for spill cleanup:

- Plastic shovels for recovering corrosive and flammable materials.
- Sausage-shaped absorbent booms for diking liquid spills, drains, or sewers.
- Sorbent sheets (diapers) for absorbing liquid spills.
- Overpack drums for containerizing leaking drums.
- 55-gallon open-top drums for containerization of waste materials.

*NOTE: All contaminated soils, absorbent materials, solvents and other materials resulting from the clean-up of spilled or discharged substances shall be properly stored, labeled, and disposed of off-site.

8.7 EMERGENCY CONTINGENCY PLAN

This section of the ERCP details the contingency measures OHM will take to prepare for and respond to fires, explosions, spills and releases of hazardous materials, hazardous weather, and medical emergencies.

8.8 MEDICAL EMERGENCY CONTINGENCY MEASURES

The procedures listed below will be used to respond to medical emergencies. The PSO will contact the local hospital and inform them of the site hazards and potential emergency situations. A minimum of two First-Aid/CPR trained personnel will be maintained on site.

8.8.1 Response

The nearest workers will immediately assist a person who shows signs of medical distress or who is involved in an accident. The work crew supervisor will be summoned.

The work crew supervisor will immediately make radio contact with the on-site emergency coordinator to alert him of a medical emergency situation. The supervisor will advise the following information:

- Location of the victim at the work site
- Nature of the emergency

- Whether the victim is conscious
- Specific conditions contributing to the emergency, if known

The Emergency Coordinator will notify the Project Safety Officer. The following actions will then be taken depending on the severity of the incident:

- Life-Threatening Incident — If an apparent life-threatening condition exists, the crew supervisor will inform the emergency coordinator by radio, and the local Emergency Response Services (EMS) will be immediately called. An on-site person will be appointed who will meet the EMS and have him/her quickly taken to the victim. Any injury within the EZ will be evacuated by OHM personnel to a clean area for treatment by (EMS) personnel. No one will be able to enter the EZ without showing proof of training, medical surveillance and site orientation.

- Non Life-Threatening Incident — If it is determined that no threat to life is present, the Project Safety Officer will direct the injured person through decontamination procedures (see below) appropriate to the nature of the illness or accident. Appropriate first aid or medical attention will then be administered.

*NOTE: The area surrounding an accident site must not be disturbed until the scene has been cleared by the Project Safety Officer.

Any personnel requiring emergency medical attention will be evacuated from exclusion and contamination reduction zones if doing so would not endanger the life of the injured person or otherwise aggravate the injury. Personnel will not enter the area to attempt a rescue if their own lives would be threatened. The decision whether or not to decontaminate a victim prior to evacuation is based on the type and severity of the illness or injury and the nature of the contaminant. For some emergency victims, immediate decontamination may be an essential part of life-saving first aid. For others, decontamination may aggravate the injury or delay life-saving first aid. Decontamination will be performed if it does not interfere with essential treatment.

If decontamination can be performed, observe the following procedures:

- Wash external clothing and cut it away.

If decontamination cannot be performed, observe the following procedures:

- Wrap the victim in blankets or plastic to reduce contamination of other personnel.

- Alert emergency and off-site medical personnel to potential contamination, instruct them about specific decontamination procedures.

- Send site personnel familiar with the incident and chemical safety information, e.g. MSDS, with the affected person.

All injuries, no matter how small, will be reported to the PSO or the RM. An accident/injury/illness report will be completely and properly filled out and submitted to the OSC and Regional Health and Safety Director/Project CIH (OHM only).

A list of emergency telephone numbers is given in Table 8.1.

8.8.2 Notification

The following personnel/agencies will be notified in the event of a medical emergency:

- Local Fire Department or EMS
- On-site Emergency Coordinator
- Workers in the affected areas
- Client Representative

8.9 FIRE CONTINGENCY MEASURES

Because flammable/combustible materials are present at this site, fire is an ever-present hazard. OHM personnel and subcontractors are not trained professional firefighters. Therefore, if there is any doubt that a fire can be quickly contained and extinguished, personnel will notify the emergency coordinator by radio and vacate the structure or area. The emergency coordinator will immediately notify the local Fire Department.

The following procedures will be used to prevent the possibility of fires and resulting injuries:

- Sources of ignition will be kept away from where flammable materials are handled or stored.
- The air will be monitored for explosivity before and during hot work and periodically where flammable materials are present. Hot work permits will be required for all such work.
- "No smoking" signs will be conspicuously posted in areas where flammable materials are present.
- Fire extinguishers will be placed in all areas where a fire hazard may exist.
- Before workers begin operations in an area the foreman will give instruction on egress procedures and assembly points. Egress routes will be posted in work areas and exit points clearly marked.

8.9.1 Response

The following procedures will be used in the event of a fire:

- Anyone who sees a fire will notify their supervisor who will then contact the Emergency Coordinator by radio. The emergency coordinator will activate the emergency air horns and contact the local Fire Department.
- When the emergency siren sounds, workers will disconnect electrical equipment in use (if possible) and proceed to the nearest fire exit.
- Work crews will be comprised of pairs of workers (buddy system) who join each other immediately after hearing the fire alarm and remain together throughout the emergency. Workers will assemble at a predetermined rally point for a head count.
- When a small fire has been extinguished by a worker, the emergency coordinator will be notified.

8.10 HAZARDOUS WEATHER CONTINGENCY MEASURES

Operations will not be started or continued when the following hazardous weather conditions are present:

- Lightning
- Heavy Rains/Snow
- High Winds

8.10.1 Response

- Excavation/soil stock piles will be covered with plastic liner.
- All equipment will be shut down and secured to prevent damage.
- Personnel will be moved to safe refuge, initially crew trailers. The emergency coordinator will determine when it is necessary to evacuate personnel to off-site locations and will coordinate efforts with fire, police and other agencies.

8.10.2 Notification

The emergency coordinator will be responsible for assessing hazardous weather conditions and notifying personnel of specific contingency measures. Notifications will include:

- OHM employees and subcontractors
- Client Representative
- Local Emergency Management Agency

8.11 SPILL/RELEASE CONTINGENCY MEASURES

In the event of release or spill of a hazardous material the following measures will be taken:

8.11.1 Response

Any person observing a spill or release will act to remove and/or protect injured/contaminated persons from any life-threatening situation. First aid and/or decontamination procedures will be implemented as appropriate.

First aid will be administered to injured/contaminated personnel. Unsuspecting persons/vehicles will be warned of the hazard. All personnel will act to prevent any unsuspecting persons from coming in contact with spilled materials by alerting other nearby persons. Attempt to stop the spill at the source, if possible. Without taking unnecessary risks, personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum, closing a valve or temporarily sealing a hole with a plug.

Utilizing radio communications, the emergency coordinator will be notified of the spill/release, including information on material spilled, quantity, personnel injuries and immediate life threatening hazards. Air monitoring will be implemented by the emergency coordinator and PSO to determine the potential impact on the surrounding community. Notification procedures will be followed to inform on-site personnel and off-site agencies. The emergency coordinator will make a rapid assessment of the spill/release and direct confinement, containment and control measures. Depending upon the nature of the spill, measures may include:

- Construction of a temporary containment berm utilizing on-site clay absorbent earth
- Digging a sump, installing a polyethylene liner and
- Diverting the spill material into the sump placing drums under the leak to collect the spilling material before it flows over the ground
- Transferring the material from its original container to another container

The emergency coordinator will notify the Client Representative of the spill and steps taken to institute clean-up. Emergency response personnel will clean-up all spills following the spill clean-up plan developed by the emergency coordinator. Supplies necessary to clean up a spill will be immediately available on-site. Such items may include, but are not limited to:

- Shovel, rake
- Clay absorbent
- Polyethylene liner
- Personal safety equipment
- Steel drums
- Pumps and miscellaneous hand tools

The major supply of material and equipment will be located in the Support Zone. Smaller supplies will kept at active work locations. The emergency coordinator will inspect the spill site to determine that the spill has been cleaned up to the satisfaction of the Client. If necessary, soil, water or air samples may be taken and analyzed to demonstrate the effectiveness of the spill clean-up effort. The emergency coordinator will determine the cause of the spill and determine remedial steps to ensure that recurrence is prevented. The emergency coordinator will review the cause with the Client Representative and obtain his concurrence with the remedial action plan.

9.0 TRAINING REQUIREMENTS

As a requirement for work at this site, in any hazardous waste work area, all field personnel will be required to take a 40-hour training class. This training must cover the requirements in 29 CFR 1910.120: personal protective equipment, toxicological effects of various chemicals, hazard communication, bloodborne pathogens, handling of unknown tanks and drums, confined-space entry procedures, electrical safety, etc. In addition, all personnel must receive annual 8-hour refresher training and three day on-site training under a trained, experienced supervisor. Supervisory personnel shall have received an additional 8-hour training in handling hazardous waste operations.

All personnel entering the exclusion zone will be trained in the provisions of this site safety plan and be required to sign the Site Safety Plan Acknowledgment in Appendix A.

Site specific training for the Central Steel Drum site will include potential site contaminants, Hazard Communication as per 29 CFR 1910.1200, site physical and environmental hazards, the Federal Lead Standard 29 CFR 1910.1025), emergency response, and evacuation procedures. Emergency telephone numbers will be posted at the site location before any work at the site begins.

Outlines of the orientation for OHM / OHM sub-contract personnel and visitors are presented below:

9.1 SITE ORIENTATION

OHM/SUBCONTRACTORS

a. HASP sign off
b. Sign in/out procedures
c. Site background
d. Chain of command
e. Rules and regulations
f. Hours of work
g. Absences
h. Equipment
I. Emergency Information
   - Emergency signal
   - Gathering point
   - Responsibilities/roles
   - Emergency phone numbers

j. Contaminants and Material Safety Data Sheets (MSDS) [Hazard Communication Program]
k. JSAs (Phase Safety Plans)
l. Forms, site-specific

d. Work Zones in progress
e. Hazard Communication
f. Emergency plan/signals
g. Training/medical requirements
h. Zones/areas open to visitors

VISITOR ORIENTATION

a. Sign in/out procedures
b. Observation platform safety
c. Review of Site map

10.0 MEDICAL SURVEILLANCE PROGRAM

All site personnel shall participate in a medical monitoring program as outlined below. This program is initiated when the employee starts work with a complete physical and medical history and is continued on a regular basis. This program was developed in conjunction with a consultant toxicologist. Other medical consultants are retained when additional expertise is required.

TABLE 10.1
WORKER MEDICAL PROFILE

Item	Initial	Annual
Medical History	X	X
Work History	X	X
Visual Acuity and Tonometry	X	X
Pulmonary Function Tests	X	X
Physical Examination	X	X
Audiometry Tests	X	X
Chest X-Ray	X	X
Complete Blood Counts	X	X
Blood Chem. (SSAC-23 or equivalent)	X	X
Urinalysis	X	X
Dermatology Examination	X	X
Electrocardiogram (Stress Test) - based on age	X	X (based on age)

Specific tests required for Lead include blood lead, zinc protoporphoryn

10.1 EXAMINATION SCHEDULE

Employees are examined initially upon start of employment, bi-annually or annually thereafter, and may be examined upon termination of employment. Unscheduled medical examinations are conducted:

- At employee request after known or suspected exposure to toxic or hazardous materials
- At the discretion of the client, the CIH, PSO, or employer occupational physician after known or suspected exposure to toxic or hazardous materials
- At the discretion of the employer occupational physician

All nonscheduled medical examinations will include, as a minimum, all items specified above for periodic surveillance examination, with the exception of the chest X-ray, which will be conducted at the discretion of the occupational physician performing the examination.

10.2 BLOOD LEAD MONITORING

In accordance with the Federal Lead Standard 29 CFR 1910.1025, if workers are exposed to airborne lead levels exceeding 0.03 mg/m3 medical monitoring for blood lead and Zinc Protoporphryn will be implemented at that site. Other health considerations will be required in addition to the medical monitoring. These will include site dedicated clothing and laundry, showers prior to leaving the project site, clean food and break areas.

Biological monitoring will consist of pre-and post site activities. Base line biological monitoring will be taken prior to personnel arrival at the project site. Personnel will not enter the EZ without a blood lead base line. The current work schedule for this project will only require post project biological monitoring. If a change in the work schedule extends the project beyond 90 days, a mid point blood lead test will be added to insure worker exposure doesn't exceed the Federal exposure guidelines (40 ug lead per 100g whole blood). Continuing personal air monitoring results indicating high airborne lead contamination (≥ 1.0 mg/m^3) would require monthly (30 days) blood testing.

Workers exceeding the Federal exposure guideline will be removed from EZ activities until blood lead levels drop below 20 ug lead per 100 g whole blood. Workers with baseline blood leads exceeding 20 ug lead per 100 g whole blood will not be permitted in the EZ.

APPENDIX A
HEALTH AND SAFETY PLAN CERTIFICATION

HEALTH-AND-SAFETY PLAN CERTIFICATION

By signing this document, I am stating that I have read and understand the site health-and-safety plan for OHM Remediation Services Corp. personnel and visitors entering the Central Steel Drum site.

REPRESENTING	NAME (PRINT)	SIGNATURE	DATE
OHM CORP	STANFORD GABLE		09-29-97
OHM CORP	STEVEN R WILSON		09-29-97
OHM CORP	RANDY HAWES		10-1-97
EPA	MICHAEL J. BRESCIA		10-1-97
OHM Corp	Takimeca Ashe		10-3-97
WESTON	RAYMOND J. KLIMCSAK		09-29-97
OHM			10-6-97
OHM	Sabrel Warren		10-6-97
OHM	Allan Jenkins		10-6-97
OHM	Nikita D. Ward		10-6-97
OHM	Pat Rose		10/6/97
OHM	Mike Lacy		10/6/97
EPA	G. DEANGELIS		10/6/97
OHM	Lynette Ruffo		10/7/97
OHM	JEFFREY L WATOH		10/9/97
OHM	KEN RINEHOLD		10/14/97
EPA	NEIL NORRELL		10/14/97
EPA	Paul Koester		10/15/97
OHM	John J Gallimore		10/16/97
S.O.I	Keska GARJIN		10/16/97
OHM	TOM O'HARA		10/17/97
OHM	Ron Kenyon		10/17/97
OHM	Marsha Robinson		10/17/97
EPA	Jim DAloia		10/23/97
EPA	Arlene Anderson		10/23/97
OHM	Dumitru Radu		10/23/97
OHM	John Witsa		10-23-97

APPENDIX B
OHM HAZARD COMMUNICATION PROGRAM

APPENDIX B
OHM HAZARD COMMUNICATION PROGRAM

1. OBJECTIVE

A Site Specific Hazard Communication (Employee Right-To-Know) Program will be instituted at the Central Steel Drum Site, Newark, New Jersey.

2. PURPOSE

The purpose of Hazard Communication (Employee Right-to-Know) is to ensure that the hazards of all chemicals located at field project sites, shops, and facilities are transmitted (communicated), according to 29 CFR 1910.1200 and 29 CFR 1926.59 to all OHM personnel and OHM subcontractors.

3. GENERAL REQUIREMENTS

3.1 It is the responsibility of the Response Manager to ensure that the Hazard Communication Program for the area under their supervision is updated as necessary.

3.2 Container Labeling — OHM personnel will ensure that all drums and containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced by on site operations. All incoming and outgoing labels shall be checked for identity, hazard warning, and name and address of responsible party.

3.3 Material Safety Data Sheets (MSDSs) — There will be an MSDS located on site for each hazardous chemical known to exist or which is being used on site. All MSDSs will be located in the site health and safety plan which can be found in the office trailer. MSDS's for products in use may be stored in a separate binder.

3.4 Employee Information and Site Specific Training — Training employees on chemical hazards is accomplished through an ongoing corporate and regional training program. Additionally, chemical hazards will be communicated to employees through daily safety meetings held at the project and by an initial site orientation program.

3.5 OHM employees will be instructed on the following:

- Chemicals and their hazards in the work area
- How to prevent exposure to these hazardous chemicals
- What the company has done to prevent workers' exposure to these chemicals
- Procedures to follow if they are exposed to these chemicals
- How to read and interpret labels and MSDSs for hazardous substances
- Emergency spill procedures
- Proper storage and labeling

3.6 Before any new hazardous chemical is introduced on site, each employee will be given information in the same manner as during the initial safety class. The response manager will be responsible for seeing that the MSDS on the new chemical is available. During the mandatory morning safety briefing, information on each new chemical will be presented.

Should any new chemical be brought on site, the appropriate MSDSs will be added and reviewed with the employees.

1. GENERAL

The following written Hazard Communication Program has been established for OHM Remediation Services Corp. (OHM). The purpose of this program is to transmit information to the workers about the chemical hazards in the work place using various media. The transmittal of information will be accomplished by means of a comprehensive Hazard Communication Program, which will include container labeling and other forms of warning, material safety data sheets (MSDSs), and employee training in accordance with 29 CFR 1910.1200 and 29 CFR 1926.59.

Upon mobilization at the job site the Hazard Communication Program will be reviewed with all employees. Upon reading the Hazard Communication Program employees will be asked to sign the "Worker Hazard Communication Acknowledgment Form". The Hazard Communication Program will also be reviewed with new employees and visitors as they arrive on site. These persons will also be asked to sign the acknowledgment form. The Hazard Communication Program shall be available for review by anyone on site any time during normal work hours. OHM will accomplish the hazard communication requirements through formal safety training, departmental safety meetings, and job-site safety meetings.

The Health and Safety Department shall update the Hazard Communication Program when personnel responsibilities change, a new non-routine task is introduced, or an extremely hazardous material needs particular attention. This new program will then be distributed throughout the company.

2. RESPONSIBILITIES

Overall responsibility for compliance with the site specific Hazard Communication Program rests with the OHM RM. A brief outline of responsibilities for those persons directly involved with the program will follow. These responsibilities are not all inclusive, but are designed to give guidance in initial and long-term program development. Since each area is different, these responsibilities may vary.

This program is intended to cover those employees who are directly involved with the handling of hazardous chemicals or supervision of activities that involve the use of hazardous chemicals.

2.1 Health and Safety Department Responsibilities

- Review operations with Response Managers to determine what tasks require hazard communication training.
- Advise supervisory people as to which materials may need to be considered hazardous initially and eventually to ensure that hazard task determination is being done according to the written policy.
- Follow up through safety meetings and safety audits to ensure that supervisors are carrying out prescribed company policy.
- Notify supervisors immediately of any operating changes affecting the hazardous chemicals being used.

2.2 Training Department Responsibilities

- Ensure that up-to-date records are maintained on training of all employees required to handle hazardous chemicals. The supervisor should keep copies of these records and should also send copies of the initial training to the corporate training secretary for the training file.
- Educate personnel upon initial 40-hour OSHA training to the requirements of the Hazard Communication Standard.

2.3 Response Managers' Responsibilities

- Identify jobs requiring the use of hazardous chemicals and develop a list of those jobs and chemicals.
- Provide the training required by the Hazard Communication Standard and document training of employees in the safe handling of hazardous chemicals.
- Ensure inspection of engineering controls and personal protective equipment before each use. The health and safety department shall help determine a suitable inspection plan for each application as needed.
- Make daily surveys of the work area to ensure that safe practices are being followed. Advise employees of and document unsafe work practices on the first occasion and consider further unsafe work practices as disciplinary violations. Use documentation as topics of safety meetings.
- Ensure required labeling practices are being followed. Labels should be affixed to the container when it arrives. If the contents are transferred to another container, then all label information (manufacturer, manufacturer's telephone number, product name, target organ(s) and product number) must also be affixed to the new container, so that all containers of the material, regardless of size, are labeled. Contact the health and safety department for proper labels.
- Enforce all applicable safety and health standards through periodic documented audits.
- Before ordering a material, determine if a MSDS exists on file. Request a MSDS from the manufacturer for all new products.

2.4 Employee Responsibilities

- Read and understand entire Site Specific Hazard Communication Program.
- Obey established safety rules and regulations.
- Use all safety procedures and personal protective equipment as required by company procedures.
- Notify supervisor of the following:
  - Any symptoms or unusual effects that may be related to the use of hazardous chemicals.
  - Any missing, incomplete, or unreadable labels on containers.
  - Missing, damaged, or malfunctioning safety equipment.
- Use approved labels on containers; do not remove labels (labels are available from the health and safety department).
- Use only approved containers for hazardous chemicals. (Is chemical and container compatible and appropriate?)
- Know where emergency equipment and first-aid supplies are located.
- Know location of MSDSs. These will be located in the break/decon area and the job-site office trailer.
- Know what you are expected to do in case of an emergency. Before the commencement of any task, emergency considerations shall be made.

2.5 Shipping/Receiving Personnel Responsibilities

- The Project Accountant (PA) or other persons assigned by the RM shall ensure MSDSs are received with initial shipment of a hazardous chemical; if not, contact purchasing to request the appropriate MSDS and also call the health and safety department to determine if there is a MSDS available until the requested MSDS arrives.
- Ensure labels with required information are affixed to all containers.
- Store hazardous materials in designated locations.
- Use proper personal protective equipment when handling hazardous chemicals.
- Report damaged containers or spills to the Response Manager and the Project Safety Officer immediately.

3. HAZARD DETERMINATION

OHM will rely on MSDSs from chemical suppliers and manufacturers to meet hazard determination requirements. Other relevant data from laboratory analyses, chemical reference materials, and chemical manufacturers' written evaluation procedures will be utilized when warranted. No other method shall be used to determine a chemicals' hazards unless approved by the health and safety department.

4. LABELING

The Response Manager will be responsible for seeing that all containers arriving at OHM job sites are properly and clearly labeled. Response Manager shall also check all labels for chemical identity and appropriate hazard warnings. If the hazardous chemical is regulated by OSHA in a substance specific health standard (29 CFR 1910), the Response Manager shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard. Any container that is not labeled shall be immediately labeled after initial discovery with the required information.

The Response Manager or Team Leader (TL) shall be responsible for seeing that all portable containers used in their work area are properly labeled with chemical identity and hazard warning. (Refer to MSDS for required labeling information.)

The Response Manager or Team Leader shall also ensure that labels on hazardous chemical containers are not removed or defaced unless the container is immediately marked with the required information and that all labels are legible in English and prominently displayed on the container or readily available in the work area throughout each shift.

If any container is found and the contents cannot be identified, the Response Manager shall be contacted immediately. When proper identification is made, a label shall be affixed to the container immediately. If it is discovered that no MSDS is available, the manufacturer and the health and safety department shall be contacted to assist in locating the proper MSDS. If there is no means of identifying the material in the container, the container shall be taken out of service, away from all personnel until it can be tested by the health and safety department or laboratory personnel. The Response Manager shall communicate their findings or awareness of such containers to all personnel working in the area and to the district health and safety manager.

5. MATERIAL SAFETY DATA SHEETS (MSDS)

The Response Manager at the job site will be responsible for maintaining a current MSDS relevant to the hazardous chemicals used on their job sites. The health and safety department will be responsible for compiling the initial MSDS file for the job site and aiding all job sites with the completion and maintenance of their respective MSDS files.

All MSDSs shall be readily available for review by all employees during each work shift. Each job site will designate a clearly marked "Employee Right-to-Know" station where employees can immediately obtain a MSDS and the required information in an emergency. MSDSs shall also be made available, upon request, to designated OHM representatives, other employer's employees, and to any OSHA inspector in accordance with the requirements of 29 CFR 1910.1200(e).

Although manufacturers are required to provide employers with MSDSs on an initial chemical shipment, OHM purchasing agents (and response managers purchasing their own material) shall request MSDSs and updates to MSDSs on all purchase orders. Response managers that are without proper MSDSs shall be responsible for requesting this information from chemical manufacturers. The Response Manager shall maintain a file of follow-up letters for all hazardous chemical shipments they receive without MSDSs.

6. EMPLOYEE INFORMATION AND TRAINING

It is the responsibility of the supervisor in charge of each employee to ensure that the employee is properly trained. Training employees on chemical hazards and chemical handling is accomplished at the time of initial employment at OHM, whenever a new chemical (or physical) hazard is introduced into the work area, and through ongoing formal and informal training programs. Additionally, chemical hazards are communicated to employees through weekly and morning, job- site safety meetings, which shall be documented according to topic, major points discussed, and names of those attending (attendance is mandatory). Records of all formal training conducted at OHM are coordinated and maintained by the Training Department secretary.

At a minimum, OHM will inform employees on the following:

- The requirements of 29 CFR 1910.1200--Hazard Communication--Evaluating the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees. OHM shall accomplish employee training in several different ways including, but not limited, to 40-hour OSHA Hazardous Waste Worker Training (29 CFR 1910.120), shop safety meetings, job-site safety meetings, Health and Safety Department safety meetings, and formal and informal training about specific chemical hazards.

- The location and availability of the written Hazard Communication Program, list of hazardous chemicals, and MSDSs will be periodically posted on the employee bulletin boards providing the location of the above material.

- Any operations in their work area where hazardous chemicals are present.

- How to work safety with chemicals present in the workplace and minimize potential exposure.

Employee training shall include the following:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (monitoring instruments, visual appearance or odor, and acute and chronic health effects).
- The physical, chemical, and health hazards of the chemicals in the work area.

- The methods of preventing exposure to hazardous chemicals including the measures OHM has taken to protect the employees.

- Procedures to follow if OHM employees are exposed to hazardous chemicals (location of the nearest phone, emergency eyewash, and shower will be included). These discussions shall include proper operating procedures for all emergency equipment.

- The details of the OHM written Hazard Communication Program, including an explanation of the labeling system and the MSDSs, and how employees can obtain and use the appropriate hazard information.

- Procedures for workers involved in non-routine tasks.

Each Response Manager shall ensure that the above training is emphasized to OHM employees. The health and safety department will ensure that each job site is properly informing and training all employees through group meetings and individual discussions. Whenever a new hazardous chemical is placed into use, the Response Manager shall inform the employees of the hazards said chemical may pose. The Response Manager shall also be responsible for obtaining and making available a MSDS for the new chemical.

7. HAZARDOUS NON-ROUTINE TASKS

Occasionally, employees at OHM are required to perform tasks which are considered to be non-routine. All tasks OHM considers non-routine shall be carefully discussed among the supervisor and those performing the task. This safety briefing shall include all possible hazards an employee may encounter while completing the task, including:

- Hazard recognition
- Chemicals involved and their hazardous properties
- Physical hazards
- Methods of avoiding hazards (monitoring instruments, proper personal protective equipment, etc.)

The following is a list of some of the non-routine tasks which may occur at OHM job sites. These tasks are all covered in detail in various OHM standard operating Procedures.

7.1 Confined Space Entry
7.2 Excavation, Trenching, and Shoring
7.3 Decontamination of Equipment
7.4 Laboratory Spills
7.5 High-Pressure Washer (Laser) Operation
7.6 Line Entry Procedure
7.7 Hot Work

8. INFORMING CONTRACTORS

It shall be the responsibility of the OHM Response Manager/PSO to provide subcontractors with the following information:

- Hazardous chemicals to which they may be exposed while performing a task including the following:
  - Chemical properties
  - Physical properties
  - Acute/Chronic health effects
- Location of "Employee Right-to Know" station which includes the following:
  - MSDS for work area
  - Hazard Communication Program
  - Other relevant safety material such as Project Health and Safety Plan (HASP)
- Precautionary measures to be taken to protect employees from chemical and physical hazards.
- Location of nearest emergency equipment (fire extinguisher, eyewash, shower, phone, first-aid kit, etc.)
- Procedures to follow in the event of employee exposure.
- Steps OHM has taken to reduce the risk of exposure to physical and chemical hazards including the following:

- Safety meetings
- Hazard Communication Program
- Proper storage and labeling of hazardous chemicals
- Health and safety department shop audits

- The methods used to label all hazardous chemicals.

- Emergency evacuation signals and evacuation rally locations.

The health and safety department shall offer assistance in providing the above information to subcontractors working at OHM job sites. On initial visit by a subcontractor to OHM job sites, a "Contractor Right-to-Know" release form shall be completed. This form will state that the above information has been communicated to the perspective contractor.

Conversely, the Response Manager shall obtain the above information from subcontractors for hazardous materials they have brought to our projects.

8.1 Contractor Right-to-Know Acknowledgment

By signing this sheet, the signee is stating that an OHM employee or representative has briefed said signee on the essentials of OHM's Hazard Communication Program, including hazardous chemical(s) to which one may be exposed, location of program and MSDS, precautionary measures taken to protect contractors from chemical and physical hazards, location of nearest emergency equipment, procedures to follow in the event of employer's employee chemical exposure, and method used to label all hazardous chemicals.

Name	Date	Company

9. LIST OF HAZARDOUS CHEMICALS

The following is a list of hazardous chemicals used on this OHM job site. Further information on each hazardous chemical listed below can be found in the MSDS which are included in the site specific health and safety plan.

- Typical OHM Job-Site Hazardous Chemical Inventory List

Available On Site	Chemicals
_____	Acetone
_____	Acetylene
_____	Activated Charcoal, Powder

_____ Alum (Aluminum Sulfate)
_____ Anti-fog Bausch & Lomb
_____ Argon/Methan (95%/5%)
_____ Brake Fluid
_____ Calcium Hydroxide (Hydrated Lime)
_____ Calibration Check Gas
_____ Carbon
_____ Caustic Soda (Sodium Hydroxide)
_____ Citrikleen
_____ Coal Fly Ash
_____ Compressed Air
_____ Diatomaceous Earth
_____ Diesel Fuel
_____ Dry Ice (Solid Carbon Dioxide)
_____ Ethylene Glycol
_____ Ferric Chloride
_____ Freon
_____ Gear Grease - Delta
_____ Helium
_____ Hexane
_____ Hydraulic Fluid
_____ Hydrochloric Acid
_____ Hydrogen
_____ Isobutylene
_____ Kiln Dust
_____ Methanol
_____ Nitrogen
_____ Nitrous Oxide
_____ Oxygen
_____ Penetone
_____ Pentane
_____ Polymers (Flocculants)
_____ Premium Unleaded Gasoline
_____ PVC Solvent Cleaner
_____ PVC Cement
_____ Regular Leaded Gasoline
_____ Starting Fluid
_____ Stoddard Solvent
_____ Sulfuric Acid
_____ 10W-40 Motor Oil - Shell
_____ Tube Grease - Kendall
_____ TU Type 555 Thread Sealing Compound
_____ 2-Cycle Oil - Wolf's Head

- Site-Specific Hazardous Chemical Inventory

_____

_____

_____

_____

APPENDIX C
MATERIAL SAFETY DATA SHEETS

AT & T TECHNOLOGIES GENERAL HQ -- 000000001 LEAD
MATERIAL SAFETY DATA SHEET
FSC: 6850
NIIN: 00F037221
Manufacturer's CAGE: 1D306
Part No. Indicator: A
Part Number/Trade Name: 000000001 LEAD

General Information

Company's Name: AT AND T TECHNOLOGIES GENERAL HQ
Company's Street: 1 OAK WAY
Company's City: BERKELEY HEIGHTS
Company's State: NJ
Company's Country: US
Company's Zip Code: 07922-2727
Company's Emerg Ph #: 201-771-2000/908-204-8243
Company's Info Ph #: 201-771-2000/908-204-8243
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 18MAR91
Safety Data Review Date: 02NOV94
Preparer's Company: AT AND T TECHNOLOGIES GENERAL HQ
Preparer's St Or P. O. Box: 1 OAK WAY
Preparer's City: BERKELEY HEIGHTS
Preparer's State: NJ
Preparer's Zip Code: 07922-2727
MSDS Serial Number: BVTJQ

Ingredients/Identity Information

Proprietary: NO
Ingredient: LEAD, INORGANIC LEAD (IARC GROUP 2B) *94-3*
Ingredient Sequence Number: 01
Percent: >99
NIOSH (RTECS) Number: OF7525000
CAS Number: 7439-92-1
OSHA PEL: 50 UG/CUM
ACGIH TLV: 0.15 MG/CUM

Physical/Chemical Characteristics

Appearance And Odor: HEAVY, DUCTILE SOFT GRAY SOLID
Boiling Point: 3164F
Melting Point: 621.32F
Vapor Pressure (MM Hg/70 F): 1
Specific Gravity: 11.3
Solubility In Water: INSOLUBLE
Percent Volatiles By Volume: 0

Fire and Explosion Hazard Data

Flash Point: NONE
Extinguishing Media: USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE CONDITIONS.
Special Fire Fighting Proc: USE SCBA & PROTECTIVE CLOTHING.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH TEMPS
Materials To Avoid: STRONG OXIDIZERS, HYDROGEN PEROXIDE, ACTIVE METALS
Hazardous Decomp Products: TOXIC FUMES OF LEAD
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES

Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: EARLY SYMPTOMS OF LEAD INTOXICATION INCLUDE PERSISTENT METALLIC TASTE, ANOREXIA, CONSTIPATION & SEVERE ABDOMINAL PAIN. CONTINUED EXPOSURES RESULT IN MUSCLE WEAKNESS & FATIGUE, DEGENERATIVE CHANGES IN MOTOR NEURONS, PALLOR OF FACE, ANEMIA, LIVER & KIDNEY DAMAGE, HEADACHE & INSOMNIA. CAUSES CHROMOSOMAL ABBERATIONS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS.
Signs/Symptoms Of Overexp: EARLY SYMPTOMS OF LEAD INTOXICATION INCLUDE PERSISTENT METALLIC TASTE, ANOREXIA, CONSTIPATION & SEVERE ABDOMINAL PAIN. CONTINUED EXPOSURES RESULT IN MUSCLE WEAKNESS & FATIGUE, DEGENERATIVE CHANGES IN MOTOR NEURONS, PALLOR OF FACE, ANEMIA, LIVER & KIDNEY DAMAGE, HEADACHE & INSOMNIA. CAUSES CHROMOSOMAL ABBERATIONS.
Emergency/First Aid Proc: FLUSH W/LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINS. SKIN: WASH W/SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. INGESTION: IF CONSCIOUS GIVE LARGE AMOUNTS OF WATER & INDUCE VOMITING. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: IF MATERIAL IS RECLAIMED (GROUND/CHOPPED), CLEAN-UP SHOULD BE PERFORMED AS SOON AS POSSIBLE TO MINIMIZE DISPERSION. IF POSSIBLE, VACUUM EQUIPPED W/HEPA FILTER SHOULD BE USED. IF NOT, USE WET METHODS.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE W/FEDERAL, STATE & LOCAL REGULATIONS. LEAD MUST BE DISPOSED OF IN COMPLIANCE W/RCRA. RECLAMATION OF LEAD AT AN APPROPRIATE FACILITY IS SUGGESTED.
Precautions-Handling/Storing: DON'T EAT, DRINK, SMOKE/APPLY COSMETICS IN ANY WORK AREA WHERE EXPOSURE TO LEAD, LEAD DUST/LEAD FUME MAY OCCUR.
Other Precautions: ANNUAL PHYSICAL EXAMINATIONS ARE REQUIRED WHEN AIRBORNE LEAD LEVELS EXCEED 30 UG/CUM FOR 30 DAYS.

Control Measures

Respiratory Protection: REQUIRED IF CONCENTRATION EXCEEDS PEL. FOR CONCENTRATIONS 50-500 UG/CUM, USE HIGH EFFICIENCY TOXIC DUST RESPIRATOR CARTRIDGE.
Ventilation: GENERAL MAY BE ADEQUATE. LOCAL EXHAUST IS PREFERRED. SHOULD BE IN PATTERN/VOLUME SUFFICIENT TO MAINTAIN EXPOSURE LEVELS.
Protective Gloves: REQUIRED. COTTON TYPE SUGGESTED.
Eye Protection: SAFETY GLASSES W/SIDE SHIELDS
Other Protective Equipment: SHOE COVERS, COVERALLS, HEAD PROTECTION, GOGGLES
Work Hygienic Practices: CLOTHES MUST BE CLEANED & DRIED WEEKLY. WASH AFTER EXPOSURE/HANDLING & BEFORE EATING/DRINKING/SMOKING/APPLYING MAKE-UP.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: 000000001 LEAD
Special Hazard Precautions: EARLY SYMPTOMS OF LEAD INTOXICATION INCLUDE PERSISTENT METALLIC TASTE, ANOREXIA, CONSTIPATION & SEVERE ABDOMINAL PAIN. CONTINUED EXPOSURES RESULT IN MUSCLE WEAKNESS & FATIGUE, DEGENERATIVE CHANGES IN MOTOR NEURONS, PALLOR OF FACE, ANEMIA, LIVER & KIDNEY DAMAGE, HEADACHE & INSOMNIA. CAUSES CHROMOSOMAL ABBERATIONS. EARLY SYMPTOMS OF LEAD INTOXICATION INCLUDE PERSISTENT METALLIC TASTE, ANOREXIA, CONSTIPATION & SEVERE ABDOMINAL PAIN. CONTINUED EXPOSURES RESULT IN MUSCLE WEAKNESS & FATIGUE, DEGENERATIVE CHANGES IN MOTOR NEURONS, PALLOR OF FACE, ANEMIA, LIVER & KIDNEY DAMAGE, HEADACHE & INSOMNIA. CAUSES CHROMOSOMAL ABBERATIONS.
Label Name: AT AND T TECHNOLOGIES GENERAL HQ
Label Street: 1 OAK WAY
Label City: BERKELEY HEIGHTS
Label State: NJ
Label Zip Code: 07922-2727

Label Country: US
Label Emergency Number: 201-771-2000/908-204-8243
==========
URL for this msds http://hazard.com. If you wish to change, add to, or delete information in this archive please sent updates to dan@hazard.com.

GEORGIA-PACIFIC BELLINGHAM DIV -- SODIUM HYDROXIDE,50% LIQUID. - SODIUM HYDROXIDE SOLUTION
MATERIAL SAFETY DATA SHEET
FSC: 6810
NIIN: 010513050
Manufacturer's CAGE: 95732
Part No. Indicator: A
Part Number/Trade Name: SODIUM HYDROXIDE,50% LIQUID.

General Information

Item Name: SODIUM HYDROXIDE SOLUTION
Company's Name: GEORGIA-PACIFIC CORP. BELLINGHAM DIVISION
Company's Street: 300 LAUREL STREET
Company's P. O. Box: 1236
Company's City: BELLINGHAM
Company's State: WA
Company's Country: US
Company's Zip Code: 98227
Company's Emerg Ph #: 206-733-4410
Company's Info Ph #: 206-733-4410
Record No. For Safety Entry: 025
Tot Safety Entries This Stk#: 026
Status: SE
Date MSDS Prepared: 24FEB88
Safety Data Review Date: 26MAR92
Supply Item Manager: CX
MSDS Preparer's Name: KIP HOWLETT
MSDS Serial Number: BMDTZ
Specification Number: NOT APPLICABLE
Hazard Characteristic Code: C2
Unit Of Issue: DR
Unit Of Issue Container Qty: 55 GALLONS
Type Of Container: DRUM
Net Unit Weight: 700.7 LBS

Ingredients/Identity Information

Proprietary: NO
Ingredient: SODIUM HYDROXIDE (SARA III)
Ingredient Sequence Number: 01
Percent: >48.5
NIOSH (RTECS) Number: WB4900000
CAS Number: 1310-73-2
OSHA PEL: 2 MG/M3
ACGIH TLV: C 2 MG/M3; 9293
Other Recommended Limit: NONE SPECIFIED

Physical/Chemical Characteristics

Appearance And Odor: CLEAR LIQUID, NO ODOR.
Boiling Point: 284F,140C
Melting Point: UNKNOWN
Vapor Pressure (MM Hg/70 F): 13 @ 140F
Vapor Density (Air=1): UNKNOWN
Specific Gravity: 1.53
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: UNKNOWN
Solubility In Water: COMPLETE
Viscosity: UNKNOWN
pH: > 12.5
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: NONE
Extinguishing Media: NON-FLAMMABLE. USE EXTINGUISHING MEDIA APPROPIATE FOR SURROUNDING FIRE.
Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire And Expl Hazrds: SODIUM HYDROXIDE WILL REACT WITH METALS SUCH

AS ALUMINUM, TIN, AND ZINC TO GENERATE FLAMMABLE AND EXPLOSIVE HYDROGEN GAS.

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Reactivity Data

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Stability: YES
Cond To Avoid (Stability): NONE NOTED.
Materials To Avoid: ACIDS, MANY ORGANIC CHEMICALS, ESPECIALLY NITROCARBONS & HALOCARBONS, LEATHER, WOOL, ALUMINUM, TIN, ZINC, & THEIR ALLOYS
Hazardous Decomp Products: NONE.
Hazardous Poly Occur: NO

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Health Hazard Data

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LD50-LC50 Mixture: LD50 ORAL RAT IS UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: SODIUM HYDROXIDE IS A STRONG ALKALI AND IS DESTRUCTIVE OF ALL HUMAN TISSUE IT CONTACTS, GIVING SEVERE BURNS. EYE CONTACT WILL PRODUCE SEVERE OR PERMANENT INJURY. INHALATION OF MIST OR SPRAY CAN INJURE THE ENTIRE RESPIRATORY TRACT. CHRONIC: MANUFACTURER DID NOT SPECIFY.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT APPLICABLE.
Signs/Symptoms Of Overexp: EYES: SEVERE BURNS. POSSIBLE PERMANENT TISSUE DAMAGE AND POSSIBLE BLINDNESS. SKIN: SEVERE IRRITATION. POSSIBLE CHEMICAL BURNS AND POSSIBLE PERMANENT TISSUE DAMAGE. INHALATION: SEVERE IRRITATION AND POSSIBLE PERMANENT DAMAGE TO UPPER RESPIRATORY TRACT.
Med Cond Aggravated By Exp: NONE.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SEE DOCTOR IMMEDIATELY. SKIN: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. SEE DOCTOR. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN/CPR IF NEEDED. SEE DOCTOR IMMEDIATELY. INGESTION: DO NOT INDUCE VOMITING. DRINK LARGE AMOUNTS OF WATER. SEE DOCTOR IMMEDIATELY.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: PICK UP SPILL WITH VACUUM EQUIPMENT (ALKALI RESISTANT) FOR DISPOSAL OR FLUSH TO HOLDING AREA WITH LARGE AMOUNTS OF WATER.
Neutralizing Agent: 5% ACETIC ACID.
Waste Disposal Method: NOTIFY YOUR LOCAL ENVIRONMENTAL OFFICER. WASTE CAUSTIC MUST NEVER BE DISCHARGED TO SEWERS OR SURFACE WATERS. FIRST CONVERT TO NEUTRAL SALTS AND DILUTE WELL WITH WATER. SODIUM HYDROXIDE WASTE EXHIBITS THE EPA CHARACTERISTIC OF CORROSIVITY.
Precautions-Handling/Storing: DO NOT PERMIT WORKERS TO HANDLE SODIUM HYDROXIDE WITHOUT PROPER TRAINING OR EQUIPMENT. STORE IN SEALED CONTAINERS PROTECTED FROM PHYSICAL DAMAGE.
Other Precautions: AVOID HANDLING CONDITIONS WHICH LEAD TO SPILLS OR MIST FORMATION. DRAINS MUST HAVE RETENTION BASINS FOR PH ADJUSTMENT AND NEUTRALIZATION OF SPILLED MATERIAL. HAVE ABUNDANT RUNNING WATER AVAILABLE WHERE MATERIAL IS STORED, UNLOADED OR HANDLE

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Control Measures

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Respiratory Protection: IF TLV IS EXCEEDED, USE SUPPLIED AIR RESPIRATOR WITH FULL FACEPIECE, HELMET OR HOOD, OR SELF-CONTAINED BREATHING APPARATUS WIHT A FULL FACEPIECE.
Ventilation: LOCAL EXHAUST ESPECIALLY WHERE POSSIBILITY OF MIST FORMATION EXISTS.
Protective Gloves: RUBBER.
Eye Protection: DUSTPROOF AND SPLASHPROOF SAFETY GOGGLES
Other Protective Equipment: APRON OR PROTECTIVE CLOTHING, AND RUBBER BOOTS (TOPS COVERED BY APRON OR CLOTHING TO PREVENT ENTRANCE OF CAUSTIC).
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE SMOKING OR EATING.LAUNDER CONTAMINATED CLOTHING. DISCARD CONTAMINATED SHOES.
Suppl. Safety & Health Data: NONE

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Transportation Data

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Trans Data Review Date: 92086
DOT PSN Code: NGY
DOT Proper Shipping Name: SODIUM HYDROXIDE SOLUTION
DOT Class: 8
DOT ID Number: UN1824
DOT Pack Group: II
DOT Label: CORROSIVE
IMO PSN Code: NTB
IMO Proper Shipping Name: SODIUM HYDROXIDE, SOLUTION
IMO Regulations Page Number: 8226
IMO UN Number: 1824
IMO UN Class: 8
IMO Subsidiary Risk Label: -
IATA PSN Code: WST
IATA UN ID Number: 1824
IATA Proper Shipping Name: SODIUM HYDROXIDE SOLUTION
IATA UN Class: 8
IATA Label: CORROSIVE
AFI PSN Code: WST
AFI Prop. Shipping Name: SODIUM HYDROXIDE, SOLUTION
AFI Class: 8
AFI ID Number: UN1824
AFI Pack Group: II
AFI Label: CORROSIVE
AFI Special Prov: N34
AFI Basic Pac Ref: 12-5
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Disposal Data

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Label Data

==========
Label Required: YES
Label Status: G
Common Name: SODIUM HYDROXIDE,50% LIQUID.
Special Hazard Precautions: ACUTE: SODIUM HYDROXIDE IS A STRONG ALKALI AND IS DESTRUCTIVE OF ALL HUMAN TISSUE IT CONTACTS, GIVING SEVERE BURNS. EYE CONTACT WILL PRODUCE SEVERE OR PERMANENT INJURY. INHALATION OF MIST OR SPRAY CAN INJURE THE ENTIRE RESPIRATORY TRACT. CHRONIC: MANUFACTURER DID NOT SPECIFY. EYES: SEVERE BURNS. POSSIBLE PERMANENT TISSUE DAMAGE AND POSSIBLE BLINDNESS. SKIN: SEVERE IRRITATION. POSSIBLE CHEMICAL BURNS AND POSSIBLE PERMANENT TISSUE DAMAGE. INHALATION: SEVERE IRRITATION AND POSSIBLE PERMANENT DAMAGE TO UPPER RESPIRATORY TRACT.
Label Name: GEORGIA-PACIFIC CORP. BELLINGHAM DIVISION
Label Street: 300 LAUREL STREET
Label P.O. Box: 1236
Label City: BELLINGHAM
Label State: WA
Label Zip Code: 98227
Label Country: US
Label Emergency Number: 06-733-4410
==========
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COULTON CHEMICAL -- SULFURIC ACID, CONCENTRATED - SULFURIC ACID, TECHNICAL
MATERIAL SAFETY DATA SHEET
FSC: 6810
NIIN: 009750907
Manufacturer's CAGE: COULT
Part No. Indicator: A
Part Number/Trade Name: SULFURIC ACID, CONCENTRATED

General Information

Item Name: SULFURIC ACID, TECHNICAL
Company's Name: COULTON CHEMICAL CORPORATION
Company's Street: 6600 SYLVANIA AVE
Company's City: SYLVANIA
Company's State: OH
Company's Country: US
Company's Zip Code: 43560
Company's Emerg Ph #: 419-885-4661
Company's Info Ph #: 419-885-4661
Distributor/Vendor # 1: MAYS CHEMICAL CO INC (317-842-8722)
Distributor/Vendor # 1 Cage: 6T060
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 25SEP91
Safety Data Review Date: 27JUN95
Supply Item Manager: CX
MSDS Serial Number: BXCPC
Hazard Characteristic Code: C1
Unit Of Issue: DR
Unit Of Issue Container Qty: 13 GALLONS
Type Of Container: DRUM

Ingredients/Identity Information

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS, OILY LIQUID
Boiling Point: 518F,270C
Melting Point: -30F,-34C
Vapor Pressure (MM Hg/70 F): NOT GIVEN
Vapor Density (Air=1): NOT GIVEN
Specific Gravity: 1.84
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: NOT GIVEN
Solubility In Water: COMPLETE
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: NONFLAMMABLE
Lower Explosive Limit: NOT GIVEN
Upper Explosive Limit: NOT GIVEN
Extinguishing Media: DO NOT USE WATER. IF WATER IS ADDED TO CONCENTRATED ACID A SEVERE ERUPTION MAY RESULT. USE CARBON DIOXIDE, DRY CHEMICAL
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS. COOL TANKS AND CONTAINERS EXPOSED TO FIRE WITH WATER.
Unusual Fire And Expl Hazrds: DILUTE SULFURIC ACID WILL REACT WITH MOST METALS TO LIBERATE HYDROGEN GAS WHICH CAN REACH FLAMMABLE OR EXPLOSIVE LIMITS IF ALLOWED TO COLLECT.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): WATER
Materials To Avoid: BASES, ORGANIC MATERIALS, METALS
Hazardous Decomp Products: HYDROGEN GAS
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE. WILL NOT OCCUR.

Health Hazard Data

LD50-LC50 Mixture: NOT GIVEN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CONCENTRATED SULFURIC ACID IS A STRONG DEHYDRATING AGENT THAT WILL QUICKLY DAMAGE HUMAN TISSUE, ESPECIALLY IF HEATED. INHALATION OF MISTS CAN DAMAGE RESPIRATORY TRACT AND LUNGS. EYE INJURIES CAN BE SEVERE AND PERMANENT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: THIS COMPOUND CONTAINS NO INGREDIENTS AT CONCENTRATIONS OF 0.1% OR GREATER THAT ARE CARCINOGENS OR SUSPECT CARCINOGENS.
Signs/Symptoms Of Overexp: TISSUE DAMAGE, RESPIRATORY TRACT DAMAGE, SEVERE EYE DAMAGE, BLINDNESS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES. FLUSH UNDER LIDS BY LIFTING THEM OR ROLLING EYES. SEE DOCTOR ASAP. SKIN: FLUSH WITH WATER. REMOVE CLOTHING AND CONTINUE FLUSHING. INHALATION: REMOVE TO FRESH AIR AND RESTORE BREATHING. GET MEDICAL HELP. INGESTION: DO NOT INDUCE VOMITING. DILUTE STOMACH CONTENTS BY GIVING WATER OR MILK TOGETHER WITH MILK OF MAGNESIA. GET PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: MINOR SPILLS CAN BE DILUTED AND NEUTRALIZED WITH SODA ASH, LIME OR CAUSTIC. LARGE SPILLS SHOULD BE CONTAINED.
Neutralizing Agent: SODA ASH, LIME, CAUSTIC
Waste Disposal Method: PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT, RESIDUE, DISPOSAL CONTAINER OR LINER IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN SHADED, WELL DRAINED STORAGE AREA. DO NOT ADD WATER TO CONCENTRATED SULFURIC ACID. DO NOT ALLOW DILUTE ACID TO CONTACT METALS.
Other Precautions: MOST METALS ARE RAPIDLY CORRODED IN WEAK SULFURIC ACID AND EXPLOSIVE HYDROGEN IS GENERATED. BE SURE SAFETY SHOWER OR OTHER SOURCE OF WATER IS QUICKLY AVAILABLE IN AREAS WHERE PERSONNEL EXPOSURE TO SULFURIC ACID IS POSSIBLE.

Control Measures

Respiratory Protection: WEAR SELF-CONTAINED BREATHING APPARATUS IF TLV IS EXCEEDED. IF VENTILATION IS GOOD, VAPOR FROM SULFURIC ACID AT AMBIENT TEMPERATURES SHOULD NOT EXCEED THE TLV.
Ventilation: LOCAL EXHAUST AND MECHANICAL (GENERAL) VENTILATION AS REQUIRED TO MAINTAIN EXPOSURE LEVELS.
Protective Gloves: REQUIRED
Eye Protection: SAFETY GOGGLES
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING AS NECESSARY TO PREVENT SKIN CONTACT. AN EMERGENCY EYEWASH AND SHOWER SHOULD BE AVAILABLE.
Work Hygienic Practices: WASH HANDS THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES.
Suppl. Safety & Health Data: AGITATION, SPRAY FROM LEAKS, ADDING WATER TO SPILLS, ETC, CAN GENERATE MIST LEVELS THAT WILL GREATLY EXCEED THE TLV. PROPER PERSONAL PROTECTIVE EQUIPMENT SHOULD BE WORN IN SUCH CIRCUMSTANCES.

Transportation Data

Trans Data Review Date: 95178
DOT PSN Code: NUC
DOT Proper Shipping Name: SULFURIC ACID
DOT Class: 8
DOT ID Number: UN1830
DOT Pack Group: II
DOT Label: CORROSIVE
IMO PSN Code: OFJ
IMO Proper Shipping Name: SULPHURIC ACID
IMO Regulations Page Number: 8230 *
IMO UN Number: 1830
IMO UN Class: 8

IMO Subsidiary Risk Label: -
IATA PSN Code: XIX
IATA UN ID Number: 1830
IATA Proper Shipping Name: SULPHURIC ACID
IATA UN Class: 8
IATA Label: CORROSIVE
AFI PSN Code: XIX
AFI Prop. Shipping Name: SULPHURIC ACID
AFI Class: 8
AFI ID Number: UN1830
AFI Pack Group: II
AFI Label: CORROSIVE
AFI Special Prov: 2,A3,A7,N34
AFI Basic Pac Ref: 12-5

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Disposal Data

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Label Data

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Label Required: YES
Label Status: G
Common Name: SULFURIC ACID, CONCENTRATED
Special Hazard Precautions: CONCENTRATED SULFURIC ACID IS A STRONG DEHYDRATING AGENT THAT WILL QUICKLY DAMAGE HUMAN TISSUE, ESPECIALLY IF HEATED. INHALATION OF MISTS CAN DAMAGE RESPIRATORY TRACT AND LUNGS. EYE INJURIES CAN BE SEVERE AND PERMANENT. TISSUE DAMAGE, RESPIRATORY TRACT DAMAGE, SEVERE EYE DAMAGE, BLINDNESS.
Label Name: COULTON CHEMICAL CORPORATION
Label Street: 6600 SYLVANIA AVE
Label City: SYLVANIA
Label State: OH
Label Zip Code: 43560
Label Country: US
Label Emergency Number: 419-885-4661

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ASHLAND OIL -- TT-T-548,TOLUENE - TOLUENE,TECHNICAL
MATERIAL SAFETY DATA SHEET
FSC: 6810
NIIN: 007351751
Manufacturer's CAGE: 81355
Part No. Indicator: A
Part Number/Trade Name: TT-T-548,TOLUENE

General Information

Item Name: TOLUENE,TECHNICAL
Company's Name: ASHLAND OIL,INC
Company's Street: 1409 WINCHESTER AVE
Company's P. O. Box: 391
Company's City: ASHLAND
Company's State: KY
Company's Country: US
Company's Zip Code: 41114
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Date MSDS Prepared: 01JAN85
Safety Data Review Date: 04APR83
Supply Item Manager: CX
MSDS Serial Number: BFMSQ
Specification Number: TT-T-548
Hazard Characteristic Code: F3
Unit Of Issue: CO
Unit Of Issue Container Qty: BULK

Ingredients/Identity Information

Proprietary: NO
Ingredient: TOLUENE (SARA III)
Ingredient Sequence Number: 01
Percent: >60
NIOSH (RTECS) Number: XS5250000
CAS Number: 108-88-3
OSHA PEL: 200 PPM/150 STEL
ACGIH TLV: 50 PPM; 9293

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS,BENZENELIKE ODOR
Boiling Point: 232F
Vapor Pressure (MM Hg/70 F): 38
Vapor Density (Air=1): 4.5
Specific Gravity: 0.871
Evaporation Rate And Ref: 4.5,ETHER
Solubility In Water: NEGLIGIBLE
Percent Volatiles By Volume: 100

Fire and Explosion Hazard Data

Flash Point: 40F TCC.
Lower Explosive Limit: 1.2
Upper Explosive Limit: 7.0
Extinguishing Media: DRY CHEMICAL,REGULAR FOAM,WATER FOG,CARBON DIOXIDE
Special Fire Fighting Proc: SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE
Unusual Fire And Expl Hazrds: VAPORS MAY TRAVEL ALONG THE GROUND & CAUSE FLASH FIRES OR BE IGNITED BY PILOT LIGHTS,FLAMES,SPARKS.

Reactivity Data

Stability: YES
Materials To Avoid: AVOID CONTACT WITH STRONG OXIDIZING AGENTS
Hazardous Decomp Products: CO*2,CO WHEN BURNED
Hazardous Poly Occur: NO

Health Hazard Data

Signs/Symptoms Of Overexp: EYES:SEVERE IRRITATION.SKIN:MODERATE IRRITATION,DEFATTING.BREATHING:NASAL& RESPIRATORY IRRITATION
Emergency/First Aid Proc: SKIN:WASH AREA WITH SOAP & WATER.REMOVE CONTAMINATED CLOTHING-WASH BEFORE RE-USE.EYES:FLUSH WITH LARGE AMTS OF WATER.SWALLOWED:DONOT INDUCE VOMITING,KEEP PERSON WARM,QUIET,GET MEDICAL ATTENTION.BREATHED: REMOVE TO FRESH AIR.KEEP PERSON WARM,QUIET

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: SMALL SPILL: ABSORB LIQUID ON PAPER, VERMICULITE,FLOOR ABSORBENT & TRANSFER TO HOOD.LARGE SPILL: ELIMINATE ALL IGNITION SOURCES.EXCLUDE PEOPLE FROM AREA NIOT WEARING PROTECTIVE EQUIPMENT.STOP SPILL AT SOURCE.RESIDUAL LIQUID MAY BE TAKEN UPON SAND,CLAY
Waste Disposal Method: SMALL SPILL:ALLOW VOLATILE PORTION TO EVAPORATE IN DESTROY BTY LIQUID INCINERATION UNDER CONTROLLED CONDITIONS.MATERIAL COLLECTED ON ABSORBENT MATERIAL MAY BE DEPOSITED IN LANDFIL
Precautions-Handling/Storing: PROTECT CONTAINERS AGAINST PHYSICAL DAMAGE. OUTDOOR OR DETACHED STORAGE IS PREFERABLE.I
Other Precautions: WEAR CHEMICAL GOGGLES,CHEMICAL CARTRIDGE RESPIRATOR OR SELF-CONTAINED BREATHING APPARATUS & RUBBER GLOVES.

Control Measures

Respiratory Protection: NIOSH/MESA JOINTLY APPROVED SELF-CONTAINED BREATHING APPARATUS
Ventilation: AS REQUIRED TO CONTROL TLV IN AIR
Protective Gloves: BUNG-N GLOVES
Eye Protection: CHEMICAL SPLASH GOGGLES
Other Protective Equipment: WEAR IMPERVIOUS CLOTHING & BOOTS
Suppl. Safety & Health Data: SWALLOWING:STOMACH IRRITATION,NAUSEA, VOMITING,DIARRHEA,CHEMICAL PNEUMONITIS (FATAL).SELF CONTAINED BREATHING APPARATUS MUST BE OPERATED IN A PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

Transportation Data

Trans Data Review Date: 83094
DOT PSN Code: OJY
DOT Proper Shipping Name: TOLUENE
DOT Class: 3
DOT ID Number: UN1294
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: OSR
IMO Proper Shipping Name: TOLUENE
IMO Regulations Page Number: 3285
IMO UN Number: 1294
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: YEL
IATA UN ID Number: 1294
IATA Proper Shipping Name: TOLUENE
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: YEL
AFI Prop. Shipping Name: TOLUENE
AFI Class: 3
AFI ID Number: UN1294
AFI Pack Group: II
AFI Label: FLAMMABLE LIQUID
AFI Basic Pac Ref: 7-7

Disposal Data

Disposal Data Review Date: 88085
Rec # For This Disp Entry: 01
Tot Disp Entries Per NSN: 001
Landfill Ban Item: YES
Disposal Supplemental Data: SWALLOWING:STOMACH IRRITATION,NAUSEA,VOMITING, DIARRHEA,CHEMICAL PNEUMONITIS (FATAL).SELF CONTAINED BREATHING APPARATUS MUST BE OPERATED IN A PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE. IN CASE OF ACCIDENTAL EXPOSURE OR DISCHARGE, cONSULT HEALTH AND SAFETY FILE FOR PRECAUTIONS.

SD - 2.8090

Wst Code New: U220
1st EPA Haz Wst Name New: TOLUENE; METHYLBENZENE
1st EPA Haz Wst Char New: TOXIC (T)
1st EPA Acute Hazard New: NO
2nd EPA Haz Wst Code New: D001
2nd EPA Haz Wst Name New: IGNITIBLE
2nd EPA Haz Wst Char New: IGNITABILITY
2nd EPA Acute Hazard New: NO

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Label Data

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Label Required: YES
Label Status: F
Special Hazard Precautions: MAY BE POISONOUS IF INHALED OR ABSORBED THROUGH SKIN. VAPORS MAY CAUSE DIZZINESS OR SUFFOCATION. CONTACT MAY IRRITATE OR BURN SKIN AND EYES. FIRE MAY PRODUCE IRRITATING OR POISONOUS GASES. RUNOFF FROM FIRE CONTROL OR DILUTION WATER MAY CAUSE POLLUTION.
Label Name: ASHLAND OIL INC
Label Street: 1409 WINCHESTER AVE
Label P.O. Box: 391
Label City: ASHLAND
Label State: KY
Label Zip Code: 41114
Label Country: US

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APPENDIX D
SITE-SPECIFIC PERSONAL PROTECTIVE EQUIPMENT (PPE) PROGRAM

OHM Remediation Services Corp.

HEALTH & SAFETY PROCEDURES

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

PROCEDURE NUMBER 4-1 Page 1 of 10

LAST REVISED 1/95 APPROVED BY: FHH

1. OBJECTIVE

OHM Remediation Services Corp. (OHM) personnel will be protected for chemical, physical, and environmental hazards by the appropriate personal protective equipment (PPE) when engineering and administrative controls are not effective in controlling job hazards.

2. PURPOSE

The purpose of this procedure is to address the elements of the PPE program. This PPE program conforms to the requirements found in 29 CFR 1910.120 (g) Engineering controls, work practices, and personal protective equipment for employee protection; 29 CFR 1910 Subpart I - Personal Protective Equipment - .132 General Requirements, .133 Eye and Face Protection, .135 Head Protection, .136 Foot Protection, .138 Hand Protection; and 29 CFR 1910.1200 Hazard Communication.

3. RESPONSIBILITY AND AUTHORITY

The responsibility and authority for the selection, use, and maintenance of personal protective equipment is shared between management, supervisory, health and safety, and employee personnel.

3.1 Management - Management has the responsibility to provide PPE appropriate for the hazard/s associated with expected work tasks.

3.2 Supervisors - Supervisors have the responsibility to conduct hazard assessments and ensure personnel to utilize PPE in compliance with this SOP. Supervisors may request assistance from or designate authority to health and safety personnel for hazard assessment, selection, inspection, and decontamination of PPE. The use of PPE by employees is the supervisor's responsibility.

3.3 Health and Safety Personnel - Health and safety personnel have the responsibility to assist supervisors in hazard assessment, selection, inspection, and decontamination of PPE. In the event of conflict, health and safety personnel have the authority to implement the necessary measures.

3.4 Employees - Employees have the responsibility to use, inspect, and decontaminate PPE as directed by supervisors.

4. PROGRAM ELEMENTS

Program elements define the regulatory requirements of a PPE program.

4.1 Hazard assessment - All tasks undertaken by OHM personnel will be assessed for chemical, physical, and environmental hazards present or likely to be present which necessitate the use of PPE to ensure adequate protection. This assessment shall take place prior to commencement of work.

4.2 Hazard Reassessment - The level of protection or type of personal protective equipment shall be increased when additional information on site conditions indicates that increased protection is necessary to reduce employee exposures below permissible exposure limits, published exposure levels for hazardous substances and health hazards, or other physical and environmental hazards.

4.3 PPE Selection - The regional health and safety director/manager or designee will initially select the level and types of PPE that will protect the affected employee from the hazards identified in the initial hazard assessment.

4.4 Written Certification - The site specific Health and Safety Plan (HASP) will serve as the written certification that identifies the workplace was evaluated. The HASP shall be dated. The signature line shall designate the person certifying that the evaluation has been performed.

4.5 Communication of Selection - Employees will be informed of the PPE selection decisions through reading or verbally reviewing the HASP, attending pre-project safety briefings, job safety analysis (JSA) review, or attending safety meetings.

4.6 PPE Use and Fit - The supervisor will be responsible for the proper use and fit of PPE by workers under their direction and will monitor the effectiveness of these items. Heath and safety personnel will advise and assist the supervisor in these areas.

4.7 Work Mission Duration - The supervisor will be responsible for the establishment of the duration of specific work missions. The duration will be determined by the complexity of the assignment, PPE involved, physical factors, temperature, humidity, weather conditions, elevation of work, and acclimation of the worker to the demands of the task assigned. The supervisor will consider the recommendations of the health and safety personnel.

A sufficient amount of rest breaks will be allowed in order to avoid overexertion or thermal stress by the employees while maintaining productive work practices. Further guidance is offered in OHM Health and Safety Procedures entitled Heat Stress and Cold Stress.

4.8 PPE Maintenance and Storage - Each employee is responsible for the proper maintenance and storage of the standard issue equipment (e.g., hard hat, full-face piece negative pressure respirator, safety glasses). The supervisor will assure that proper maintenance is carried out.

4.9 PPE Decontamination - Each employee is responsible for daily cleaning and decontamination of reusable PPE such as outer gloves, outer boots, reusable chemically resistant clothing, and standard issue PPE such as hard hats and respirators.

OHM will provide an area/s for decontamination operations, necessary cleaning agents, cleaning tools, such as brushes and wash basins, and a method to dispose of materials generated during decontamination activities.

OHM will attempt to reduce decontamination requirements through the use of disposable protective clothing and gloves as feasible.

4.10 PPE Training - All employees will receive training in the proper use of PPE prior to wearing the equipment in a work situation. This training will be administered upon commencement of employment during HAZWOPER training. PPE refresher training will be reviewed annually during the HAZWOPER refresher training. Project specific training will be provided as required.

4.11 PPE Donning and Doffing Procedures - All employees will receive training upon commencement of employment and during annual refresher training concerning the donning and doffing of PPE. Periodic training will be provided as required.

4.12 PPE Inspection - Each employee shall inspect PPE for defects and proper function prior to each use. Defective or damaged PPE shall not be used. Any PPE found to be defective or have missing parts will be replaced prior to use.

4.13 PPE In Use Monitoring - The supervisor is responsible for monitoring the effectiveness of selected PPE. If at any time level of PPE is to be downgraded, it is mandatory that the change be approved by the regional health and safety director/manager or designee.

4.14 Evaluation of PPE Program - Health and safety personnel will compile data on PPE in the field to determine that the PPE performs to OHM needs. Periodically, this information should be reviewed cognizant health and safety professional to ensure that PPE is providing the necessary level of protection, quality, and is appropriate for the work performed.

If at any time the failure of PPE causes injury to an employee or fails to perform as expected, the supervisor will take the unit or item out of service and investigate the incident. The incident shall be immediately reported to the regional health and safety director/manager. If after scrutiny, the unit or item is determined to have a manufacturing defect, all identical units will be removed from use until corrective actions are taken.

4.15 Limitations During Temperature Extremes - Extreme temperatures exert stress on personnel and may alter the performance characteristics of PPE. During periods of extreme temperature, work assignments will be adjusted to protect the employee from overexertion or exposure. The supervisor will evaluate if temperature extremes are effecting performance characteristics of PPE and report these findings to the regional health and safety director/manager.

4.16 Unserviceable PPE - Any PPE which is no longer functioning properly or is no longer serviceable shall be removed from use and either repaired or destroyed.

5. SAFETY EQUIPMENT POLICY

OHM will provide, maintain, and replace personal protective equipment as detailed below.

5.1 Standard issue safety equipment - Standard issue safety equipment will be provided at no cost to field employees. These items consist of:

- Hard hat
- Safety glasses with clear and shaded lenses
- Full-face respirator with nose cup

5.2 Company provided equipment - OHM will provide at no cost to the employee the following items on a task specific or project specific basis:

- Chemical protective equipment such as gloves, boots, and clothing
- Specialty glasses or goggles

- Face shields
- Flame resistant clothing
- Hearing protection
- Fall protection

5.3 Employee provided equipment - The employee shall provide the following equipment:

- ANSI approved steel toed and shank boots/shoes (Note: Further guidance is provided in Section 7 Safety footwear)
- Outerwear for cold weather

5.4 Equipment replacement - OHM will replace worn-out or work-damaged equipment detailed in 5.1 and 5.2. OHM reserves the right to charge employees for the replacement cost of equipment which is lost or damaged though neglect or abuse.

5.5 Additional PPE - The regional health and safety director/manager or the supervisor may require additional company provided PPE on a task specific basis.

6. WORK CLOTHES

OHM employees, subcontractors, and visitors will observe the requirements for proper work clothing when on OHM project sites, facilities, and shops.

6.1 Pants - Long pants are required at all times. These pants must be in good repair.

6.2 Shirts - Shirts will be worn on the job. Shirts will be buttoned up the front and at the cuff unless rolled up. Shirt tails must be kept in the trousers. Sleeveless shirts are prohibited at all work locations. Supervisory personnel are expected to wear a shirt with a collar. T-shirts are permitted for personnel who wear protective clothing most of the day.

6.3 Clothing - Loose or ragged clothing will not be worn.

6.4 Modifications - Regional health and safety director/manager may modify work clothing requirements on a project specific basis.

6.5 Contaminated Clothing - Clothing (including shoes) saturated with petroleum products or chemicals will be removed immediately to prevent irritation and possible dermal exposure.

6.6 Jewelry - Rings and other jewelry (except watches) must be removed when working in areas where they could catch on moving objects, sharp protrusions, come in contact with electrical circuits or chemical agents, or compromise PPE ie. rings capable of cutting gloves. Additionally, the supervisor may deem other types of jewelry inappropriate for the work task.

6.7 Hair Length - Hair long enough to constitute a hazard while working around moving machinery or rotating tools and equipment must be secured by a net or tied back. Hair styles must not interfere with the ability to properly wear safety headgear, safety spectacles, and respiratory protection.

7. EYE/FACE PROTECTION

All OHM employees, subcontractors, and visitors shall wear eye and face protection meeting the requirements of ANSI document Z87.1 - 1989 titled "Practice of Occupational and Educational Eye and Face Protection" during the tasks posing exposure to eye or face injury.

7.1 Requirements - To protect the face and eyes against injuries from flying objects, splashing liquids, and harmful rays, safety spectacles with side shields, goggles, face shields, cutting goggles, and welding helmets will be used as appropriate. The supervisor will be responsible to identify the need for eye/face protection and specify the eye/face protection required for each operation. A selection guide is attached in Table 1.

7.2 Safety spectacles - Safety spectacles are protective devices intended to shield the wearer's eyes from a variety of hazards. While they are primary protectors and may be used alone, they may also be used in conjunction with other protective devices such as goggles and face shields.

7.3 Goggles - Goggles are protective devices intended to fit the face immediately surrounding the eyes in order to shield the eyes from a variety of hazards. While they are primary protectors and may be used alone, they also may be used in conjunction with other protectors.

7.4 Face shields - Face shields are protective devices intended to shield the wearer's face, or portions thereof, in addition to the eyes, from certain hazards. Face shields are secondary protectors and shall be used with primary protectors.

7.5 Cutting goggles - Cutting goggles are protective devices designed to protect the eyes from radiation and impact. Goggles are primary protectors and in some situations must be supplemented with face shields. See Table 2 for selection guidelines.

7.6 Welding helmets - Welding helmets are protective devices intended to shield the eyes and face from optical radiation and impact. Welding helmets are secondary protectors and shall be used only in conjunction with primary protectors such as safety spectacles or goggles. See Table 3 for selection guidelines.

7.7 Prescription Spectacles - For personnel that wear prescription spectacles, OHM provides prescription safety spectacles with side shields. It is mandatory that prescription safety spectacles not be altered by the employee and be worn at all times when safety spectacles are required.

7.8 Contact lenses - Contact lenses are not permitted to be worn where accidental eye contact with chemical agents or physical materials is possible. OHM provides prescription spectacles and other protective devices for use in these situations.

7.9 Shaded lenses - Shaded lenses are not to be worn indoors or under low light conditions.

8. SAFETY HEADGEAR

All OHM employees, subcontractors, and visitors shall wear safety headgear meeting the requirements of ANSI document Z89.1-1986 titled "Protective Headwear for Industrial Workers - Requirements" when exposed to overhead hazards.

8.1 Requirement - Safety headgear shall be worn by all personnel while engaged in work where there is a hazard of falling objects, low overhead restrictions, and other overhead hazards exist. Safety headgear may also be required to be worn by contractual requirements.

8.2 Use - Safety headgear must be worn as prescribed by the manufacturer in the bill front position unless the headgear was approved to be worn in another position.

8.3 Modifications - Safety headgear shall not be painted, drilled or modified in any manner. Use of safety related headgear stickers are permitted.

8.4 Life Expectancy - No maximum mandatory service life is specified by regulation for safety headgear. However, a hard hat should be removed from service if chemical corrosion, cracks, deformities, worn suspension, or discoloration is noted with the unit.

9. SAFETY FOOTWEAR

All OHM employees, subcontractors, and visitors that enter OHM project sites and are exposed to foot hazards shall wear footwear meeting the ANSI document Z41 - 1991 titled "Protective Footwear" during operations posing foot injury.

9.1 Project Sites - Steel toe and shank leather work boots shall be worn on all OHM project sites. High top or low top sneakers, western style boots, or other footwear even though ANSI approved are not appropriate for the activities encountered at hazardous waste and emergency response sites and shall not be worn.

9.2 OHM Facilities and Shops - Personnel working at OHM shops and facilities have the option of wearing other types of ANSI approved safety work shoes and boots provided they are appropriate for the tasks being performed. The supervisor of the work area is responsible to decide what type footwear is appropriate.

10. HAND PROTECTION/GLOVES

OHM employees, subcontractors, and visitors will don appropriate gloves when engaged in any operation that presents a hazard to the hands.

10.1 Use - Appropriate work gloves shall be available for hand protection against heat and flame, cold, chemicals, petroleum products, corrosive materials, moisture, mechanical abrasion, electricity, and sharp and rough surfaces.

10.2 Selection - Glove selection of the appropriate hand protection shall be based on an evaluation of the performance characteristic of the hand protection relative to the task(s) to be performed, chemical concentration and properties, physical conditions present, duration of use, and the hazards and potential hazards identified. The type of work gloves used must be approved by the regional health and safety director/manager and designee as specified in the HASP for the particular task.

10.3 Electrical - When working on high voltage (480 volts and above) electrical equipment, electrically tested high voltage gloves will be worn. Leather protection will be worn over these gloves. (NOTE: Only authorized personnel are permitted to work on High Voltage electrical equipment).

11. PROTECTIVE CLOTHING

OHM employees, subcontractors, and visitors will don appropriate protective clothing when engaged in any operation that presents a hazard to the body.

11.1 Use - Appropriate clothing shall be available for body protection against heat and flame, cold, chemicals, petroleum products, corrosive materials, moisture, mechanical abrasion, electricity, and sharp and rough surfaces.

11.2 Selection - Clothing selection of the appropriate body protection shall be based on an evaluation of the performance characteristic of the body protection relative to the task(s) to be performed, chemical concentration and properties, physical conditions present, duration of use, and the hazards and potential hazards identified. The type of protective clothing used must be approved by the regional health and safety director/manager and designee and specified in the HASP for the particular task.

12. TOTALLY-ENCAPSULATING CHEMICAL PROTECTIVE SUITS

Totally-encapsulating chemical protective suits (Level A) shall be used in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate death, immediate serious illness or injury, or impair the ability to escape.

12.1 Use - OHM will only use Level A protection when all other reasonable efforts of controlling employee exposure through engineering or administrative means are not possible.

12.2 Authorization - Level A protection may only be used after authorization of the regional health and safety director/manager has been granted.

12.3 Health and Safety Personnel - An appropriately experienced health and safety employee must be assigned to the project site where Level A is to be used. They must evaluate that the following items are ready:

- Communications
- Decontamination
- Emergency rescue procedures and personnel
- Emergency medical attention

12.4 OHM will discard and properly dispose of any Level A suit which has come in contact with chemical contaminants or sustained physical damage at least at the end of the project.

13. LOANING PERSONAL PROTECTIVE EQUIPMENT

OHM personnel should not loan OHM personal protective equipment to any client, subcontractor, or visitor personnel. If there are urgent circumstances, such as an emergency response where the equipment cannot be obtained elsewhere and chemical exposure is possible, OHM personnel can loan personal protective equipment such as respirators, protective clothing and other safety equipment to client personnel or personnel from other organizations. However because of the potential liability involved, approval of senior OHM management is required as well as the requirement that a representative of the company and the individual using the equipment execute an OHM Indemnification and Release Agreement. A copy of this agreement is attached in Appendix A.

13.1 Execution of Indemnification and Release Agreement - In general, the following will be required BEFORE the personal protective equipment may be loaned:

- The OHM Regional Vice President (or designee) must specifically authorize the loaning of personal protective equipment on the particular project.
- An authorized representative of the company whose personnel will use the equipment must sign the Indemnification and Release Agreement.
- The individual who will use the equipment must also sign the Indemnification and Release Agreement attesting to the fact that the individual is either experienced in the use of the equipment or has been given instruction on the safe use of the equipment and is medically qualified to wear the equipment.
- An OHM representative must also sign the form as a witness to the above.

13.2 Contractual Requirement - An indemnification and release agreement is not required if providing personal protective equipment to clients or regulatory personnel is a contractual requirement.

13.3 Exemptions - Hard hats, safety glasses, hearing protection, and protective clothing provided for cleanliness is exempted for the indemnification requirement. Instruction should be provided to the individual prior to wearing.

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

APPENDIX A
OHM REMEDIATION SERVICES CORP.
INDEMNIFICATION AND RELEASE AGREEMENT FOR PERSONAL PROTECTION CLOTHING

FOR AND IN CONSIDERATION OF the use by the undersigned of property belonging to OHM Remediation Services Corp. (hereinafter referred to as "OHM") and which may include full-face mask respirators, self-contained breathing apparatus, and other equipment and supplies, and other good and valuable consideration, the undersigned , for himself and his successors, and assigns, does hereby release and discharge OHM, its officers, employees, agents, and subcontractors from any and all claims, actions, demands, damages, costs, loss of services, expenses, compensation, third-party actions, or suits, including attorneys fees, arising and resulting from the aforementioned use of property, equipment, or supplies belonging to OHM.

In addition, the undersigned, on behalf of his employer, principal, himself, and his successors, and assigns, agrees to release, save, and hold harmless, protect, indemnify, and defend OHM, and its officers, employees, agents, and subcontractors against any and all claims, actions, and expenses as above described, whether for bodily injury, property damage or destruction, or both, arising or resulting in any way from the use by the undersigned of property of OHM and agrees to save, hold harmless, protect, indemnify, and defend OHM against any such claims, actions, or expenses, referenced above, that might be brought against OHM by any third persons or the heirs, successors, executors or assigns of the undersigned.

The undersigned acknowledges by signing that he has carefully read this Agreement, understands the contents thereof, and has freely and voluntarily signed the same.

EXECUTED on _____, 19___.

1. OHM Regional Vice President (or designee) authorizing use of equipment:

   _____

2. CLIENT OR SUBCONTRACTOR REPRESENTATIVE AUTHORIZING EQUIPMENT USE:

   I authorize the individual(s) in 3. below to use OHM provided personal protective equipment

   Company Name_____

   Sign Name_____

   Print Name_____

   Title_____

3. INDIVIDUAL USING EQUIPMENT: I certify that I am familiar with the equipment and medically qualified to wear the equipment

   Company Name_____

   Sign Name_____

   Print Name_____

   NOTE: A continuation sheet can be used if more than one individual is to be certified to use equipment

4. OHM Representative Acknowledging Signatures:

   Sign Name _____

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

TABLE 1
FACE PROTECTION SELECTION GUIDELINES

Hazard	Protection
Flying fragments, objects, large chips, particles, sand, and dirt from chipping, grinding, machining, masonry work, riveting, and sanding	Safety spectacles or goggles Supplement with face shield for severe exposure
Chemical splash from corrosive and chemical handling, pressure washing operations	Goggles Supplement with face shield for severe exposure
Nuisance dust from woodworking, buffing, and general dusty conditions	Safety spectacles or goggles
Hot sparks from grinding operations	Safety spectacles or goggles Supplement with face shield for severe exposure
Molten metal from torch cutting operations	Shaded cutting goggles (see Table 3) and face shield
Welding operations	Safety spectacles and shaded welding hood (see Tables 2)

TABLE 2

GUIDE FOR CUTTING SHADE NUMBERS

Operation	Plate Thickness	Minimum Protective Shade
Gas Welding		
Light	Under 1/8	4 or 5
Medium	1/8 to 1/2	5 or 6
Heavy	over 1/2	6 or 8
Oxygen Cutting		
Light	Under 1	3 or 4
Medium	1 to 6	4 or 5
Heavy	Over 6	5 or 6

TABLE 3

GUIDE FOR WELDING SHADE NUMBERS

Operation	Electrode Size 1/32 inch	Arc Current (A)	Minimum Protective Shade	Suggested* Shade No. (Comfort)
Shielding metal arc welding	Less than 3	Less than 60	7	—
	3-5	60-160	8	10
	5-8	160-250	10	12
	More than 8	250-550	11	14
Gas metal arc welding and flux cored arc welding		Less than 60	7	—
		60-160	10	11
		160-250	10	12
		250-500	10	14
		150-500	10	14
Air carbon Air cutting	(Light)	Less than 500	10	12
	(Heavy)	500-1000	11	14
Plasma arc welding		Less than 20	6	6 to 8
		20-100	8	10
		100-400	10	12
		400-800	11	14
Plasma arc cutting	(Light)	Less than 300	8	9
	(Medium)	300-400	9	12
	(Heavy)	400-800	10	14
Torch brazing		—	—	3 or 4
Torch soldering		—	—	2
Carbon arc welding		—	—	14

*As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxyfuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.

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NOTICE OF PUBLIC AVAILABILITY

The United States Environmental Protection Agency (EPA) announces the availability for public review of files comprising the administrative record for the selection of the removal action at the Central Steel and Drum Site. The EPA seeks to inform the public of the availability of the record file at this repository and to encourage the public to comment on documents as they are placed in the record file.

The administrative record file includes documents which form the basis for the selection of a removal action at this site. Documents now in the record file include: Action Memorandum, Expedited Removal Assessment, Sampling Plans, Sampling Trip and Site Assessment Reports, Work Plans, Health and Safety Plan, Fact Sheet, and the EPA regional guidance documents list. Other documents may be added to the record files as they become available. These additional documents may include, but are not limited to, other technical reports, validated sampling data, comments, and new data submitted by interested persons, and the EPA responses to significant comments.

The administrative record files are available for review during normal business hours at:

Newark Public Library
109 Monroe Street
Newark, NJ 07105
(201) 733-7800

U.S. EPA - Region II
Response and Prevention Branch
2890 Woodbridge Avenue
Edison, NJ 08837
(732) 906-6874

Additional guidance documents and technical literature is available at the following location:

U.S. EPA - Region II
Removal Records Center
2890 Woodbridge Avenue
Edison, NJ 08837
(732) 906-6980

Written comments on the Administrative Record should be sent to:

Greg DeAngelis
On-Scene Coordinator
Response and Prevention Branch
U.S. EPA - Region II
2890 Woodbridge Avenue
Edison, NJ 08837

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REMOVAL ACTION FACT SHEET

CENTRAL STEEL DRUM
704 DOREMUS AVENUE
NEWARK, NEW JERSEY 07105

REGION: II
ESTIMATED PROJECT COSTS: $ 928,000
INCIDENT CATEGORY: Abandoned Facility
START DATE: 9/17/97
FACILITY ID#: NJD011482577

NPL: No
OSC: DeAngelis
SITE ID#: JR
COMPLETION DATE: / /

DESCRIPTION:

The site is situated in an industrial area in the Iron Bound section of Newark and consists a large manufacturing building located on 8.5 acres of filled wetland. On the south end of the property, bordering one side of the property is an existing wetland where drums have been observed. To the west, along Doremus Avenue are Railroad Tracks. The site, other than the main building is gravel/weed covered filled, urban, vacant land. The property is fenced. The production building is 200ft x 500ft of masonry construction with a metal truss roof. The building is in a deteriorated condition and the roof leaks. All utilities have been turned off, so there is no fire suppression system available in the building. The building was found to be unsecured and there is evidence of vandalism, dumping and public entry.. Before 1952 an ink manufacturer occupied this Site (International Printing Ink Division of Interchemical Corporation, now part of Inmont Corp.). From 1952 to approximately 1991, Central Steel Drum operated a drum reconditioning business. After vacating the property, a container shipping operation leased the property. According to NJDEP, the property has been abandoned since 1994.

MATERIALS:

Approximately 750 drums of flammable, corrosive, possible water reactive, incinerator ash, and sand blasting materials are abandoned on the site. In total, approximately 50,000 gallons of hazardous wastes are estimated to be abandoned throughout the building/site (approximately 35% are solid wastes). In addition, large piles of incinerator ash and sand blasting materials are scattered throughout the site.

THREATS:

Many of the materials on the site are toxic, flammable and/or corrosive and present a risk of direct human contact. Many of the materials are incompatible if mixed and present the threat of a runaway chemical reaction. The site is located in an industrial area and is directly adjacent to railroad commuter and freight lines as well as major traffic arterials. Also within 1.5 miles residential areas. Hazardous wastes are abandoned throughout the site and are stored in an unsafe manner. The areas where these materials are stored are not maintained in a temperature controlled environment, which only heightens the number of drums that rupture, leak and continue to release vapor emissions. Some of these drums are leaking. While most are currently in marginal to fair condition, they will continue to deteriorate. Additionally, these containers are being stored without regard to compatibility which will only heighten the chance of accidental release. Direct contact with the materials abandoned at the site, as a result of fire or vandalism, would present an immediate threat to the individuals involved as well as nearby residents and businesses. The condition of materials at the Site, proximity of other commercial, industrial and residential areas, and major traffic arterials lead to the possibility of direct human contact.

3/96

REMOVAL ACTION FACT SHEET

Due to the presence of flammable liquids and waste corrosives, the threat of fire at the facility does exist. This fire threat is enhanced by vagrants who live at the facility. Should a fire occur it could spread across the facility and involve most of the material found at the Site. The toxic fumes created by the uncontrolled combustion of these materials could impact the surrounding population, possibly necessitating the evacuation of the surrounding population and the closure of city roads, rail lines and arterials. Many of the materials present are unknowns. Therefore, the complete effects of acute or chronic exposure from the fumes released in an uncontrolled release, cannot be predicted.

Waste material has the potential of flowing directly into ditches which empty into the Newark Bay. Runoff from rain or fire fighting efforts could allow waste material to flow directly into the Newark Bay which will cause further destruction of the wetlands.

ACTIONS:

EPA issued a Consent agreement and Final Compliance on 11/15/83 for a number of RCRA violations and also required the facility to conduct an investigation of contamination and develop a remediation program under the direction of NJDEP. Monitoring wells were installed and sampling data was produced. This case became inactive in 1985. An Preliminary Assessment was conducted by NJDEP on 3/5/85. The FIT Team conducted an site inspection report on 2/14/86. The site was referred on 5/9/97 to EPA by NJDEP almost immediately following notification by the City of Newark. On 3/14-15/97, the EPA, NJDEP, and Newark Office of Emergency Management (OEM) conducted a ERA and confirmed the presence of the materials described earlier in this memorandum. During the first week of 6/97, a more detailed inventory of the materials abandoned at the site was completed that included mapping, chemical label identification and the numbering of drums.

PRESENT STATUS:

The action memorandum for approval to conduct a CERCLA removal action at the site is was signed 7/8/97. Site mobilization is scheduled for 9/29/97.

EPA REGIONAL GUIDANCE DOCUMENTS

The following documents are available for public review at the EPA Region II Field Office, 2890 Woodbridge Avenue, Edison, New Jersey 08837 during regular business hours.

* Glossary of EPA Acronyms.

* Superfund Removal Procedures--Revision #3. OSWER Directive 9360.0-03B, February 1988.

* Hazardous Waste Operations and Emergency Response.
  Notice of Proposed Rule making and Public Hearings.
  29 CFR Part 1910, Monday, August 10, 1987.

* Guidance on Implementation of Revised Statutory Limits on Removal Action.
  OSWER Directive 9260.0-12, May 25, 1988.

* Redelegation of Authority under CERCLA and SARA.
  OSWER Directive 9012.10, May 25, 1988.

* Removal Cost Management Manual.
  OSWER Directive 9360.0-02B, April, 1988.

* Field Standard Operating Procedures (FSOP).
  #4 Site Entry.
  #6 Work Zones.
  #8 Air Surveillance.
  #9 Site Safety Plan.

* Standard Operating Safety Guides -- U.S. EPA Office of Emergency and Remedial Response, July 5, 1988.

* CERCLA Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund).

* SARA: Superfund Amendments and Reauthorization Act of 1986.

* NCP: National Oil and Hazardous Substances Pollution Contingency Plan. - Publication No. 9200.2-14.

* Guidance on Implementation of the "Contribute to Efficient Remedial Performance" Provision - Publication No. 9360.0-13.

Additional Guidance Documents are listed below and are available for review at the EPA Region II Removal Records Center.

* The Role of Expedited Response Actions (EPA) Under SARA - Publication No. 9360.0-15.

* Guidance on Non-NPL Removal Actions Involving Nationally Significant or Precedent Setting Issues - Publication No. 9360.0-19.

* ARARS During Removal Actions - Publication No. 9360.3-02.

* Consideration of ARARS During Removal Actions -Publication No. 9360.3-02FS.

* Public Participation for OSCs - Community Relations and the Administrative Record - Publication No.9360.3-05.

* Superfund Removal Procedures - Removal Enforcement Guidance for On-Scene Coordinators - Publication No. 9360.3-06.

* QA/QC for Removal Actions - Publication No. 9360.4-01.

* Compendium for ERT Air Sampling Procedures - Publication No. 9360.4-05.