# DISPOSAL AREA 1 REMOVAL ACTION WORK PLAN

## NORTH SANITARY LANDFILL
## DAYTON, OHIO

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# 1.0 BACKGROUND

## 1.1 INTRODUCTION

The following document presents the Disposal Area 1 Removal Action Work Plan (Work Plan) for the North Sanitary Landfill (Site), also known as the Valleycrest Landfill, located in Dayton, Ohio. This Work Plan was prepared by Conestoga-Rovers & Associates (CRA) for certain respondents to the Administrative Order known as the Valleycrest Removal Action Coalition (VRAC), formerly known as the Valleycrest Drum Removal Action Group (VDRAG). This Work Plan supercedes the previous Work Plan, Removal Action Work Plan for Suspected Buried Container Areas, and all former submittals relating to drum removal activities at Valleycrest.

### 1.1.1 ADMINISTRATIVE ORDER

The work is being conducted under the terms of an Administrative Order (Order) between the United States Environmental Protection Agency (U.S. EPA) and the respondents. The Order is provided in Appendix A.

The potentially responsible parties (PRPs) identified by the U.S. EPA are listed in the Order (Appendix A).

### 1.1.2 WORK PLAN OBJECTIVES AND SCOPE OF WORK

The project objectives are as follows:

1) to conduct removal of buried drums and drum material in accordance with the terms of the Order and this Work Plan;
2) to address buried drums, drum contents, and other waste materials impacted by drum contents via off-Site disposal or on-Site management in accordance with the terms of the Order and this Work Plan; and
3) to conduct in situ vapor extraction (VE) treatment of TCLP VOC impacted media.

### 1.1.3 SCHEDULE

The schedule for the removal action is presented in Appendix D of this Work Plan.

## 1.2 SITE HISTORY AND DESCRIPTION

The Site is located at 950 Brandt Pike, in the City of Dayton, Montgomery County, Ohio. The Site location is shown on Figure 1.1. The Site comprises an area of approximately 100 acres that is separated into east and west portions by north-south trending Valleycrest Drive. (In December 1998, Valleycrest Drive was closed to the public and an access road from Brandt Pike to the residents located north of the Site was constructed.) The eastern portion of the Site comprises approximately 35 acres and the western portion of the Site comprises approximately 65 acres. The Site is owned by Keystone Gravel Company of Dayton, Ohio.

The Site is located in a mixed urban, industrial, and residential area. The Site is bordered on the east and northeast by a residential neighborhood, on the north by several residences, and further north by an abandoned demolition landfill. The Site is bordered on the southeast by commercial and residential structures and Valley Pike, and on the southwest by the CSX railroad property and residences. The Site is bordered on the west by two residences, located at [redacted] and [redacted] Brandt Pike, and several industrial facilities, including the Brandt Pike petroleum terminals [comprised of the British Petroleum (formerly Sohio), Shell Oil Company, and Sun Oil facilities], Van Dyne Crotty Inc. industrial cleaner facility, and the Hotop demolition landfill. Approximately 1,500 people live within 1/2 mile of the Site (Ohio Department of Health, 1994).

The Site is currently owned by the Keystone Gravel Company, and was operated as a sand and gravel quarry from before 1935 until the 1970s. In 1966, the landfill began accepting waste in the eastern portion of the Site. Filling in the eastern portion of the Site continued until approximately 1970. In 1970, the landfill began accepting waste in the eastern part of the western portion of the Site and continued until approximately 1975. Disposal of foundry sand in parts of the western portion continued until the late 1980s/early 1990s. The locations of the former disposal areas are shown on Figure 1.2.

## 1.3 DISPOSAL AREA 5 DRUM REMOVAL SUMMARY

In November 1998 a removal action involving removal of drums and drum carcasses, drummed contents, and landfilled municipal and industrial waste was initiated. The work was conducted under the Administrative Order and as specified in the "Removal Action Work Plan for Suspected Buried Container Areas" (CRA, October 1998), with oversight by U.S. EPA.

Approximately 27,000 drums and drum carcasses were removed from the eighty-two 50-foot by 50-foot grids identified as removal action areas based on geophysical anomalies. Of that total, about 98 percent of the drums removed were not intact, being either crushed, punctured, rusted, in pieces, or some combination of these conditions. Drums containing any measurable liquids (containing combinations of flammable liquids, polychlorinated biphenyls [PCBs], and/or Toxicity Characteristic Leaching Procedure [TCLP] trichloroethylene [TCE], vinyl chloride, tetrachloroethylene [PCE], benzene, methyl ethyl ketone, arsenic, barium, cadmium, chromium, and lead) accounted for less than 3 percent of the total drums (totaling approximately 6,700 gallons collected). Liquid waste from an underground storage tank and rinse water used to aid pumping drummed liquids accounted for 2,845 gallons and approximately 4,500 gallons, respectively. Drums containing hazardous waste solid (containing combinations of PCBs, ignitable waste, sulfides, and/or TCLP TCE, vinyl chloride, lead, PCE, benzene, methyl ethyl ketone, and heptachlor epoxide) and solid waste accounted for 67 percent of the total drums removed in Area 5. In addition, drums defined by the Resource Conservation and Recovery Act (RCRA) as RCRA empty drums totaled approximately 33 percent.

Excavation, stockpiling, and sampling of all non-drummed material was conducted throughout the works to characterize the material and determine the appropriate disposition. Material below RCRA and Toxic Substances Control Act (TSCA) regulatory limits was backfilled, TCLP volatile organic compound (VOC)-impacted material was maintained on Site, and other TCLP-impacted soil and debris was sent for off-Site disposal. An estimated 36,000 cubic yards of TCLP VOC-impacted soil and debris (greater than TCLP regulatory limits for TCE and PCE) are currently stockpiled on Site pending VE treatment. In addition, approximately 6,900 tons of TCLP TCE soil/debris, 280 tons of TCLP chlordane soil/debris, 320 tons of TCLP lead soil/debris, and 3,100 tons of PCB soil/debris were shipped for off-Site disposal.

# 2.0 GENERAL WORK REQUIREMENTS

## 2.1 SITE MOBILIZATION

### 2.1.1 PRE-WORK MEETING

Prior to work commencing at the Site, a pre-work meeting will be held. The meeting will be attended by the VRAC (or an agent of the VRAC), CRA, U.S. EPA, Ohio EPA, Dayton Hazmat, local fire department personnel, and the removal action contractor. The approved Work Plan, including the Site Safety Plan, will be reviewed along with Site security, mobilization, emergency procedures, communications, and responsibilities.

### 2.1.2 WEEKLY SITE PROGRESS MEETING

For the purpose of updating project status and contingency planning, site weekly progress meetings will continue to be held at the U.S. EPA command post every Wednesday at 1:00 p.m. during removal action activities unless cancelled by U.S. EPA. The VRAC will provide a telephone conference bridge for those who cannot attend in person. The weekly meetings may be attended by U.S. EPA, Superfund Technical Assessment Response Team (START), select VRAC representatives, CRA, Ohio EPA, Dayton and Riverside Fire Departments, Regional Hazmat, City of Dayton, City of Riverside, and the removal action contractor.

### 2.1.3 EMERGENCY CONTINGENCY PLAN

The existing emergency contingency plan, dated September 2001 and presented in Appendix C, has been prepared by CRA, on behalf of the VRAC, and includes comments from U.S. EPA, Ohio EPA, Regional Hazmat, and the local fire departments from the cities of Dayton and Riverside.

The emergency contingency plan will be updated to provide contact information for the selected removal action contractor and will be reviewed at the pre-work meeting, as discussed in Section 2.1.1. Local, state, and federal officials will be notified prior to the commencement of work.

### 2.1.4 SITE PREPARATION

Some clearing of shrubs and trees, upgrading of access roads, and installation of additional security fencing may be required. Surveying the grid system for removal action grids subject to excavation will be required.

## 2.2 SITE SAFETY

A Site Safety Plan (SSP) has been prepared and is incorporated into this Work Plan as Appendix B. The SSP will be implemented during all removal or cleanup activities at the Site. The SSP includes an air monitoring plan, which will be implemented during Site activities.

## 2.3 SITE SECURITY

Site security measures include a fence along the perimeter of the Site, signs warning of danger, security measures to control access to the Site during working hours, and security patrol during non-working hours. The contractor will be responsible for security during working hours and will implement measures to restrict access to the Site and prevent unauthorized personnel from proceeding beyond the staging area.

During operating hours, access to the Site will be controlled by the contractor. All personnel will be required to sign the visitor logbook. The contractor will be responsible to control all access to the Site. The automatic gate will be closed before leaving the Site at the end of each working day. The following personnel currently have keys and gate controllers to the Site.

1) Pete Schwarz, CRA;
2) Henry Cooke, CRA;
3) Will Armes, CRA;
4) Kurt Kollar, Ohio EPA;
5) Steven Renninger, U.S. EPA;
6) Dion Novak, U.S. EPA;
7) Michelle Simon, U.S. EPA;
8) John Sherrard, TetraTech EM, Inc.;
9) John Vanover, TetraTech EM, Inc.;

10) Mike Broyles, R.M. Broyles Co.; and

11) Maximum Security (four controllers).

The list will be updated periodically as additional personnel are provided with keys and controllers to the Site.

A 6-foot tall, galvanized, chain-link fence with three strands of barbed wire was installed around the perimeter of the Site in May 1995. The fence perimeter and layout of the Site are shown on Figure 2.1. The fence is currently inspected on a weekly basis, at a minimum, to identify any tears or other damage to the fence. The perimeter fence will be inspected on a daily basis during the removal operations. Any breaches in the fence will, at a minimum, be temporarily repaired to restrict access within 12 hours from time of discovery. The fence will be repaired to its original condition within 5 working days from the day of discovery.

Warning signs are placed at all access gates and around the perimeter of the Site at intervals of 200 feet. The signs are secured to the inside of the fence to minimize the potential for theft. The signs are 2 feet by 3 feet with 2-inch black lettering on a yellow background, stating:

DANGER
KEEP OUT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
SUPERFUND CLEANUP SITE

FOR INFORMATION CALL
OHIO EPA (937) 285-6012

Notification of incidents involving trespass, damage to the perimeter fence, theft, or vandalism will be promptly reported to the U.S. EPA On-Scene Coordinator (OSC).

## 2.4 SITE CONTROL MEASURES

### 2.4.1 DECONTAMINATION FACILITY

An existing equipment decontamination pad is located along the edge of the contaminant reduction zone (CRZ). The decontamination pad and CRZ are identified on Figure 2.1. Decontamination of equipment and materials will be performed, as needed, using a pressure washer. Decontamination rinse water will be pumped from the decontamination pad sump into a wastewater tank for subsequent characterization and disposal.

### 2.4.2 DRUM STAGING PAD

An existing drum staging pad is located within the southwestern portion of Disposal Area 1, as shown on Figure 2.1. Drums removed from the excavation containing liquids and intact drums will be placed in overpack containers and transferred to the drum staging pad pending characterization and disposal. Water accumulating within the pad will be pumped from the pad sump into a wastewater tank and will be characterized and disposed of in accordance with Section 4.4.

### 2.4.3 AIR MONITORING

Air monitoring will be conducted in accordance with Attachment K of the SSP (Appendix B), and Section 4.3.4 of this Work Plan.

### 2.4.4 DUST CONTROL

The main potential fugitive dust sources will be the excavation and the use of mobile equipment. Fugitive dust generated by construction activities such as loader or truck traffic will be controlled by wetting the surface of haulage routes and other Site access roads with potable water or use of a dust palliative (if required). Fugitive dust generated from the excavation will be controlled by the use of a spray-applied biodegradable cover material (e.g., Concover), if required. Controls will be implemented by the contractor if dust action levels are exceeded at the excavation perimeter or if migration of visible dust necessitates control measures be implemented. At a minimum, dust suppressants will be applied twice daily during dry periods.

Dust control relating to activities associated with the drum removal activities are further discussed in Section 4.3.6 and the SSP (Appendix B).

### 2.4.5 VOC/ODOR CONTROL

Control of VOCs and odors resulting from drum removal activities is discussed in detail in Section 4.3.5 and the SSP (Appendix B).

### 2.4.6 SEDIMENT CONTROL

Sediment control, if required due to local topography, will be accomplished using silt fences, shallow ditches, or low earth dikes to trap and contain sediments. These sediment controls will be placed in downslope positions from the active working areas. Collected sediment will be placed in temporary storage for testing to determine disposal requirements.

### 2.4.7 SURFACE WATER CONTROL

All excavation, backfilling, and staging operations will be carried out under dry/dewatered conditions to the maximum extent possible.

Surface water runoff will be prevented from entering or leaving the excavation by constructing temporary berms or using dikes, sandbags, ditching, or other available means. Surface water runoff which may potentially contain waste constituents will be contained on Site, characterized (full TCLP and PCBs), and properly disposed.

### 2.4.8 GENERAL HOUSEKEEPING

Daily accumulations of solid waste material such as discarded safety equipment, debris, and rubbish will be collected in garbage bags and disposed of in accordance with federal and state regulations. Discarded safety equipment will be collected in garbage bags, temporarily stored in sealed containers (i.e., roll-off containers), characterized, and disposed of appropriately.

Sanitary refuse will be contained in a designated area in the general office and support area. Trash removal services will be provided on a regular basis for uncontaminated solid waste.

The Site will not be allowed to become littered with sanitary refuse and/or waste materials from the working areas, but will be maintained in a neat and orderly condition throughout the construction period.

## 2.5 IMPORTED FILL MATERIAL

Imported fill material from off-Site locations may be used to maintain the decontamination pad, drum staging pads, haul roads, and other support areas. In addition, imported fill may be used as fill material in the resulting excavations where necessary.

One or more representative samples will be collected from any prospective off-Site source of fill material. The representative sample will consist of a composite of five grab samples collected from each 10,000 cubic yards of potential fill. The sample(s) will be sent to an off-Site laboratory for chemical analysis, including TAL metals, TCL VOCs, SVOC, herbicides, pesticides, and PCBs. Results of the chemical analysis will be evaluated and provided to U.S. EPA for their approval before any of the fill material is transported onto the Site. In addition, any hardfill imported to the Site will meet the requirements of Ohio Administrative Code 3745-400-05.

## 2.6 OFFICE TRAILERS/SUPPORT EQUIPMENT

At the commencement of work, the removal contractor will initially mobilize an office trailer and all additional personnel support facilities as specified in the SSP and as required by the contractor to perform the work. Facilities already located at the Site include:

1) Decontamination trailer;
2) Decontamination pad;
3) Two drum staging pads;
4) Engineer's office trailer;
5) U.S. EPA/Ohio EPA office trailer;
6) U.S. EPA support trailer
7) Ohio EPA support trailer; and
8) Nine storage tanks, including six 12,500 gallon frac tanks, one 5,000 gallon rinsewater tank, one 5,000 gallon drummed liquid tank, and one 1,000 gallon drummed liquid tank.

Locations of the above facilities are shown on Figure 2.1. The contractor will be given the opportunity to upgrade the above existing facilities, as desired.

The contractor's office trailer will be equipped with phone lines to enable both fax transmissions and telephone service. The contractor, CRA, and EPA trailers will also be provided with first aid kits, a water cooler, and fire extinguishers. The location of the contractor's office trailer will be as shown on Figure 2.1.

## 2.7 SCHEDULE FOR SITE MOBILIZATION

The schedule for mobilization to the Site is presented in Appendix D.

## 2.8 PERSONNEL/EQUIPMENT

Expected personnel/equipment requirements are as follows:

A. Test Pit Excavation Activities

i) Engineer Oversight:

- 1 Site Manager, and
- 1 engineer overseeing the excavation activities; and

ii) Drum Removal Contractor (Based upon 1 crew operating):

- 1 operator for excavation machinery,
- 1 technician,
- 1 superintendent,
- 1 health and safety officer,
- track-mounted backhoe with bucket attachment,
- photoionization device, $H_2S$/HCN monitor, oxygen monitor, radiation monitor, dust monitor, and explosimeter, and
- safety equipment/supplies.

B. Full-Scale Excavation Activities

i) Engineer Oversight:

- 1 Site Manager,
- 1 Engineer overseeing the excavation activities,
- 4 portable field GC units,
- 4 air sampling pumps; and
- EM-38 geophysical survey equipment; and

ii) Drum Removal Contractor (Based upon 1 crew operating):

- 2 operators for excavation machinery,
- 1 operator for mobile equipment,
- 2 technicians and a chemist for drum overpacking and sampling,
- 1 superintendent,
- 1 health and safety officer,
- track-mounted backhoe with grapple attachment,
- track-mounted backhoe with bucket attachment,
- front-end loader,
- vacuum truck,
- bobcat, forklift,
- water truck,
- photoionization device, $H_2S$/HCN monitor, oxygen monitor, radiation monitor, dust monitor, and explosimeter,
- 2 Summa canisters,
- safety equipment/supplies,
- HazCat trailer and sample storage trailer,
- 85- and 110-gallon overpack containers,
- roll-off containers and/or sludge boxes,
- polyethylene wastewater tanks,
- sample jars and thieves, and
- weather station.

# 3.0 SAMPLING ACTIVITIES

## 3.1 STATEMENT OF OBJECTIVES

1) Air Sampling:
   - to determine the level of personal protective equipment (PPE) required;
   - to determine the necessity of VOC, odor, or dust control measures; and
   - to monitor potential off-Site migration of VOCs, metals, and/or dust, during the removal action.
2) Solids and Liquids Sampling:
   - to characterize waste material for determining removal, backfilling, bulking, on-Site treatment, and/or disposal requirements.

## 3.2 SCHEDULE FOR SAMPLING ACTIVITIES

The schedule for sampling activities is provided in Appendix D.

## 3.3 SAMPLING PROCEDURES

### 3.3.1 GENERAL

Sampling procedures are to be performed as discussed herein, and additionally as described in the following documents:

| | | |
|---|---|---|
| • Air monitoring during removal | Site Safety Plan | Appendix B |
| • Quality assurance/quality control | Quality Assurance Project Plan | Appendix E |
| • Solid and liquid compatibility and characterization testing | Sampling and Analysis Plan | Appendix G |

### 3.3.2 SAMPLING ANALYSIS

During the test pit investigation and the full-scale removal phase, sampling and analysis of various media will be conducted. The materials to be sampled and the analyses required are as follows:

A. <u>Solids</u>

i) contents of overpacked drum(s) for HazCat (i.e., fingerprint analysis)/compatibility analysis (to be performed on Site by the removal contractor) and PCBs, and as described in the Sampling and Analysis Plan (SAP) contained in Appendix G;

ii) roll-off container sampling of bulked debris drums for RCRA hazardous characteristics [full TCLP (metals, herbicides, pesticides, VOCs, and SVOCs) and reactivity, corrosivity, and ignitability] and PCBs;

iii) post-excavation sampling for full TCLP and PCBs; and

iv) composite samples of waste material from intact drums for RCRA hazardous characteristics and PCBs.

B. <u>Liquids</u>

i) contents of overpacked drum(s) sampled for HazCat/compatibility analysis (to be performed on Site by the removal contractor) and PCBs, and as described in the SAP;

ii) composite samples of drummed waste material for RCRA hazardous characteristics and PCBs; and

iii) contents of frac tanks and other wastewater storage tanks for RCRA hazardous characteristics and PCBs.

C. <u>Air</u>

i) direct measurement of total dust, total VOCs, hydrogen sulfide, hydrogen cyanide, oxygen, and explosive gases in the exclusion zone and at the edge of the active excavation area;

ii) collection of two Summa canisters at the edge of the active excavation area at a frequency of once per week during intrusive activities;

iii) direct measurement of total VOCs, oxygen, hydrogen sulfide, hydrogen cyanide, and vinyl chloride in the work area immediately outside of the exclusion zone;

iv) Site perimeter sampling and analysis of specific VOCs (including tetrachloroethylene, trichloroethylene, cis-1,2-dichloroethylene, vinyl chloride, benzene, toluene, ethylbenzene, m-,o-,p-xylene, and methylene chloride) utilizing real-time portable gas chromatographs (Photovac Voyager units); and

v) collection of Site perimeter air samples using air sampling pumps and analyzed for metals and total particulate (using NIOSH Method 0500) at a frequency of once per week during instrusive activities.

### 3.3.3 SAMPLING METHODOLOGY

Composite samples of waste material will be collected according to the following guidelines and as outlined in the SAP:

Solid Waste

- for overpacked drum waste, samples will be collected from each individual intact drum to develop composite samples of compatible waste streams, with a maximum of 100 full drums per composite sample. U.S. EPA will be provided with split samples for analysis of individual drum samples upon request. In addition, a copy of the drum composite scheme will be included with the solid drum composite analytical results which will be submitted to U.S. EPA;
- for debris drum waste, samples will be collected at a frequency of one 5-point composite sample per each 20 cubic yard or 30 cubic yard roll-off container containing shredded drums and drum contents. Samples will be collected at a depth of 1 foot within the waste and at locations as illustrated on Figure 3.1. U.S. EPA will be provided with split samples for analysis of roll-off container samples upon request; and
- for post-excavation waste, samples will be collected using a drill rig at a frequency of one 5-point composite sample per backfilled grid. Samples will be collected once ten grids are ready to be sampled, from within the middle third of the depth to which excavation extended in that grid, and at locations as illustrated on Figure 3.2. U.S. EPA will be provided with split samples for analysis upon request. Prior to backfilling, a grab sample will be collected using an excavator bucket from the center of each removal grid at a depth of one foot for use in the RI/FS. The sample location may be modified subject to the discretion of Ohio EPA prior to the sampling.

Liquid Waste

- for drummed waste, samples will be collected from each individual drum to develop composites of compatible waste streams, with a maximum of 100 drums per composite sample. U.S. EPA will be provided with split samples of liquid drum, bulked drum waste (Baker/poly tanks), and bulk non-drum waste composites for analysis upon request. In addition, a copy of the drum composite scheme will be included with the liquid drum composite analytical results which will be submitted to U.S. EPA; and

- for bulked non-drum waste (including rain water collected in staging pads and decontamination rinse water), samples will be collected from up to three points, including all layers in the tank to produce one composite sample, with a maximum of 12,500 gallons per composite sample.

## 3.4 SAMPLE SHIPPING

Samples which require off-Site analysis will be delivered by overnight courier service or hand delivery to the selected laboratory for analysis. Sample preservation, packaging, shipment, and holding time requirements are outlined in the QAPP (Appendix E).

# 4.0 REMOVAL ACTIVITIES

## 4.1 GENERAL

### 4.1.1 SEQUENCING OF ACTIVITIES

The removal activities will be carried out by one or more full-scale removal crews. As shown on Figure 4.1, a total of forty-nine and one half 50-foot by 50-foot grids have been designated for removal activities, and a total of seven additional areas will be investigated by excavating test pits. Initially, a test pit crew and a full-scale removal crew will be mobilized. The crews will work concurrently, with the full-scale removal crew starting at a predetermined location and moving in a continuous direction until work is complete.

### 4.1.2 OVERVIEW OF PROCEDURES

Test pits will be excavated at the locations shown on Figure 4.1, and are based upon previously identified geophysical anomalies (see Appendix F). The test pit procedure will be performed as described in Section 4.3.2.

Full-scale removal activities will proceed sequentially from one drum removal area to the next adjacent or closest area. Within each area the following will be removed:

i) intact drums (i.e., drums that have no holes, tears, punctures, head seal missing/broken, or other non-manufactured openings, and that retain at least 75 percent of their original volume);

ii) drums containing liquids;

iii) pooled non-aqueous phase liquids (NAPL); and

iv) other drummed material, including debris drums, RCRA empty drums, and drum pieces.

Intact drums and all drums containing liquids will be placed in suitable overpack containers. Pooled non-aqueous phase liquid (the presence of which will be confirmed by an interface probe), will be removed from excavation(s) using either a pump or a vacuum truck and be placed in drums or tanks, depending on the volume encountered.

Materials which will be disposed off Site will include those removed waste materials which are: i) liquids; or ii) drummed material and drum carcasses (excluding RCRA empty drums). All material which is excavated or relocated within the excavation in order to facilitate the removal of drums will remain in the excavation and either be treated with VE (in the case that the material is represented by post-excavation samples with analytical results that exceed the TCLP regulatory limits for VOCs) as is described in Section 4.6.3 or evaluated for further action as discussed in Section 4.7.

## 4.2 CLEANUP CRITERIA

The cleanup criteria for the removal action are based on regulatory limits established under RCRA and TSCA. The following cleanup criteria will apply:

1) All liquid wastes which are removed from intact drums, drum pads, decontamination pads, and as pooled NAPL from the excavated container areas will be sampled and analyzed (RCRA hazardous characteristics and PCBs) to determine disposal requirements, followed by off-Site disposal;
2) All solid wastes which are removed from intact drums and debris drums will be sampled and analyzed (RCRA hazardous characteristics and PCBs) to determine disposal requirements. All drummed material and drum carcasses, excluding RCRA empty drums, will be disposed of off Site.
3) Post-excavation samples of waste material relocated within the excavation will be collected and analyzed (full TCLP and PCBs) to determine the appropriate course of action, as discussed below:
    i) Removal grids and test pit areas, where drums are encountered, in which the post-excavation sample results are below the regulatory limits for TCLP parameters and PCBs will be considered complete.
    ii) Removal grids in which the sample results exceed the TCLP regulatory limits for VOC parameters will require subsequent in situ VE treatment, as discussed further in Section 4.6.3.
    iii) Removal grids for which the sample results exceed TCLP regulatory limits for non-VOC parameters or TSCA limits for PCBs will be evaluated in accordance with Section 4.7.

## 4.3 SITE ACTIVITIES

### 4.3.1 GENERAL

The following tasks will be undertaken as part of the Work Plan:

Test Pit Phase

1) Develop a contractor Site-specific Health and Safety Plan (HASP) for the removal activities, in accordance with the SSP included as Appendix B;
2) Excavate test pits at the locations identified on Figure 4.1;
3) At a minimum, test pits will be 3 feet wide, 15 feet deep, and 20 feet long;
4) Excavated material will be temporarily staged along side each test pit;
5) If no drums are encountered, no further excavation will proceed in that area and excavated material will be backfilled;
6) If drums are encountered, the test pits will be handled following the procedures in Sections 3.3.3 and 4.3.3;
7) No test pits will extend below the water table;
8) Perform air monitoring during test pit investigations; and
9) Backfill excavated material into completed test pits.

Full-Scale Removal Phase

1) Conduct excavation activities at locations identified on Figure 4.1;
2) Segregate drums removed from the excavation into the following categories: intact drums containing solids, drums containing liquids, debris drums, and RCRA empty drums;
3) Conduct excavation and overpacking of intact drums and drums containing liquids;
4) Conduct excavation, shredding, and bulking of debris drums and load into roll-off containers;
5) Conduct excavation, pressure washing, and backfilling of RCRA empty drums within a designated portion of the excavation;
6) Inspect all drums and drum carcasses removed from the excavation for the presence of PRP information (as discussed further in Section 4.3.3.3). Drums or

containers with PRP information shall be segregated and fully documented prior to managing;

7) Conduct removal of pooled NAPL from excavated areas and place in a designated storage tank;

8) Conduct excavation of all waste material above, adjacent to, and two feet below buried drums and containers, and relocate to previously excavated areas within the active excavation;

9) Perform a geophysical scan at the base of each excavated removal grid for which the bottom of the excavation contains industrial waste (i.e., ≥50 percent industrial waste, by visual inspection) to verify that buried drums have been removed, and continue excavation as necessary (based on the procedures described in Section 4.3.3.1);

10) Stage overpacked drums on the drum staging pad;

11) Conduct HazCat/compatibility testing of material in overpacked drums;

12) Conduct analysis for RCRA hazardous characteristics and PCBs of representative sample(s) of compatible material from overpacked drums and from bulked compatible liquids;

13) Conduct bulking of compatible liquids from overpacked drums;

14) Conduct bulking of compatible solids from intact drums, if appropriate;

15) Collect samples from roll-off containers containing direct-bulked debris drums and analyze for RCRA hazardous characteristics and PCBs;

16) Conduct off-Site disposal of solid waste material from drums at licensed disposal facilities approved by U.S. EPA;

17) Conduct off-Site disposal of all accumulated liquids at licensed disposal facilities approved by U.S. EPA;

18) Collect post-excavation samples from each completed removal grid and test pit area, where drums are encountered, from material located within the middle third of the depth to which excavation extended in that grid, and analyze for full TCLP and PCBs;

19) Cover relocated waste in completed removal grids and test pit areas, where drums were encountered, with a minimum of 6 inches of clean fill after analysis of post-excavation samples. Grids for which post-excavation sample results exceed regulatory limits for VOCs will have a 12-mil polyethylene liner installed above the waste prior to covering with the 6-inch fill layer;

20) Following the completion of Disposal Area 1 excavation, address in situ VE treatment for all removal grids for which their respective post-excavation sample

results exceeded TCLP regulatory limits for VOCs in accordance with Section 4.6.3.

21) Following the completion of Disposal Area 1 excavation, address the final disposition of material from all removal grids for which their respective post-excavation sample results exceeded TCLP regulatory limits for non-VOC parameters or PCBs in accordance with Section 4.7

### 4.3.2 TEST PIT INVESTIGATION

During the investigative phase, seven test pits will be excavated to determine the existence of buried containers. The locations of the test pits are based upon the information obtained from the U.S. EPA geophysical survey (see Appendix F) and are shown on Figure 4.1.

Prior to starting test pit excavations, the location of the center of each test pit will be staked in the field by an Ohio Professional Surveyor. The surveyed location and alignment of the test pits will be based upon coordinates provided to the VRAC by U.S. EPA at least one week prior to initiation of the work. During the test pit phase, a backhoe or excavator will be used to excavate one test pit at each location. Each test pit will be centered on the surveyed location and will be, at a minimum, 20 feet long, 3 feet wide, and 15 feet deep. If no drums are encountered, no further test pit investigation or full-scale excavation (as defined in Section 4.3.3.1) will proceed in that area.

If drums are encountered, the extent of the drums (drum anomaly) will be removed and the excavation will extend 2 feet horizontally and vertically beyond the drums and managed as described in Section 4.3.3 and post-excavation samples will be obtained as described in Section 3.3.3. No test pit excavation will proceed beyond the water table.

Excavation at each location will be completed in a controlled manner to minimize damage to any potentially intact drums. If possible, soil/waste material will be backfilled into open excavations before the contractor leaves the Site for the day. If the waste material cannot be backfilled at the end of the work day, the contractor will ensure the material is covered securely with a polyethylene liner or Concover to control odors. Any excavation left open overnight will be secured with temporary fencing, at a minimum.

The following information will be recorded for each test pit:

1) unique test pit identification number;
2) test pit location tied into Site coordinate system;
3) test pit log describing orientation, dimension, and material encountered;
4) videotape of each test pit during its progression; and
5) photographs of any unique markings on any individual drum keyed to a unique drum identification number (if drums are removed during test pit activities).

### 4.3.3 FULL-SCALE REMOVAL PHASE

#### 4.3.3.1 EXCAVATION

Excavation will begin starting at the northwestern removal grids identified on Figure 4.1. Non-drummed material for approximately the first two or three grids will be removed from the excavation and temporarily staged next to the excavation on a minimum 12-mil thick polyethylene liner (to allow future delineation between waste and existing grade). Sufficient material will be moved to open up a sufficient area within the excavation to allow the contractor to efficiently relocate waste for subsequent grids. The staged waste will be sprayed with an encapsulating agent (i.e., Concover) at the end of each working day and will be covered with a liner of minimum 12-mil thickness once staging of material from the first few grids is completed. Once sufficient room is opened up in the excavation (i.e., more room than is needed to efficiently relocate subsequent waste material and segregate drums), the staged material will be backfilled and sampled in accordance with the protocols for waste that is relocated within the excavation.

Excavation will proceed to the depth of drums within each identified removal grid, which is estimated to be approximately 13 feet. An additional 2 feet of excavation will be performed to investigate the potential for additional drums and to confirm that the removal goal has been met. Any drums or drum parts uncovered during the excavation of the additional 2 feet will be removed and excavation in that immediate location will continue until 2 feet of material has been removed without identifying any drums or drum parts. Excavation of the additional 2 feet, or deeper excavation as necessary, below the depth of drums will be performed as excavation progresses throughout the grid. Each completed grid will likely vary in depth across its base and is not anticipated to be uniform in depth. Upon removal of the anomaly plus 2 feet, the base of the grid will be evaluated to determine the nature of the waste. In the event the waste consists primarily of soil and municipal waste (i.e. >50 percent municipal waste and soil, be visual inspection), excavation within that grid will be complete.

In the event that industrial waste is identified at the base of the grid following removal of drums plus 2 feet, a geophysical scan using an EM-38 instrument (described in Appendix H) will be performed to indicate whether additional drums may still be present. The results of the survey will be immediately evaluated by the VRAC (or their representatives) and the results provided to U.S. EPA for their use. U.S. EPA will be notified a minimum of 24 hours prior to the geophysical field work and will be provided the opportunity to be present during the VRAC's investigation or to conduct an independent scan within 24 hours of receipt of the VRAC's results.

If no anomalies are identified, excavation within that grid will be complete. If one or more anomalies are identified, excavation will continue until each anomaly is removed, excavation has proceeded a depth of 5 feet, or municipal waste is encountered. If the anomaly is removed or no anomaly is identified within 5 feet of excavation and the base of the grid is still primarily industrial waste, an additional geophysical scan will be performed and the requirements for further excavation will be re-evaluated following the same procedures that were used upon completion of the initial geophysical survey. If at any time municipal waste is encountered, excavation within that grid will be considered complete.

Figure 4.2 includes a decision tree for determining the appropriate course of action, as described above.

Once the first few removal grids have been completed and the excavated material temporarily staged, excavation of material in subsequent removal grids will proceed by relocating or transporting excavated waste within the active excavation. Each removal grid will have all material excavated to the necessary depth, as described above, to allow the removal of drums and drum parts. The material removed will be loaded into a dump truck and transported within the excavation to a removal grid previously completed. The excavator removing material within a grid may also directly dump the bucket load into a previously completed grid instead of loading in a truck, to the extent practical. Removal grids begun in areas that are not contiguous with previously excavated and completed grids will require the excavated material to be loaded into trucks, transported above grade to the location of the completed grid, and dumped into the excavation as backfill.

In the event waste and drums are present below the water table, no further removal will be performed. The presence of groundwater will be confirmed through a comparison of the surveyed water level within the excavation to the water levels measured in adjacent wells during the previous groundwater level monitoring period conducted under the Remedial Investigation.

Each completed grid that has been backfilled to grade will be sampled in accordance with Section 3.3.3 to characterize the material. One 5-point composite sample will be collected per grid. Grids for which the sample results are below TCLP regulatory limits for VOCs will have a 6-inch lift of clean fill installed above the waste. Grids in which the sample results exceed TCLP regulatory limits for VOCs will have a liner (minimum 12-mil thickness) installed above the waste prior to covering with a 6-inch lift of clean fill.

Excavation of removal grids will generally progress from the north to the south, although sequencing will be at the discretion of the VRAC. When all test pits and removal grids have been completed, the material that had been temporarily staged at the north end of Disposal Area 1 will be backfilled in the remaining excavation from the last excavated removal grids at the south end of Disposal Area 1 (if this material has not already been backfilled). This material may be placed within the excavation at any time when sufficient space is available to effectively continue removal activities. A 6-inch lift of clean fill will also be placed above the location where the waste was temporarily staged.

Prior to initiation of removal action activities, a professional survey utilizing an Ohio Licensed Surveyor will be conducted to record existing elevations and coordinates within the proposed test pit areas and removal grids. Additional surveying of the bottom of the excavation of each removal grid will be conducted as work progresses to record the elevation and coordinates of the material excavated. Prior to grid sampling, the survey results will be provided to U.S. EPA.

#### 4.3.3.2 DRUM AND WASTE HANDLING

Excavation of material within the removal grids will be performed using a minimum of one excavator with a bucket attachment for removal of soil, debris, and other waste, and one excavator with a grappler attachment for removal of drums. The teeth of the excavator bucket will be removed or covered to reduce the potential for damaging drums encountered while excavating. Each crew performing excavation will consist of a minimum of two equipment operators and one safety technician.

During the handling of drums, safety apparel and equipment as specified in the SSP will be worn or used at all times. In particular, full-face respirators with supplied air (Level B) will be worn at all times while excavating waste in removal grids or while handling drums whose contents are unknown. A total of two supplied air lines will be provided for U.S. EPA and their contractor.

During the excavation of drums, a team of personnel specifically trained in the handling of drummed waste will be designated to perform this task. During the handling of drummed waste, visual contact will be maintained between members of the working team at all times. All team members will be able to communicate with ease between themselves through the use of hand signals or with two-way radios. At a minimum, each equipment operator, crew leader, foreman, and superintendent will have a two-way radio. U.S. EPA will be provided with two radios on a separate frequency for their use. Drums will be removed from the excavation by grappler, within the excavator bucket, or by other means that will minimize damage to drums and containers.

Extreme care will be exercised while opening intact drums in which the contents are unknown or known to be dangerous. Drums will be grounded prior to opening or sampling. An intact drum with unknown contents that has a badly rusted bung or cover bolt will be entered using a non-sparking penetrating device, operated remotely. Hand operated, non-sparking tools may be used to penetrate an intact drum, if the contents of the drum are known and acceptable for such activity.

All handling, moving, and transporting of drums will be done using mechanical equipment whenever possible. Drums will be moved by grappler, excavator bucket, loader bucket, or by other approved means that will prevent damage to drums and release of their contents. Movement or handling by personnel (outside of the excavation area) may be required in the event that mechanical means cannot be properly or safely employed due to drum breakage or leakage. If necessary, non-metallic slings will be used to handle drums, but only after removal from the excavation by other means.

All handling and transport equipment will be equipped with Class ABC fire extinguishers. All equipment used for the handling and transport of containers will be regularly maintained. In particular, the ignition, manifold, and exhaust components will be maintained to prevent backfiring or generation of sparks within the exhaust gases.

The handling and transport of drummed waste will be conducted in a controlled and safe manner which will minimize damage to the drums and prevent release of the contents. Intact drums and drums containing liquids will be placed in an 85-gallon or

110-gallon overpack container and staged on the drum staging pad pending characterization and disposal of the drums.

In the event that a drum or container of liquid is spilled outside of the excavation areas, the drum handling team will immediately respond to the spill. The spilled liquids will be confined to the immediate area of the spill and the liquids will be pumped, utilizing a hand pump or intrinsically safe electric pump, into an overpack container. The spilled liquids will be confined by diking around the spill with native material or with an inert absorbent. Any residual liquids which cannot be pumped will be absorbed with a sufficient quantity of inert absorbent to ensure that no free liquids remain. If the spill occurs on soil, the visibly affected soil will be treated as contaminated material based on a visual determination of spill contaminant.

Drum and waste handling will be performed in accordance with the procedures outlined herein. CRA's Drum Handling Standard Operating Procedures (SOPs) are also included as Attachment N of the SSP for reference.

#### 4.3.3.3 DRUM SEGREGATION AND STAGING

As waste material within the removal grids is excavated and relocated within the excavation, care will be taken to identify any and all drums and drum parts within the waste. Once the drum or drum part is removed from the excavation, the contractor will immediately inspect the condition of the drum and contents to determine how it should be characterized. Each drum or drum part removed from the excavation will be put into one of the following categories: intact drum, liquid drum, debris drum, or RCRA empty drum. All drums removed from the excavation, regardless of the category, will be initially screened for PRP information, as is discussed below. U.S. EPA will be provided with a weekly summary in spreadsheet format identifying drums removed per category and grid number.

Intact Drum

Any drum or container that has no holes, tears, punctures, or other non-manufactured openings, and that retains at least 75 percent of its original volume will be considered an intact drum, consistent with the definition in the Federal Register, Vol. 57, 1992. Upon removal of an intact drum from the excavation, a preliminary screening of the drum will be performed by the contractor to identify organic vapors, explosive gases, or radiation, prior to physically handling the drum by the field workers. This information will be recorded on the drum removal field data sheet, presented in Table 4.1. Once the screening has been performed, a detailed inspection of the drum and its contents is performed and recorded on the drum removal field data sheet. Intact drums will be sampled in accordance with the SAP, overpacked in an 85-gallon or 110-gallon overpack, and transported to the drum staging pad pending characterization and ultimate disposal of the waste. Each intact drum will be assigned a unique drum identification number and will have all subsequent information associated with it documented on the drum database.

Liquid Drum

Any drum or container, whether intact or not, that contains more than 1 inch of liquid will be recorded as a liquid drum. (Exceptions may be made in certain circumstances, such as a drum part (i.e., a RCRA empty drum) that contains none of its original contents, but has simply collected rainwater or perched water due to its orientation within the waste.) Upon removal of a liquid drum from the excavation, special care will be taken to prevent spilling of liquid within the excavation. At the edge of the excavation, screening of the liquid contents for organic vapors, explosive gases, and radiation will be performed, as well as a detailed inspection of the drum and contents and documentation of such on the drum removal field data sheet. The liquid drum will then be immediately sampled at the edge of the excavation and placed in an 85-gallon or 110-gallon overpack container. Depending upon the condition of the drum and whether liquid may be likely to spill, the drum may be overpacked first and sampled at a later time on the drum pad. Overpacked liquid drums will be segregated on the drum staging pad pending characterization and ultimate disposal of the waste. Each liquid drum will be assigned a unique drum identification number and will have all subsequent information associated with it documented on the drum database.

Debris Drum

Any drum or container that contains more than 1 inch of material, does not contain a measurable amount of liquid, and is not an intact drum will be recorded as a debris drum. Debris drums will be sent directly to the mixing/shredding box or will be placed temporarily on a polyethylene liner near the excavation area and transported to the mixing box in bulk. No more than 100 drums will be temporarily staged on the polyethylene liner prior to transporting to the mixing/shredding box. Debris drums will not be assigned a unique drum identification number but will be counted and recorded on a spreadsheet by the date and grid location from which they were removed.

RCRA Empty Drum

Any drum or container that contains less than 1 inch of material, flattened drums, or large pieces of former drums will be recorded as a RCRA empty drum, consistent with the definition in the Federal Register, Vol. 57, 1992. Empty drums will be staged on polyethylene pending pressure washing to remove loose debris. Once a quantity of 100 drums or less have been accumulated, the drums will be transported to the decontamination pad (or other designated lined pad) for pressure washing using potable water. A single rinse will be performed to remove clumps of debris and soil, and the contained rinse water will be pumped into a storage tank pending characterization and subsequent off-Site disposal. Solids that accumulate on the pad from pressure washing RCRA empty drums will be handled similar to the debris drum wastestream. RCRA empty drums will not be assigned a unique drum identification number but will be counted and recorded on a spreadsheet by the date and grid location from which they were removed. Drum fragments, lids, and other small pieces of metal that may formerly have been drums will not be counted, but will be pressure washed as described above. Following pressure washing, the drums and drum fragments will be disposed of within the Disposal Area 1 excavation at a predetermined location agreed to by U.S. EPA.

PRP Drum

All drums or containers excavated (regardless of category) will be examined for any nameplates, trademarks, markings, labels, stenciling, or other wording, whether complete, incomplete, or illegible, and referencing a manufacturer or potential manufacturer, facility, or supplier. All drums that exhibit one or more of the above (regardless of category) will be segregated by the contractor and staged on polyethylene, or segregated on the drum staging pad if already overpacked, pending inspection by CRA. CRA will review the markings on each drum to assess whether PRP markings are present. Drums which do not contain PRP information, as determined by CRA with Ohio EPA concurrence, will be managed appropriately based on the type of drum as described above. Drums that are determined by CRA to contain potential PRP information will be documented by recording all information contained on the drum and taking a photograph. A unique drum identification number will be given to each of these drums. Ohio EPA will be notified of drum(s) containing potential PRP information and will be provided 3 working days to perform an independent inspection. At the end of the 3 working day period, potential PRP drums will be managed appropriately based on the type of the drum, as described above.

#### 4.3.3.4 DRUM SHREDDING AND BULKING

Debris drums will be sent to the bulking area for shredding and bulking prior to characterization and subsequent off-Site disposal. Drums will be deposited in one of the two steel mixing boxes where shredding will be accomplished through the use of mechanical means by tearing into pieces with excavators, or through the use of a drum shredder. Drums will be sufficiently ripped and shredded to result in the drum contents being removed from the drum and the contents shredded adequately to allow disposal under the appropriate facility's disposal profile. Following shredding of the drums, the contents will be transferred to a roll-off container.

Debris material within the roll-off container will be sampled by collecting a 5-point composite of material from a depth of 1 foot from the top of the waste. The location of each grab sample will be as shown on Figure 3.1. The results of the laboratory analysis will be used to determine the appropriate off-Site disposal.

Bulking of drummed liquids will be performed based upon a review of the HazCat/compatibility testing, RCRA hazardous characteristics, and PCB analytical results, as described in Section 3.3.3 and the Sampling and Analysis Plan contained in Appendix G. Prior to consolidating liquids in a storage tank, drummed contents are to be emptied into a drum tray to allow accurate measurement of the volume of the liquid within each drum. The contents will subsequently be pumped from the drum tray into the waste tank pending off-Site disposal.

#### 4.3.3.5 BACKFILLING

As excavation of removal action grids progresses, backfilling will be performed by relocating waste from active removal grids to areas previously excavated, as described in Section 4.3.3.1. Waste will be compacted in approximate 2-foot lifts by tracking a minimum of two times over the waste using heavy equipment. Backfilling of the waste will be performed to its original grade or within 1 foot of the original grade, to the extent possible.

Following relocation of debris and subsequent characterization, a polyethylene liner (minimum 12-mil thickness) will be installed above the entire 50-foot by 50-foot area of each grid for which analytical results exceed TCLP regulatory limits for VOCs. A 6-inch soil cover will be installed above the polyethylene liner. For those removal grids in which the relocated waste was determined through laboratory analytical testing to not exceed TCLP regulatory limits for VOCs, a 6-inch cover of clean fill will be installed directly above the solid waste. Compaction of the clean fill will be performed by tracking a minimum of two times over the fill with heavy equipment.

### 4.3.4 AIR MONITORING

During the test pit and the full-scale removal phases, real-time VOC, hydrogen sulfide, hydrogen cyanide, explosive gas (LEL), oxygen, and dust monitoring will be conducted on a continuous basis at active excavations and in the work area of each active excavation. It is not intended that the person performing the air monitoring would enter the excavation at any time. The results of the VOC monitoring will be used as an indicator to determine the need for immediate VOC controls (e.g., Concover), as described in the SSP. The results of the dust monitoring will be compared to the action levels developed in the SSP, and if an exceedance occurs, the contractor would initiate dust control measures in the excavation area.

In the event of an exceedance of the action level for dust, the air sample collected at the Site perimeter stations would be analyzed for total suspended particulate and metals. Otherwise the daily air samples collected at the perimeter locations would not be sent to the laboratory for analysis. At a minimum, one set of upwind and downwind Site perimeter air samples will be sent to the laboratory for analysis each week, during the test pit and the full-scale removal action (during intrusive work activities).

Two samples will be collected using Summa® canisters each week at active excavation areas for TO-14 analysis to characterize the VOCs present at the work area.

In addition to the above, real time chemical-specific VOC monitoring will be conducted daily using on-Site gas chromatograph (GC) monitoring devices (i.e., Voyagers, as manufactured by Perkin-Elmer). These devices will be set up at one upwind location and three downwind locations relative to the active work area, and will be placed at one of the monitoring stations identified on Figure 4.3. These devices will be used to monitor and record concentrations of Site-specific VOCs at intervals of approximately two per hour. These results will be compared to action levels established by the Occupational Safety Health Administration (OSHA) and the Ohio Department of the Health (ODH).

The Site-specific VOCs to be monitored were chosen based upon those chemicals that were identified in Summa canister air sample and waste sample analytical results during the Disposal Area 5 drum removal activities. The 11 specific compounds to be analyzed include trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), vinyl chloride (VC), methylene chloride, benzene, tetrachloroethylene (PCE), toluene, ethylbenzene, and m-,o-,p-xylene.

Real-time perimeter air monitoring utilizing the Voyager GC units will be performed on a daily basis during intrusive drum removal activities and no less frequently than once per week during non-intrusive activities conducted during the period of the Area 1 removal action work. At a minimum, monitoring will be conducted at one upwind and three downwind locations. The location for placement of the three downwind Voyagers will be made twice per day based upon the wind direction as determined from the on-Site weather station. The placement of the units will be located at stationary positions (as shown on Figure 4.3) and spaced to subtend an angle of approximately 90 degrees between the downwind left and downwind right units, using the center of the excavation, or primary working location, as the apex. The intent of this spacing is to allow the voyagers the ability to effectively monitor compounds even during fluctuating wind conditions. For excavation grids within 200 feet of the Area 1 perimeter fence, a minimum of two stations must be within the 90 degree pattern and the third station placed at the next closest downwind station.

Short-term indicator values and defined stop-work action levels will be utilized to determine the appropriate course of action based upon real-time VOC monitoring. Voyager data at each downwind perimeter air monitoring station will be recorded every half hour and rolling hourly average values will be compared to the indicator values, as tabulated in Table K.5 of Attachment K of the SSP. The indicator values are based upon Ohio EPA Maximum Acceptable Ground Level Concentrations (MAGLCs). In the event any individual downwind station records an hourly average sample value for any individual constituent above its respective indicator value, an evaluation will be performed to locate the potential source, and if necessary, to implement additional engineering controls. This is discussed in more detail in the SSP. The intent of the indicator values are to provide an early warning to prevent exceedances of the 14 day and 365 day action levels established by the ODH, as presented in Table K.1 of Attachment K of the SSP. The daily average VOC level for each parameter will also be calculated and compared to the applicable ODH perimeter monitoring levels. A concentration of the daily downwind average for any parameter that is higher than its respective acute action level established by the ODH will also warrant an evaluation of the Site activities and may necessitate changing work conditions to prevent an actual 14 day or 365 day exceedance.

Stop-work action levels and notification procedures are identified in Section 1.5 of Attachment K of the SSP.

As removal action work progresses in Disposal Area 1, the perimeter air monitoring data will be evaluated to determine whether any additional compounds should be added or deleted from the Voyager assay.

The air monitoring program is further detailed in Attachment K of the SSP (Appendix B). Procedures for VOC and dust control are discussed in Sections 4.3.5 and 4.3.6.

### 4.3.5 VOC/ODOR CONTROL

The need for VOC/odor control measures will be triggered by: elevated total VOC readings at the excavation area, as specified in the SSP (Appendix B); an exceedance of the VOC action level using Photovac Voyagers at the downwind Site perimeter; or the continued presence of objectionable odors at receptor location(s). The presence of objectionable odors will be monitored by on-Site personnel.

VOC/odor control measures may include the use of non-toxic, bio-degradable odor counteractants (i.e., Ecosorb), and temporary liner covers. In addition, an encapsulating material such as a spray-applied, biodegradable slurry (i.e., Concover) or foam suppressant may be used to limit the emissions of VOCs and/or odors emanating from open excavations.

An odor counteractant such as Ecosorb would be sprayed downwind of excavation areas to control VOCs and/or odors. The odor counteractant is diluted with water and applied as an atomized mist of small droplets. The oils in the droplets combine to form a thin, electrostatically charged film around each droplet. The film then attracts VOC and/or odor molecules that are present in the air, which are neutralized by the essential oil mixture.

An encapsulating material (i.e., Concover) would be sprayed as a slurry consisting of polymers and recycled film to form a uniform encapsulating layer between the base of the excavation and the environment. The resulting encapsulating layer would provide a solid, weather resistant, non-toxic, biodegradable cover over waste material.

### 4.3.6 DUST CONTROL

The need for dust control measures will be triggered by the generation of visible dust or by an exceedance of action level for dust at the perimeter of the exclusion zone(s). The dust action levels contained in the SSP in Appendix B were calculated based upon risk levels associated with the various metals which may be present in airborne dust originating on the Site. At a minimum, dust suppressants will be applied twice daily (weather permitting) to areas of potential dust generation (i.e., haulage roads).

Dust control aids by the contractor may include the use of potable water or a dust palliative such as calcium chloride. Other dust control measures may include modifying the method of excavation and stockpiling of material during test pit and full-scale removal phases and reducing the allowable speed of mobile equipment traveling on the Site.

#### 4.3.7 DECONTAMINATION OF EQUIPMENT

All equipment used in the handling of material associated with the test pit and the full-scale removal phase will be decontaminated prior to demobilization from the Site or removal from the exclusion zone or CRZ to the support zone.

Decontamination of mobile equipment will consist of using a high pressure spray washer (or high pressure steam spray washer, if necessary) to remove all visible soil or waste debris from the equipment. Decontamination of mobile equipment will be conducted on the equipment decontamination pad located at the Site within the CRZ.

### 4.4 WASTE DISPOSAL

All waste material subject to potential off-Site disposal will be sampled and characterized as discussed in Section 3.0. Waste that requires off-Site disposal will be documented and shipped in accordance with all federal, state, and local laws, including, but not limited to, those regulations contained in 40 CFR 260, 261, 262, 268 and 49 CFR 171 and 172.

The following waste streams/materials will be generated/handled during the test pit and full-scale removal work:

1) intact drums;
2) drums containing liquids;
3) debris drums;
4) non-aqueous phase liquid;

5) TCLP VOC-impacted material subject to in situ vapor extraction treatment;
6) Non-VOC impacted TCLP material or PCB material (>50 ppm);
7) RCRA empty drums or other scrap metal associated with buried containers to be pressure washed and backfilled;
8) PPE; and
9) decontamination wastewater.

As identified in previous sections, those waste streams that must be sent off Site for disposal include all non-RCRA empty drums, all drummed liquid waste, all non-drum liquid wastewater and leachate, and PPE. All other waste material will be backfilled, treated on Site in accordance with Section 4.6.3, or managed as described in Section 4.7.

Waste material, both liquid and solid, designated for off-Site disposal will be transported to licensed disposal facilities approved by the U.S. EPA prior to transportation off Site.

## 4.5 SCHEDULE

Figure D.1 in Appendix D presents the removal action schedule including the estimated time periods for the test pit and full-scale removal phases, sampling and analysis, and disposal of all waste streams designated for off-Site disposal.

## 4.6 IN SITU VAPOR EXTRACTION OF DISPOSAL AREA 1 VOC-IMPACTED SOIL AND DEBRIS

### 4.6.1 BACKGROUND

On October 12, 1999, U.S. EPA granted approval for excavated TCLP VOC-impacted soil and debris, generated under the Disposal Area 5 drum removal action, to be stockpiled on Site for up to 2 years. A Site-specific bench-scale treatability study was subsequently conducted to evaluate the effectiveness of VE technology on removing the VOC concentrations from a soil and debris mixture. After reviewing the results of the study, VRAC representatives and U.S. EPA, in a meeting in Cincinnati, Ohio, agreed that VE had been shown in the treatability study to effectively reduce the VOC concentrations and had the potential to sufficiently to remove the hazardous characteristic on a larger scale.

### 4.6.2 VOC-IMPACTED SOIL AND DEBRIS

As discussed in Section 4.3.3.1 and the Sampling and Analysis Plan, upon relocation of material within the removal grids and backfilling to grade, sampling will be conducted on each completed grid to characterize the material. Those grids where the sample results exceed the TCLP regulatory limits for VOCs will remain in place and be subject to in situ VE treatment.

### 4.6.3 VE SYSTEM DESIGN

Following characterization of all Disposal Area 1 removal grids and test pit locations in accordance with Section 3.3.3 and the SAP, plans for in situ VE treatment of the VOCs will be submitted to the U.S. EPA Remedial Project Manager (RPM) as an Addendum to *the Disposal Area 1 Removal Action Work Plan* within 14 days of receipt of the final laboratory analytical results or at the latest January 31, 2003. In the event all characterization is not completed by January 31, 2003, the Addendum will be submitted to describe treatment of only that material already sampled, characterized, and results received 14 days prior to the January 31, 2003 submittal date.

## 4.7 NON-VOC-IMPACTED SOIL AND DEBRIS

Removal grids and test pit areas, where drums are encountered, for which the sample results exceed TCLP regulatory limits for non-VOC parameters or TSCA limits for PCBs will be evaluated for removal or remedial action. The evaluation will consider the constituents present, concentration levels, quantity, and locations of affected material. The evaluation of options will be submitted as a Work Plan to the U.S EPA On-Scene Coordinator (OSC) within 14 days of receipt of the final data from the last backfilled grids in Area 1 or at the latest January 31, 2003 for those grids that have been backfilled, sampled, and results received 14 days prior to the January 31, 2003 submittal date.

## 5.0 SITE RESTORATION/PROJECT CLOSEOUT ACTIVITIES

### 5.1 SITE RESTORATION

Temporary drum staging pad(s) including the liner material and any associated impacted soil will be removed and disposed of appropriately. Non-hazardous solid waste material will be placed back into the Disposal Area 1 excavation. Following backfilling, the immediate area will be covered with a minimum of 6 inches of clean imported fill or native borrow material to ensure the completed excavation sites are graded to match the surrounding grades. To prevent erosion, completed grids will be seeded and maintained for vegetation cover.

### 5.2 FINAL EQUIPMENT DECONTAMINATION

A final decontamination of all equipment will be performed on the equipment decontamination pad. Decontamination of equipment will consist of brushing to remove loose dirt and debris and adhered residues, and a high pressure, hot water wash. Particular attention will be paid to joints, sprockets, and undercarriages. Solids generated during decontamination activities will be properly sampled (full TCLP and PCBs), characterized and handled appropriately. Each piece of equipment will be inspected after decontamination prior to removal from the Site. An inspection record will be maintained. Each decontaminated piece of equipment leaving the Site will be recorded on the inspection record along with the name of the inspector.

### 5.3 WASTEWATER REMOVAL

The stored wastewater will be properly sampled (full TCLP and PCBs) and characterized prior to removal from the Site. The characterization analyses of the liquid contents will determine the appropriate disposal method. The tank contents will be transferred to liquid waste tankers as necessary and disposed of at an appropriate off-Site facility. Following emptying of the wastewater tanks, the tank interiors will be decontaminated in an appropriate manner if they contained contaminated materials. Any decontamination water generated will be collected and transported to appropriate off-Site facilities for final disposition in accordance with all applicable state and federal regulations.

## 5.4 FINAL CLEANUP

Final cleanup will involve cleaning the Site of litter and trash resulting from the work and leaving the Site in a neat and orderly condition. Litter and trash resulting from the work will be disposed of at a local sanitary landfill. Following backfilling, the immediate area will be graded to match the surrounding grades.

## 6.0 PROJECT MANAGEMENT

The following personnel have been identified to U.S. EPA in relation to the drum removal action:

| | |
|---|---|
| • Project Coordinator | Mike Miller, *de maximis* |
| • Alternate Project Coordinator | Mike Samples, *de maximis* |
| • Supervising Contractor (CRA Project Manager) | Ian Richardson, CRA |
| • Site Manager | Pete Schwarz, CRA |

The following additional personnel will be identified prior to commencement of work activities at the Site:

- Contractor Superintendent;
- Contractor Health and Safety Officer; and
- Contractor Project Manager.

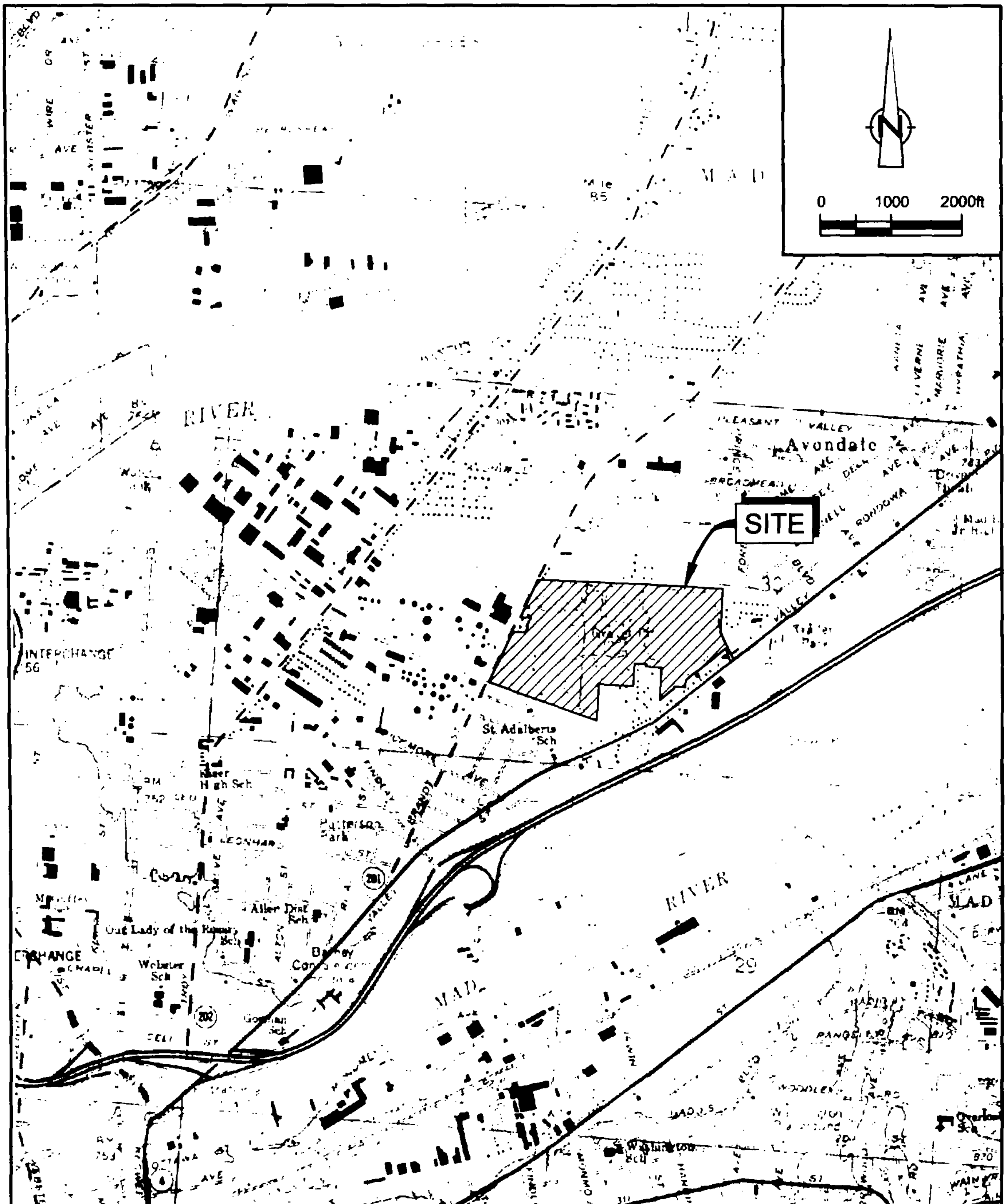
Overall responsibility for Work Plan implementation and reporting will be handled by the CRA Site Manager.

Overall project planning, scheduling, and amending of the Work Plan (if necessary) will be conducted by the CRA Site Manager.

Site entry and exit logs will be maintained by the contractor.

Agency communications and PRP representation will be provided by the Project Coordinator or Alternate Project Coordinator.

FIGURES




SOURCE: USGS QUADRANGLE MAP;
DAYTON NORTH, OHIO


OHIO

figure 1.1

SITE LOCATION
NORTH SANITARY LANDFILL
*Dayton, Ohio*

06351-27(033)GN-WA026 SEP 07/2001

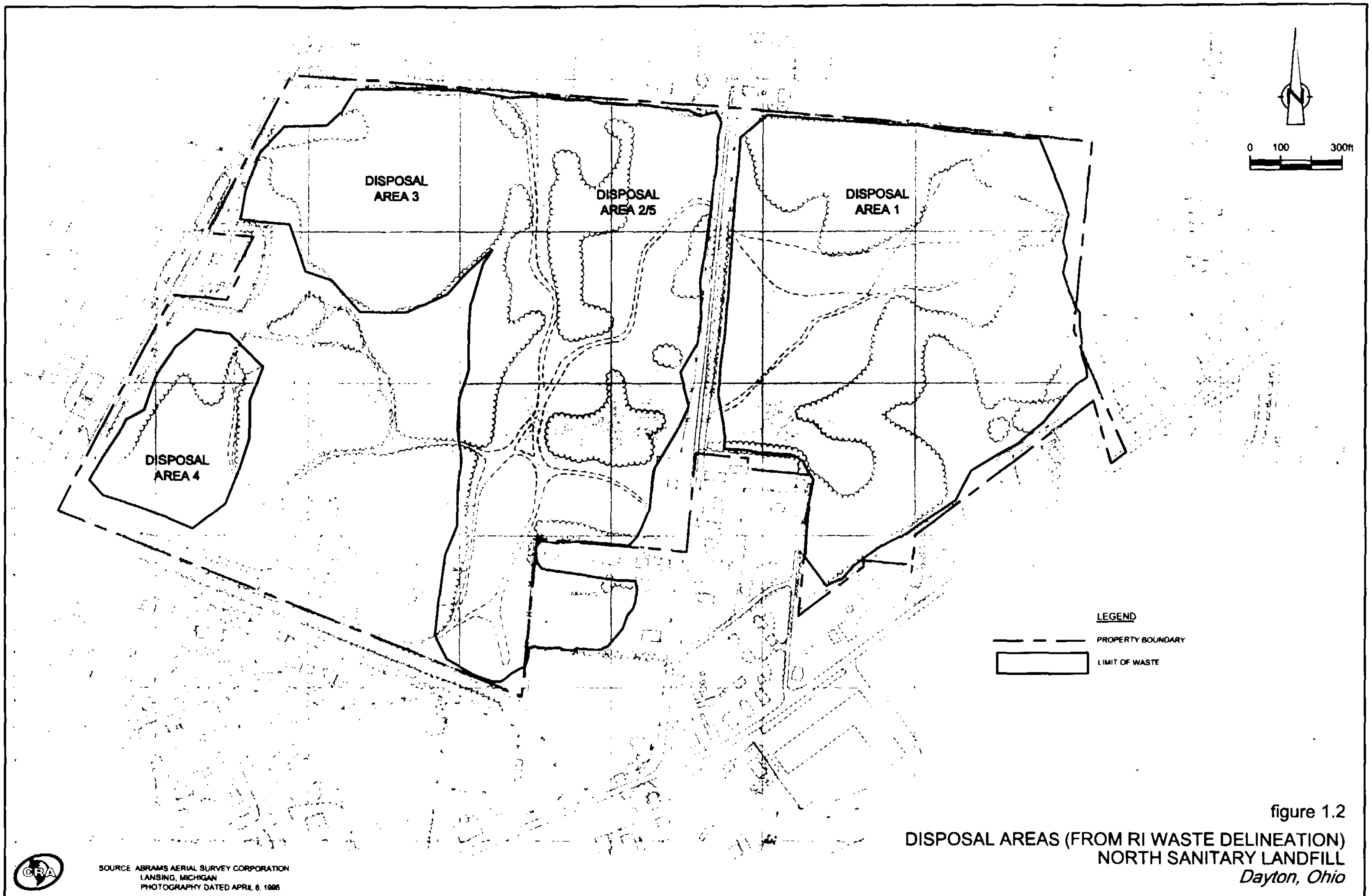
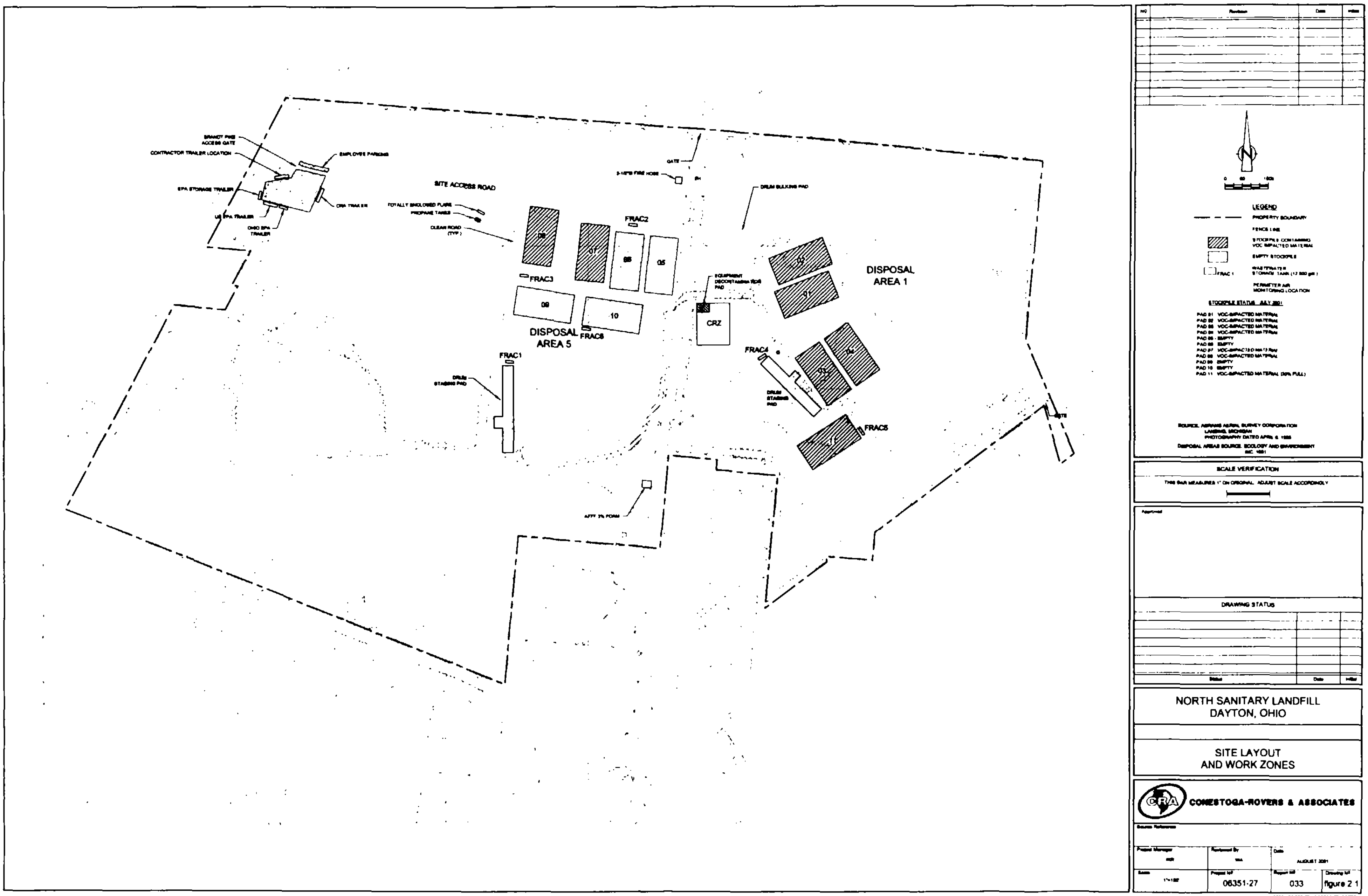


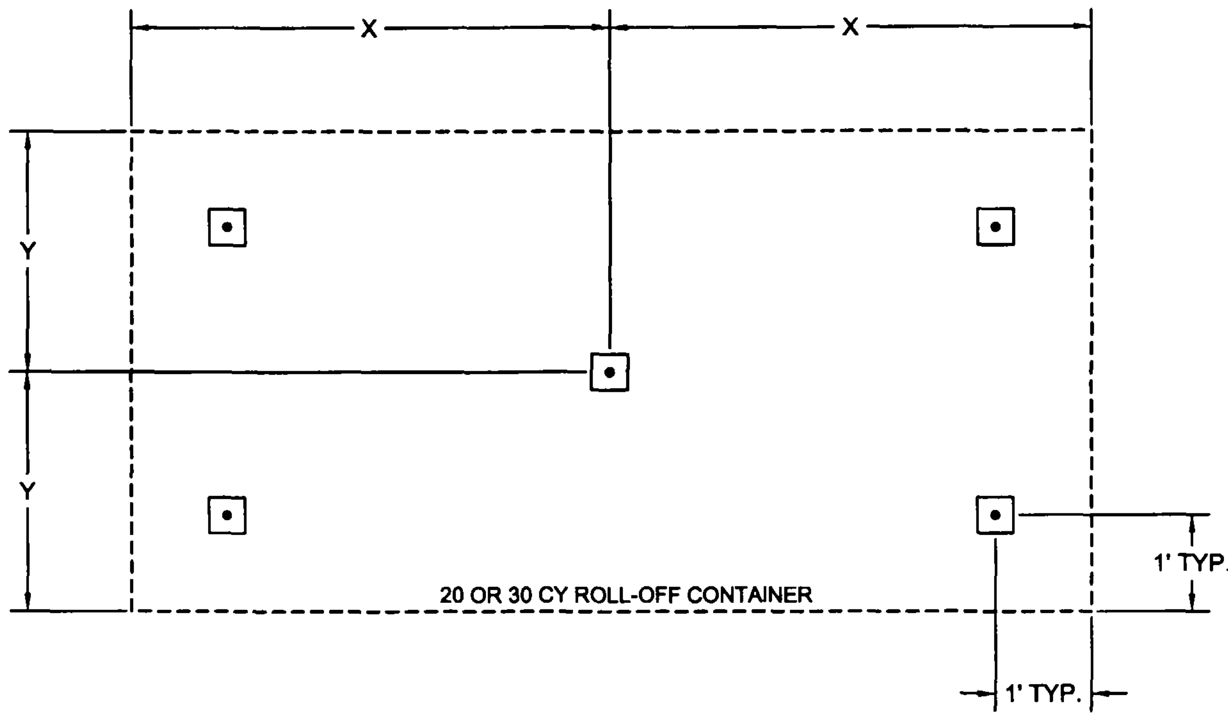

figure 1.2

DISPOSAL AREAS (FROM RI WASTE DELINEATION)
NORTH SANITARY LANDFILL
*Dayton, Ohio*

06351-27(033)GN-WA027 SEP 13/2001



SITE ACCESS ROAD
FRAC1
FRAC2
FRAC3
FRAC4
FRAC5
FRAC6
DISPOSAL AREA 5
DISPOSAL AREA 1
CRZ
09
10
07
06
05
02
01
LEGEND
PROPERTY BOUNDARY
FENCE LINE
EMPTY STOCKPILE
PERIMETER AIR MONITORING LOCATION
PAD 09 EMPTY
PAD 10 EMPTY
SCALE VERIFICATION
DRAWING STATUS
NORTH SANITARY LANDFILL
DAYTON, OHIO
SITE LAYOUT
AND WORK ZONES
CONESTOGA-ROVERS & ASSOCIATES
AUGUST 2001
06351-27
033
figure 2 1




LEGEND

------ ROLL-OFF CONTAINE r

GRAB SAMPLE LOCATION
ALL GRAB SAMPLES ARE COLLECTED
AT A DEPTH OF APPROX. 1 FOOT

figure 3.1

ROLL-OFF CONTAINER SAMPLING
NORTH SANITARY LANDFILL
*Dayton, Ohio*

06351-27(033)GN-WA006 SEP 05/2001

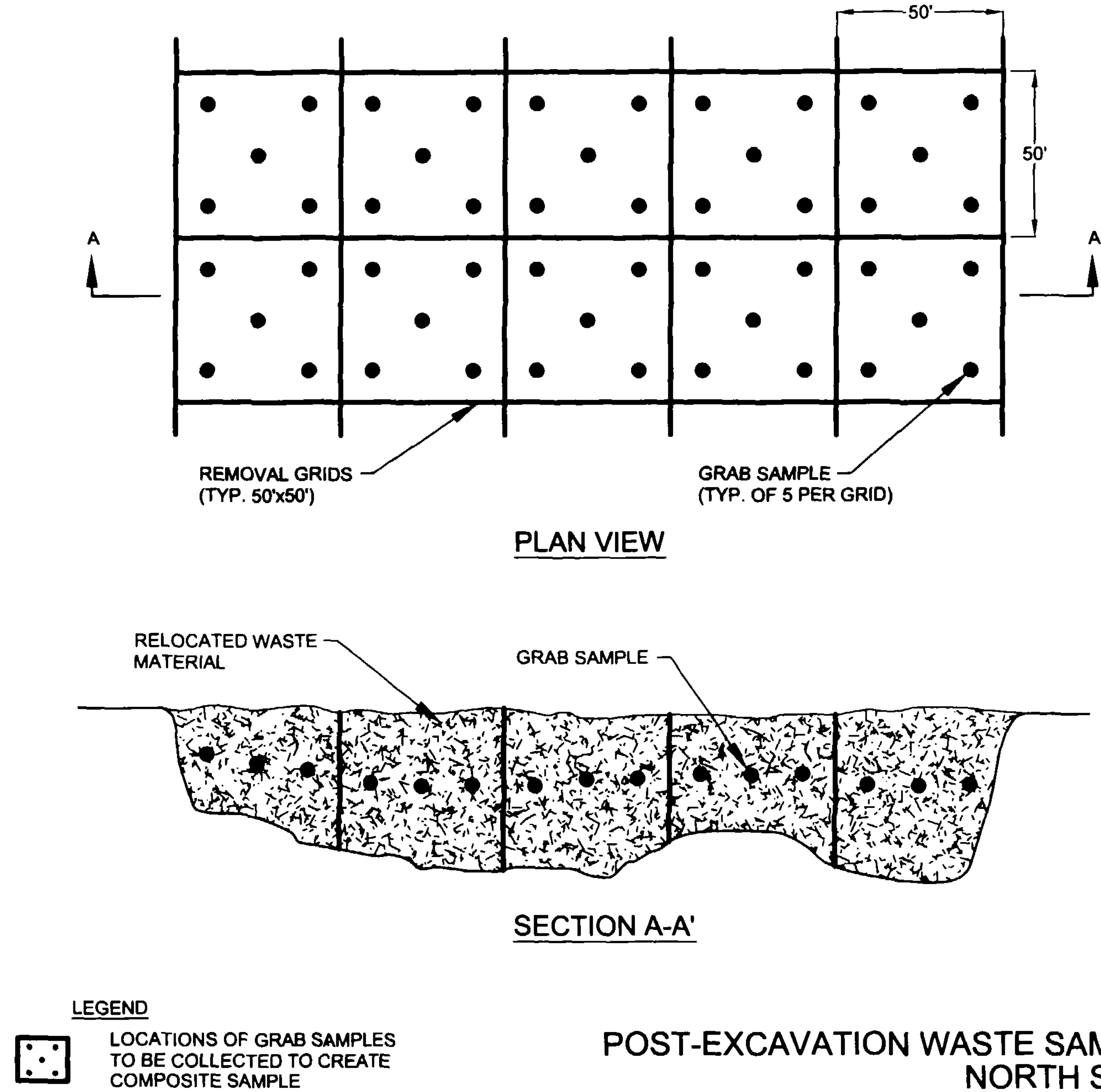
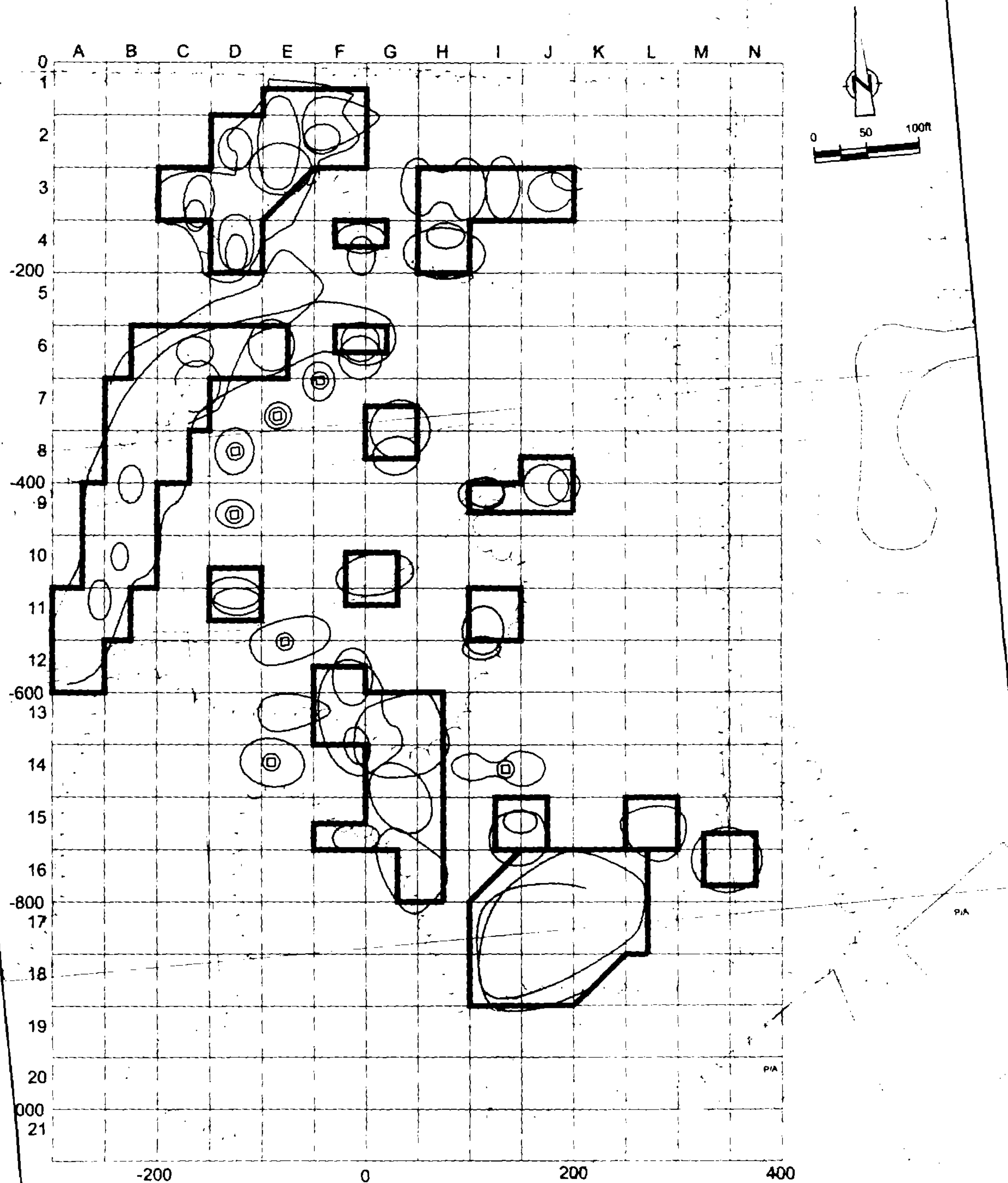



figure 3.2

POST-EXCAVATION WASTE SAMPLING SCHEMATIC
NORTH SANITARY LANDFILL
*Dayton, Ohio*

06351-27(033)GN-WA007 SEP 07/2001




LEGEND

GEOPHYSICAL ANOMALY LOCATION (MAY 1998)

50-FOOT SITE GRID

GRID PROPOSED FOR REMOVAL

PROPOSED TEST PIT

figure 4.1

DISPOSAL AREA 1 REMOVAL GRIDS AND TEST PIT LOCATIONS NORTH SANITARY LANDFILL *Dayton, Ohio*

06351-27(033)GN-WA004 SEP 13/2001

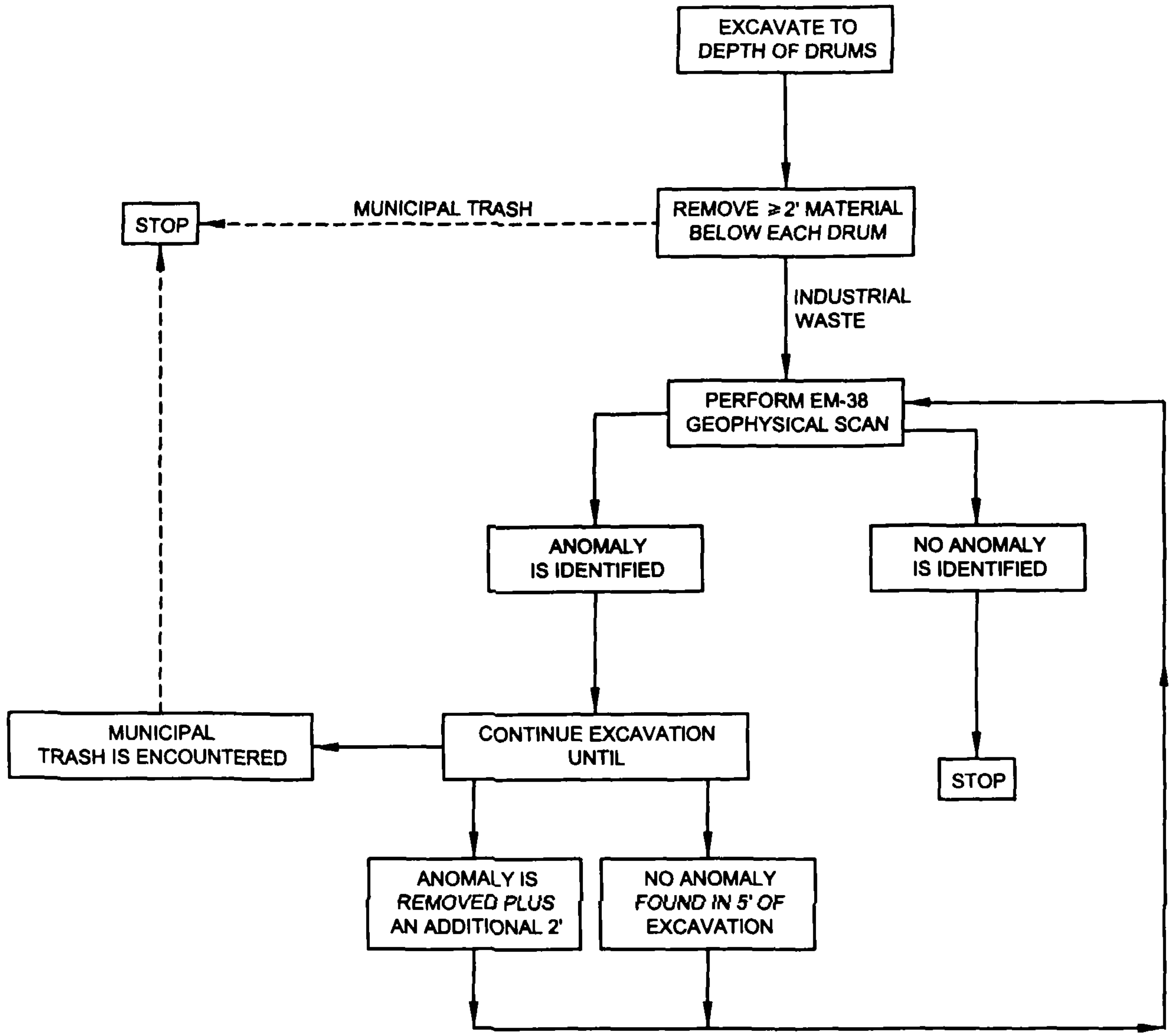



figure 4.2

DECISION TREE FOR DISPOSAL AREA 1 EXCAVATION
NORTH SANITARY LANDFILL
*Dayton, Ohio*

06351-27(033)GN-WA029 NOV 09/2001

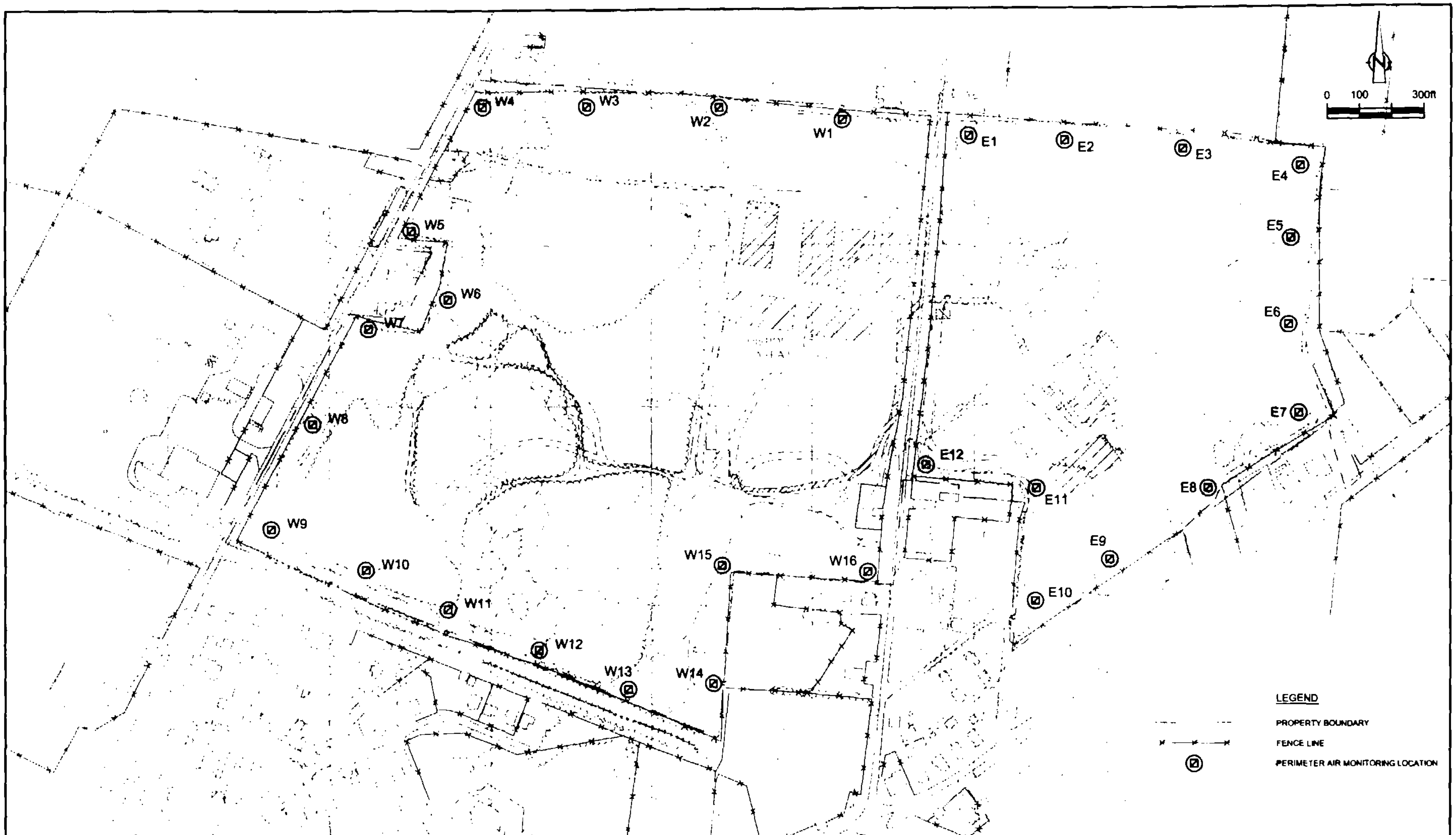



figure 4.3
PERIMETER AIR MONITORING
STATION LOCATIONS
NORTH SANITARY LANDFILL
*Dayton, Ohio*

06351-27(033)GN-WA005 NOV 07/2001

TABLES

**TABLE 4.1**

**DRUM REMOVAL FIELD DATA SHEET**
**NORTH SANITARY LANDFILL**
**DAYTON, OHIO**

Site Name: North Sanitary Landfill ____________ Sheet ____ of ____

Project No.: 6351 (23) ____________ Drum No.: ____________

Area: ❑ 1 ❑ 5 ❑ Tanker Date: ____________

*Drum Assessment:*

Drum Size: (circle one) 5 15 20 30 55 85 gallons

Drum Type: ❑ Carbon Steel ❑ Stainless Steel ❑ Plastic ❑ Other

Head Type: ❑ Open Head ❑ Closed Head ____________

Condition: ❑ Crushed ❑ Punctured Other ____________
❑ Bent ❑ Corroded ____________
❑ Ruptured ❑ Unrecognizable ____________
❑ Head seal broken/missing

Contents: ❑ Liquid ❑ Solid ❑ Semi-Solid ❑ Empty ❑ Unknown

Markings: ____________

*Soil/Drum Screening:*

HNu - *Drum Headspace:* ____________ Explosimeter: ____________
*Soil:* ____________ Rad. Survey: ____________

Visual: ____________ Other: ____________

*Location:*

Section View Plan View

Overpack Drum Size: ❑ 85-gallon ❑ 110-gallon ❑ Not Overpacked
Photograph(s): Roll #(s): ____________ Exposure #(s): ____________

Comments: ____________

Date Removed From Excavation: ____________
Date Sampled: ____________

Field Observer: ____________

# APPENDICES

A

# APPENDIX A

# ADMINISTRATIVE ORDER

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 5**

| | | |
|---|---|---|
| IN THE MATTER OF: | ) | Docket No. V-W-98-C-496 |
| | ) | |
| | ) | ADMINISTRATIVE ORDER BY |
| NORTH SANITARY LANDFILL | ) | CONSENT PURSUANT TO |
| (A.K.A. VALLEYCREST LANDFILL) | ) | SECTION 106 OF THE |
| | ) | COMPREHENSIVE |
| | ) | ENVIRONMENTAL RESPONSE, |
| Respondents: | ) | COMPENSATION, AND |
| | ) | LIABILITY ACT OF 1980, |
| | ) | as amended, 42 U.S.C. |
| See attached Service List | ) | § 9606(a) |
| | ) | |

## I. JURISDICTION AND GENERAL PROVISIONS

This Order is entered voluntarily by the United States Environmental Protection Agency ("U.S. EPA") and the Respondents. The Order is issued pursuant to the authority vested in the President of the United States by Sections 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §§ 9606(a), 9607 and 9622. This authority has been delegated to the Administrator of the U.S. EPA by Executive Order No. 12580, January 23, 1987, 52 Federal Register 2923, and further delegated to the Regional Administrators by U.S. EPA Delegation Nos. 14-14-A, 14-14-C and 14-14-D, and to the Director, Superfund Division, Region 5, by Regional Delegation Nos. 14-14-A, 14-14-C and 14-14-D.

This Order provides for performance of investigation and removal actions and reimbursement of response costs incurred by the United States in connection with property located at 200 Valleycrest Drive, Montgomery County, Dayton, Ohio (the "North Sanitary Landfill Site", "NSL Site", or the "Site"). This Order requires the Respondents to conduct investigation and removal actions described herein to abate a potential imminent and substantial endangerment to the public health, welfare or the environment that may be presented by the actual or threatened release of hazardous substances at or from the Site.

A copy of this Order will also be provided to the State of Ohio, which has been notified of the issuance of this Order pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

Respondents' participation in this Order shall not constitute an admission of liability or of U.S. EPA's findings or determinations contained in this Order except in a proceeding to enforce the terms of this Order. Respondents agree to comply with and be bound by the terms of this Order. Respondents further agree that they will not contest the basis or validity of this Order or its terms in any proceeding to enforce this Order.

## II. PARTIES BOUND

This Order applies to and is binding upon U.S. EPA, and upon Respondents and Respondents', receivers, trustees, successors and assigns. Any change in ownership or corporate status of Respondents including, but not limited to, any transfer of assets or real or personal property shall not alter such Respondents' responsibilities under this Order. Respondents are jointly and severally liable for carrying out all activities required by this Order. Compliance or noncompliance by one or more Respondents with any provision of this Order shall not excuse or justify noncompliance by any other Respondent.

Respondents shall ensure that their contractors, subcontractors, and representatives comply with this Order. Respondents shall be responsible for any noncompliance with this Order.

## III. FINDINGS OF FACT

Based on available information, including the Administrative Record in this matter, U.S. EPA hereby finds that:

1. The North Sanitary Landfill Site ("NSL Site"), also known as (a.k.a.) the Valleycrest Landfill Site, is located at 200 Valleycrest Drive in Dayton, Montgomery County, Ohio. The NSL Site occupies approximately 102 acres and is located in a mixed residential/industrial area within the northeast portion of Dayton, Ohio. The NSL Site is bordered by residential areas to the north (Valleycrest Drive), west (Brandt Street), and south (Valley Street). Commercial businesses are also located along the southern perimeter of the Site along Valley Street.

2. The NSL Site is owned by the Keystone Gravel Company of Dayton, Ohio ("Keystone") which operated a sand and gravel mining operation on the property from the 1940s until the 1970s. Keystone's mining operations created large depressions across the majority of the NSL Site which were later used for disposal of municipal, commercial, industrial and other types of wastes.

3. As extrapolated from historical evidence, there were five disposal areas designated at the Site in U.S. EPA's site investigation report in 1991. Between approximately 1966

and 1975, disposal operations were conducted on three portions of the Keystone property encompassing an area of approximately 50 acres (Disposal Areas 1,2, and 5) by the North Sanitary Landfill Company, Inc. Disposal Areas 1 and 5 were used for among other things, drum disposal areas. The areas within Disposal Area 1 and 5 where drums were alleged to have been disposed of are hereinafter referred to as "Drum Disposal Areas 1 and 5". Beginning in the late 1970s and continuing until 1989 two portions of the NSL site were used by Peerless Transportation Company, Inc. for disposal of foundry sand, fly ash and baghouse dust (Disposal Areas 3 and 4). The industrial and municipal wastes were placed into unlined former gravel pits which historical accounts suggest were either ponded with water or intersected the water table and reportedly include used oils, solvents, scrap paint, electrical transformers, brake grindings containing asbestos, and sewage. Historic photographs of the NSL site and information on file with the Ohio Environmental Protection Agency ("OEPA") documents disposal of drums containing both liquid and non-liquid industrial wastes. The integrity of these drums, remaining contents and the potential threat posed by residual contamination from these drums is, at this time, undefined.

4. The NSL Site is split into two sections by Valleycrest Drive. Disposal Area 1 occupies the area east of Valleycrest Drive. OEPA Site records indicate that Disposal Area 1 was used for disposal of municipal and industrial wastes between 1966 and 1970. At the completion of municipal landfill activities, drummed industrial wastes were reportedly used to fill a large water filled depression within Disposal Area 1 and may have been used to fill in other depressions within that disposal area. Based on historic photographs, the depth of the buried drums appears to be limited to approximately ten feet below ground surface. The existing topography consists of small irregular mounds. Observations made during the fire mitigation drum removal activities performed by the Potentially Responsible Party's ("PRP") contractors in November 1997, indicate that drums or drum remnants may be present in some of these mounds.

5. An additional area where drums were disposal of is Disposal Area 5, located along the western side of Valleycrest Drive. OEPA records and historical photographs indicate that drums were deposited in Disposal Area 5. OEPA records indicate that Disposal Area 5 operated between 1973 and 1974. During a Site inspection on January 29, 1974, the Miami Conservancy District observed at least 50 drums of used oil and unknown liquid chemicals in an area along the western side of Valleycrest Drive within Disposal Area 5. In addition, representatives from Inland Products were observed dumping a

40-cubic yard dumpster full of drums onto the ground during the inspection. The contents of many of the drums spilled onto the ground. Some of the drums were labeled "polyurethane foam", "fiberglass resin", "clear coat vinyl lacquer", "mold release", "flammable cyclo-scrap", "formaldehyde", and "hot dump".

6. U.S. EPA began investigating the NSL Site in 1986. As part of the U.S. EPA investigation, a geophysical survey was conducted on the eastern portion of the Site and 21 monitoring wells were installed in the sand and gravel aquifer beneath the Site. The Site is situated in between the City of Dayton's two major municipal well fields. This aquifer, known as the Great Miami Buried Valley Aquifer, is a federally designated sole -source aquifer and provides drinking water for approximately 487,000 people in the Greater Dayton Area. Analysis of groundwater and soil samples collected by U.S. EPA revealed the presence of volatile organic compounds ("VOCs"), heavy metals, and PCBs. The extent to which drum disposal at the NSL Site has contributed to these measured levels of contamination is at this time unknown. Organic substances have been detected in several private drinking water wells in the area. It appears that affected residences have been connected to the municipal water supply.

7. U.S. EPA placed the NSL Site on the National Priorities List ("NPL") in May of 1994. U.S. EPA also entered into a Cooperative Agreement with the OEPA pursuant to Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, ("CERCLA"). Under the terms of the Cooperative Agreement, the OEPA was authorized to take state-lead enforcement actions at the NSL Site with respect to the performance of a Remedial Investigation/ Feasibility Study ("RI/FS"). In accordance with the terms of the Cooperative Agreement, the OEPA entered into an Administrative Order by Consent ("OEPA AOC") with the Valleycrest Landfill Site PRP Group ("VLSG") on January 31, 1995, and has been proceeding to oversee the performance of the RI/FS for the NSL Site. The VLSG completed the first phase of the RI in 1996. Analysis of groundwater samples collected during Phase I of the Remedial Investigation from a single shallow ground water monitoring well screened immediately beneath the waste in Disposal Area 5, detected elevated levels (above background concentrations) of vinyl chloride (120 parts per billion), benzene (19 ppb), trichloroethene (10 ppb), cis-1,2-dichloroethene (1,000 ppb), 1,1-dichloroethane (100 ppb). Additionally, the following contaminants were also detected in the same monitoring well: carbon disulfide, chlorobenzene, chloroethane, ethyl benzene, tetrachloroethene ("PCE"), toluene, xylenes, endrin, and

lindane. Twenty-nine (29) groundwater monitoring wells located around the perimeter of the Site were also sampled during Phase I of the RI. Analysis of the groundwater samples from the perimeter monitoring wells did not detect chemicals or detected chemicals at low concentrations.

8. In September of 1996, the Dayton Fire Department, the Regional Hazmat Team, and OEPA Emergency Response personnel and the VLSG contractors responded to an underground fire in Disposal Area 1. Pursuant to the emergency clause of the OEPA AOC, VLSG contractors removed multiple surface drums (partially buried) associated with the underground fire. VLSG contractor actions included a reduction in the height of vegetative cover, identification of on-site emergency access routes, and the collection and off-site disposal of several hundred tons of surface debris including approximately 27 surface drums (including partially buried drums). During the fire mitigation drum removal activities in November 1997, additional subsurface drums were documented but not removed. Waste from five drums, selected by OEPA for sampling based on the OEPA PID readings, and stained soils from within four localized areas of visible staining identified by OEPA withing certain drum excavation pits, were sampled during the fire mitigation drum removal activities. Subsequent analysis of the select samples detected the presence of inorganic compounds, semi-volatile compounds, and volatile organic compounds. The following represents a portion of the compounds detected: Barium (4,600 mg/kg), Trichloroethene (370,000 mg/kg), Toluene (2,500 mg/kg), Lead (1,370 mg/kg), 1,1,1-Trichloroethane (190,000 mg/kg), Tetrachloroethene (2,500 mg/kg), Mercury (16 mg/kg), Phenol (1,400 mg/kg), and Chromium (839 mg/kg).

9. On March 5,1998, U.S. EPA's On-Scene Coordinator ("OSC"), Steven L. Ren...inger and U.S. EPA's Environmental Response Team ("ERT") Geologist Greg Powell conducted a site investigation at the NSL Site with OEPA site coordinator Kurt Kollar. During U.S. EPA's investigation, the OSC observed numerous mounded areas some of which exhibited partially exposed drums and drum parts in Disposal Areas 1 and 5. Subsequently, on April 13, 1998, OEPA's Kurt Kollar and representatives of VLSG went onto the Site and covered all remaining alleged observable drums or drum remnants on the Site with at least three inches of clean soil.

10. On April 22, 1998, U.S. EPA Superfund Technical Assessment and Response Team ("START") collected five summa canister samples from the NSL site for volatile organic ("VOC") analysis. Samples from perimeter gas probes TGP-30, TGP-23 detected benzene, toluene, ethyl benzene and xylene, at the landfill perimeter. Additionally, daily methane monitoring performed by VLSG since January, 1998 has documented up to

70% methane (TGP-30) in perimeter gas probes adjacent to off-site residential areas. The majority of perimeter gas probes have not exhibited an excedence of the lower explosive limit ("LEL") for methane. In addition, no methane or VOCs have been detected during VLSG and U.S. EPA monitoring rounds within occupied structure in the vicinity of the Site.

## IV. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set forth above, and the Administrative Record supporting these investigation and removal actions, U.S. EPA has determined that:

1. The North Sanitary Landfill Site a.k.a. Valleycrest Landfill Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

2. Trichloroethene, toluene, lead, 1,1,1-trichloroethane, tetrachloroethene, mercury, methylene chloride, phenol, vinyl chloride, benzene, ethyl benzene, and polychlorinated biphenyls ("PCBs") are "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

3. Each Respondent is a "person" as defined by Section 101(21)of CERCLA, 42 U.S.C. § 9601(21).

4. Respondents NCR Corporation; General Motors Corporation; North Sanitary Landfill Co.; Industrial Waste Disposal; Blaylock Trucking Company; Danis Industries Corporation; Bendix (Allied Signal, Inc.); DAP/Roberts Consolidated; Dayton Industrial Drum (Lammers Barrel); and Gayston Corporation. are either persons who at the time of disposal of any hazardous substances owned or operated the North Sanitary Landfill Site, or who arranged for disposal or transport for disposal of hazardous substances at the North Sanitary Landfill Site. Respondents are therefore liable persons under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

5. The conditions described in the Findings of Fact above constitute an actual or threatened "release" of a hazardous substance from the facility into the "environment" as defined by Sections 101(8) and (22) of CERCLA, 42 U.S.C. §§ 9601(8) and (22).

6. The conditions present at the Site constitute a potential threat to public health, welfare, or the environment based upon the factors set forth in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, as amended ("NCP"), 40 CFR § 300.415(b)(2). The North Sanitary Landfill Site Action Memo which was signed by the Director of the

Superfund Division on April 23, 1998 describes the potential threats at the Site.

7. The actual or threatened release of hazardous substances from the Site may present an imminent and substantial endangerment to the public health, welfare, or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

8. The actions required by this Order, if properly performed under the terms of this Order, are consistent with the NCP. The actions required by this Order are necessary to protect the public health, welfare, or the environment.

## V. ORDER

Based upon the foregoing Findings of Fact, Conclusions of Law and Determinations, it is hereby ordered and agreed that Respondents shall comply with the following provisions, including but not limited to all documents attached to or incorporated into this Order, and perform the following actions:

1. Designation of Contractor, Project Coordinator, and On-Scene Coordinator

Respondents shall perform all actions required by this Order themselves or retain contractors to implement such actions. Respondents shall notify U.S. EPA of Respondents' qualifications or the name and qualifications of such contractors, whichever is applicable, within 5 business days of the effective date of this Order. Respondents shall also notify U.S. EPA of the name and qualifications of any other contractors or subcontractors retained to perform work under this Order at least 5 business days prior to commencement of such work. U.S. EPA retains the right to disapprove of the Respondents or any of the contractors and/or subcontractors retained by the Respondents. If U.S. EPA disapproves a selected contractor, Respondents shall retain a different contractor within 14 business days following U.S. EPA's disapproval and shall notify U.S. EPA of that contractor's name and qualifications within 14 business days of U.S. EPA's disapproval or notify U.S. EPA that Respondents will perform the action thereof.

Within 7 business days after the effective date of this Order, the Respondents shall designate a Project Coordinator who shall be responsible for administration of all the Respondents' actions required by the Order. Respondents shall submit the designated coordinator's name, address, telephone number, and qualifications to U.S. EPA. To the greatest extent possible, the Project Coordinator shall be present on-site or readily available during site work. U.S. EPA retains the right to disapprove of any

Project Coordinator named by the Respondents. If U.S. EPA disapproves a selected Project Coordinator, Respondents shall retain a different Project Coordinator within 7 business days following U.S. EPA's disapproval and shall notify U.S. EPA of that person's name and qualifications within 7 business days of U.S. EPA's disapproval. Receipt by Respondents' Project Coordinator of any notice or communication from U.S. EPA relating to this Order shall constitute receipt by all Respondents.

The U.S. EPA has designated Steven L. Renninger of the Emergency Response Branch, Region 5, as its On-Scene Coordinator ("OSC"). Respondents shall direct all submissions required by this Order to the OSC at 26 West Martin Luther King Drive, B-2, Cincinnati, Ohio, 45268, by certified or express mail. Respondents shall also send a copy of all submissions to Sean Mulroney, Assistant Regional Counsel, 77 West Jackson Boulevard, C-14J, Chicago, Illinois, 60604-3590. All Respondents are encouraged to make their submissions to U.S. EPA on recycled paper (which includes significant postconsumer waste paper content where possible) and using two-sided copies.

U.S. EPA and Respondents shall have the right, subject to the immediately preceding paragraph, to change their designated OSC or Project Coordinator. U.S. EPA shall notify the Respondents, and Respondents shall notify U.S. EPA, as early as possible before such a change is made, but in no case less than 24 hours before such a change. The initial notification may be made orally but it shall be promptly followed by a written notice.

2. Work to Be Performed

Respondents shall perform the following activities:

a) Develop and implement a site Health and Safety plan to address landfill gas extraction system installation and drum removal activities, including an air monitoring plan and site contingency plan;

b) Develop and implement a site security plan or modify the existing VLSG site security plan to address removal activities;

c) Identify and delineate drum, tank and container disposal areas utilizing U.S. EPA ERT geophysical survey results generated May 18-27, 1998 and submitted to VLSG contractors on June 9 and 26, 1998. Areas to be investigated include Drum Disposal Areas 1 & 5 and suspected subsurface tanker area in Disposal Area 2. The investigation shall use test pits within areas identified by geophysical survey results as containing anamolies;

d) Conduct removal of: i)intact drums; ii)pooled non-aqueous phase liquid; and iii) other drummed material and surrounding media impacted by drum contents which exceed a)regulatory limits (defined by 40 C.F.R. 261.24 Table 1) of selected TCLP parameters as agreed upon in the Work Plan pursuant to Attachment A; or b) PCBs (defined by 40 C.F.R. 761.60). The determination whether this material will be disposed of off site shall be made pursuant to Paragraph 2(g) below;

e) Excavate, stage, sample, overpack, if necessary, and characterize waste materials identified in d) above;

f) Decontaminate and/or dispose of all scrap metal associated with buried containers and RCRA-empty drums produced during removal activities. The degree of decontamination and/or need for disposal of scrap metal will be based on criteria established in the Work Plan;

g) Transport and dispose of all characterized or identified hazardous waste which exceed: a)regulatory limits (defined by 40 C.F.R. 261.24 Table 1) of selected TCLP parameters as agreed upon in the Work Plan pursuant to Attachment A; or b)regulatory limits for PCBs (defined by 40 C.F.R. 761.60); which cannot be disposed of on Site, as agreed upon in the Work Plan, at a RCRA/CERCLA/TSCA approved disposal facility in accordance with U.S. EPA's Off-Site Rule (40 CFR § 300.440);

h) Backfill excavated areas with clean fill or non-hazardous solid waste from removal activities and vegetate or otherwise stabilize exposed soils to prevent soil erosion;

i) Construct, operate, and maintain a landfill gas management system designed to intercept laterally-migrating landfill gas from the perimeter of the North Sanitary Landfill. The performance of this system shall be such that methane concentrations shall not exceed 25 percent of the LEL in any off-site structures and shall not exceed 100 percent of the LEL in soil at the landfill property boundary. The conditions to be met by the landfill gas management system will include the criteria established in the May 22, 1998 technical meeting and summarized by Ohio EPA's correspondence dated May 22, 1998 except as follows: drill cuttings will be managed in accordance with correspondence with OEPA dated June 9, 18 and 19, 1998. The landfill gas abatement system Work Plan will be due to U.S. EPA and OEPA on July 7, 1998. The landfill gas abatement will be constructed and the system startup commenced

September 1, 1998;

j) Develop a monitoring plan, including installation of a system of monitoring probes designed to allow appropriate evaluation of the gas extraction system performance; and

k) This landfill gas monitoring plan will include provisions for routine monitoring (including dedicated probe placement, if necessary) of all site perimeters and, where warranted, off-site structures which could be impacted by lateral off-site migration of landfill gas from the NSL Site.

l) All work done by the VLSG pursuant to the OEPA AOC regarding investigating the Site, landfill gas conditions and drum investigation and removal, will be utilized by U.S. EPA and Respondents to the fullest extent possible in its Site work under this AOC. As reflected in OEPA correspondence dated June 8, 1998 and July 9, 1998, all future work done by the Respondents herein in compliance with this AOC regarding landfill gas conditions and drum conditions on the Site shall constitute compliance with the OEPA AOC FFOs in regard to these same Site conditions.

The activities described above are consistent with the potential final remedial action for these source areas as, based on recent sample results, the subsurface drums, tanks and containers may represent principal threat wastes which may threaten the integrity and long term effectiveness of the anticipated source area containment system(s).

2.1 Work Plan and Implementation

The Respondents shall submit to U.S. EPA for approval a draft Landfill Gas Abatement System Work Plan on July 28, 1998 and a draft Work Plan for performing the drum investigation and removal activities on August 24, 1998. The draft Work Plans shall provide a description of, and an expeditious schedule for, the activities required by this Order.

U.S. EPA may approve, disapprove, require revisions to, or modify the draft Work Plan or portions thereof. If U.S. EPA requires revisions, Respondents shall submit a revised draft Work Plan within 14 calendar days of receipt of U.S. EPA's notification of required revisions. Respondents shall implement the Work Plan as finally approved in writing by U.S. EPA in accordance with the schedule approved by U.S. EPA. Once approved, or approved with modifications, the Work Plan, the schedule, and any subsequent modifications shall be fully enforceable under this Order. Respondents shall notify U.S. EPA at least 48 hours prior to performing any on-site work pursuant to the U.S. EPA approved Work Plan. Respondents shall not commence or undertake any removal actions at the Site without prior U.S. EPA approval.

The landfill gas abatement system will be implemented in accordance with OEPA's correspondence dated May 22, 1998 and "landfill gas abatement plan" submitted to OEPA in March 1998 as modified pursuant to the terms hereof, and the schedule agreed to by the parties hereto.

The monitoring plan will also be implemented in accordance with OEPA's correspondence dated May 22, 1998 and "explosive gas monitoring plan" submitted to OEPA in March 1998 as modified pursuant to the terms hereof, and the schedule agreed to by the parties hereto.

2.2 Health and Safety Plan

The Respondents shall submit a plan for U.S. EPA review and comment that ensures the protection of the public health and safety during performance of on-site work under this Order by no later than July 28, 1998 for the landfill gas abatement system and August 24, 1998 for the drum investigation and removal activities. This plan shall comply with applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 CFR Part 1910. This provision can be satisfied by the submission of the Site Health and Safety Plans submitted by the VLSG to OEPA pursuant to the OEPA AOC with any modifications that are necessary due to a different or extended scope of work under this AOC. If U.S. EPA determines it is appropriate, the plan shall also include contingency planning. Respondents shall incorporate all changes to the plan recommended by U.S. EPA, and implement the plan during the pendency of the investigation and removal action.

2.3 Quality Assurance and Sampling

All sampling and analyses performed pursuant to this Order shall conform to U.S. EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondents shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with U.S. EPA guidance. This provision can be satisfied by the submission of the Quality Assurance and Sampling Plan submitted by the VLSG to OEPA pursuant to the OEPA AOC with any modifications that are necessary due to a different or extended scope of work under this AOC.

Upon request by U.S. EPA, Respondents shall have such a laboratory analyze samples submitted by U.S. EPA for quality assurance monitoring. Respondents shall provide to U.S. EPA the quality assurance/quality control procedures followed by all sampling teams and laboratories performing data collection and/or analysis. Respondents shall also ensure provision of analytical tracking information consistent with OSWER Directive No. 9240.0-2B, "Extending the Tracking of Analytical Services to PRP-Lead Superfund Sites."

Upon request by U.S. EPA, Respondents shall allow U.S. EPA or its authorized representatives to take split and/or duplicate samples of any samples collected by Respondents or their contractors or agents while performing work under this Order. Respondents shall notify U.S. EPA not less than 3 business days in advance of any sample collection activity. U.S. EPA shall have the right to take any additional samples that it deems necessary.

2.4 Post-Removal Site Control

In accordance with the Work Plan schedule, or as otherwise directed by the OSC, Respondents shall submit a proposal for post-removal site control, consistent with Section 300.415(l) of the NCP, 40 CFR § 300.415(l), and OSWER Directive 9360.2-02. Upon U.S. EPA approval, Respondents shall implement such controls and shall provide U.S. EPA with documentation of all post-removal site control arrangements.

2.5 Reporting

Respondents shall submit a monthly written progress report to U.S. EPA concerning actions undertaken pursuant to this Order, beginning 30 calendar days after the date of U.S. EPA's approval of the Work Plan, until termination of this Order, unless otherwise directed in writing by the OSC. These reports shall describe all significant developments during the preceding period, including the work performed and any problems encountered, analytical data received during the reporting period, and developments anticipated during the next reporting period, including a schedule of work to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

Any Respondent that owns any portion of the Site shall, at least 30 days prior to the conveyance of any interest in real property at the Site, give written notice of this Order to the transferee and written notice of the proposed conveyance to U.S. EPA and the State. The notice to U.S. EPA and the State shall include the name and address of the transferee. The party conveying such an interest shall require that the transferee will provide access as described in Section V.3 (Access to Property and Information).

2.6 Final Report

Within 60 calendar days after completion of all removal actions required under this Order, the Respondents shall submit for U.S. EPA review a final report summarizing the actions taken to comply with this Order. The final report shall conform to the requirements set forth in Section 300.165 of the NCP, 40 CFR § 300.165. The final report shall also include a good faith estimate of total costs incurred in complying with the Order, a listing of quantities and types of materials removed off-site or handled on-site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destinations of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during this action (e.g., manifests, invoices, bills, contracts, and permits).

The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

> Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete.

3. Access to Property and Information

Respondents shall use their best efforts to provide or obtain access to the Site and off-site areas to which access is necessary to implement this Order, and shall provide access to all records and documentation related to the conditions at the Site and the actions conducted pursuant to this Order. If for any reason Respondents are, after a good faith effort to obtain such access, unable to obtain access, U.S. EPA, at the Respondents written request, shall take action in cooperation with Respondents to obtain such access. Such access shall be provided to U.S. EPA employees, contractors, agents, consultants, designees, representatives, and State of Ohio representatives. These individuals shall be permitted to move freely at the Site in order to conduct actions which U.S. EPA determines to be necessary. Respondents shall submit to U.S. EPA, upon request, the results of all sampling or tests and all other data generated by Respondents or their contractors, or on the Respondents' behalf during implementation of this Order.

Where work under this Order is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use their best efforts to obtain all necessary access agreements within 21 calendar days after the effective date of this Order, or as otherwise specified in writing by the OSC. Respondents shall immediately notify U.S. EPA if, after using their best efforts, they are unable to obtain such agreements. Respondents shall describe in writing their efforts to obtain access. U.S. EPA may then assist Respondents in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as U.S. EPA deems appropriate. Respondents shall reimburse U.S. EPA for all costs and attorneys fees incurred by the United States in obtaining such access.

4. Record Retention, Documentation, Availability of Information

Respondents shall preserve all non-privileged documents, in their possession or the possession of their contractors, subcontractors or representatives, relating to work performed under this Order, or relating to the hazardous substances found on or released from the Site, for six years following completion of the actions required by this Order. At the end of this six year period and at least 60 days before any document or information is destroyed, Respondents shall notify U.S. EPA that such non-privileged documents are available to U.S. EPA for inspection, and upon request, shall provide the originals or copies of such non-privileged documents and information to U.S. EPA. In addition, Respondents shall provide non-privileged documents and information retained under this Section at any time before expiration of the six year period at the written request of U.S. EPA. Respondents may delegate their duties under this Section to their project coordinator.

5. Off-Site Shipments

All hazardous substances, pollutants or contaminants removed off-site pursuant to this Order for treatment, storage or disposal shall be treated, stored, or disposed of at a facility in compliance, as determined by U.S. EPA, with the U.S. EPA Off-Site Rule, 40 CFR § 300.440, 58 Federal Register 49215 (Sept. 22, 1993).

6. Compliance With Other Laws

Respondents shall perform all actions required pursuant to this Order in accordance with all applicable local, state, and federal laws and regulations except as provided in CERCLA Section 121(e), 42 U.S.C. § 9621(e), and 40 CFR § 300.415(j). In accordance with 40 CFR § 300.415(j), all on-site actions required pursuant to this Order shall, to the extent practicable, as determined by U.S. EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements under federal environmental or state environmental or facility siting laws.

7. Emergency Response and Notification of Releases

If any incident, or change in Site conditions, resulting from the activities conducted pursuant to this Order causes or threatens to cause an additional release of hazardous substances which poses an imminent and substantial endangerment to the public health, welfare, or the environment, the Respondents shall immediately take all reasonable and appropriate action to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify the OSC or, in the event of his unavailability, shall notify the Regional Duty Officer, Emergency Response Branch, Region 5 at (312) 353-2318, of the incident or Site conditions. If Respondents fail to respond, U.S. EPA may respond to the release or endangerment and reserve the right to recover costs associated with that response.

Respondents shall submit a written report to U.S. EPA within 10 business days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. Respondents shall also comply with any other notification requirements, including those in CERCLA Section 103, 42 U.S.C. § 9603, and Section 304 of the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. § 11004.

## VI. AUTHORITY OF THE U.S. EPA ON-SCENE COORDINATOR

The OSC shall be responsible for overseeing the implementation of this Order. The OSC shall have the authority vested in an OSC by the NCP, including the authority to halt, conduct, or direct any work required by this Order, or to direct any other response action undertaken by U.S. EPA or Respondents at the Site. Absence of the OSC from the Site shall not be cause for stoppage of work unless specifically directed by the OSC.

## VII. REIMBURSEMENT OF COSTS

As soon as practicable after the effective date of this Order, U.S. EPA will send Respondents a bill for "past response costs" at the Site. U.S. EPA's bill will include an Itemized Cost Summary. "Past response costs" are all costs authorized by law, including, but not limited to, direct and indirect costs and interest, that the United States, its employees, agents, contractors, consultants, and other authorized representatives incurred and paid with regard to the Site prior to the date through which the Itemized Cost Summary runs.

U.S. EPA will send Respondents a bill for "oversight costs" on an annual basis. "Oversight costs" are all costs authorized by law, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this AOC.

Respondents shall, within 30 calendar days of receipt of a bill, remit a cashier's or certified check for the amount of the bill made payable to the "Hazardous Substance Superfund", to the following address:

U.S. Environmental Protection Agency
Superfund Accounting
P.O. Box 70753
Chicago, Illinois 60673

Respondents shall simultaneously transmit a copy of the check to the Director, Superfund Division, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, Illinois, 60604-3590. Payments shall be designated as "Response Costs - North Sanitary Landfill Site" and shall reference the payer's name and address, the U.S. EPA site identification number B543, and the docket number of this Order.

In the event that any payment is not made within the deadlines described above, Respondents shall pay interest on the unpaid balance. Interest is established at the rate specified in Section 107(a) of CERCLA, 42 U.S.C. § 9607(a). The interest shall begin to accrue on the date of the Respondent's receipt of the bill (or for past response costs, on the effective date of this Order). Interest shall accrue at the rate specified through the date of the payment. Payments of interest made under this paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondents' failure to make timely payments under this Section.

Respondents may dispute all or part of a bill for Oversight costs submitted under this Order, if Respondents allege that U.S. EPA has made an accounting error, or if Respondents allege that a cost item is inconsistent with the NCP.

If any dispute over costs is resolved before payment is due, the amount due will be adjusted as necessary. If the dispute is not resolved before payment is due, Respondents shall pay the full amount of the uncontested costs into the Hazardous Substance Fund as specified above on or before the due date.

## VIII. DISPUTE RESOLUTION

The parties to this Order shall attempt to resolve, expeditiously and informally, any disagreements concerning this Order.

If the Respondents object to any U.S. EPA action taken pursuant to this Order, including billings for response costs, the Respondents shall notify U.S. EPA in writing of their objections within 14 calendar days of such action, unless the objections have been informally resolved. This written notice shall include a statement of the issues in dispute, the relevant facts upon which the dispute is based, all factual data, analysis or opinion supporting Respondents' position, and all supporting documentation on which such party relies. U.S. EPA shall submit its Statement of Position, including supporting documentation, no later than 14 calendar days after receipt of the written notice of dispute. The time periods for exchange of written documents relating to disputes over billings for response costs may be extended by agreement of the parties.

An administrative record of any dispute under this Section shall be maintained by U.S. EPA. The record shall include the written notification of such dispute, and the Statement of Position served pursuant to the preceding paragraph. Upon review of the administrative record, the Director of the Superfund Division, U.S. EPA Region 5, shall resolve the dispute consistent with the NCP and the terms of this Order.

Respondents' obligations under this Order shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondents shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with U.S. EPA's decision, whichever occurs.

## IX. FORCE MAJEURE

Respondents agree to perform all requirements under this Order within the time limits established under this Order, unless the performance is delayed by a *force majeure*. For purposes of this Order, a *force majeure* is defined as any event arising from causes beyond the control of Respondents or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, that delays or prevents performance of any obligation under this Order despite Respondents' best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the work or increased cost of performance.

Respondents shall notify U.S. EPA orally within 24 hours after Respondents become aware of any event that Respondents contend constitutes a *force majeure*, and in writing within 7 calendar days after the event. Such notice shall: identify the event causing the delay or anticipated delay; estimate the anticipated length of delay, including necessary demobilization and re-mobilization; state the measures taken or to be taken to minimize the delay; and estimate the timetable for implementation of the measures. Respondents shall take all reasonable measures to avoid and minimize the delay. Failure to comply with the notice provision of this Section may be grounds for U.S. EPA to deny

Respondents an extension of time for performance. Respondents shall have the burden of demonstrating by a preponderance of the evidence that the event is a _force majeure_, that the delay is warranted under the circumstances, and that best efforts were exercised to avoid and mitigate the effects of the delay.

If U.S. EPA determines a delay in performance of a requirement under this Order is or was attributable to a _force majeure_, the time period for performance of that requirement shall be extended as deemed necessary by U.S. EPA. Such an extension shall not alter Respondents' obligation to perform or complete other tasks required by the Order which are not directly affected by the _force majeure_.

## X. STIPULATED AND STATUTORY PENALTIES

For each day, or portion thereof, that Respondents fail to fully perform any requirement of this Order, which includes all requirements under the approved Work Plan, in accordance with the schedule established pursuant to this Order, Respondents shall be liable as follows: (1) $200 for each requirement for each calendar day for the first 14 calendar days or portion thereof; (2) after the first 14 calendar days, $300 for each requirement for each calendar day for the next 14 calendar days or portion thereof; (3) after the first 28 calendar days, $400 for each requirement for each calendar day for the next 14 calendar days or portion thereof; (4) after the first 42 calendar days, $500 for each requirement for each calendar day for the next 14 calendar days or portion thereof; and (5) after the first 56 calendar days, $750 for each requirement for each calendar day or portion thereof thereafter. The provisions of this Section are subject to the provisions of Section VIII (Dispute Resolution) and Section IX (Force Majeure).

Upon receipt of written demand by U.S. EPA, Respondents shall make payment to U.S. EPA within 30 days and interest shall accrue on late payments in accordance with Section VII of this Order (Reimbursement of Costs).

Even if violations are simultaneous, separate penalties shall accrue for separate violations of this Order. Penalties accrue and are assessed per violation per day. Penalties shall accrue regardless of whether EPA has notified Respondents of a violation or act of noncompliance. The payment of penalties shall not alter in any way Respondents' obligation to complete the performance of the work required under this Order. Stipulated penalties shall accrue, but need not be paid, during any dispute resolution period concerning the particular penalties at issue. If Respondent prevail upon resolution, Respondents shall pay only such penalties as the resolution requires. In its unreviewable discretion, U.S. EPA may waive its rights to demand all or a portion of the stipulated penalties due under this Section. Such a waiver must be made in writing.

Should Respondents violate this Order or any portion hereof, U.S. EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Order pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606 and/or seek penalties pursuant to Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1) and Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3).

## XII. OTHER CLAIMS

By issuance of this Order, the United States and U.S. EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or U.S. EPA shall not be a party or be held out as a party to any contract entered into by the Respondents or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out activities pursuant to this Order.

Except as expressly provided in Section XIII (Covenant Not To Sue), nothing in this Order constitutes a satisfaction of or release from any claim or cause of action against the Respondents or any person not a party to this Order, for any liability such person may have under CERCLA, other statutes, or the common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106(a) or 107(a) of CERCLA, 42 U.S.C. §§ 9606(a), 9607(a).

This Order does not constitute a preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2). No action or decision by U.S. EPA pursuant to this Order shall give rise to any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

## XIII. COVENANT NOT TO SUE

Except as otherwise specifically provided in this Order, during the pendency of this Order so long as Respondents are in compliance thereof and/or upon issuance of the U.S. EPA notice referred to in Section XVII (Notice of Completion), U.S. EPA covenants not to sue Respondents for judicial imposition of damages or civil penalties or to take administrative action against Respondents for any failure to perform removal actions agreed to in this Order except as otherwise reserved herein.

Except as otherwise specifically provided in this Order, in consideration and upon Respondents' payment of the response costs specified in Section VII of this Order, U.S. EPA covenants not to sue or to take administrative action against Respondents under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), for recovery of response and oversight costs incurred by the United States in connection with this Order an any matters addressed herein. This covenant not to sue shall take effect upon the receipt by U.S. EPA of the payments required by Section VII (Reimbursement of Costs).

These covenants not to sue are conditioned upon the complete and satisfactory performance by Respondents of their obligations under this Order. These covenants not to sue extend only to the Respondents and do not extend to any other person.

## XIV. CONTRIBUTION PROTECTION

With regard to claims for contribution against Respondents for matters addressed in this Order, the Parties hereto agree that the Respondents are entitled to protection from contribution actions or claims to the extent provided by Section 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4). Nothing in this Order precludes Parties from asserting any claims, causes of action or demands against any persons not parties to this Order for indemnification, contribution, or cost recovery.

## XV. INDEMNIFICATION

Respondents agree to indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action: (A) arising from, or on account of, acts or omissions of Respondents and Respondents' officers, heirs, directors, employees, agents, contractors, subcontractors, receivers, trustees, successors or assigns, in carrying out actions pursuant to this Order; and (B) for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between (any one or more of) Respondents, and any persons for performance of work on or relating to the Site pursuant to this AOC including claims on account of construction delays. Nothing in this Order, however, requires indemnification by Respondents for any claim or cause of action against the United States based on negligent action taken solely and directly by U.S. EPA.

## XVI. MODIFICATIONS

Modifications to any plan or schedule may be made in writing by the OSC or at the OSC's oral direction. If the OSC makes an oral modification, it will be memorialized in writing within 7 business days; however, the effective date of the modification shall be the date of the OSC's oral direction. Any other requirements of this Order may be modified in writing by mutual agreement of the parties.

If Respondents seek permission to deviate from any approved plan or schedule, Respondents' Project Coordinator shall submit a written request to U.S. EPA for approval outlining the proposed modification and its basis.

No informal advice, guidance, suggestion, or comment by U.S. EPA regarding reports, plans, specifications, schedules, or any other writing submitted by the Respondents shall relieve Respondents of their obligations to obtain such formal approval as may be required by this Order, and to comply with all requirements of this Order unless it is formally modified.

## XVII. NOTICE OF COMPLETION

When U.S. EPA determines, after U.S. EPA's review of the Final Report, that all drum/tanker and/or landfill gas work has been fully performed in accordance with this Order, except for certain continuing obligations required by this Order (e.g., record retention, payment of costs), U.S. EPA will provide written notices to the Respondents that they have successfully completed the work required under this AOC which Notice as recognized by OEPA in it correspondence of June 8, 1998 shall constitute compliance with the requirements of the OEPA AOC relating to matters addressed in this AOC. This Notice by U.S. EPA of completion of the drum/tanker work under this AOC will represent a determination that these hot spots as defined in U.S. EPA guidance have been addressed at the Site. If U.S. EPA determines that any removal activities have not been completed in accordance with this Order, U.S. EPA will notify the Respondents, provide a list of the deficiencies, and require that Respondents modify the Work Plan if appropriate to correct such deficiencies. The Respondents shall, subject to Section VIII (Dispute Resolution) and Section IX (Force Majeure), implement the modified and approved Work Plan and shall submit a modified Final Report in accordance with the U.S. EPA notice. Failure to implement the finally approved modified Work Plan shall be a violation of this Order.

## XVIII. SEVERABILITY

If a court issues an order that invalidates any provision of this Order or finds that Respondents have sufficient cause not to comply with one or more provisions of this Order, Respondents shall remain bound to comply with all provisions of this Order not invalidated by the court's order.

## XIX. EFFECTIVE DATE

This Order shall be effective upon receipt by Respondents of a copy of this Order signed by the Director, Superfund Division, U.S. EPA Region 5.

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

**SIGNATORIES**

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this ___________ day of _______________, 1998.

By ___________________________________________

IT IS SO ORDERED AND AGREED

BY: ______________________ DATE: 9/10/98

William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

**SIGNATORIES**

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this August 20 ~~day of~~ ______________, 1998.

By Kate Moertl
Attorney, Waste Management, Inc.
North Sanitary Land Fill Co.
Industrial Waste Disposal
Blaylock Trucking Co.

IT IS SO ORDERED AND AGREED

BY:________________________________ DATE:______________

William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

## SIGNATORIES

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this 28th day of August, 1998.

By ______________________________
Elizabeth Sitterly, Assistant Corporate Counsel of Cross & Trecker
Successor to the Bendix plant located at 721 Springfield Street, Dayton, OH

IT IS SO ORDERED AND AGREED

BY: ______________________________ DATE: ______________
William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

**SIGNATORIES**

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this 27th day of August, 1998.
DAYTON INDUSTRIAL DRUM, INCORPORATED

By ______________________
David Hussong

IT IS SO ORDERED AND AGREED

BY: ______________________ DATE: ______________
William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

**SIGNATORIES**

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this 31 day of AUGUST, 1998.

By ______________________
Gayston Corporation
Jay G. Heitz
Vice President Commerce

IT IS SO ORDERED AND AGREED

BY:______________________ DATE:______________

William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

**SIGNATORIES**

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this 20th day of August, 1998.

General Motors Corporation

By Don A. Schiemann

Don A. Schiemann, Esq.
General Motors Corporation, Legal Staff, MC 482-112-149
3044 W. Grand Blvd., Detroit, MI 48202

IT IS SO ORDERED AND AGREED

BY:____________________ DATE:__________

William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

**SIGNATORIES**

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this 20th day of August, 1998.

DANIS INDUSTRIES CORPORATION

By Gregory L. McCann
Gregory L. McCann, Senior Vice President,
General Counsel and Secretary

IT IS SO ORDERED AND AGREED

BY:______________________ DATE:______________

William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

IN THE MATTER OF:

NORTH SANITARY LANDFILL SITE (A.K.A. VALLEYCREST LANDFILL SITE)
DAYTON, OHIO

**SIGNATORIES**

Each undersigned representative of a signatory to this Administrative Order on Consent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind such signatory, its directors, officers, employees, agents, successors and assigns, to this document.

Agreed this 20th day of August, 1998.

By Jon S. Hoak
Jon S. Hoak
On behalf of NCR

IT IS SO ORDERED AND AGREED

BY:______________________ DATE:______________
William E. Muno, Director
Superfund Division
United States
Environmental Protection Agency
Region 5

**RESPONDENTS TO ADMINISTRATIVE ORDER ON CONSENT**
**NORTH SANITARY LANDFILL (VALLEYCREST) SITE**

NCR Corporation
Attn: Paul Samson
101 Schantz Avenue
Dayton, Ohio 45419

General Motors Corporation
Attn: Don Schieman
New Centre One Building
3031 West Grand Blvd.
P.O. Box 33122
Detroit, Michigan 48232

North Sanitary Landfill Company
c/o Waste Management North America
Attn: Katie Moertl, Esq.
3003 Butterfield Road
Oak Brook, IL 60523

Industrial Waste Disposal
c/o Waste Management North America
Attn: Katie Moertl, Esq.
3003 Butterfield Road
Oak Brook, IL 60523

Blaylock Trucking Company
c/o Waste Management North America
Attn: Katie Moertl, Esq.
3003 Butterfield Road
Oak Brook, IL 60523

Danis Industries Corp
Attn: Greg McCann
2 River Place Suite 400
Dayton, Ohio 45405

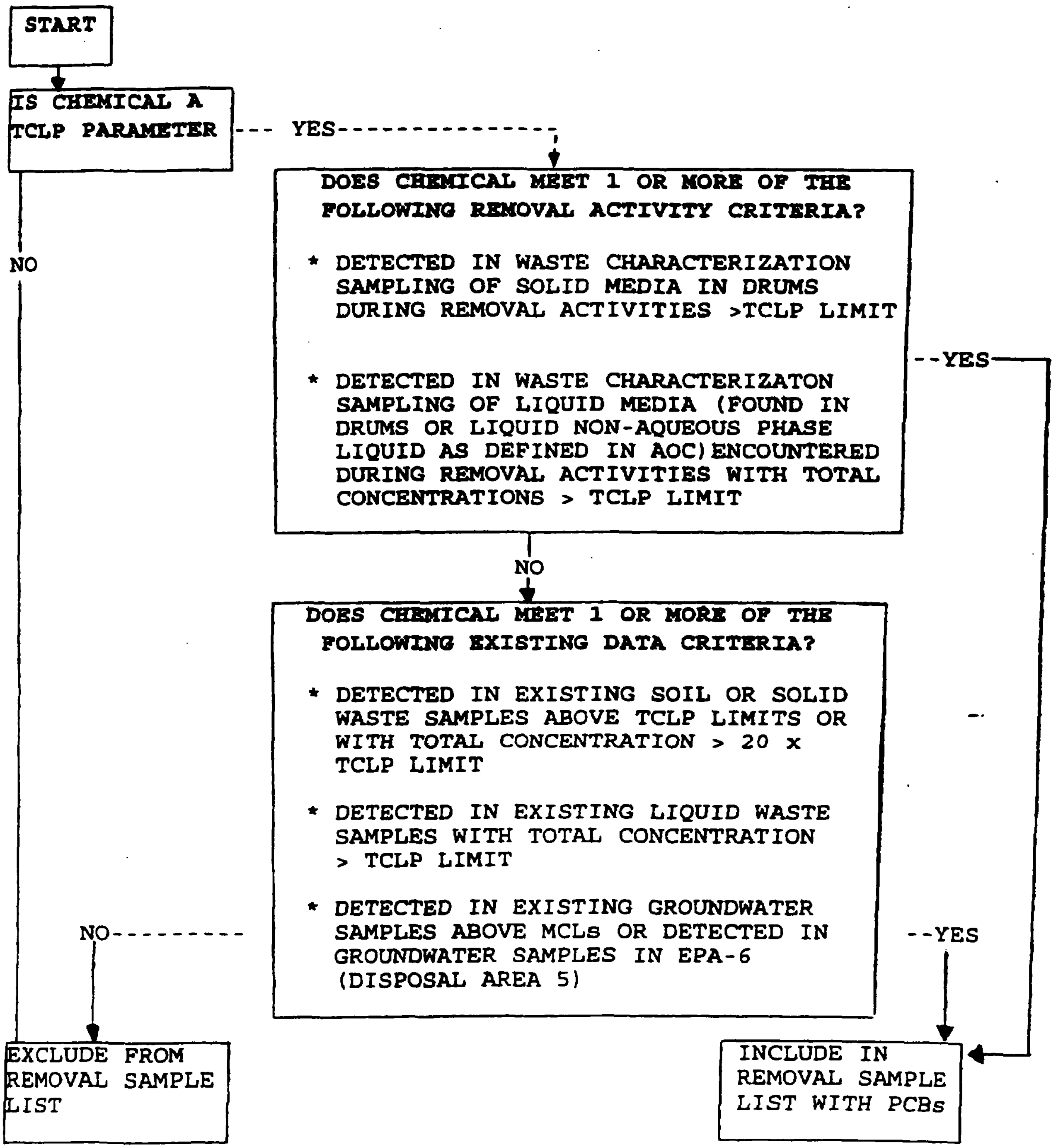
Dayton Industrial Drum
(f/k/a Lammars Barrel)
c/o Tim Hoffman
Coolidge, Wall, Womsley & Lombard
Suite 600
33 W. First Street
Dayton, Ohio 45402-1289

Gayston Corporation
c/o Tim Hoffman
Coolidge, Wall, Womsley & Lombard
Suite 600
33 W. First Street
Dayton, Ohio 45402-1289

Bendix (Allied Signal, Inc.)
c/o Heleen Schiller
P.O. Box 2246
R Building AB-3
101 Columbia Road
Morristown, NJ 07960

DAP/Roberts Consolidated
Paul R. Noll
SmithKline Beecham
One Franklin Plaza
Philadelphia, PA 19102

# ATTACHMENT A
# TCLP PARAMETER LIST



| TCLP PARAMETER | EXISTING DATA CRITERIA MET |
|---|---|
| Chlordane | Detected in EPA-6 |
| Endrin | Detected in EPA-6 |
| Heptachlor | Detected in EPA-6 |
| Lindane | EPA-6 > MCL |
| Methoxychlor | Detected in EPA-6 |
| Arsenic | EPA-6 > MCL |
| Barium | Detected in EPA-6<br>Soil >20x TCLP (Total)<br>Drum >20x TCLP (Total) |
| Cadmium | Soil >20x TCLP (Total)<br>Drum >20x TCLP (Total) |
| Chromium | Detected in EPA-6<br>Soil >20x TCLP (Total)<br>Drum >20x TCLP (Total) |
| Lead | Soil >20x TCLP (Total)<br>Drum >20x TCLP (Total) |
| Mercury | Soil >20x TCLP (Total) |
| Benzene | >MCL |
| 1,2-Dichloroethane | Drum > TCLP |
| 1,1-Dichloroethylene | Drum > TCLP |
| Tetrachloroethylene | Drum > TCLP<br>Soil > 20x TCLP (Total) |
| Trichloroethylene | > MCL<br>Drum > TCLP<br>Soil > 20x TCLP (Total) |
| Vinyl Chloride | > MCL |

APPENDIX B

SITE SAFETY PLAN

# SITE SAFETY PLAN

Date: November 2001

Project Name: Disposal Area 1 Drum Removal Action
North Sanitary Landfill
Dayton, Ohio

Approved By: ________________ Date: ________
CRA Project Manager

Approved By: ________________ Date: ________
CRA Health and Safety Coordinator

Approved By: ________________ Date: ________
CRA Site Manager

Approved By: ________________ Date: ________
CRA Health and Safety Officer

SSP: ________________ Date: ________________

<u>TABLE OF CONTENTS</u>



SSP: ______________________ Date: ______________________

TABLE OF CONTENTS



SSP: ______________________ Date: ______________________

## LIST OF FIGURES
(Following Text)



## LIST OF TABLES
(Following Text)



SSP: ______________________ Date: ______________________

# LIST OF ATTACHMENTS



SSP: ______________________ Date: ______________________

# GLOSSARY OF ACRONYMS

| | | |
|---|---|---|
| ANSI | - | AMERICAN NATIONAL STANDARDS INSTITUTE |
| APR | - | AIR PURIFYING RESPIRATOR |
| ACGIH | - | AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS |
| CFR | - | CODE OF FEDERAL REGULATIONS |
| CGI | - | COMBUSTIBLE GAS INDICATOR |
| CLEAN ZONE | - | SUPPORT ZONE |
| CSEP | - | CONFINED SPACE ENTRY PERMIT |
| DECON | - | DECONTAMINATION |
| ERCS | - | EMERGENCY RESPONSE CLEAN-UP SERVICES |
| HNU-PID | - | HNU PHOTOIONIZATION DETECTOR |
| HOT ZONE | - | EXCLUSION ZONE |
| IDLH | - | IMMEDIATELY DANGEROUS TO LIFE AND HEALTH |
| MREM/hr | - | MILLI-ROENTGENS EQUIVALENT IN MAN PER HOUR |
| NIOSH | - | NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH |
| OSC | - | ON-SCENE COORDINATOR |
| OSHA | - | OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION LIMIT |
| OVA | - | ORGANIC VAPOR ANALYZER |
| PEL | - | PERMISSIBLE EXPOSURE LIMIT |
| PPM | - | PARTS PER MILLION |
| RM | - | RESPONSE MANAGER |
| SCBA | - | SELF-CONTAINED BREATHING APPARATUS |
| SOP | - | STANDARD OPERATING PROCEDURE |
| SPCC | - | SPILL PREVENTION CONTROLS AND COUNTERMEASURES |
| START | - | SUPERFUND TECHNICAL ASSISTANCE AND RESPONSE TEAM |
| TLV | - | THRESHOLD LIMIT VALUE |
| TWA | - | TIME WEIGHTED AVERAGE |
| U.S. EPA | - | U.S. ENVIRONMENTAL PROTECTION AGENCY |

SSP: ____________________ Date: ____________________

# INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed for the North Sanitary Landfill (Site), to protect on-Site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during implementation of the Disposal Area 1 Removal Action Work Plan (Work Plan). The procedures and guidelines contained herein were based upon available information at the time of the plan's preparation. Specific requirements will be revised when new information is received or conditions change. A written amendment will document all changes made to the plan. Any amendments to this plan will be included in Attachment A. Where appropriate, specific OSHA standards or other guidance will be cited and applied.

## DAILY SAFETY MEETINGS

Daily safety meetings will be held at the start of each shift to ensure that all personnel understand Site conditions and operating procedures, to ensure that personal protective equipment is being used correctly, and to address worker health and safety concerns.

## SITE SAFETY PLAN ACCEPTANCE ACKNOWLEDGMENT

The Health and Safety Officer (HSO) or designated representative shall be responsible for informing all individuals entering the exclusion zone or decontamination zone of the contents of this plan and ensuring that each person signs the Safety Plan Acknowledgment Form in Attachment Z. By signing the Safety Plan Acknowledgment Form, individuals are recognizing the hazards present on Site and the policies and procedures required to minimize exposure or adverse effects of these hazards.

## TRAINING REQUIREMENTS

All personnel (including visitors) entering an exclusion zone or decontamination zone must have completed training requirements for hazardous waste site work in accordance with OSHA 29 CFR 1910.120 or be qualified by previous training or experience. Documentation of training requirements is the responsibility of each employer.

SSP: ______________________ Date: ______________________

## MEDICAL MONITORING REQUIREMENTS

All personnel (including visitors) entering an exclusion zone or decontamination zone must have completed appropriate medical monitoring requirements required under *OSHA 29-CFR 1910.120 (f)*. Documentation of medical monitoring is the responsibility of each employer. If there are additional medical monitoring requirements for this Site, evidence of compliance must also be included.

## FIT TESTING REQUIREMENTS

All personnel (including visitors) entering an exclusion zone or decontamination zone using a full-face negative pressure respirator must have successfully passed a qualitative respirator FIT test in accordance with OSHA 29 CFR 1910.134; or, ANSI within the last 12 months. *Documentation of FIT testing is the responsibility of each employer.* Quantitative FIT testing is required for the use of negative pressure respirators for protection against airborne asbestos fibers (OSHA 29 CFR 1926.58) and lead (OSHA 29 CFR 1910.1025).

## ASSOCIATED DOCUMENTS

Contractors are required to follow the requirements of this Site Safety Plan. Contractors performing activities which involve potential contact with waste materials are also required to implement their own Health and Safety Plans to address specific functions that they perform.

SSP: ______________________ Date: ______________________

## 1.0 SITE BACKGROUND AND SCOPE OF WORK

### 1.1 ROLES AND RESPONSIBILITIES

On-Scene Coordinator (OSC):

The OSC, as the representative of U.S. EPA, is responsible for project oversight and for coordinating health and safety standards for all individuals on Site at all times. All U.S. EPA health and safety guidelines and requirements as well as all applicable OSHA standards shall be applied. However, each contractor (as an employer under OSHA) is also responsible for the health and safety of its employees. If there is any dispute with regard to health and safety, the following procedures shall be followed:

1. attempt to resolve the issue on Site; and
2. if the issue cannot be resolved, on-Site personnel shall consult off-Site supervisors for assistance and the specific task operation in dispute shall be discontinued until the issue is resolved.

Site Manager:

The Site Manager, as the field supervisor of the clean-up contractor of the Respondents, has the responsibility for fulfilling the terms of the Administrative Order. The Site Manager must oversee the project and ensure that all technical, regulatory and safety requirements are met. It is the Site Manager's responsibility to communicate with the OSC as frequently as dictated by the OSC, but at least daily, regarding Site clean-up progress and any problems encountered.

Superfund Technical Assistance and Response Team (START):

START 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 relating to sampling, treatment, packaging, labeling, transport, and disposal of hazardous materials, but is not limited to the above-mentioned.

Other:

Any persons who observe safety problems should immediately report observations/concerns to appropriate key personnel listed on the following page.

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## 1.2 KEY PERSONNEL

| | |
|---|---|
| U.S. EPA On-Scene Coordinator (OSC): | Steve Renninger<br>26 W. Martin Luther King Dr.<br>Cincinnati, Ohio 45268<br>513-569-7539 |
| CRA Project Manager | Ian Richardson |
| CRA Site Manager | Pete Schwarz |
| Principal Contractor: | to be determined |
| Subcontractors: | Judge Engineering (Surveying)<br>Data Chem Laboratory<br>Southern Petroleum Laboratory<br>Belmonte Park Environmental Labs |
| CRA Health and Safety Officer: | Pete Schwarz |
| Superfund Technical Assistance and Response Team (START): | TetraTech EM Inc.<br>250 W. Court St., Suite 200W<br>Cincinnati, Ohio 45202<br>513-241-0149 |
| START Representatives: | John Sherrard |
| Ohio EPA | Kurt Kollar<br>401 E. Fifth Street<br>Dayton, Ohio<br>45402-2911 |

SSP: ______________________ Date: ______________________

## 1.3 SITE BACKGROUND

### 1.3.1 GENERAL

The Site is located at 950 Brandt Pike, in the City of Dayton, Montgomery County, Ohio. The Site location is shown on Figure 1.1. The Site comprises an area of approximately 100 acres that is separated into east and west portions by north-south trending Valleycrest Drive. (In December 1998, Valleycrest Drive was closed to the public and an access road from Brandt Pike to the residents located north of the Site was constructed.) The eastern portion of the Site comprises approximately 35 acres and the western portion of the Site comprises approximately 65 acres. The Site is owned by Keystone Gravel Company of Dayton, Ohio.

The Site is located in a mixed urban, industrial, and residential area. The Site is bordered on the east and northeast by a residential neighborhood, on the north by several residences, and further north by an abandoned demolition landfill. The Site is bordered on the southeast by commercial and residential structures and Valley Street, and on the southwest by the CSX railroad property and residences. The Site is bordered on the west by two residences, located at [redacted] and [redacted] Brandt Pike, and several industrial facilities, including the Brandt Pike petroleum terminals [comprised of the British Petroleum (formerly Sohio), Shell Oil Company, and Sun Oil facilities], Van Dyne Crotty Inc. industrial cleaner facility, and the Hotop demolition landfill. Approximately 1,500 people live within 1/2 mile of the Site (Ohio Department of Health, 1994).

The Site is currently owned by the Keystone Gravel Company, and was operated as a sand and gravel quarry from before 1935 until the 1970s. In 1966, the landfill began accepting waste in the eastern portion of the Site. Filling in the eastern portion of the Site continued until approximately 1970. In 1970, the landfill began accepting waste in the eastern part of the western portion of the Site and continued until approximately 1975. Disposal of foundry sand in parts of the western portion continued until the late 1980s/early 1990s.

### 1.3.2 DISPOSAL AREAS

As part of the investigation work conducted at the Site, five disposal areas were identified. The five disposal areas are shown on Figure 1.3. Disposal Areas 1, 2, and 5 reportedly received municipal/industrial waste, while Disposal Areas 3 and 4 reportedly received foundry sand. Based on the area of Disposal Areas 1, 2, and 5 and

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an average depth of 25 feet of waste material, the Site received approximately 2.2 million cubic yards of municipal/industrial waste.

### 1.3.2.1 DISPOSAL AREA 1

Mixed municipal and industrial waste was reportedly disposed in Disposal Area 1, in the excavation from the sand and gravel quarrying. The waste types known to have been disposed include household refuse and industrial wastes including some drummed waste. It has been reported that the base of the former quarry in parts of Disposal Area 1 contained standing water during the period of waste disposal activities. Landfilling progressed from southeast to northwest. Landfilling commenced in 1966 and continued until 1970. Photographs taken at Disposal Area 1 during landfill operations indicate the presence of drums.

### 1.3.2.2 DISPOSAL AREAS 2 AND 5

Mixed municipal and industrial waste was reportedly disposed in Disposal Areas 2 and 5, in the excavation from the sand and gravel quarrying. Drums of waste oil, paint, paint thinner, formaldehyde, solvents, and other liquid waste were reportedly disposed in 1973 and 1974 in Disposal Area 5 immediately west of Valleycrest Drive (Ohio Department of Health, 1994). It has been reported that the base of the former quarry in parts of Disposal Areas 2 and 5 contained standing water during the period of waste disposal activities. Landfilling commenced in Disposal Area 2 in 1970. Landfilling ceased in Disposal Areas 2 and 5 in 1975 (E&E, 1991). Photographs taken at Disposal Area 5 during landfill operations indicate the presence of drums.

### 1.3.3 TOPOGRAPHY

The surface topography of the Site is variable. Elevations in the eastern portion range from approximately 770 feet above mean sea level (AMSL) around the perimeter to approximately 762 feet AMSL in the center. Elevations in the western portion of the Site range from approximately 770 feet AMSL around the perimeter and across the surface of the disposal areas to approximately 745 feet AMSL within the unfilled depressions in the center of the western portion. As a result of the topography, as described above, off-Site surface drainage is not promoted. Hence, precipitation which falls on the Site will tend to infiltrate rather than run off of the Site.

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The surface topography for the lands in the vicinity of the Site is generally flat with minor undulations. The surface contours range from the 750 to 775 feet AMSL. Several man-made features disturb the natural topography. These include a former sand and gravel pit to the southeast, the elevated highway to the south, and the excavated area to the northeast of the area.

### 1.3.4 GEOLOGY

The local geology beneath the Site generally consists of continuous glaciofluvial deposits consisting of loose sands and gravels and discontinuous glacial till deposits consisting of very dense silts and clays.

The first encountered native material underlying the Site is glaciofluvial material generally consisting of loose sand and gravel. This sand and gravel unit appears to be present everywhere beneath the Site. Lying below this sand and gravel unit is a discontinuous zone of dense glacial till consisting predominantly of dry to moist silts and clays, with small amounts of intermixed gravel and sand throughout.

## 1.4 SCOPE OF WORK FOR REMOVAL CONTRACTOR

The Scope of Work for the removal contractor includes but is not limited to the following:

1) Conduct excavation activities at locations identified in the Work Plan;
2) Segregate drums removed from the excavation into the following categories: intact drums containing solids, drums containing liquids, debris drums, and RCRA empty drums;
3) Conduct excavation and overpacking of intact drums and drums containing liquids;
4) Conduct excavation, shredding, and bulking of debris drums and load into roll-off containers;
5) Conduct excavation, pressure washing, and backfilling of RCRA empty drums within a designated portion of the excavation;

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6) Inspect all drums and drum carcasses removed from the excavation for the presence of PRP information (as discussed further in the Wok Plan). Drums or containers containing valid PRP information shall be segregated and fully documented;

7) Conduct removal of pooled NAPL from excavated areas and place in a designated storage tank;

8) Conduct excavation of all waste material above, adjacent to, and 2 feet below buried drums and containers, and relocate to previously excavated areas within the active excavation;

9) Perform a geophysical scan at the base of each excavated removal grid for which the bottom of the excavation contains industrial or mixed waste to verify buried drums have been removed, and continue excavation as necessary (based on the procedures described in the Work Plan);

10) Stage overpacked drums on the drum staging pad;

11) Conduct HazCat/compatibility testing of material in overpacked drums;

12) Conduct analysis for RCRA hazardous characteristics (full TCLP and reactivity, corrosivity, and ignitability) and PCBs of representative sample(s) of compatible material from overpacked drums and from bulked compatible liquids;

13) Conduct bulking of compatible liquids from overpacked drums;

14) Conduct bulking of compatible solids from intact drums, if appropriate;

15) Collect samples from roll-off containers containing direct-bulked debris drums and analyze for RCRA hazardous characteristics and PCBs;

16) Conduct off-Site disposal of solid waste material from drums;

17) Conduct off-Site disposal of all accumulated liquids at licensed disposal facilities approved by the U.S. EPA;

18) Collect post-excavation samples from each completed removal grid from material located within the middle third of the depth to which excavation extended in that grid, and analyze for full TCLP and PCBs;

19) Cover completed removal grids with a minimum of 6 inches of clean fill. Grids for which post-excavation sample results exceeded regulatory limits for VOCs will have a 12-mil polyethylene liner installed above the waste prior to covering with the 6-inch fill layer;

20) At the completion of Disposal Area 1 excavation, install vapor extraction piping within grids for which their respective post-excavation sample results exceeded TCLP regulatory limits for VOCs. This is discussed further in the Work Plan.

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Note that grids that are represented by post-excavation samples with analytical results that exceed regulatory limits for other parameters will be evaluated under the ongoing Remedial Investigation/Feasibility Study (RI/FS), being conducted under the oversight of Ohio EPA;

21) Treat grids that are represented by post-excavation samples with analytical results that exceed TCLP regulatory limits for VOCs using VE;

22) Conduct post-treatment sampling of treated grids in order to confirm successful completion of treatment; and

23) Continue treatment of grids that are represented by post-treatment samples with analytical results that exceed TCLP regulatory limits for VOCs and re-sample these grids, if necessary. Repeat this process, if necessary, until all grids are represented by post-treatment samples for which analytical results do not exceed TCLP regulatory limits for VOCs.

## 1.5 SCOPE OF WORK FOR U.S. EPA DESIGNATED OVERSIGHT PERSONNEL

START and/or Ohio EPA will conduct oversight of all Site work and report directly to the U.S. EPA OSC.

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## 2.0 TASK SAFETY AND HEALTH RISK ANALYSIS

This Hazard Assessment identifies the general hazards associated with specific Site operations and presents an analysis of documented or potential chemical hazards that exist at the Site. Every effort must be made to reduce or eliminate these hazards. Those which cannot be eliminated must be guarded against by use of engineering controls and/or personal protective equipment.

### 2.1 ACTIVITY SPECIFIC HAZARDS AND SOPS

#### 2.1.1 HAZARDS AND SOPS ASSOCIATED WITH DRUM REMOVAL ACTIVITIES

Hazards associated with drum removal activities include but are not limited to the following; cold stress (Attachment C), heat stress (Attachment D) inclement weather (Attachment S), chemical hazards (Table 2.1), management of decontamination wastes (Attachment I), use of respiratory protection (Attachment J), air monitoring program (Attachment K), personnel training requirements for entry (Attachment L), hazardous waste storage (Attachment M), drum handling (Attachment N), compressed gas cylinders (Attachment T), fall protection (Attachment U), hazard communication (Attachment V), work around heavy equipment (Attachment P), test pit/excavations (Attachment O), equipment decontamination (Attachment Q), liquid transfer (Attachment N), liquid sampling (Attachment N - Drum Handling), soil sampling (Attachment R), and equipment refueling (Attachment X).

### 2.2 GENERAL SITE HAZARDS

Lighting - Work areas must have adequate lighting for employees to see to work and identify hazards (5-foot-candles minimum comparable to a single 75- to 100- watt bulb). Personnel should carry flashlights in all normally dark areas for use in the event of a power failure. Applicable OSHA standards for lighting - 29 CFR 1910.120 (m) - shall apply.

Electrical Power - All electrical power must have a ground fault circuit interrupter as part of the circuit. All equipment must be suitable and approved for the class of hazard. Applicable OSHA standards for electrical - 29 CFR 1926 Subpart "K" shall apply.

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Walkways, etc. - N/A

High or Elevated Work - The edges around all excavations will be considered as high or elevated work areas due to the fall potential. These areas will be either fenced to keep unnecessary personnel away from the fall potential or will be appropriately sloped to eliminate the fall hazard.

Drum Handling - The movement and opening of drums will be performed in accordance with 29 CFR 1910.120 (j) and the SOP contained in Attachment N of this SSP.

Cold Stress - When the temperature falls below 35°F (2°C) a cold stress program will be considered and implemented as appropriate. Employees shall have access to break periods and warming shelters as required. Cold stress is discussed in detail in Attachment C.

Heat Stress - When the temperature exceeds 70°F and personnel are wearing protective clothing, a heat stress monitoring program shall be implemented as appropriate. Employees shall have access to break periods and drinking water as necessary. Heat stress is discussed in detail in Attachment D.

Eye Wash-Protection - All operations involving the potential for eye injury, splash, etc. must have approved eye wash units locally available as per 29 CFR 1910.151 (c).

Fire Protection/Fire Prevention - Operations involving the potential for fire hazards shall be conducted in a manner as to minimize the risk. Non-sparking tools and fire extinguishers shall be used or available as appropriate. Sources of ignition shall be removed. When necessary, explosion-proof instruments and/or bonding and grounding will be used to prevent fire or explosion.

Utilities - overhead and underground utility hazards shall be identified and or inspected prior to conducting operations involving potential contact.

Medical Waste - Operations involving medical waste shall not be undertaken until contacting the Site Safety Officer to assess the nature of the hazard. Depending upon the volume, the waste shall be collected using a shovel or backhoe bucket and placed into a 110-gallon, DOT-approved overpack container. Minimum protective equipment shall be Level D PPE, including hard hat, safety glasses, steel-toe work boots, and gloves. At no time shall workers touch the medical waste.

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## 2.3 CHEMICAL HAZARDS

Health effects, exposure limits and guidelines for selected hazardous substances known or suspected to be present at the Site based on laboratory analysis of groundwater, soil, and drum samples obtained during previous investigations are described in Table 2.1. The hazardous substances presented in Table 2.1 were selected based on contaminant concentrations from previous Site investigative work and the contaminant's toxicity. The chemical hazards will be evaluated and incorporated into the SSP, through recommended work practices, levels of protection and monitoring equipment usage.

Due to the nature of landfill sites, methane is present in significant concentrations. Methane is a simple asphyxiant and therefore poses little toxicological risk. Methane is explosive between the concentrations of 5 to 15 percent by volume in air. Precautions will be made during all activities where methane is detected, to limit ignition sources. Continuous monitoring will occur during intrusive activities (i.e., excavating) to ensure that explosive gas levels are below 2 percent in the work area. This monitoring will be conducted using an explosimeter.

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## 3.0 TRAINING AND FIT TESTING REQUIREMENTS

Refer to Introduction for site entry requirements.

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## 4.0 PERSONAL PROTECTIVE EQUIPMENT

The following is a brief description of the personal protective equipment which may be required during various phases of the project. The U.S. EPA terminology for protective equipment will be used: Levels A, B, C, and D. The anticipated levels of protection for this project are Levels B, C, Modified C, and D.

Respiratory protective equipment shall be National Institute of Occupational Safety and Health (NIOSH)-approved and use shall conform to OSHA 29 CFR Part 1910.134 requirements. Each employer shall maintain a written respirator program detailing selection, use, cleaning, maintenance, and storage of respiratory protective equipment.

### 4.1 LEVEL A PROTECTION SHALL BE USED WHEN:

- The extremely hazardous substance requires the highest level of protection for skin, eyes, and the respiratory system;
- Substances with a high degree of hazard to the skin are known or suspected;
- Chemical concentrations are known to be above Immediately Dangerous to Life and Health (IDLH) levels; or
- Biological hazards requiring Level A are known or suspected.

Note: Level A protection is not anticipated for this project.

#### 4.1.1 LEVEL A PROTECTIVE EQUIPMENT AT A MINIMUM SHALL CONSIST OF:

- Fully encapsulating exposure suit (selected for resistance to chemical(s) at the Site);
- Chemical resistant boot covers worn over safety-toe work boots;
- Chemical resistant outer gloves (disposable);
- Chemical resistant inner gloves (disposable);
- Pressure-demand SCBA or airline system with egress bottles;
- Hard-hat;
- Use of the "buddy system" of Site entry personnel and appropriate back-up support personnel; and

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- Inspect personnel prior to entry to hot zone.

## 4.2 LEVEL B PROTECTION SHALL BE USED WHEN:

- The substance(s) has been identified and requires a high level of respiratory protection but less skin protection;
- Concentrations of chemicals in the air are IDLH or above the maximum use limit of an air-purifying respirator (APR) with full-face mask;
- Oxygen deficient or potentially oxygen deficient atmospheres (<19.5 percent) are *possible; and/or*
- Confined space entry requires Level B.

### 4.2.1 LEVEL B PROTECTIVE EQUIPMENT AT A MINIMUM SHALL CONSIST OF:

- Chemical resistant coveralls: tyvek or sarenex (for handling liquids);
- Steel-toe workboots;
- Chemical resistant boots or disposable boot covers: latex;
- Disposable inner gloves: nitrile;
- Disposable outer gloves: nitrile;
- Supplied air pressure demand SCBA or airline system with 5-minute egress bottle;
- Hard-hat; and
- Ankles/wrists taped with duct tape.

Note: Use of Level B personal protective equipment require that one person must be available as backup ready to provide emergency assistance.

## 4.3 LEVEL C PROTECTION SHALL BE USED WHEN:

- The same level of skin protection as Level B, but a lower level of respiratory protection is required;

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- The types of air contaminants have been identified, concentrations measured, and an APR is available that can remove contaminants; or
- The substance has adequate warning properties criteria for the use of APRs has been met.

### 4.3.1 LEVEL C PROTECTIVE EQUIPMENT AT A MINIMUM SHALL CONSIST OF:

- Chemical resistant coveralls: tyvek;
- Steel-toe workboots;
- Chemical resistant boots or disposable boot covers: latex;
- Disposable inner gloves: nitrile;
- Disposable outer gloves: nitrile;
- Full-face air purifying respirator (APR);
- Chemical cartridge or canister: MSA GME-H or equivalent;
- Hard-hat; and
- Ankles/wrists taped with duct tape.

### 4.4 MODIFIED LEVEL C PROTECTION SHALL BE USED WHEN:

- The same level of skin protection as Level B, but no respiratory protection is required;
- The types of air contaminants have been identified, concentrations measured, and an APR is available that can remove contaminants;
- The substance has adequate warning properties criteria for the use of APRs has been met; or
- Due to the work activity there is the potential for immediate upgrade to Level C protection.

SSP: ________________ Date: ________________

### 4.4.1 MODIFIED LEVEL C PROTECTIVE EQUIPMENT AT A MINIMUM SHALL CONSIST OF:

- Chemical resistant coveralls: tyvek;
- Steel-toe workboots;
- Chemical resistant boots or disposable boot covers: latex;
- Disposable inner gloves: nitrile;
- Disposable outer gloves: nitrile;
- Full-face air purifying respirator (APR) available at all times and donned as required by air monitoring program;
- Chemical cartridge or canister: MSA GME-H or equivalent;
- Hard-hat; and
- Ankles/wrists taped with duct tape.

### 4.5 LEVEL D PROTECTION SHALL BE USED WHEN:

- The atmosphere contains no known hazard; and
- Work functions preclude splashes, immersion, or the potential for unexpected inhalation of, or contact with, hazardous concentrations of harmful chemicals.

### 4.5.1 LEVEL D PROTECTION EQUIPMENT AT A MINIMUM SHALL CONSIST OF:

- Standard work uniform or coveralls;
- Safety-toe work boots;
- Gloves as needed;
- Safety glasses as needed;
- Splash shield as needed; and
- Hard-hat.

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## 4.6 ACTIVITY SPECIFIC LEVELS OF PROTECTION

| *Activity* | *Level of Protection* | *Special Requirements* |
|---|---|---|
| Site Mobilization | Level D | |
| Clearing | Level D | |
| Construction (i.e., maintenance on decontamination pad, fencing, etc.) | Level D | |
| Test Pit Activities | Level B | |
| Drum Sampling | Level B | |
| Contaminated Waste Material/Soil Excavation | Level B | |
| Soil/Waste Sampling | Level B | |
| Backfilling | Modified Level C | |
| Drum Handling | Level B | |
| Decontamination | Modified Level C/Level C | |
| Air Monitoring | Level D (Site perimeter)<br>Modified Level C/Level C/<br>Level B in Exclusion Zone | |
| Overpacked Drum Handling | Level C/<br>Level B in Exclusion Zone | |
| Waste Liquid Transfer | Level B | |
| Delivery of Materials | Level D | |

Note: Refer to Attachment J for respirator program.

SSP: ______________________ Date: ______________________

## 5.0 MEDICAL MONITORING REQUIREMENTS

Refer to Introduction for site entry requirements.

SSP: ______________________ *Date:* ______________________

## 6.0 AIR MONITORING AND ACTION LEVELS

According to 29 CFR 1910.120 (h), air monitoring shall be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection needed on Site.

### 6.1 ROUTINE AIR MONITORING REQUIREMENTS

- Upon initial entry to rule out IDLH conditions;
- When the possibility of an IDLH condition or flammable atmosphere has developed;
- When work begins on a different portion of the Site;
- Contaminants other than those previously identified are being handled;
- A different type of operation is initiated;
- Employees are handling leaking drums or containers or working in areas with obvious liquid contamination; and
- During confined space work.

Air monitoring will consist at a minimum of the criteria listed in the Site Air Monitoring Program (Attachment K). All air monitoring data will be documented and available in the Site files for review by all interested persons. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications.

SSP: ______________________ Date: ______________________

## 7.0 SITE CONTROL AND STANDARD OPERATING PROCEDURES

### 7.1 WORK ZONES

Work Zones are shown on the Site layout map on Figure 1.2. The primary purpose for Site controls is to establish the hazardous area perimeter, to reduce migration of contaminants into clean areas and to prevent access or exposure to hazardous materials by unauthorized persons. At the end of each workday, the Site should be secured or guarded, to prevent unauthorized entry. Site work zones will include:

#### 7.1.1 CLEAN ZONE/SUPPORT ZONE

This uncontaminated support zone or clean zone will be the area outside the exclusion and decontamination zones and within the geographic perimeters of the Site. This area is used for staging of materials, parking of vehicles, office and laboratory facilities, sanitation facilities, and receipt of deliveries. Personnel entering this zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the exclusion zone. All personnel arriving in the support zone will, upon arrival, report to the command post and sign the Site entry/exit log. There will be one controlled entry/exit point from the clean zone to the decontamination zone.

#### 7.1.2 CONTAMINANT REDUCTION ZONE

This zone will occur at the interface of the exclusion zone and support zone and will provide access for the transfer of construction materials and Site dedicated equipment to the exclusion zone, the decontamination of transport vehicles and equipment handling contaminated soil prior to entering the support zone, the decontamination of personnel and clothing prior to entering the support zone and for the physical segregation of the support zone and exclusion zone.

The location of the contaminant reduction zone is shown on Figure 1.2.

#### 7.1.3 DECONTAMINATION ZONE

The decontamination zone will provide a location for removal of contaminated personal protective equipment and final decontamination of personnel and equipment. All

SSP: ______________________ Date: ______________________

personnel and equipment should exit via the decontamination area. A separate decontamination area will be established for heavy equipment.

This zone will occur at the interface between the clean zone/support zone and the contaminant reduction zone.

### 7.1.4 EXCLUSION ZONE/HOT ZONE

The exclusion zone will be the "hot zone" or contaminated area inside the Site perimeter. Entry to and exit from this zone will be made through a designated point and all personnel will be required to sign the hot zone entry/exit log located at the decon area. Appropriate warning signs to identify the exclusion zone should be posted (e.g., "DANGER - AUTHORIZED PERSONNEL ONLY", PROTECTIVE EQUIPMENT REQUIRED BEYOND THIS POINT", etc.) Exit from the exclusion zone must be accompanied by personnel and equipment decontamination as described below in Section 8.0.

The exclusion zone/hot zone will occur around each excavation. At each excavation, the exclusion zone will extend approximately 100 feet from the edge of excavations and will be adjusted as necessary based on air monitoring results.

## 7.2 GENERAL-FIELD SAFETY AND STANDARD-OPERATING PROCEDURES

- It is our policy to practice administrative hazard control for all Site areas by restricting entrance to exclusion zones to essential personnel and by using operational Standard Operating Procedures (SOPs).
- The "buddy system" will be used at all times by all field personnel in the hot zone. No one is to perform field work alone. Maintain visual, voice or radio communication at all times.
- Whenever possible, avoid contact with contaminated (or potentially contaminated) surfaces. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or set equipment on the ground. Stay away from any waste drums unless necessary. Protect equipment from contamination by bagging.
- Eating, drinking, or smoking is permitted only in designated areas in the support zone.

SSP: ______________________ Date: ______________________

- Hands and face must be thoroughly washed upon leaving the decontamination area.
- Beards or other facial hair that interferes with respirator fit will preclude admission to the hot zone.
- All equipment must be decontaminated or discarded upon exit from the exclusion zone, as determined by the HSO or designate.
- All personnel exiting the exclusion zone must go through the decontamination procedures described in Section 8.0.
- Safety equipment described in Section 4.0 will be required for all field personnel.

SSP: ______________________ Date: ______________________

## 8.0 DECONTAMINATION PROCEDURES

In general, everything that enters the exclusion zone at this Site must either be decontaminated or properly discarded upon exit from the exclusion zone. All personnel, including any state and local officials must enter and exit the hot zone through the decon area. Prior to demobilization, contaminated equipment will be decontaminated and inspected by the HSO or HSO designate before it is moved into the clean zone. Any material that is generated by decontamination procedures will be stored in a designated area in the exclusion zone until disposal arrangements are made.

All personnel must sign the "HOT ZONE ENTRY/EXIT LOG" when entering and exiting the exclusion zone.

Note: The type of decontamination solution to be used is dependent on the type of chemical hazard. The decontamination solution for this Site is soap and water or trisodium phosphate (TSP) detergent and water. Decontamination solution will be changed daily (at a minimum) and collected and stored on Site until disposal arrangements are finalized. Potable water will be available at the decon area.

### 8.1 PROCEDURES FOR EQUIPMENT DECONTAMINATION

Following decontamination and prior to exit from the hot zone, the HSO (or a designated alternate) shall be responsible for ensuring that the item has been sufficiently decontaminated. This inspection shall be included in the Site log.

### 8.2 PROCEDURE FOR PERSONNEL DECONTAMINATION

These are the minimum acceptable requirements:

**LEVEL C/MODIFIED LEVEL C - ROUTINE DECONTAMINATION**

Step 1: Equipment Drop

Deposit equipment used on Site (tools, sampling devices and monitoring instruments, radios, etc.) on plastic dropcloths. These items must be decontaminated or discarded as waste prior to removal from the exclusion zone.

SSP: ______________________ Date: ______________________

Step 2: Outer Boot and Outer Glove Wash and Rinse

Scrub outer boots, outer gloves and/or splash suit with decontamination solution or detergent water. Rinse off using water.

Step 3: Outer Boot and Glove Removal

Remove outer boots and gloves. If outer boots are disposable, deposit in container with plastic liner. If non-disposable, store in a clean, dry place.

Step 4: Cartridge Change

If person leaves exclusion zone to change cartridges, this is the last step in the decontamination procedure. Cartridges are exchanged, new outer gloves and boot covers donned, joints taped, and person returns to hot zone.

Step 5: Outer Garment Removal

Remove chemical resistant outer garments and deposit in container lined with plastic. Decontaminate or dispose of splash suits as necessary.

Step 6: Respiratory Protection Removal

Remove hardhat and facepiece. APR cartridges will be discarded as appropriate. Wash and rinse respirator at least daily. Wipe off and store respiratory gear in a clean, dry location.

Step 7: Inner Glove Removal

Remove inner gloves. Deposit in container for disposal.

Step 8: Field Wash

Utilizing the facilities in the on-Site decontamination trailer (location indicated on Figure 1.2).

Thoroughly wash hands and face with soap and water. Shower as soon as possible.

A sketch of a typical decontamination area for Level C is shown on Figure 8.1.

SSP: ______________________ Date: ______________________

## LEVEL B - ROUTINE DECONTAMINATION

### Step 1 - Equipment Drop

- Deposit equipment used on Site (tools, sampling devices, monitoring equipment, radios, etc.) on plastic drop cloths.
- Decontaminate or dispose of items before removal from Exclusion Zone.

### Step 2 - Outer Boot/Glove Wash and Rinse

- Scrub outer boots/gloves with decontamination solution.
- Rinse using water.

### Step 3 - Outer Boot/Glove Removal

- Remove outer boots/gloves.
- If outer boots/gloves are disposable, deposit in container with plastic liner.
- If outer boots/gloves are non-disposable, store in a clean, dry location.

### Step 4 - Outer Garment Removal

- If using self-contained breathing apparatus (SCBA), remove SCBA back pack and keep the facepiece on until garments are removed. Remove chemical protective outer garments and deposit in appropriate container.

### Step 5 - Respiratory Protection Removal

- Remove hard hat and face piece, and place them on a clean surface.
- Wash and rinse face piece.
- Wipe off and store face piece in a clean, dry location.

SSP: ______________________ Date: ______________________

Step 6 - Inner Glove Removal

- Remove inner gloves.
- Deposit in container for disposal.

Step 7 - Field Wash

Utilizing the facilities in the on-Site decontamination trailer.

- Thoroughly wash hands and face with soap and water.
- Shower as soon as possible.

For Air Tank Exchange Only, Complete the Following Steps:

Step 1 - Equipment Drop

- Deposit equipment used on Site (tools, sampling devices, monitoring equipment, radios, etc.) on plastic drop cloths.
- Decontaminate or dispose of items before removal from Exclusion Zone.

Step 2 - Glove Removal

- Remove gloves.
- If gloves are disposable, deposit in container with plastic liner.
- If gloves are non-disposable, store in a clean, dry location.

Step 3 - Tank Change

- Exchange air tank.
- Don new gloves.
- Tape joints and return to exclusion zone.

A sketch of a typical decontamination area for Level B decontamination is shown on Figure 8.2.

SSP: ______________________ Date: ______________________

## 9.0 EMERGENCY CONTINGENCY PLAN

It is essential that Site personnel be prepared in the event of an emergency. Emergencies can take many forms; illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. Emergency information should be posted as appropriate.

The route to the hospital is shown on Figure 9.1.

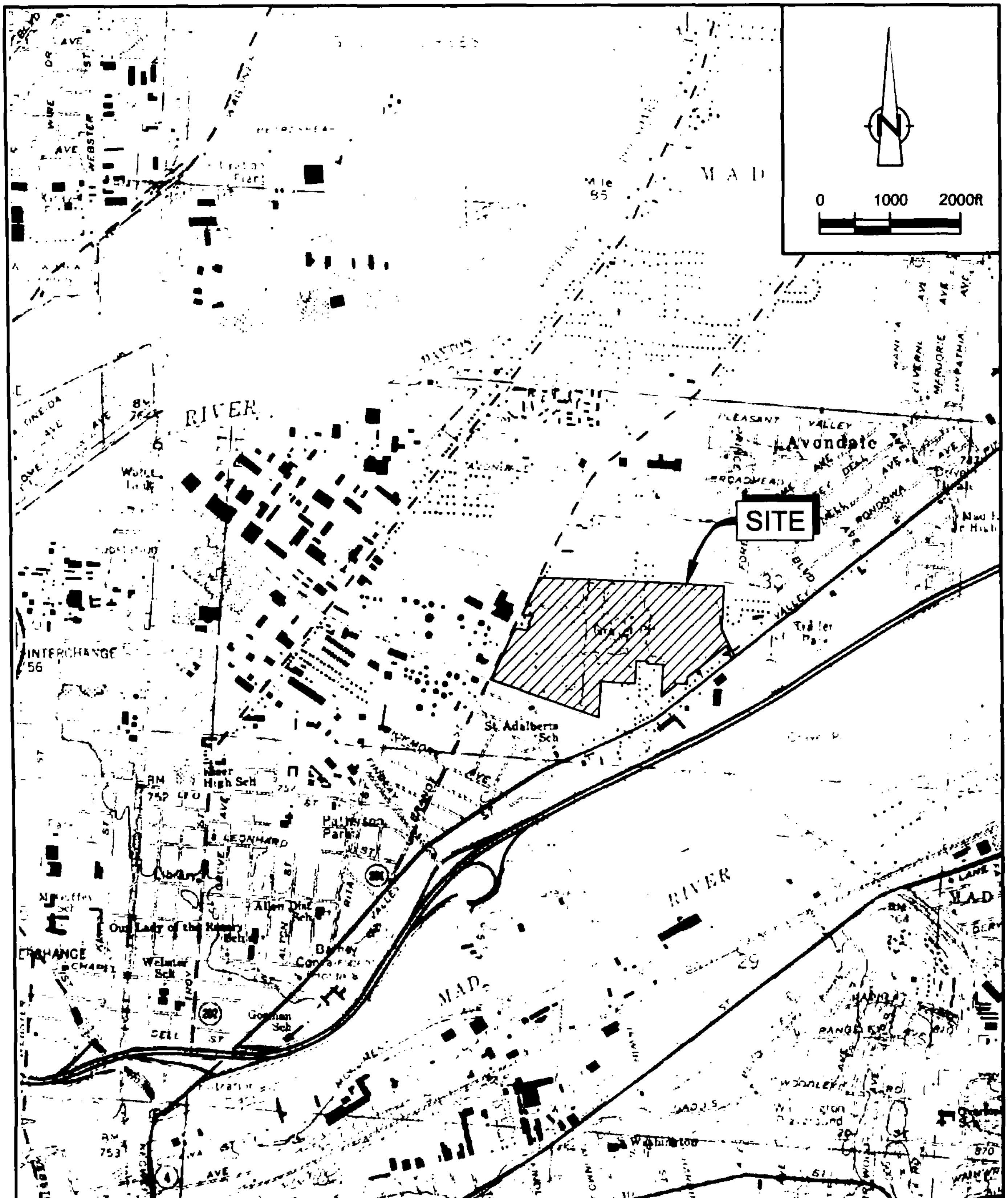
The Emergency Contingency Plan, dated September 2001, is included within the Work Plan as Appendix C.

SSP: ______________________ Date: ______________________

## 10.0 CONFINED SPACE ENTRY PROCEDURES

Under no circumstances will Site personnel enter a trench greater than 4 feet deep or any other confined space.

SSP: ______________________ Date: ______________________

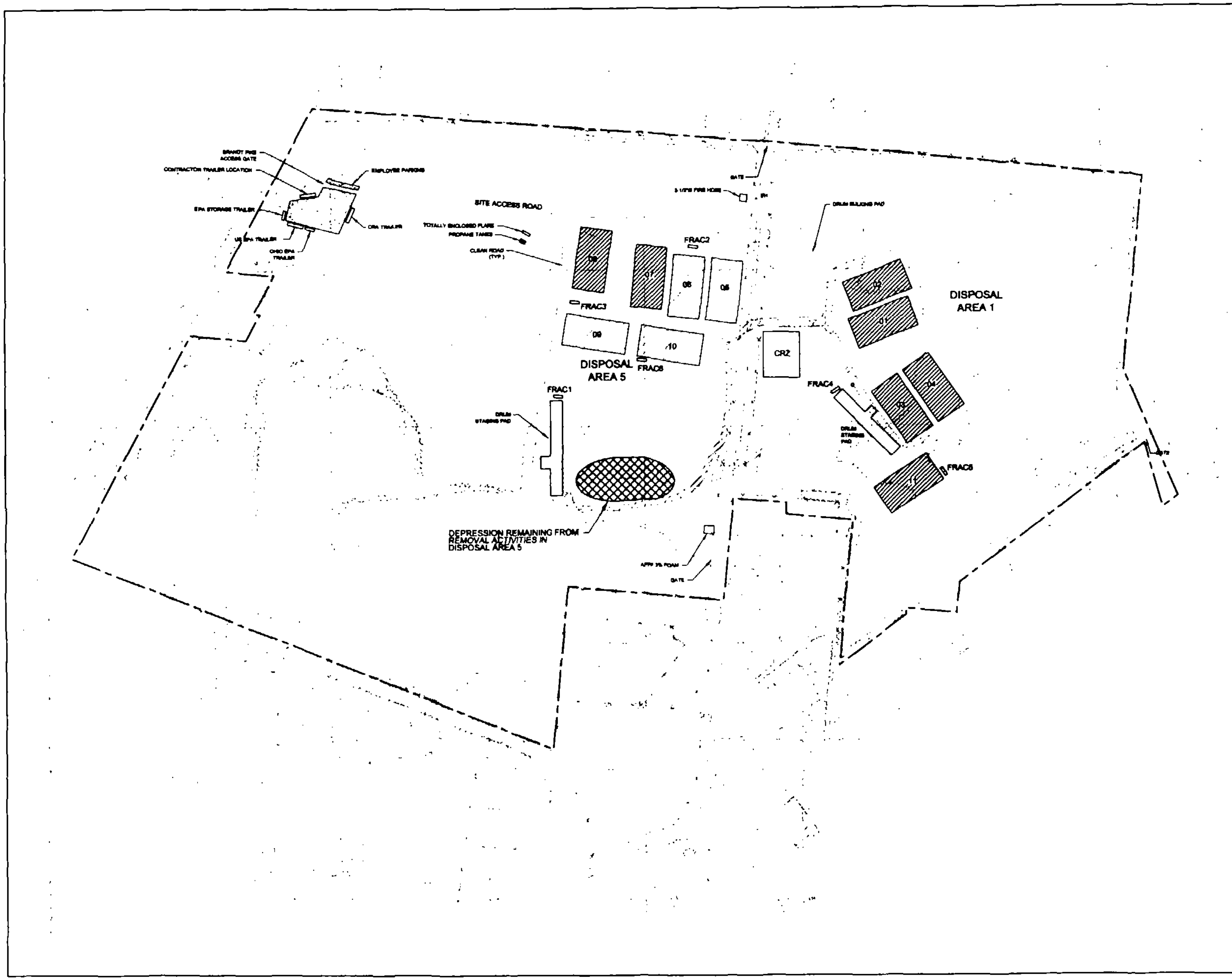



SOURCE: USGS QUADRANGLE MAP;
DAYTON NORTH, OHIO



figure 1.1

SITE LOCATION
NORTH SANITARY LANDFILL
*Dayton, Ohio*




LEGEND

PROPERTY BOUNDARY

FENCE LINE

STOCKPILE CONTAINING VOC IMPACTED MATERIAL

EMPTY STOCKPILE

FRAC 1 WASTEWATER STORAGE TANK

STOCKPILE STATUS JULY 2001

PAD 01 - VOC-IMPACTED MATERIAL
PAD 02 - VOC-IMPACTED MATERIAL
PAD 03 - VOC-IMPACTED MATERIAL
PAD 04 - VOC-IMPACTED MATERIAL
PAD 05 - EMPTY
PAD 06 - EMPTY
PAD 07 - VOC-IMPACTED MATERIAL
PAD 08 - VOC-IMPACTED MATERIAL
PAD 09 - EMPTY
PAD 10 - EMPTY
PAD 11 - VOC-IMPACTED MATERIAL

SOURCE: ABRAMS AERIAL SURVEY CORPORATION, LANSING, MICHIGAN
DISPOSAL AREAS SOURCE: ECOLOGY AND ENVIRONMENT INC.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY

Approved

DRAWING STATUS

| Status | Date | Initial |
| --- | --- | --- |

NORTH SANITARY LANDFILL
DAYTON, OHIO

SITE LAYOUT AND
WORK ZONES

CONESTOGA-ROVERS & ASSOCIATES

Source Reference

| Project Manager | Reviewed By | Date | |
| --- | --- | --- | --- |
| | | AUGUST 2001 | |
| Scale | Project Nº | Report Nº | Drawing Nº |
| | 06351-27 | 033 | figure 1 2 |

APPENDIX B

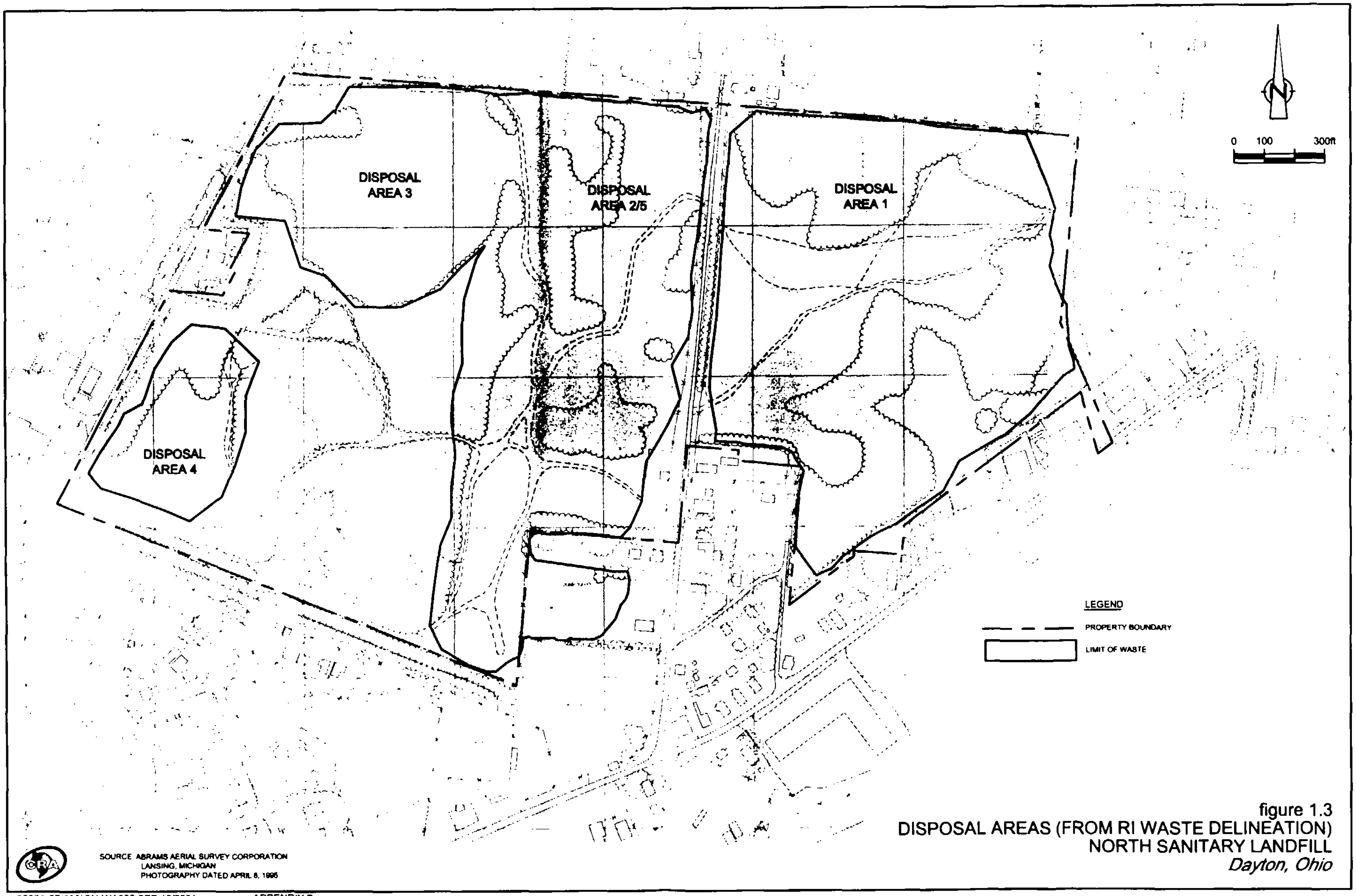



figure 1.3
DISPOSAL AREAS (FROM RI WASTE DELINEATION)
NORTH SANITARY LANDFILL
*Dayton, Ohio*

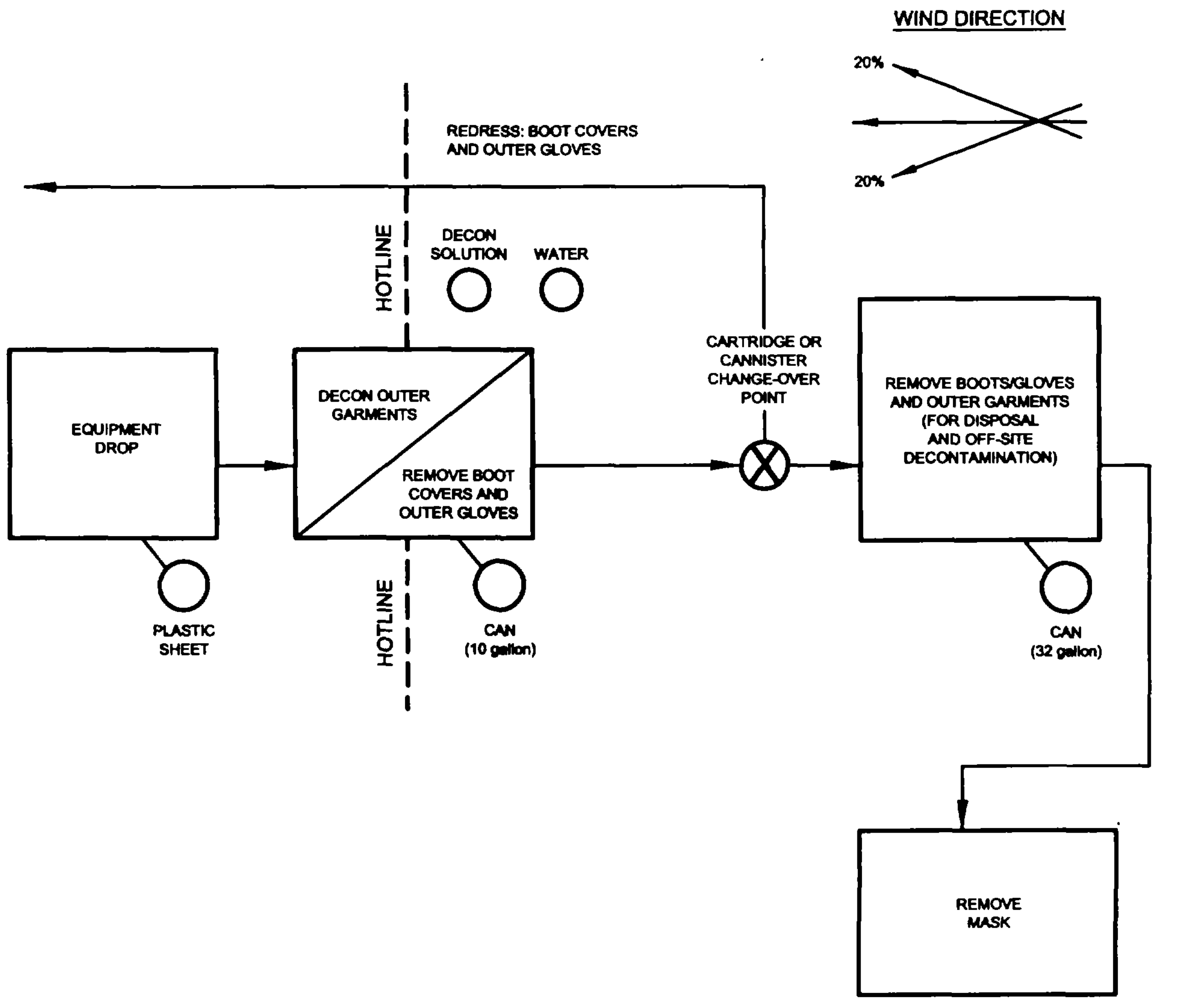



figure 8.1

MINIMUM DECONTAMINATION LAYOUT
LEVEL C PROTECTION
NORTH SANITARY LANDFILL
*Dayton, Ohio*

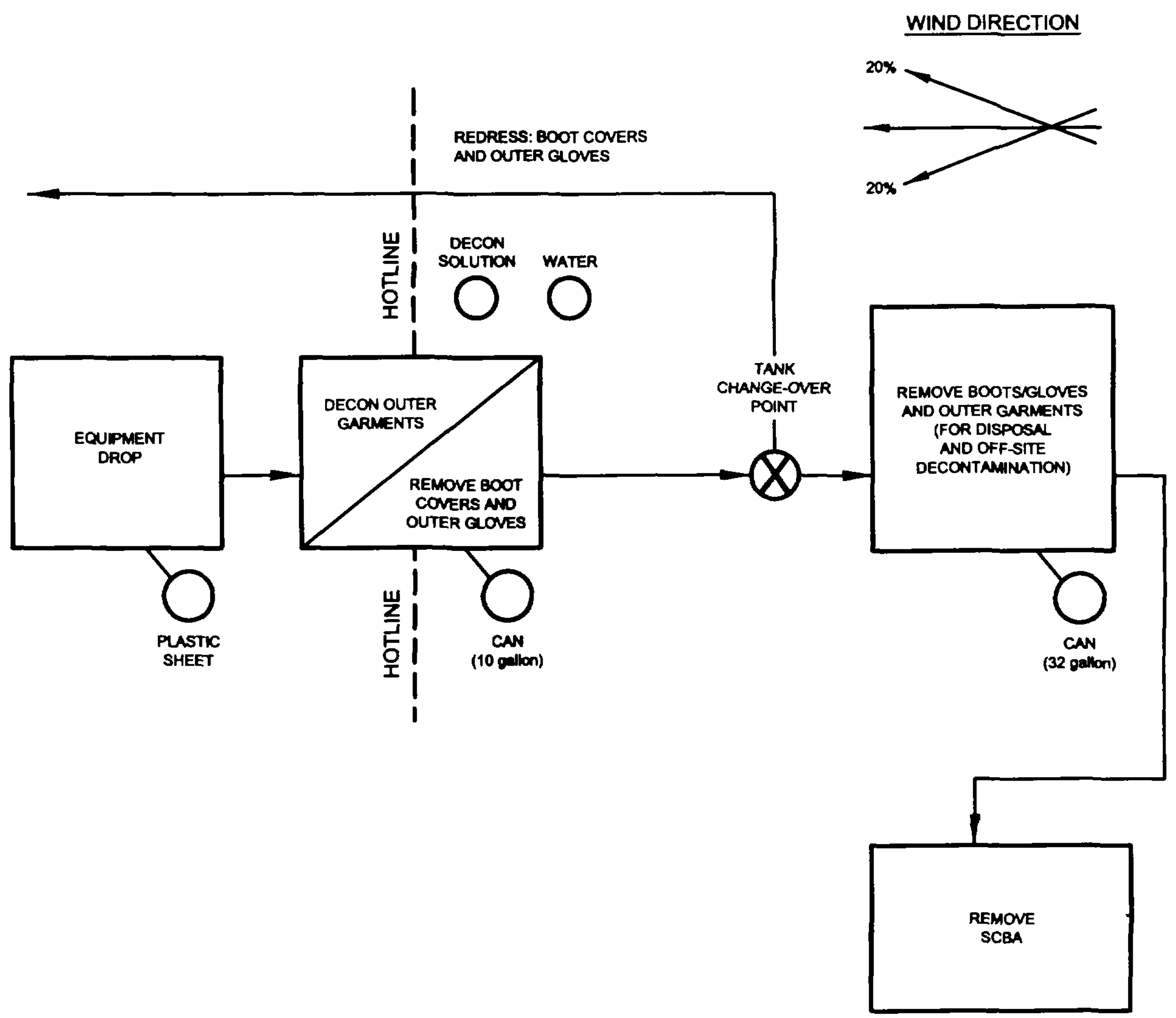
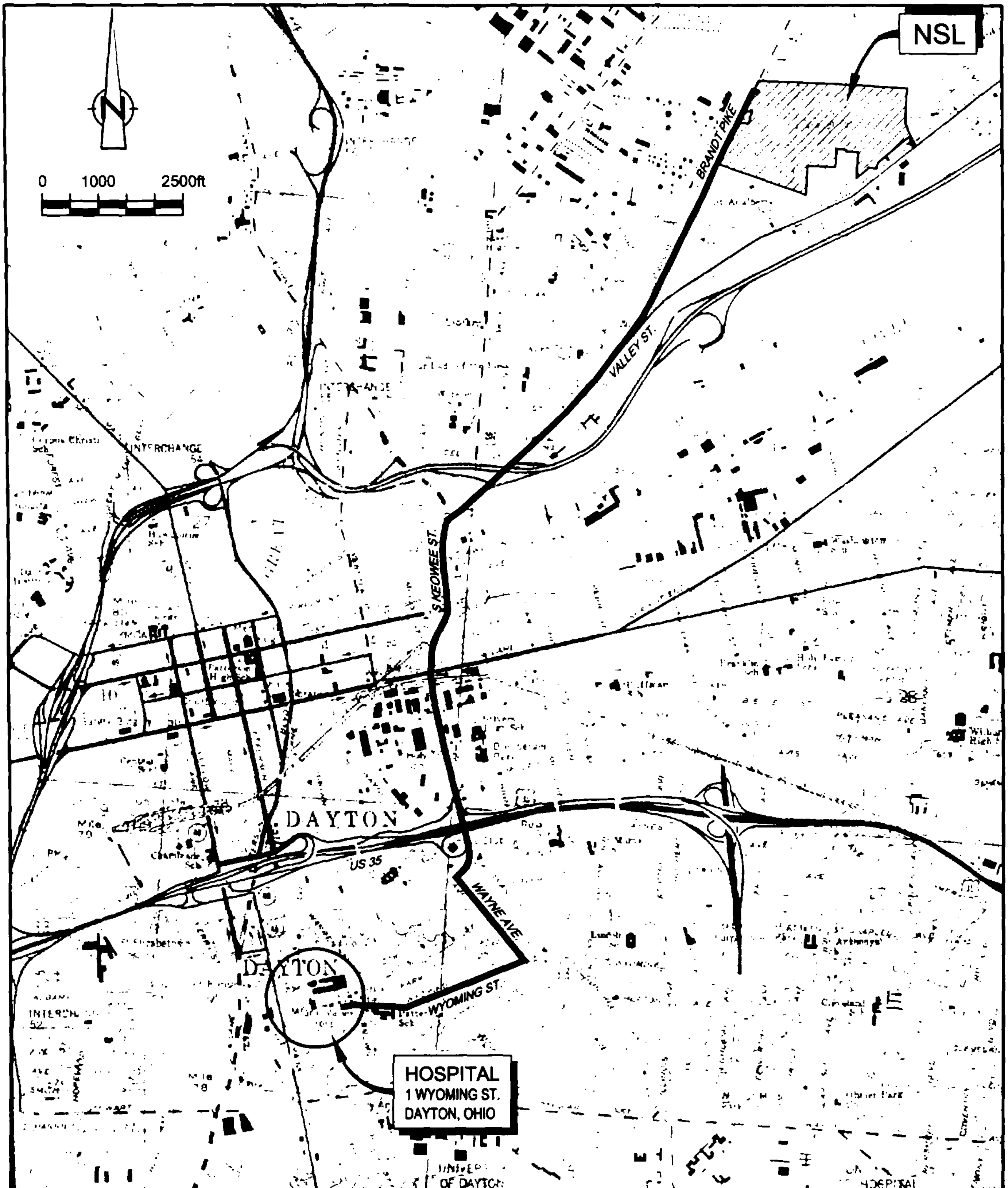



figure 8.2

MINIMUM DECONTAMINATION LAYOUT
LEVEL B PROTECTION
NORTH SANITARY LANDFILL
*Dayton, Ohio*




SOURCE: USGS QUADRANGLE MAPS;
DAYTON NORTH AND DAYTON SOUTH, OHIO

figure 9.1

HOSPITAL ROUTE MAP
NORTH SANITARY LANDFILL
*Dayton, Ohio*

TABLE 2.1

POTENTIAL CHEMICAL HAZARDS ON SITE

| *Substance* | *IDLH (ppm)* | *TLV*[1] *(ppm)* | *STEL*[2] *(ppm)* | *I.P. (eV)* | *Acute Effects* |
|---|---|---|---|---|---|
| **VOLATILE ORGANIC COMPOUNDS** | | | | | |
| Acetone | 2,500 | 500 | 750 | 9.7 | Irritation of eyes, nose, and throat. Headache, dizziness and dermatitis. Inhalation, ingestion and skin contact hazard. |
| Benzene | 500 | 1* (Carc, S) | 2.5 | 9.2 | Irritation of eyes, skin, nose and respiratory system. Headache, dizziness, giddiness, nausea and dermatitis. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Chlorobenzene | 1,000 | 10 | NA | 9.1 | Irritation of eyes, skin and nose. Drowsiness and incoordination. Inhalation, ingestion and skin contact hazard. |
| Chloroethane | 3,800 (LEL) | 100 (S) | NA | 11.0 | Incoordination and abdominal cramps. Inhalation, ingestion, skin absorption and skin contact hazard. |
| 1,1-Dichloroethane | 3,000 | 100 | NA | 11.1 | Skin irritation. Inhalation, ingestion and skin contact hazard. |
| 1,1-Dichloroethene (Vinylidene Chloride) | NA | 5 | 20 | 10.0 | Irritation of eyes, skin, throat. Dizziness, headache, nausea, difficulty breathing. Inhalation, ingestion, skin absorption, and skin contact hazard. |
| 1,2-Dichloroethene | 1,000 | 200 | NA | 9.6 | Irritation to eyes and respiratory system. Inhalation, ingestion and skin contact hazard. |
| Ethyl benzene | 800 (LEL) | 100 | NA | 8.8 | Irritation to eyes, skin and mucous membranes. Headache and dermatitis. Inhalation, ingestion and skin contact hazard. |
| Methane | NA | NA | NA | 13.0 | Simple asphyxiant. Explosive between 5.3 - 14.0 % by volume methane in air. |
| Methylene Chloride | 2,300 | 25 | 125 | 11.3 | Irritation to eyes and skin. Fatigue, weakness, light-headedness, numbness and nausea. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Tetrachloroethene (Perchloroethylene) | 150 | 25 | 100 | 9.3 | Irritation to eyes, nose and throat. Nausea, flushed face and neck, vertigo, dizziness, incoordination and headache. Inhalation, ingestion, skin absorption and skin contact hazard. |

TABLE 2.1

## POTENTIAL CHEMICAL HAZARDS ON SITE

| *Substance* | *IDLH (ppm)* | *TLV[1] (ppm)* | *STEL[2] (ppm)* | *I.P. (eV)* | *Acute Effects* |
|---|---|---|---|---|---|
| Toluene | 500 | 50 (S) | 300 (Ceiling) | 8.8 | Irritation to eyes and nose. Fatigue, weakness, confusion, euphoria, dizziness, headache, nervousness and dermatitis. Inhalation, ingestion, skin absorption and skin contact hazard. |
| 1,1,1-Trichloroethane | 700 | 350 | 450 | 11.0 | Irritation to eyes and skin. Headache, weakness, exhaustion and dermatitis. Inhalation, ingestion and skin contact hazard. |
| 1,1,2-Trichloroethane | 100 | 10 (S) | NA | 11.0 | Irritation eyes, nose. CNS depression. Inhalation, ingestion, skin absorption, and skin contact hazard. |
| Trichloroethene | 1,000 | 50 | 100 | 9.4 | Irritation to eyes and skin. Headache, vertigo, fatigue, giddiness, tremor, nausea, vomiting and dermatitis. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Vinyl Chloride | NA | 1 (Carc) | 5 (Ceiling) | 10.0 | Weakness and abdominal pain. Contact with liquid may cause frostbite. Inhalation and skin contact hazard. |
| Xylene (o,m,p isomers) | 900 | 100 | 150 | 8.5 | Irritation to eyes, skin, nose and throat. Dizziness, excitement, drowsiness, incoordination, nausea, vomiting, abdominal pain and dermatitis. Inhalation, ingestion, skin absorption and skin contact hazard. |
| **<u>SEMI-VOLATILE ORGANIC COMPOUNDS</u>** | | | | | |
| Bis(2-ethylhexyl)phthalate | NA | 5 $mg/m^3$ | NA | NA | NA |
| Butyl benzyl phthalate | NA | NA | NA | NA | NA |
| Di-n-butyl phthalate | 4,000 $mg/m^3$ | 5 $mg/m^3$ | NA | NA | Irritation of eyes, upper respiratory system, and stomach. Inhalation, ingestion, and skin contact hazard. |
| 1,4-Dichlorobenzene | 150 ppm | 10 ppm | NA | 9.0 | Eye irritation. Swelling around eyes, headache, nausea and vomiting. Inhalation, ingestion, skin absorption and skin contact hazard. |
| 1,2-Dichlorobenzene (o-dichlorobenzene) | 200 ppm | 25 ppm | 50 ppm (Ceiling) | NA | Irritation of eyes and nose. Skin blisters. Inhalation, ingestion, skin absorption, and skin contact hazard. |

TABLE 2.1

POTENTIAL CHEMICAL HAZARDS ON SITE

| *Substance* | *IDLH (ppm)* | *TLV[1] (ppm)* | *STEL[2] (ppm)* | *I.P. (eV)* | *Acute Effects* |
|---|---|---|---|---|---|
| Diethylphthalate | NA | 5 $mg/m^3$ | NA | NA | Irritation of eyes, skin, nose and throat. Headache, dizziness, nausea, discharge of tears, pain, numbness, weakness and spasms in arms and legs. Inhalation, ingestion and skin contact hazard. |
| 2,4-Dimethylphenol | NA | NA | NA | NA | NA |
| Dimethylphthalate | 2,000 $mg/m^3$ | 5 $mg/m^3$ | NA | 9.6 | Irritation of eyes and upper respiratory system. Stomach pain. Inhalation, ingestion and skin contact hazard. |
| Di-n-octyl phthalate | NA | NA | NA | NA | NA |
| 1,2-Diphenyl hydrazine | NA | NA | NA | NA | NA |
| Fluorene | 80 $mg/m^3$ | 0.2 $mg/m^3$ | NA | NA | NA |
| 2,6-Dinitrotoluene | 50 $mg/m^3$ | 0.2 $mg/m^3$ (S) | NA | NA | Anoxia and cyanosis. Inhalation, ingestion, skin absorption and skin contact hazard. |
| 2-Methylphenol (o-Cresol) | 250 ppm | 5 ppm (S) | NA | 8.9 | Irritation of eyes and mucous membrane. Central nervous system effects, confusion, depression, weak pulse, dermatitis, eye and skin burns. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Naphthalene | 250 ppm | 10 ppm | 15 ppm | 8.1 | Irritation to eyes. Headache, confusion, excitement, malaise, nausea, vomiting, abdominal pain and dermatitis. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Phenanthrene | 80 $mg/m^3$ | 0.2 $mg/m^3$ | NA | NA | NA |
| Phenol | 250 ppm | 5 ppm (S) | NA | 8.7 | Irritation to eyes, nose and throat. Weakness, muscle ache, pain, dark urine, skin burns, tremors and convulsions. Inhalation, ingestion, skin absorption and skin contact hazard. |

TABLE 2.1

POTENTIAL CHEMICAL HAZARDS ON SITE

| *Substance* | *IDLH (ppm)* | *TLV[1] (ppm)* | *STEL[2] (ppm)* | *I.P. (eV)* | *Acute Effects* |
|---|---|---|---|---|---|
| **PESTICIDES and PCBs** | | | | | |
| Aroclor - 1016 | NA | NA | NA | NA | NA |
| Aroclor - 1254 | 5 mg/m$^3$ | 0.5 mg/m$^3$ (S) | NA | NA | Eye irritation. Chloracne. Inhalation, ingestion, skin absorption and skin contact hazard. |
| 4,4'-DDD | NA | NA | NA | NA | NA |
| Endrin | 2 mg/m$^3$ | 0.1 mg/m$^3$ (S) | NA | NA | Epileptiform convulsions, stupor, headache, dizziness, abdominal discomfort, nausea, vomiting, confusion and weakness. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Lindane (Gamma - BHC) | 50 mg/m$^3$ | 0.5 mg/m$^3$ (S) | NA | NA | Irritation to eyes, skin, nose and throat. Headache, nausea, respiratory difficulty, cyanosis and muscle spasms. Inhalation, ingestion, skin absorption and skin contact hazard. |
| **METALS** | | | | | |
| Aluminum | NA | 10 mg/m$^3$ | NA | NA | Irritation to eyes, skin and respiratory system. Inhalation and skin contact hazard. |
| Antimony | 50 mg/m$^3$ | 0.5 mg/m$^3$ | NA | NA | Irritation to eyes, skin, nose, throat and mouth. Cough, dizziness, headache, nausea, vomiting, diarrhea, stomach cramps. Inhalation, ingestion and skin contact hazard. |
| Arsenic | 5 mg/m$^3$ | 0.01 mg/m$^3$ (Carc) | NA | NA | Irritation of respiratory system. Dermatitis. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Barium | 50 mg/m$^3$ | 0.5 mg/m$^3$ | NA | NA | Irritation to eyes, skin and upper respiratory system. Inhalation, ingestion and skin contact hazard. |
| Beryllium | 4 mg/m$^3$ | 0.002 mg/m$^3$ (Carc) | 0.01 mg/m$^3$ | NA | Amnesia, low-weight, weakness, chest pain, coughing. Eye irritation. Dermatitis. Inhalation and skin contact hazard. |

## TABLE 2.1

## POTENTIAL CHEMICAL HAZARDS ON SITE

| *Substance* | *IDLH (ppm)* | *TLV[1] (ppm)* | *STEL[2] (ppm)* | *I.P. (eV)* | *Acute Effects* |
|---|---|---|---|---|---|
| Cadmium | 9 mg/m$^3$ | 0.002 mg/m$^3$ (Carc) | NA | NA | Cough, tightness in chest, headache, chills, muscle aches, nausea, vomiting and diarrhea. Inhalation and ingestion hazard. |
| Chromium | 250 mg/m$^3$ | 0.5 mg/m$^3$ | NA | NA | Irritation to eyes, skin and lungs. Inhalation, ingestion and skin contact hazard. |
| Cobalt | 20 mg/m$^3$ | 0.02 mg/m$^3$ | NA | NA | Cough, wheezing and dermatitis. Inhalation, ingestion and skin contact hazard. |
| Copper | 100 mg/m$^3$ | 1 mg/m$^3$ | NA | NA | Irritation to eyes, nose and pharnyx. Metallic taste and dermatitis. Inhalation, ingestion and skin contact hazard. |
| Cyanides | 25 mg/m$^3$ | 5 mg/m$^3$ (Ceiling) | NA | NA | Irritation to eyes and skin. Headache, confusion, nausea and vomiting. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Iron | 2,500 mg/m$^3$ | 5 mg/m$^3$ | NA | NA | Inhalation hazard. |
| Lead | 100 mg/m$^3$ | 0.05 mg/m$^3$ | NA | NA | Irritation to eyes. Weakness, exhaustion and abdominal pain. Inhalation, ingestion and skin contact hazard. |
| Manganese | 500 mg/m$^3$ | 0.2 mg/m$^3$ | NA | NA | Dry throat, cough, chest tightness, vomiting, malaise and fatigue. Inhalation and ingestion hazard. |
| Mercury | 10 mg/m$^3$ | 0.025 mg/m$^3$ | NA | NA | Irritation to eyes and skin. Coughing, chest pain, headache, fatigue and weakness. Inhalation, ingestion, skin absorption and skin contact hazard. |
| Nickel | 10 mg/m$^3$ | 1 mg/m$^3$ | NA | NA | Dermatitis. Inhalation, ingestion and skin contact hazard. |
| Selenium | 1 mg/m$^3$ | 0.2 mg/m$^3$ | NA | NA | Irritation eyes, skin, nose, and throat. Visual distortions, headache, chills, fever, gastrointestinal disturbances, dermatitis, eye, and skin burns. |
| Vanadium | 35 mg/m$^3$ | 0.05 mg/m$^3$ | 0.5 (Ceiling) | NA | Irritation to eyes, skin and throat. Metallic taste in mouth. Inhalation, ingestion and skin contact hazard. |

TABLE 2.1

POTENTIAL CHEMICAL HAZARDS ON SITE

| Substance | IDLH (ppm) | TLV[1] (ppm) | STEL[2] (ppm) | I.P. (eV) | Acute Effects |
|---|---|---|---|---|---|
| Zinc | 500 mg/m$^3$ | 10 mg/m$^3$ | NA | NA | Chills, muscle ache, nausea, fever, dry throat, cough, weakness, exhaustion, vomiting, fatigue, tight chest and metallic taste in mouth. Inhalation hazard. |

Notes:

1 - The Threshold Limit Value (TLV) is determined by the lowest documented level between OSHA and ACGIH
2 - The Short-Term Exposure Limit (STEL) is determined by the lowest documented level between OSHA and ACGIH
* - The exposure limit is based on the OSHA permissible exposure limit (PEL) for benzene
(Carc) - The chemical substance is classified by ACGIH as a confirmed or suspected human carcinogen.
(S) - There is potential significant contribution to the overall exposure by direct skin contact with vapors and/or liquid
(LEL) - The IDLH is designated since 10 percent of the LEL will be reached at that substance concentration
(Ceiling) - The concentration that should not be exceeded during any part of the working exposure
NA - Not Available

ATTACHMENT A

SITE SAFETY PLAN AMENDMENTS

## SITE HEALTH AND SAFETY PLAN AMENDMENT FORM

Amendment # ______________________________

Site Name ______________________________

Work Assignment # ______________________________

Date ______________________________

Type of Amendment ______________________________

Reason for Amendment ______________________________

______________________________

______________________________

Alternate Safeguard Procedures ______________________________

______________________________

______________________________

Required changes in PPE ______________________________

______________________________

______________________________

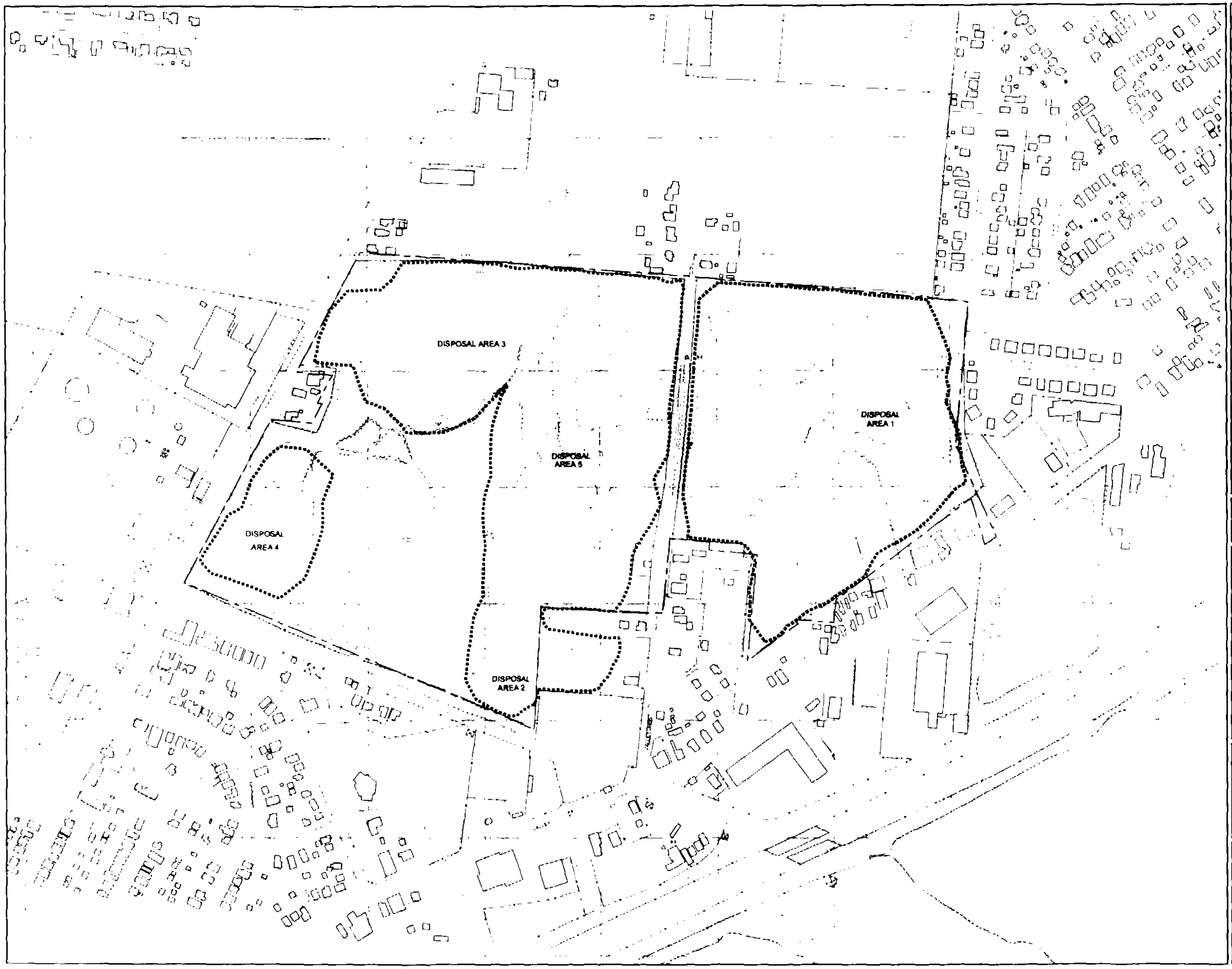
| | |
|---|---|
| Site Safety Officer | Date |
| Project Manager | Date |
| USEPA OSC | Date |

This original form must remain on Site and a copy placed in the office file HASP.

SSP: ______________________ Date: ______________________

# ATTACHMENT B

# GENERAL SITE PLAN




LEGEND

SCALE VERIFICATION

DRAWING STATUS

NORTH SANITARY LANDFILL
DAYTON, OHIO

GENERAL SITE PLAN

CONESTOGA-ROVERS & ASSOCIATES

| Project Manager | Reviewed By | Date | |
|---|---|---|---|
| J. HAYWARD | J.R. YARDLEY | JULY 1998 | |
| Scale | Project Nº | Report Nº | Drawing Nº |
| 1" = 200' | 08351-27 | 033 | 1 |

# ATTACHMENT C

# COLD STRESS

TABLE OF CONTENTS



LIST OF TABLES
(Following Text)

# 1.0 COLD STRESS

## 1.1 OVERVIEW

Fatal exposures to cold have been reported in employees failing to escape from low environmental air temperatures or from immersion in low temperature water. Hypothermia, a condition in which the body's deep core temperature falls significantly below 98.6°F, can be life threatening. A drop in core temperature to 95°F or lower must be prevented.

Air temperature is not sufficient to determine the cold hazard of the work environment. The wind-chill must be considered as it contributes to the effective temperature. The body's physiologic defense against cold includes constriction of the blood vessels, inhibition of the sweat glands to prevent loss of heat via evaporation, glucose production and involuntary shivering to produce heat by rapid muscle contraction.

The frequency of accidents increases with cold temperature exposures as the body's nerve impulses slow down, individuals react sluggishly and numb extremities make for increased clumsiness. Additional safety hazards include ice, snow blindness, reflections from snow and possible skin burns from contact with cold metal.

There are certain predisposing factors that make an individual more susceptible to cold stress. It is the responsibility of the project team members to inform the Health and Safety Officer to monitor an individual, if necessary, or use other means of preventing/reducing the individual's likelihood of experiencing a cold related illness or disorder.

## 1.2 PREDISPOSING FACTORS

Predisposing factors that will increase an individual's susceptibility to cold stress are listed below:

- Dehydration: The use of diuretics and/or alcohol, or diarrhea can cause dehydration. Dehydration reduces blood circulation to the extremities.
- Fatigue During Physical Activity: Exhaustion reduces the body's ability to constrict blood vessels. This results in the blood circulation occurring closer to the surface of the skin and the rapid loss of body heat.
- Age: Some older and very young individuals may have an impaired ability to sense cold.
- Alcohol Consumption: Alcohol dilates the blood vessels near the skin surface resulting in excessive body heat loss.

- Sedative Drugs: Sedatives may interfere with the transmission of impulses to the brain, thereby interfering with the body's physiological defense against cold. Some prescription drugs may react the same way.
- Poor Circulation: Vasoconstriction of peripheral vessels reduces blood flow to the skin surface.
- Heavy Work Load: Heavy work loads generate metabolic heat and make an individual perspire even in extremely cold environments. If perspiration is absorbed by the individual's clothing and is in contact with the skin, cooling of the body will occur.
- The Use of PPE: PPE usage which traps sweat inside the PPE may increase an individual's susceptibility to cold stress.
- Lack of Acclimatization: Acclimatization, the gradual introduction of workers into a cold environment, allows the body to physiologically adjust to cold working conditions.
- History of Cold Injury: Previous injury from cold exposures may result in increased cold sensitivity.

## 1.3 PREVENTION OF COLD STRESS

There are a variety of measures that can be implemented to prevent or reduce the likelihood of employees developing cold related ailments and disorders. These include acclimatization, fluid and electrolyte replenishment, eating a well balanced diet, wearing warm clothing, the provision of shelter from the cold, thermal insulation of metal surfaces, adjusting work schedules, and employee education.

- Acclimatization: Acclimatization is the gradual introduction of workers into the cold environment to allow their bodies to physiologically adjust to cold working conditions. However, the physiologic changes are usually minor and require repeated uncomfortably cold exposures to induce them.
- Fluid and Electrolyte Replenishment: Cold, dry air can cause employees to lose significant amounts of water through the skin and lungs. Dehydration affects the flow of blood to the extremities and increases the risk of cold injury. Warm, sweet, caffeine-free, non-alcoholic drinks and soup are good sources to replenish body fluids.
- Eating a Well-Balanced Diet: Restricted diets including low salt diets can deprive the body of elements needed to withstand cold stress. Eat high energy foods throughout the day.

- Warm Clothing: It is beneficial to maintain air space between the body and outer layers of clothing in order to retain body heat. However, the insulating effect provided by such air spaces is lost when the skin or clothing is wet.

The parts of the body most important to keep warm are the feet, hands, head, and face. As much as 40 percent of body heat can be lost when the head is exposed.

Recommended clothing includes:

- inner layers (t-shirts, shorts, socks) should be of a thin, thermal insulating material.
- wool or thermal trousers. Denim is not a good protective fabric;
- felt-lined, rubber-bottomed, leather-upper boots with a removable felt insole is preferred. Change socks when wet;
- wool shirts/sweaters should be worn over inner layer;
- a wool cap is good head protection. Use a liner under a hard hat;
- mittens are better insulators than gloves;
- face masks or scarves are good protection against wind;
- tyvek/poly-coated Tyvek provides good wind protection;
- wear loose fitting clothing, especially footwear;
- carry extra clothing in your vehicle;
- shelters with heaters should be provided for the employees' rest periods if possible. Sitting in a heated vehicle is a viable option. Care should be taken that the exhaust is not blocked and that windows are partially open to provide ventilation;
- at temperatures of 30°F (-1°C) or lower, cover metal tool handles with thermal insulating material if possible; and
- schedule work during the warmest part of the day if possible, rotate personnel and adjust the work/rest schedule to enable employees to recover from the effects of cold stress.

### 1.3.1 EMPLOYEE EDUCATION

Employees have already been trained to recognize and treat the effects of cold stress during their 40-hour training. Signs, symptoms, and treatment of cold stress should be reviewed in project safety meetings where applicable. The buddy system will help in preventing cold stress once the employees are trained to recognize the signs and symptoms of cold stress.

### 1.3.2 COLD STRESS PREVENTION GUIDELINES

It may not be practically feasible to implement all the above prevention measures. A cold stress prevention should be considered and implemented as appropriate when the temperature falls below 35°F (2°C). The following are recommended guidelines:

- contact the PM or the IH to determine if the project team should be on Site in such temperatures;
- dress warm;
- replenish fluids and electrolytes at regular intervals;
- provide shelter from the cold; and
- adjust work/rest schedules.

### 1.3.3 ADJUST WORK-REST SCHEDULES

Follow the work/rest schedule in Table C.1. It is based on the cooling power of air which is a function of wind speed and ambient air temperature.

## 1.4 FIRST-AID TREATMENT GUIDELINES

The following describes symptoms of different stages in cold stress and the related first-aid treatment guidelines.

### 1.4.1 FROSTBITE

Stages

| | |
|---|---|
| Incipient (frost nip) | May be painless. Tips of ears, nose, cheeks, fingers, toes, chin affected. Skin blanched white. |
| Superficial | Affects skin/tissue just beneath skin; turns purple as it thaws. Skin is firm, waxy; tissue beneath is soft, numb. |

| | |
|---|---|
| Deep | Tissue beneath skin is solid, waxy, white with purplish tinge. Entire tissue depth is affected. |

First-Aid

| | |
|---|---|
| Incipient | Warm by applying firm pressure - blow warm breath on spot or submerge in warm water (102°F to 110°F) (39°F to 43°C). Do not rub the area. |
| Superficial | Provide dry coverage, steady warmth; submerge in warm water. |
| Deep | Hospital care is needed. Do not thaw frostbitten part if needed to walk on. Do not thaw if there is danger of refreezing. Apply dry clothing over frostbite. Submerge in water; do not rub. |

### 1.4.2 GENERAL HYPOTHERMIA

Stages

- Shivering.
- Indifference.
- Decreased Consciousness.
- Unconsciousness.
- Death.

Symptoms

- Muscle Tension.
- Uncontrollable Shivering.
- Glassy Stare.
- Decreased Muscle Function.
- Speech Distortion.
- Blue, Puffy Skin.
- Slow Pulse.
- Shallow Breathing.

- Coordination Loss.
- Stumbling.
- Forgetfulness.
- Freezing Extremities.
- Dilated Pupils.
- Fatigue.

Emergency Response

- Keep person dry; replace wet clothing.
- Apply external heat to both sides of patient using available heat sources, including other bodies.
- Give warm liquids - not coffee or alcohol - after shivering stops and if conscious.
- Handle gently.
- Transport to medical facility as soon as possible.
- If more than 30 minutes from a medical facility, warm person with other bodies.

# TABLE C.1

## WORK/REST SCHEDULE
## FOR AN 8-HOUR WORK SHIFT

| *Air Temperature with Sunny Sky* | | *Work/Break Schedule (Minutes)* | | | | |
|---|---|---|---|---|---|---|
| *°F* | *°C* | *No Wind* | *5 mph Wind* | *10 mph Wind* | *15 mph Wind* | *20 mph Wind* |
| -05 to -09 | -20 to -23 | 110/10 | 110/10 | 75/10 | 55/10 | 40/10 |
| -10 to -14 | -23 to -26 | 110/10 | 75/10 | 55/10 | 40/10 | 30/10 |
| -15 to -19 | -26 to -28 | 75/10 | 55/10 | 40/10 | 30/10 | Stop |
| -20 to -24 | -29 to -31 | 55/10 | 40/10 | 30/10 | Stop | Stop |
| -25 to -29 | -32 to -34 | 40/10 | 30/10 | Stop | Stop | Stop |
| -30 to -34 | -35 to -37 | 30/10 | Stop | Stop | Stop | Stop |
| -35 & Below | -38 & Below | Stop | Stop | Stop | Stop | Stop |

Note:

This table addresses the health hazards related to cold weather work. The practicality of working under a work/rest schedule, together with the ability of the necessary equipment to function properly in cold weather, may be more restrictive than the health hazards and also need to be considered.

The cold stress schedule applies to light or sedentary work activities. Light to moderate work activities can be moved down one level, moderate to heavy work activities can be moved down two levels if workers are acclimated, have proper protective clothing and show no signs of cold stress.

| | |
|---|---|
| 0 - 5 mph Wind: | Light flag moves. |
| 15 mph Wind: | Raises newspaper sheet. |
| 10 mph Wind: | Light flag fully extended. |
| 20 mph Wind: | Blowing and drifting snow. |

# ATTACHMENT D

# HEAT STRESS

## TABLE OF CONTENTS



## LIST OF TABLES
(Following Text)



SSP: ______________________ Date: ______________________

## 1.0 HEAT STRESS

### 1.1 OVERVIEW

Heat induced occupational illnesses, injuries, and reduced productivity occur in situations in which the total heat load (environmental plus metabolic) exceeds the body's capacities to maintain normal body functions without excessive strain. Heat stress is the sum of the heat generated in the body plus the heat gained from the environment minus the heat lost from the body to the environment. The body's response to heat stress is called heat strain. The level of heat stress at which excessive heat strain will result depends on the heat tolerance of the individual. Certain predisposing factors may reduce an individual's ability to tolerate heat stress.

Using PPE may put a hazardous waste worker at an increased risk of developing heat stress. Health effects may range from heat rash or heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions such as temperature and relative humidity, protective clothing which limits natural heat loss through perspiration, workload, and the individual characteristics of the worker.

It is the responsibility of the project team members to inform the HSO if any of the predisposing factors listed below apply to them. This enables the HSO to monitor the individual if necessary, or use other means of preventing/reducing the individual's likelihood of experiencing a heat related illness or disorder.

### 1.2 PREDISPOSING FACTORS

Predisposing factors that will increase the individual's susceptibility to heat stress are listed below:

- Lack of Physical Fitness: Such individuals experience more physiological strain including a higher heart rate, a higher body temperature, less efficient sweating, and slightly higher oxygen consumption as compared to fit individuals.
- Obesity: Overweight individuals produce more heat per unit surface area than thin individuals and have a lowered ability to dissipate heat.
- Age: Older individuals may have a decreased ability to cope with heat stress.

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- Dehydration: Dehydrated individuals will have a decreased ability to cool the body by sweating. Diarrhea can cause dehydration.
- Alcohol, Medications and Drug Use: Alcohol consumption may dehydrate individuals and certain medications/drugs may act as diuretics. Hence, the individual may have a decreased ability to lose heat by sweating.
- Infection, Sunburn, Illness and Certain Chronic Diseases: These factors may interfere with the body's normal mechanisms to lose heat.
- Heart Conditions or Circulatory Problems: Heat stress may place an additional strain on the heart and circulatory system that could harm the individual as well as decrease the individual's physiologic response.
- Low Salt Diet: Could affect the individual's electrolyte balance.
- Pregnancy.
- Previous History of Heat Stroke or Heat Exhaustion: May increase the individual's susceptibility to heat stress.
- Heavy Work Load: Will generate metabolic heat thereby increasing the heat stress placed on the individual
- The Use of PPE Over Light Summer Clothing: This will decrease the ability of an individual to lose heat by sweating as evaporative cooling can no longer occur.
- Lack of Acclimatization: Acclimatization is the gradual introduction of workers into a hot environment to allow their bodies to physiologically adjust to hot working conditions. Acclimatized individuals generally have lower heart rates and lower body temperatures. In addition, they sweat sooner and more profusely and even have more dilute sweat (thereby losing less electrolytes) than non-acclimatized individuals.

### 1.3 PREVENTION OF HEAT STRESS

There are a variety of measures that can be implemented to prevent or reduce the likelihood of employees developing heat stress related disorders. These include fluid and electrolyte replenishment, the provision of shelter from the sun and heat, work schedule adjustment, the use of cooling devices, acclimatization, heat stress monitoring, and employee education, as discussed below:

- Fluid and Electrolyte Replenishment: Personnel should drink about 16 ounces of water before starting work and drink water at every break. To encourage water

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consumption, cool water and disposable cups should be made available. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, personnel should be encouraged to drink more. Replacing body fluids with Gatorade is an option. It is advisable to have Gatorade on Site if the air temperature is 70°F (21°C) or more and the workers are performing tasks with a moderate to heavy work load in chemical resistant clothing.

- Shelter From the Sun and Heat: Air-conditioned (if possible) or shaded areas should be made available for rest periods. Sitting in an air-conditioned truck is an acceptable option.
- Work Schedule Adjustment: Scheduling work for early mornings and/or late afternoons will avoid the hottest parts of the day and reduce the heat stress placed on personnel. Rotation of personnel will help reduce overexertion of workers and adjusting the work-rest schedule will help personnel recover from the effects of heat stress periodically.
- Use of Cooling Devices: The use of cooling devices like field showers, hose-down areas or cooling vests should be considered for project tasks that involve heavy work loads in chemical resistant clothing.
- Acclimatization: Acclimatization is the gradual introduction of workers into a hot environment to allow their body to physiologically adjust to hot working conditions. Acclimatized individuals generally have lower heart rates and lower body temperatures. In addition, they sweat sooner and more profusely and even have more dilute sweat (thereby losing less electrolytes) than non-acclimatized individuals.
- Heat Stress Monitoring: Monitoring hot environments for potential heat stress should be initiated when the ambient air temperature is in excess of 70°F. There are several ways to monitor heat stress: measuring heart rate, oral temperature, loss of body weight and the Wet Bulb Globe Temperature using a Reuter-Stokes or Quest Electronics heat stress monitor. On-Site personnel are advised to measure their heart rates as a primary means of heat stress monitoring following the guidelines in Section 1.3.2 and Table D.1.
- Employee Education: Workers have already been trained to recognize and treat the effects of heat stress during the 40-hour training course. Signs, symptoms and treatment of heat stress should be discussed in Site safety meetings. The buddy system will help in preventing heat stress once the employees are trained to recognize the signs and symptoms of heat stress.

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### 1.3.1 PREVENTION PRACTICES

It may not be practically feasible to implement all of the above prevention measures. The following has been developed as a field guide for use in actual field situations.

Ambient air temperature is 70°F (21°C) or more:

- Replenish fluids and electrolytes. Drink cool (50°F to 60°F/10°C to 15°C) fluids hourly. The fluids should be caffeine-free and non-alcoholic. Do not wait until you are thirsty. Your normal thirst mechanism is not sufficient to overcome the effects of dehydration. If you feel thirsty, you are already becoming dehydrated.
- Provide shelter from the sun and heat.

Ambient air temperature is 70°F (21°C) or more and chemical-resistant clothing is being used:

- Same as above.
- Adjust work schedules if feasible.
- Initiate heat stress monitoring and/or the use of cooling devices.

### 1.3.2 HEAT STRESS MONITORING

When required, heat stress monitoring will be performed by monitoring the heart rate. Heart rate should be measured at the beginning of the work shift, at regular intervals, and at the start of each rest period.

1. If the heart rate is <110 beats per minute (bpm), personnel may continue the current work/rest schedule.
2. If the heart rate is >110 bpm, take a 10-minute break. Monitor heart rate at the end of the rest period. If not <110 bpm, rest until the heart rate is <110 bpm. Reduce the current work time between breaks by approximately 1 hour. If the next scheduled monitoring session shows a heart rate of >110 bpm once again, reduce the work time between breaks by 1 hour.

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## 1.4 HEAT STRESS FIRST AID

### 1.4.1 HEAT CRAMPS

Cause: Excessive water loss/electrolyte imbalance.

| *Symptoms* | *First-Aid Guidelines* |
|---|---|
| Muscular pain in arms, legs, abdomen | Administer sips of Gatorade (1/2 glass every 15 minutes) |
| Faintness, dizziness, exhaustion | Do not massage cramping muscles |
| Normal temp, cool moist skin | Relax person |

### 1.4.2 HEAT EXHAUSTION

Cause: Large amount of water loss; blood circulation diminishes.

| *Symptoms* | *First-Aid Guidelines* |
|---|---|
| Moist, clammy, skin, usually pale | Move to a cool place |
| Dilated pupils | Apply cold, wet compresses to skin |
| Weak, dizzy, nauseous, headache | Raise feet 8 to 12 inches |
| Normal or low body temperature | Administer sips of Gatorade (1/2 glass every 15 minutes) |
| | Get medical attention |

### 1.4.3 HEAT STROKE

Cause: Body overheats; temperature rises; no sweating occurs.

| *Symptoms* | *First-Aid Guidelines* |
|---|---|
| <u>No sweating occurs</u> | <u>Get emergency medical assistance ASAP</u> |
| Dry, hot skin, usually red | Remove from sunlight |
| Constricted pupils | Wet down body with cool water or rubbing alcohol |
| Hot body temperature (105°F to 110°F/40.5°C to 43.5°C) | Elevate head/shoulders |
| Strong, rapid pulse | Wrap in wet, cold wrapping |
| Unconsciousness may occur | Once cooled to 102°F (38.9°C), stop cooling measures |
| Muscular twitching | |

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## TABLE D.1

## RECOMMENDED HEART RATE MONITORING FREQUENCY

| | *70°F - 80°F (21°C - 27°C)* | *80°F - 90°F (27°C - 32°C)* | *90°F - 100°F (32°C - 38°C)* | *>100°F (38°C)* |
|---|---|---|---|---|
| **Relative Humidity Less than 80%** | | | | |
| Light Summer Clothing | Every 3 hours | Every 3 hours | Every 2 hours | Every 2 hours |
| Kleengard or Cotton Coveralls | Every 3 hours | Every 3 hours | Every 2 hours | Every hour |
| Tyvek, Poly-coated or Saranex Tyvek | Every 2 hours | Every 2 hours | Every hour | Stop work and re-assess |
| **Relative Humidity 80% or Greater** | | | | |
| Light Summer Clothing | Every 3 hours | Every 2 hours | Every 2 hours | Every hour |
| Kleengard or Cotton Coveralls | Every 2 hours | Every 2 hours | Every hour | Every hour |
| Tyvek, Poly-coated or Saranex Tyvek | Every 2 hours | Every hour | Every hour | Stop work and re-assess |

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ATTACHMENT E

MAP TO HOSPITAL
(SEE FIGURE 9.1)

ATTACHMENT F

OSHA GUIDANCE AND REGULATIONS
(NOT INCLUDED)

ATTACHMENT G

CHEMICAL HAZARD INFORMATION (MSDS SHEETS)

## MATERIAL SAFETY DATA SHEETS

In accordance with the requirements of 29 CFR 1910.1200, the contractor will provide Material Safety Data Sheet (MSDSs) for all chemicals brought to the Site. MSDSs will be kept with their Health and Safety Plan at all times, and available to all Site employees and visitors.

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# ATTACHMENT H

# ACCIDENT/INCIDENT REPORTING SOP

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# 1.0 ACCIDENT/INCIDENT REPORTING PROCEDURE

## 1.1 INTRODUCTION

### 1.1.1 PURPOSE

The purpose of the procedure is threefold, it is to provide a method to report accidents and incidents; to continually work toward an accident/incident free work environment; and to document corrective actions which were implemented due to the accident/incident as required by regulatory agencies.

### 1.1.2 SCOPE

The accident/incident reporting procedure is intended to be used by office and field staff. The intent of this procedure is the prevention of accidents, occupational illnesses, and injuries. Reviewing reported accidents and incidents can reduce the frequency of the reoccurrence of similar injuries, assist in assessing the effectiveness of the current operating standards and employee training, and document corrective actions taken by the Engineer.

## 1.2 DEFINITIONS

| | |
|---|---|
| Accident: | An unplanned event that causes harm to people or damage to property. |
| Incident: | An unusual occurrence that could have resulted in harm to people or property if the circumstances had been slightly different. |
| Critical Injury[1]: | Means an injury of serious nature that: |

i) places life in jeopardy;

ii) produces unconsciousness;

iii) results in substantial loss of blood;

iv) involves the fracture of a leg or arm but not a finger or toe;

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1 This definition is applicable to Ontario employees only.

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v) involves the amputation of a leg, arm, hand, or foot but not finger or toe;

vi) consists of burns to any major part of the body; or

vii) causes the loss of sight in an eye.

## 1.3 PROCEDURE

### 1.3.1 RESPONSIBILITIES

| | |
|---|---|
| Health and Safety Officer: | Assure that proper medical attention is given to the injured employee. Assist in accident inspection and take appropriate corrective actions. Assure that the injured submits an accident/incident reporting form to the Human Resources Manager. |
| Injured employee: | Be responsible for the completion of the accident/incident reporting form. Provide as much information as possible regarding the accident. |
| Witness: | Be involved in the reporting process for accidents. Assist in the completion of the accident/incident reporting form when applicable. Report accidents and incidents to Project Managers. |
| Human Resources Manager: | Assist injured employee in the completion of the accident/incident report forms, use the information provided in the form to complete the necessary governing forms and inform Project Managers and Industrial Hygiene Manager of the injury. |
| Industrial Hygiene Manager: | Review completed accident/incident report forms. Determine root or underlying causes for the accident/incident. Author a file memo summarizing the event and actions taken. Revise standard operating procedures and/or work plans to assist in prevention of similar accidents. |

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| | |
|---|---|
| Certified Joint Health and Safety Committee Representative: | Assist in the completion of accident/incident form for critical or fatal injuries. |

### 1.3.2 ACCIDENT REPORTING PROCEDURES

When an accident has occurred the injured employee shall:

- Seek the appropriate medical attention and call the Human Resources Manager as soon as possible, within 1 business day.
- Human Resources Manager will contact the Industrial Hygiene Manager. If critical injury or fatality of Ontario employee, call a Certified Joint Health and Safety committee representative.
- Injured employee with the assistance of Human Resources and Site personnel, will investigate accident by completing Accident/Incident Report Form (A/I Report Form). When investigating the accident it may be necessary to involve any witnesses, the Project Manager, the Industrial Hygiene Manager, and the Certified Joint Health and Safety Committee member.
- The employee will send a copy of the completed form to the Human Resources Manager. The Human Resources Manager will distribute a completed copy of the A/I Report Form to the Industrial Hygiene Manager.
- Each party that receives a copy of the form shall review it to ensure it is accurate and to ensure corrective measures are implemented so that similar accidents are unlikely to reoccur.

### 1.3.3 AUTOMOBILE ACCIDENTS

Every automotive accident involving a company-owned or leased vehicle (including rental cars and vehicles), no matter how seemingly minor, must be reported immediately by telephone to the Finance Manager. If employees are injured during an automobile accident refer to Section 1.3.2 for a reporting procedure. Accidents involving personally-owned vehicles being used for company business must, likewise, be reported. Even if property damage or personal injury is not apparent immediately, it is imperative that the Finance Manager be notified so that any claim(s) which may arise can be adequately documented.

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In addition to prompt verbal notification by telephone, a Vehicle Accident Report must be completed and submitted to the Finance Manager within 24 hours of the accident. Employees assigned to field offices should first telefax and then mail the written, signed report within the 48-hour period.

The automobile accident form can be found attached as Attachment B.

### 1.3.4 INCIDENT REPORTING PROCEDURE

When an incident has occurred involved personnel shall:

- contact Project Manager and Industrial Hygiene Manager as soon as possible;
- investigate incident by completing A/I Report Form as soon as possible. When investigating the incident, it may be necessary to involve any Witnesses, the Project Manager, the Industrial Hygiene Manager, and the Certified Joint Health and Safety Committee Representative;
- send copies of the completed A/I Report Form to Industrial Hygiene Manager and Joint Health and Safety Committee; and
- each party that receives a copy of the A/I Report Form shall review it to ensure it is accurate and to ensure corrective measures are implemented so that similar incidents are unlikely to reoccur.

### 1.3.5 COMPLETING THE A/I REPORT FORM

The A/I Report Form should be completed by the person most knowledgeable about the accident/incident. If that person can not be determined or is unavailable, the Project Manager or Supervisor of the workplace involved in the accident/incident shall complete the A/I Report Form and ensure the appropriate parties receive a copy.

### 1.4 RECORD KEEPING[1]

Records of accidents/incidents and Workman's Compensation Claims will be maintained by the Corporate Human Resources and Industrial Hygiene Managers. The

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1 This section only applies to United States employees.

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Corporate Industrial Hygienist will maintain a Master Occupational Safety and Health Administration (OSHA) Log of incidents according to OSHA Regulations. This log will be kept at each of the company office locations. Each office location will also maintain an OSHA 200 Log, as required by the Regulations. The Corporate Industrial Hygiene Manager will coordinate and audit each field location for compliance with this procedure.

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# CRA

## ACCIDENT/INCIDENT REPORTING FORM

The information collected by this form will be an aid to improving our internal Accident Prevention Programs and for WCB purposes.

For an accident, fill in all boxes; For an incident, fill in shaded areas only!!
An accident is defined as a situation that results in property damage and/or personal injury.
An incident is defined as a situation that COULD HAVE resulted in property damage and/or personal injury.
Attach additional sheets as required.

### A. Employee Identification

| Employee # | Last Name | First Name | Middle Name/Initial |
|---|---|---|---|
| | | | |

| Area Code | Telephone Number |
|---|---|
| (      ) | |

### B. Details of Accident/Incident

| Date and Hour of Accident/Incident | | Date and Hour Reported to Employer | | Date and Hour Last Worked | | Normal Work Hours on Last Day Worked |
|---|---|---|---|---|---|---|
| Day Month Year | a.m. p.m. | Day Month Year | a.m. p.m. | Day Month Year | a.m. p.m. | from to |

| Date and Hour Returned to Work | | If a Motor Vehicle Accident, Driver's License Number | Province/State Where License Issued |
|---|---|---|---|
| Day Month Year | a.m. p.m. | | |

1. What happened to cause the injury/disease? Describe injury, part of body involved, and specify left or right side.

2. Give exact location, include address, of the accident/incident. Describe accident/incident scene, provide diagram on reverse, include location of all workers.

3. Who was the injury/disease reported to? If injury/disease was not reported immediately, provide reason for delay.

4. Describe the employee's activities at the time of the accident/incident. Include details of equip./materials used and size and weights of objects being handled.

5. Object or Substance that directly injured employee, e.g., the machine employee struck against or which struck him/her; the vapor or poison inhaled or swallowed, the chemical that irritated his/her skin. In cases of stairs, the thing (s)he was lifting, pulling, etc.

6. Is there anyone else who may have witnessed or who may know about the injury/onset of the disease? If so, provide details below.

| Name(s) | Addresses and phone number(s) if not CRA employees |
|---|---|
| | |





OVER

## C. Health Care

Treatment ("X" all that apply)

| | | | |
|---|---|---|---|
| ☐ First Aid — Name of Provider (First, Mi, Last) | What type of First Aid was Administered? | | |
| ☐ Hospital — Name, Address (Street, City, Province/State, and Postal/Zip Code) | Treatment | Length of Stay | |
| ☐ Physician — Name, Address (Street, City, Province/State, and Postal Zip Code), Phone # | Treatment | Specialty | |

## D. Property Damage

| Identify Property Damaged (include owner of property, nature and source of damage, model and serial number if appropriate | Approximate Cost of Damage |
|---|---|
| | |

## E. Project Information (Project Related Incidents Only)

| Project # | Project Manager | Resident Engineer | Site Telephone Number | Client advised, if so who |
|---|---|---|---|---|
| | | | ( ) | |

| Were Safeguards or a HASP provided | Description of Safeguards, HASP, and relationship with accident/incident. Include whether the safeguards or the HASP were in use. |
|---|---|
| ☐ Yes<br>☐ No | |

## F. Follow-Up

| Describe the obvious causes of the accident/incident | Had training or instruction been given relating to the accident or incident. If so, describe. |
|---|---|
| | |

| Indicate any actions or measures that could prevent this type of accident/incident from occurring in the future. |
|---|
| |

## G. Administration

| Report Date<br>Day Month Year | Report Prepared by: (please print) | Report Prepared by: (signature) |
|---|---|---|
| | | |

| Accident/Incident Diagram. If insufficient space, attach separate page. |
|---|
| |

Fax, then mail to the HR department, Waterloo, immediately upon completion. Fax #519-725-5240

**CRA**
**Conestoga-Rovers & Associates**

## VEHICLE ACCIDENT REPORTING FORM

Accidents involving any vehicle must be reported immediately to the Finance Manager.
Accidents involving rented vehicles, must also be reported to the rental company.

A. Employee Identification

| Employee # | Last Name | First Name | Middle Name/Initial |
|---|---|---|---|
| Area Code ( ) Telephone Number (Site/Office/Hotel/Home) | | | |

B. Details of Accident

| Date and Hour of Accident<br>Day Month Year a.m. p.m. | Drivers License Number | Prov./State where License Issued |
|---|---|---|
| Vehicle Involved<br>CRA ☐ Make<br>Rental ☐ Model<br>Personal ☐ Year | License Plate Number<br>Prov./State | |

Other Vehicles Involved

| Drivers Name | Drivers License Number | Prov./State where License Issued | Insurance Company |
|---|---|---|---|
| Vehicle Make | Vehicle Model | Vehicle Year | Insurance Policy # |

| Drivers Name | Drivers License Number | Prov./State where License Issued | Insurance Company |
|---|---|---|---|
| Vehicle Make | Vehicle Model | Vehicle Year | Insurance Policy # |

| Police Report # | Officer Name | Badge Number | Office Jurisdiction |
|---|---|---|---|

In your own words please describe details of accident:

CRA 2966 (1) PART 4 - Reporting - APPB Rev 1 - 03/02/2001



OVER

CRA 6351 (33) APPB ATTH - Vehicle

| Describe damage to your vehicle (include diagram) |
|---|
| |

| Damage to other vehicle(s) |
|---|
| |

| Describe any injuries to yourself and/or other persons involved |
|---|
| |

C. Health Care

eatment ("X" all that apply)

| Name of Provider (First, Mi., Last) ☐ First Aid | What type of First Aid was Administered? | |
|---|---|---|
| Name, Address (Street, City, Province/State, and Postal/Zip Code) ☐ Hospital/Clinic | Treatment | Length of Stay |
| Name, Address (Street, City, Province/State, and Postal/Zip Code) ☐ Physician | Treatment | Length of Stay |

D. Administration

| Report Date<br>Day Month Year | Report Prepared By: (please print) | Report Prepared By: (signature) |
|---|---|---|
| | | |

Fax, then mail to Attn. of Finance Manager, Waterloo for CRA and HR Manager, NF for CRA Services immediately upon completion.
Include copy of Police Report and Rental information (if applicable).

# ATTACHMENT I

# MANAGEMENT OF DECONTAMINATION WASTES SOP

## MANAGEMENT OF DECONTAMINATION WASTES

Decontamination wastes consist of used PPE, wastewater and solids from decontamination activities. All used PPE will be handled as hazardous waste and will be initially placed in trash bags, transferred to suitable containers, and stored at the staging area pending off-Site disposal (e.g., drums). Wastewater from decontamination activities will be placed in a designated storage tank pending off-Site disposal. The tank will be marked with appropriate placards. Solids from decontamination activities will be transferred to a designated storage area pending off-Site disposal.

SSP: ______________________ Date: ______________________

# ATTACHMENT J

# RESPIRATOR PROGRAM

# TABLE OF CONTENTS



SSP: ____________________ Date: ____________________

# 1.0 RESPIRATORY PROTECTION PROGRAM

## 1.1 GENERAL

The selected contractor will establish a respiratory protection program which at a minimum will comply with this program. This respirator program has been developed to assure compliance with State and Federal requirements (OSHA 29 CFR 1910.134 and 120) and to protect the health of personnel who wear respirators. When not in use, respirators will be stored in a clean and dry area.

The primary control of respiratory hazards shall be accomplished, whenever feasible, through the use of engineering controls, hazard substitution, revised work practices, or other administrative controls. However, when such controls are not feasible, appropriate respiratory protection shall be used in accordance with the procedures established in this program.

## 1.2 FIT-TESTING

All personnel entering the exclusion zone or decontamination zone using a full-face negative pressure respirator must have successfully passed a qualitative respirator fit-test in accordance with OSHA 29 CFR 1910.134; or, ANSI within the last 12 months. Documentation of fit-testing is the responsibility of each employer.

## 1.3 POSITIVE-NEGATIVE FIT TEST PROCEDURES

On-Site personnel will be instructed in the proper method of testing respirator fit in the field by use of positive-negative pressure test. This test will be performed each time a respirator is donned.

This test is performed to help the wearer assess respirator function and find gross leaks between the face and facepiece. This positive-negative pressure test checks the presence and functioning of the respirator valves as well as leakage that may occur due to improper cartridge seal or respirator face fit.

SSP: ______________________ Date: ______________________

## 1.4 ROUTINE RESPIRATOR INSPECTION

On-Site personnel will be instructed in the proper method of respirator inspection. At a minimum the respirators will be inspected for the following before each use:

i) tightness of connections and condition of the facepiece;

ii) the headstraps or head harness should be examined for: breaks, loss of elasticity, broken or malfunctioning buckles and attachments, and excessively worn head-harness serrations that might permit slippage;

iii) valves and valve seats;

iv) connecting tube and cartridges or supplied air cylinders;

v) rubber or elastomer parts for pliability and deterioration; and

vi) regulators, fittings, breaks/kinks in supply hoses, gauges, air supply level, and warning devices (supplied air respirators only).

## 1.5 FACIAL HAIR AND GLASSES

Any individual with facial hair which protrudes into the sealing surface of the masks will be refused entry into areas where respirators may be required.

Employees who wear prescription glasses and must wear a full-face respirator shall be fitted with special eyeglass adapters.

SSP: ______________________ Date: ______________________

# ATTACHMENT K

# AIR MONITORING PROGRAM

## TABLE OF CONTENTS

## LIST OF FIGURES
(Following Text)



## LIST OF TABLES
(Following Text)

## 1.0 AIR MONITORING

### 1.1 OVERVIEW

During the progress of active drum removal program tasks, on-Site air quality will be monitored as described herein. Monitoring will be conducted on a daily basis and additionally as required by special or work-related conditions.

The daily monitoring program will consist of monitoring with a photoionization detector (for volatile organic compounds), DATARAM (for total suspended particulates), an explosimeter, an oxygen meter, a hydrogen sulfide monitor, a hydrogen cyanide monitor, and portable GC machines, calibrated in accordance with manufacturers recommendations.

At a minimum, the air monitoring program will occur during intrusive activities and will include:

1. Limits of excavation area/exclusion zone air monitoring;
2. Breathing zone for personnel immediately outside the EZ; and
3. Property perimeter air monitoring.

The results of the air monitoring program will be recorded in a log book or an appropriate form, which upon completion will be maintained on Site and available for review by interested Site and USEPA personnel.

### 1.2 LIMITS OF EXCAVATION AREA/EXCLUSION ZONE AIR MONITORING

The Contractor will conduct the limits of excavation area/exclusion zone air monitoring. During intrusive activities, air monitoring along the limits of each active excavation area and work zone will be conducted. The following instruments and action levels will be used to monitor the air for the parameters of concern.

| *Equipment* | *Frequency* | *Action Levels* |
|---|---|---|
| PID (Thermo Environmental 580B or equivalent) | Continuous during intrusive activities. | Sustained[1] readings exceeding 15 ppm. Review perimeter VOC monitoring data and, if necessary, modify work procedures (implement VOC control measures), or cease activities. |
| Total Suspended Particulate (i.e., personal DATARAM) | Continuous during intrusive activities | Reading exceeding OSHA limits. Modify work procedures (initiate dust control measures), or cease activities. TSP perimeter air monitoring sample will be submitted for analysis within 24 hours if TSP action levels exceed 15 mg/m$^3$. |
| Landtec GEM – 500 or equivalent (explosive gases) | Continuous during intrusive activities. | <0.5 $CH_4$ (10 percent LEL) percent continue operations; >0.5 $CH_4$ (10 percent LEL) percent, modify work procedures or cease activities. All readings to be taken in work area or downwind of work area. |
| Landtec GEM – 500 or equivalent (%$O_2$) | Continuous during intrusive activities. | <19.5 or >23.5 percent in work area or downwind of work area – evaluate cause of change in oxygen conditions, modify work procedures or cease activities, as appropriate. |
| Hydrogen Sulfide | Continuous during intrusive activities. | If readings approach 10 ppm, modify work procedures or cease activities. |

1 A sustained reading will be defined as a reading which is maintained for a minimum of 1 minute.

| Equipment | Frequency | Action Levels |
|---|---|---|
| Hydrogen Cyanide | Continuous during intrusive activities. | If readings approach 4.5 ppm, modify work procedures or cease activities. |
| Summa® Canister (TO-14 Analysis) | Twice per week. | (for information purposes) |

## 1.3 BREATHING ZONE AIR MONITORING

Breathing zone air monitoring, for personnel immediately outside the EZ will be conducted by the Contractor. Immediately upon identifying elevated levels of volatile vapors in the breathing zone, the results shall be reported to the HSO, to determine whether PPE should be upgraded or operations be shut down.

The following air monitoring program will be conducted during intrusive activities:

| *Equipment* | *Frequency*[1] | *Action Levels* |
|---|---|---|
| PID (Thermo Environmental 580B or equivalent) | As required during intrusive activities | 0 - 1 ppm Modified Level C<br>>1 ppm monitor for vinyl chloride, as described below:<br>• if vinyl chloride present, follow action level, as described below;<br>• if vinyl chloride not present, 1 - 50 ppm Level C.<br>>50 ppm upgrade to Level B or modified work practices. |
| Landtec GEM – 500 or equivalent (% $O_2$) | As required during intrusive activities. | <19.5 or >23.5 percent in work area or downwind of work area – modify work procedures or cease activities. |

| *Equipment* | *Frequency*[1] | *Action Levels* |
|---|---|---|
| Landtec GEM - 500 or equivalent (explosive gases) | As required during intrusive activities | <0.5 $CH_4$ (10 percent LEL) percent, continue operations; >0.5 $CH_4$ (10 percent LEL) percent, modify work procedures or cease activities. |
| Hydrogen Sulfide | As required during intrusive activities. | If readings approach 10 ppm on a direct reading instrument, modify work procedures or cease activities. |
| Hydrogen Cyanide | As required during intrusive activities. | If reading approach 4.5 ppm - modify work procedures or cease activities. |
| Vinyl Chloride Monitoring Draeger Tubes or Photovac Voyager | As required. | 0 - 1 ppm Modified Level C<br>>1 modify work, shut down or upgrade to Level B |

Breathing zone monitoring will be conducted within a 2-foot radius around the person's head (immediately outside of EZ area).

## 1.4 PROPERTY PERIMETER AIR MONITORING

### 1.4.1 METEOROLOGICAL MONITORING

An on-property meteorological station will be placed in a representative, unobstructed location during NSL activities. The station will provide at a minimum, temperature, barometric pressure, wind direction, and wind speed. These parameters will be monitored and recorded on an hourly basis throughout the duration of work activities. This data will be used to determine the downwind property line location.

### 1.4.2 BASELINE AIR MONITORING

Baseline air monitoring will be conducted on Site when no other activities are being conducted and within 2 weeks prior to removal action activities to establish background air quality conditions. U.S. EPA and Ohio EPA will be notified one week prior to baseline air monitoring activities. Samples will be collected on two separate precipitation-free days, with sampling to occur for a minimum of 8 hours. One total suspended particulate (TSP) sample will be collected from the three designated disposal areas where work will occur, for analysis each day. A total of six TSP samples will therefore be collected using NIOSH Method 0500. In addition, a portable GC Voyager unit will record VOC concentrations each 30 minutes over each 8-hour day. Data will be recorded from the on-property meteorological station concurrent with the baseline air monitoring.

### 1.4.3 AIR MONITORING DURING ON-SITE WORK ACTIVITIES

#### 1.4.3.1 VOLATILE ORGANIC COMPOUNDS

Each perimeter air monitoring station will include the use of a field GC with a minimum two readings per hour for VOCs during working hours in addition to the proposed metals and dust monitoring. Meteorological data will be recorded every 5 minutes (using weather station software) and downloaded at the end of each working day. In addition, U.S. EPA START will conduct perimeter air sampling with a Miran ThermoSapphIRe and Summa® canister sampling periodically.

VOC air monitoring during NSL activities will be conducted each work day. Air samples will be collected over a 10-hour period, between 0700 and 1700, with adjustments based on the actual working hours as appropriate. Property perimeter VOC samples will be analyzed by the portable GC units at minimum on each working day and initially (i.e., first month) each calendar day if deemed necessary. The need to continue monitoring each calendar day will be assessed at the end of the 1-month period based upon the results of the analyses. On average, the portable GC units will be equipped to analyze approximately two samples per hour during excavation activities. The Site perimeter action levels for VOCs are summarized in Table K.1 and are discussed in detail in Section 1.5.

The Site-specific VOCs to be monitored were chosen based upon those chemicals that were identified in Summa canister air sample and waste sample analytical results during the Disposal Area 5 drum removal activities. The 11 specific compounds to be analyzed include trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), vinyl chloride (VC), methylene chloride, benzene, tetrachloroethylene (PCE), toluene, ethylbenzene, and m-,o-,p-xylene.

Real-time perimeter air monitoring utilizing the Voyager GC units will be performed on a daily basis during intrusive drum removal activities and no less frequently than once per week during non-intrusive activities conducted during the period of the Area 1 removal action work. At a minimum, monitoring will be conducted at one upwind and three downwind locations. The location for placement of the three downwind Voyagers will be evaluated twice per day based upon the wind direction as determined from the on-Site weather station. The placement of the units will be located at stationary positions (as shown on Figure 4.3) and spaced to subtend an angle of approximately 90 degrees between the downwind left and downwind right units, using the center of the excavation, or primary working location, as the apex. The intent of this spacing is to allow the voyagers the ability to effectively monitor compounds even during fluctuating wind conditions. For excavation grids within 200 feet of the Area 1 perimeter fence, a minimum of two stations must be within the 90 degree pattern and the third station placed at the next closest downwind station.

Two Summa® canisters from each active excavation area will be sent for off-Site TO-14 analysis each week.

All air monitoring data will be documented and submitted to U.S. EPA as it is generated.

U.S. EPA may conduct additional exclusion zone and perimeter air monitoring during the removal action to supplement data, including the use of the summa canisters and ERT TAGA unit (mobile lab).

### 1.4.3.2 AIR MODELING

SCREEN3, a conservative air dispersion model recommended by the United States Environmental Protection Agency (USEPA) for screening purposes, was used to calculate the on-Site action levels for TSP. SCREEN3 uses Gaussian dispersion equations and worst case meteorological conditions to estimate maximum downwind concentrations due to emissions from a source. The SCREEN3 model provides more conservative modeling results than a detailed dispersion model such as the Industrial Source Complex (ISC3) model.

The SCREEN3 model utilized rectangular area sources and only one source was modeled at a time. The area source was assumed to be a square with a length and width varying from 20 to 50 feet. These various area sources represent the potential emissions sources at any given time during the test pit and drum removal program. The SCREEN3 modeling results are attached.

The SCREEN3 modeling concluded that the estimated maximum ground level concentration for the various area sources is at or near the edge of the area source. These estimated maximum ground level concentrations would be diluted at the closest receptor.

Dispersion modeling was conducted for the different area source sizes at varying distances (100, 150, 200, 250, and 300 feet). These distances are measured from the center of the area source to the nearest receptor. The dilution factors for all scenarios were calculated by dividing the estimated maximum ground level concentration (concentrations at the edge of the area source) by the concentration at the specified distance from the center of the area source (concentration at the nearest receptor).

### 1.4.3.3 TOTAL SUSPENDED PARTICULATE

TSP air monitoring during NSL activities will be conducted each work day. Air samples will be collected over a 10-hour period, between 0700 and 1700, with adjustments based on the actual working hours as appropriate. TSP will be collected using NIOSH Method 0500. This method describes the collection of TSP using a personal air-sampling pump set to a flow rate of 2 L/min and tared 37 mm, 5 µm PVC filter cassettes. The NIOSH Method is proposed to eliminate the use of a gas-powered generator, which would be required to deliver the AC power necessary to operate a High-Volume sampler (on-property power is not available). Sampling stations for TSP will be located on the property perimeter. Data will be recorded from the on-property meteorological station on each work day. The wind direction data will be used to determine the upwind and downwind sample placement. At a minimum one upwind and three downwind air samples will be collected.

Particulate, Semivolatile Organics, and Metals

The National Ambient Air Quality Standard (NAAQs) for respirable particulate matter (PM-10) is 150 $\mu g/m^3$, based on a 24-hour averaging period. Metals and SVOCs have been considered to be present in PM-10 potentially emitted from the Site during the test pit and drum removal activities.

The TLV air quality criteria for SVOCs and metals found on the Site in soil, are summarized in Table K.2.

The air quality criteria summarized in Table K.2 are for an averaging time period of 24 hours. These air quality criteria were developed based on the 8-hour American Conference of Government Industrial Hygienist (ACGIH) TLV criteria converted to a 24-hour averaging time period. The actual concentrations may fluctuate during the time period; however, the average concentration should be maintained below the air quality criteria. Wind direction fluctuations significantly impact the average concentration over a given time period at a stationary receptor.

The concentrations of PM-10 which would result in exceedances of TLV air quality criteria for metals and SVOCs were calculated based on the assumption that the concentrations of these compounds in the PM-10 would be the same as the characteristic soils concentration. The characteristic soils concentrations, as summarized in Table K.4 for Area 1 are calculated by averaging the concentrations of compounds detected soil samples (based on attached data).

Table K.3 provides a summary of the maximum allowable concentrations of PM-10 based on the above criteria. The tables show that providing a 24-hour PM-10 concentration at the nearest receptor is below 150 $\mu g/m^3$, the TLV criteria will not be exceeded for metals or for SVOCs. Therefore, based on the soil data and above calculations, the allowable metals and soils concentrations cannot be exceeded due to the limitations of the allowable PM-10 concentration.

Samples of stockpiled waste will be collected and analyzed for TCL/TAL parameters, if elevated concentrations of metals or SVOCs are observed in TCLP analyses of the stockpiled waste. This determination will be made by comparing the theoretical total concentrations (based on TCLP results and using the 20 times factor) to currently available data, which were used in the PM-10 evaluation.

Based on the SCREEN3 dispersion modeling, the PM-10 action level was calculated by multiplying the acceptable concentration (150 $\mu g/m^3$) by the dilution factors. The PM-10 action levels for the various area sources are summarized in Table K.2.

At a minimum, one upwind and three downwind TSP samples will be collected and submitted for analysis on the first day of work, and at a frequency of twice per 6 working days, thereafter.

## 1.5 ACTION LEVELS AND RESPONSE

### 1.5.1 INDICATOR VALUES AND STOP-WORK ACTION LEVELS

Short-term indicator values and defined stop-work action levels will be utilized to determine the appropriate course of action based upon real-time VOC monitoring. Voyager data at all perimeter air monitoring stations will be recorded and evaluated during every half hour working period, with the upwind concentration for each constituent used to evaluate whether off-Site sources may be impacting the Site or contributing to elevated values at the downwind perimeter. (In the event upwind concentrations are determined to have an effect on the Site, U.S. EPA will be notified to allow RAPCA to perform an independent evaluation of the off-Site source.) The downwind perimeter Voyager data will be averaged and compared to indicator values, as tabulated in Table K.5 and described below. The indicator values are based upon Ohio EPA Maximum Acceptable Ground Level Concentrations (MAGLCs), which are calculated by applying a factor of safety of 10 times to the 8-hour Time-Weighted-Average (TWA) of the ACGIH Threshold Limit Values (TLVs) and further correcting the values for a continuous source emission, resulting in calculated values of TLV/42.

The concentration measurements from each of the three downwind Voyager units will be performed on a one-hour average recalculated every 30 minutes (rolling average) after the first hour. Thus, during the first hour of monitoring there will be three individual downwind averages, and a total of six rolling 1-hour averages during every hour thereafter. In the event any one (or all six) of those rolling averages exceeed the indicator value (Table K.5), one exceedance will be noted for the one hour period during which the rolling average ended. For convenience, this one hour period will be referenced by the integer value of the time of day. (For instance, if the 1-hour rolling average at station "A" ended at 9:37 a.m. with an exceedance of benzene and the 1-hour rolling average at station "B" ended at 9:51 a.m. with an exceedance of vinyl chloride; it would be said that 10:00 a.m. contained an exceedance of the indicator value for that hour.) A consecutive exceedance of the indicator values will be noted if any rolling average for any constituent is exceeded during a consecutive integer hour of the time of day, regardless of whether it is the same station location or constituent from the previous hour. (To continue the previous example, a second one hour exceedance at 11:00 a.m. would occur if station "C" recorded a rolling average at 10:48 a.m. of TCE, regardless of what the rolling average was at that station at 10:24 a.m. or the rolling averages at station "A" and "B".)

In the event any downwind station records a constituent above its respective indicator value for a 1-hour period (as noted above), an evaluation will be performed to locate the potential source, and if necessary, to implement additional engineering controls as discussed in Section 1.5.2. The intent of the indicator values are to provide an early warning to prevent exceedances of OSHA 8-hour TWAs or the action levels established by the Ohio Department of Health (ODH). Additionally, the daily average VOC level for each parameter will be averaged and compared relative to the ODH perimeter monitoring levels for intermediate (365-day) and acute (14-day) values. A concentration of the daily downwind average for any parameter that is higher than its respective acute action level established by ODH will also warrant an evaluation of the Site activities and may necessitate changing work conditions to prevent an actual 14-day exceedance.

An exceedance of the indicator values for four consecutive hours or an exceedance of ten times the indicator values for two consecutive hours will trigger stop-work action levels. Stop-work action levels established by OSHA and ODH will also be in effect and are identified in Table K.1. Perimeter air monitoring exceedances of the ODH 14-day or 365-day rolling averages, exceedances within the support zone or perimeter of OSHA short-term-exposure limits (STELs) or TLVs for their respective time periods, or consecutive exceedances of the indicator values (as described above) shall warrant the immediate cessation of all the activities potentially responsible for the exceedances.

### 1.5.2 EVALUATION OF SOURCE AND ENGINEERING CONTROLS

In the event of an exceedance of the indicator values or a one day station average exceeding the 14-day ODH value, as noted above, an evaluation will be performed to ascertain the source. PID values during the period of the elevated readings at the edge of each excavation will be evaluated and additional monitoring within various areas of the exclusion zone and each individual work zone will be performed to attempt to determine the source. In addition, one of the Voyager units or chemical-specific Draeger tubes may be used within the exclusion zone to obtain lower detection capabilities on an as needed basis.

In the event a source is identified, engineering controls will be implemented. These may include the spraying of Concover over stockpiled material or along the base of the excavation, covering of temporary drum stockpiles, immediate overpacking of drums, bulking of drums, use of ECOSORB neutralizing spray, use of high volume fans, modification of work practices, cessation of specific activities, or possibly shutdown all of Site activities. The type of control used will be specifically dependant upon several parameters, including the location of the source or sources, the type and concentration of the contaminant, the frequency with which the elevated concentrations occur, and the past effectiveness of various control measures with respect to the specific event. Any one control measure, or combination of controls, may be used to fully mitigate potential future exceedances of the defined action levels.

### 1.5.3 NOTIFICATION PROCEDURES

Air monitoring results will be discussed during weekly Site progress meetings, including elevated readings above the indicator values that occurred during the previous week and the engineering controls taken, if applicable.

In the event of an exceedance of the indicator values for a 1-hour period, the U.S. EPA OSC will be notified within four hours. Notification to the U.S. EPA OSC will be made within two hours if the exceedance is ten times the indicator value. In the event stop-work action levels consisting of the 14-day and 365-day ODH values or OSHA Permissible Exposure Limits (PELs) are exceeded, notification will be made to appropriate agencies within 24 hours. These agencies will include the U.S. EPA OSC, the Ohio EPA PM, and the Dayton Fire Department. (Notification to additional agencies may be performed as needed.) Notification will include an assessment of the overall situation, including description of the chemical exceedance and concentration, duration of exceedance, location of source(s) (if known), corrective action measures taken and those proposed, and any additional relevant information.

Following an exceedance of a stop-work action level, the VRAC will submit a report within 7 business days describing the situation.

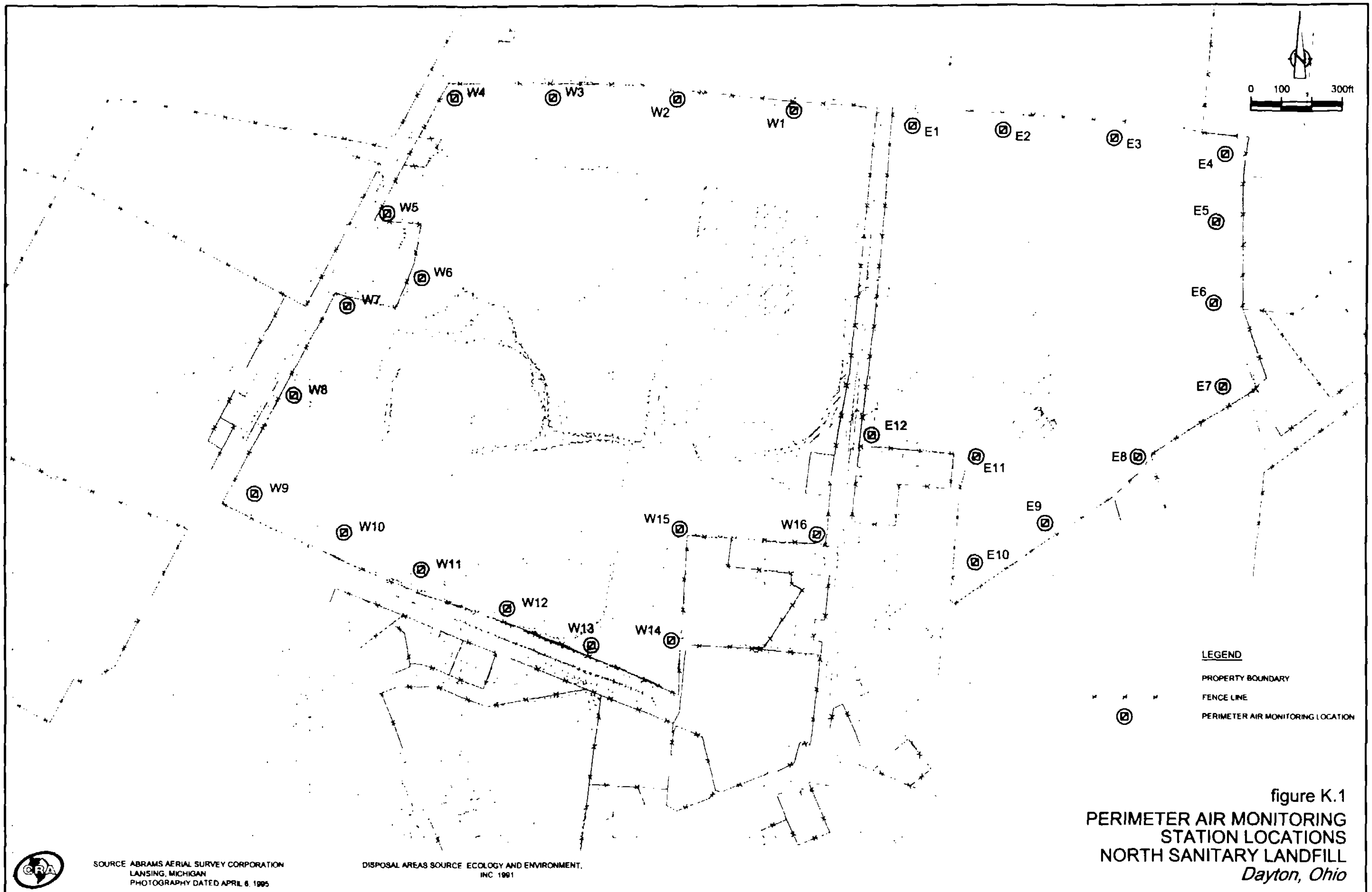


figure K.1
PERIMETER AIR MONITORING
STATION LOCATIONS
NORTH SANITARY LANDFILL
*Dayton, Ohio*

SOURCE: ABRAMS AERIAL SURVEY CORPORATION
LANSING, MICHIGAN
PHOTOGRAPHY DATED APRIL 6, 1995

DISPOSAL AREAS SOURCE: ECOLOGY AND ENVIRONMENT, INC. 1991

**TABLE K.1**

**VOC ACTION LEVELS FOR SITE PERIMETER (1)**
**VALLEYCREST LANDFILL SITE**
**DAYTON, OHIO**

| *Compound* | *Action Level (ppb)* Intermediate (3) (<365 days) | Acute (4) (<14 days) |
|---|---|---|
| Acetone | 13,000 | 26,000 |
| Benzene | (2) | 50 |
| Carbon Disulfide | 700 | |
| Chlorobenzene | | |
| Chloroethane | | 15,000 |
| Chloroform | 50 | 100 |
| 1,1-Dichloroethane | | |
| 1,2-Dichloroethane | 200 | 200 |
| 1,2-Dichloroethylene | 200 | 200 |
| Ethylbenzene | 200 | |
| Methylene Chloride | 30 | 400 |
| 4-Methyl-2-Pentanone | | |
| Tetrachloroethylene (PCE) | | 200 |
| Toluene | | 3,000 |
| Trichloroethylene (TCE) | 100 | 2,000 |
| 1,1,1-Trichloroethane | 700 | 2,000 |
| 1,1,2-Trichloroethane | | |
| Trichlorofluoromethane | | |
| Vinyl Chloride | 30 | 500 |
| Xylene | 700 | 1,000 |

Notes:

(1) These action levels were provided by the Ohio Department of Health and are based on Minimal Risk Levels (MRLs) as defined by the Agency for Toxic Substances Disease Registry (ATSDR)

(2) The ambient level for benzene exceeds the MRL based intermediate level of 4 ppb. The ambient level for benzene will be determined by the upwind air monitoring station. The action level for benzene will be the stated action level plus the ambient level.

(3) The "intermediate" action level will be compared to a continuing average of the concentrations recorded at the downwind perimeter monitoring locations.

(4) The "acute" action level will be compared to a 14-day rolling average of the concentrations recorded at the downwind perimeter monitoring locations.

# TABLE K.2

## MAXIMUM ALLOWABLE PM-10 24-HOUR CONCENTRATIONS - AREA 1
## NORTH SANITARY LANDFILL SITE
## DAYTON, OHIO

| | *Sample Concentration (µg/kg)* | *Concentration in PM-10 (%wt)* | *TLV ($\mu g/m^3$)* | *Maximum Allowable PM-10 24-Hour Concentration ($\mu g/m^3$)* |
|---|---|---|---|---|
| PM-10 | | 100 | | 150 (1) |
| ***Semi-Volatile Organic Compounds (µg/kg)*** | | | | |
| FLUORANTHENE | 300 | 0.00003 | NA | NA |
| PYRENE | 300 | 0.00003 | NA | NA |
| BIS(2-ETHYLHEXYL)PHTHALATE | 14900 | 0.00149 | NA | NA |
| PHENANTHRENE | 2200 | 0.00022 | NA | NA |
| BENZO(b)FLUORANTHENE | 72 | 0.0000072 | NA | NA |
| BENZO(a)PYRENE | 46 | 0.0000046 | NA | NA |
| 2,4-DIMETHYLPHENOL | 880 | 0.000088 | NA | NA |
| BUTYL BENZYL PHTHALATE | 620 | 0.000062 | NA | NA |
| DI-n-BUTYL PHTHALATE | 1170 | 0.000117 | NA | NA |
| FLUORENE | 1400 | 0.00014 | NA | NA |
| NAPHTHALENE | 1500 | 0.00015 | 53000 | 20,190,476,190 |
| ***Metals (mg/kg)*** | | | | |
| ALUMINUM | 7813 | 0.7813 | 10,000 | 731,382 |
| ANTIMONY | 10 | 0.001 | 500 | 28,571,429 |
| ARSENIC | 7.1 | 0.00071 | 10 | 804,829 |
| BARIUM | 1623.5 | 0.16235 | 500 | 175,987 |
| BERYLLIUM | 0.98 | 0.000098 | 2 | 1,166,181 |
| CADMIUM | 2.3 | 0.00023 | 10 | 2,484,472 |
| CALCIUM | 32288 | 3.2288 | NA | NA |
| CHROMIUM | 37.7 | 0.00377 | 500 | 7,578,628 |
| COBALT | 6.4 | 0.00064 | 20 | 1,785,714 |
| COPPER | 35.8 | 0.00358 | 200 | 3,192,338 |
| IRON | 18580 | 1.858 | 5,000 | 153,775 |
| LEAD | 151.3 | 0.01513 | 50 | 188,840 |
| MANGANESE | 12276 | 1.2276 | 200 | 9,310 |
| MAGNESIUM | 429.7 | 0.04297 | NA | NA |
| MERCURY | 2.73 | 0.000273 | 25 | 5,232,862 |
| NICKEL | 21.2 | 0.00212 | 50 | 1,347,709 |
| POTASSIUM | 1250.8 | 0.12508 | NA | NA |
| SODIUM | 115.1 | 0.01151 | NA | NA |
| VANADIUM | 20.6 | 0.00206 | 50 | 1,386,963 |
| ZINC | 191.8 | 0.01918 | 10,000 | 29,792,939 |
| CYANIDE | 9.9 | 0.00099 | 5,000 | 288,600,289 |

Notes:

NA Criteria Not Available
(1) National Ambient Air Quality Standard for PM-10
(2) Maximum allowable PM-10 concentrations such that TLV criteria for all compounds are not exceeded.

TABLE K.3

VALLEYCREST NORTH SANITARY LANDFILL - AIR MONITORING LOG

Date: ____________________

| *Time* | *Location* | *TSP (mg/m³)* | *PID (ppm)* | *Benzene (ppm)* | *CH4 (%)* | *O2 (%)* | *H2S (ppm)* | *HCN (ppm)* | *Weather* | *Sampler Initials* |
|---|---|---|---|---|---|---|---|---|---|---|
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# TABLE K.4

## SUMMARY OF SVOC, METALS, AND PESTICIDE/PCB SOIL ANALYTICAL DATA FOR AREA 1
## NORTH SANITARY LANDFILL
## DAYTON, OHIO

| | *No. of Detections (out of 12)* | *Maximum* | *Minimum* | *Average of Detections* |
|---|---|---|---|---|
| <u>SVOCs</u> **(mg/kg)** | | | | |
| fluoranthene | 3 | 0.6 | 0.12 | 0.3 |
| pyrene | 4 | 0.53 | 0.1 | 0.3 |
| Bis(2-ethylhexyl)phthalate | 6 | 41 | 1.6 | 14.9 |
| phenanthrene | 4 | 4.5 | 0.21 | 2.2 |
| benzo(b)fluoranthene | 1 | 0.072 | 0.072 | 0.072 |
| benzo(a)pyrene | 1 | 0.046 | 0.046 | 0.046 |
| 2,4-dimethylphenol | 1 | 0.88 | 0.88 | 0.88 |
| butyl benzyl phthalate | 1 | 0.62 | 0.62 | 0.62 |
| di-n-butylphthalate | 2 | 1.7 | 0.64 | 1.17 |
| fluorene | 1 | 1.4 | 1.4 | 1.4 |
| naphthalene | 1 | 1.5 | 1.5 | 1.5 |
| <u>Metals</u> **(mg/kg)** | | | | |
| aluminum | 12 | 22300 | 37 | 7813 |
| antimony | 4 | 18.3 | 3.2 | 10 |
| arsenic | 11 | 14.8 | 0.601 | 7.1 |
| barium | 12 | 8600 | 10 | 1623.5 |
| beryllium | 5 | 1.4 | 0.72 | 0.98 |
| cadmium | 7 | 9.6 | 0.39 | 2.3 |
| calcium | 12 | 74000 | 1890 | 32288 |
| chromium | 11 | 110 | 9.4 | 37.7 |
| cobalt | 8 | 10.4 | 1.4 | 6.4 |
| copper | 11 | 108 | 1.1 | 35.8 |
| iron | 12 | 35900 | 360 | 18580 |
| lead | 11 | 384 | 18.4 | 151.3 |
| magnesium | 12 | 41100 | 31 | 12276 |
| manganese | 12 | 941 | 2.7 | 429.7 |
| mercury | 8 | 16 | 0.216 | 2.73 |
| nickel | 11 | 64.7 | 3.8 | 21.2 |
| potassium | 10 | 3030 | 38 | 1250.8 |
| sodium | 5 | 210 | 29.1 | 115.1 |
| vanadium | 11 | 42.4 | 1.5 | 20.6 |
| zinc | 12 | 796 | 2.3 | 191.8 |
| cyanide | 3 | 25.5 | 1.5 | 9.9 |

**TABLE K.4**

**SUMMARY OF SVOC, METALS, AND PESTICIDE/PCB SOIL ANALYTICAL DATA FOR AREA 1**
**NORTH SANITARY LANDFILL**
**DAYTON, OHIO**

**Pest/PCBs (mg/kg)**

| | | | | |
|---|---|---|---|---|
| Arochlor 1016 | 1 | 7.8 | 7.8 | 7.8 |
| Arochlor 1254 | 5 | 2.4 | 0.84 | 1.47 |
| Arochlor 1248 | 1 | 0.98 | 0.98 | 0.98 |
| Heptachlor | 1 | 3.1 | 3.1 | 3.1 |

Notes:

This summary is based on the following twelve samples:
i) FIT surface soil samples (1991): S24, S25, S23, S4, S5, S6
ii) Fire hazard mitigation drum samples (1997): INE-001, INE-002, INE-008
iii) Fire hazard mitigation soil samples (1997): S-6351-ML-001, -002, and -003

**TABLE K.5**

**VOC INDICATOR VALUES FOR SITE PERIMETER [1]**
**VALLEYCREST LANDFILL SITE**
**DAYTON, OHIO**

| *Compound* | *Indicator Value (ppm)* |
|---|---|
| Acetone | 11.9 |
| Benzene | 0.012 [2] |
| Chloroethane | 2.4 |
| Chloroform | 0.24 |
| 1,2-Dichloroethane | 0.24 |
| 1,2-Dichloroethylene | 4.8 |
| Ethylbenzene | 2.4 |
| Methylene Chloride | 1.2 |
| Tetrachloroethylene (PCE) | 0.6 |
| Toluene | 1.2 |
| Trichloroethylene (TCE) | 1.2 |
| 1,1,1-Trichloroethane | 8.3 |
| Vinyl Chloride | 0.024 |
| Xylene | 2.4 |

Notes:

(1) These values are based upon the Ohio EPA Maximum Acceptable Ground Level Concentrations, or MAGLCs. The MAGLCs are calculated by applying a factor of safety of 10 to the ACGIH TLV-TWAs and further reducing the values by converting the 40-hour TLVs to a continuous source emission value. The resulting calculation is TLV/42.

(2) The ambient level for benzene will be determined by the upwind air monitoring station. The action level for benzene will be the stated action level plus the ambient level.

# ATTACHMENT L

# SITE ENTRY SOP

SITE ENTRY SOP

Prior to entry/exit all personnel and visitors will be required to sign a site entry/exit log book located at the Site trailer in the support zone.

All Site personnel and visitors entering the exclusion and containment reduction zone will be required to attend a Site indoctrination training session and sign the Site Safety Plan Acknowledgement Form.

All personnel requiring entry to the exclusion zone must provide current documentation proving the following:

- 40-/8-hour training as required by 29 CFR 1910.120(e)
- Medical Surveillance as required by 29 CFR 1910.120(f) and 29 CFR 1910.134
- Respirator fit-testing as required by 29 CFR 1910.134

ATTACHMENT M

HAZARDOUS WASTE STORAGE SOP

## HAZARDOUS WASTE STORAGE SOP

Any material known or suspected to be a hazardous waste will be temporarily stored in appropriately labeled securable containers (i.e., overpack drums or roll-off containers or wastewater tanks) and staged at a designated on-site drum storage area subject to characterization and potential off-site disposal.

Detailed logs will be kept of drums overpacked, materials bulked in roll-off containers, and liquids in wastewater tanks. The logs will record a description of the waste material, results of HazCat analysis, quantities, date of material containerization, etc. All overpacked drums, roll-off containers, and wastewater tanks will be labeled identifying details of their contents and their individual drum identifications markings. The drum staging area will be inspected daily to identify potential leaks or damage to containerized waste.

# ATTACHMENT N

# DRUM HANDLING SOP (INCLUDING BURIED/DAMAGED DRUMS)

TABLE OF CONTENTS

# 1.0 DRUM HANDLING PROCEDURES

## 1.1 DRUM HANDLING

Cleanup operations involving drums and containers must be carried out safely. This means that the handling, sampling, testing, staging, transport, decontamination, evacuation, excavation, and bulking of drums and containers must be carried out with minimal risk. When new containers are used, they must meet minimum standards according to DOT, OSHA, and USEPA regulations.

### 1.1.1 SITE PREPARATION

Before commencing site activities involving the handling of drummed waste, the area must be prepared to facilitate operations and eliminate obvious physical hazards. Roadways, work areas and storage areas should be constructed to provide ease of access and a sound roadbed for heavy equipment and vehicles. Security fences or barricades should be erected. Work areas should be cleared and physical hazards should be eliminated as much as possible. Physical hazards to consider include:

- ignition sources in flammable areas such as drum opening and bulking areas;
- sharp, protruding edges such as torn metal, glass, nails, and other objects which can puncture or tear protective clothing or equipment;
- unsecured railings, loose steps or flooring, holes, slippery surfaces, debris, and other obstacles that can cause slips, trips, and falls;
- protruding objects which can cause slips, trips, and falls; and
- weeds and debris which obstruct visibility.

Weeds and debris can be removed, walking surfaces can be cleared and repaired, skid resistant strips can be installed on slippery surfaces, railings can be repaired or installed, stairs and ladders can be secured, and sharp objects and protruding edges which cannot be removed can be covered or properly guarded. Staging areas can be constructed to facilitate safe and effective operations.

## 1.2 GENERAL RULES

- Drums and containers used must meet minimum DOT regulations;
- If practical, drums and containers will be inspected to insure their integrity prior to being moved. If drums or containers are stored or stacked so that inspection is impossible, they should be moved to an accessible location for inspection prior to further handling;
- Unlabeled drums and containers will be assumed to contain hazardous substances and treated accordingly until contents are positively characterized;
- Site operations shall be organized so as to minimize the amount of drum or container movement required;
- All employees exposed to transfer operations shall be warned of potential hazards associated with contents of any drums or containers involved;
- DOT specified salvage drums or containers and suitable sorbent materials shall be available in areas where spills may occur;
- Where major spills are possible, a spill containment program shall be implemented. The spill containment program shall allow for the containment and isolation of the entire volume being transferred;
- Drums and containers that can not be moved without rupture or leakage will be emptied into a sound container;
- Buried drums shall be excavated carefully to prevent rupture; and
- Suitable fire extinguishing equipment will be kept on hand and ready for use.

### 1.2.1 OPENING DRUMS AND CONTAINERS

These procedures are to be followed in areas where drums or containers are being opened:

- the buddy system is to be utilized at all times during drum opening operations;
- Level B is mandatory if the drum contents are unknown;
- if airline respirators are used, air cylinder connections must be protected from contamination and the entire system shall be protected from physical damage;
- employees who must work near drums or containers being opened must be provided protective shielding in case of explosion;

- employees not directly involved in the opening procedures will be kept at a safe distance;
- controls for opening equipment, monitoring equipment and fire suppression equipment shall be located behind the shield;
- non-sparking tools and equipment will be used when flammable atmospheres are a reasonable possibility;
- drums and containers shall be opened so as to safely relieve excess pressure. Either relieve the pressure from a remote location or place appropriate shielding between the employee and the drums or containers; and
- employees shall not stand on or work from drums or containers.

### 1.2.2 MATERIAL HANDLING EQUIPMENT

Material handling equipment shall be selected, located and operated so as to prevent ignition of vapors released during opening procedures. There are hazards associated with gas or electrically powered units.

### 1.2.3 RADIOACTIVE WASTES

If a drum exhibits radiation levels above background (approximately >2 mrem/hr), immediately contact the HSO. Do not handle any drums that are determined to be radioactive. A special contractor will be brought in to further characterize and process the drum(s).

### 1.2.4 SHOCK-SENSITIVE, AIR REACTIVE OR WATER REACTIVE WASTE

When handling drums containing or suspected of containing shock-sensitive or reactive wastes, the following special precautions should be followed:

- all nonessential employees shall be removed from the area of transfer;
- material handling equipment shall be fitted with explosion containment devices or protective shields to protect operators;
- an alarm system will be used to signal the beginning and end of the procedure;

- continuous communications will be maintained between the employee in charge of the operation and the HSO during the operation;
- pressurized drums shall not be moved until the cause of the excessive pressure is determined and appropriate measures are implemented;
- all drums and containers containing packaged laboratory wastes (lab packs) shall be considered shock-sensitive until proven otherwise; and
- work will proceed in clear, dry weather.

### 1.2.5 LAB PACKS

Laboratory packs (i.e., drums containing individual containers of laboratory materials) can be an ignition source for fires. They may contain shock-sensitive or explosive materials. Prior to handling or transporting packs, move all non-essential personnel to a safe distance. Use a grappler unit constructed for explosive containment for handling. A qualified person must inspect, classify and segregate the containers in the lab pack. Pack the segregated containers with sufficient cushioning and adsorption materials to prevent excessive movement. *If crystalline material is noted at the opening of any* container, handle it as a shock-sensitive waste.

### 1.2.6 SHIPPING AND TRANSPORT

Drums and containers shall be identified and classified prior to packaging for shipment. Staging areas shall be kept to the minimum number necessary and shall be provided adequate entrance and exit routes. Bulking of wastes shall be permitted only after a HAZCAT/compatibility characterization has been completed.

## 1.3 CONTAINER HANDLING

Waste containers of various types on a site may need to be handled during sampling, characterization or preparation of material for disposal, in addition to other reasons.

### 1.3.1 VISUAL INSPECTION

Prior to handling, visually inspect the containers for the following to determine if the containers might show whether the materials may be radioactive, explosive, corrosive, toxic, flammable, or lab-packed:

- symbols, words or markings;
- signs of deterioration such as corrosion, rust or leaks;
- indications the container is under pressure, such as swelling or bulging;
- drum type;
- configuration of drumhead; and
- conditions in the immediate vicinity of the container. Crystalline material on or around the containers could indicate shock-sensitive material. In addition, there may be other material leaked or spilled from the containers onto the ground which might give a clue as to what may be in the drum.

### 1.3.2 MONITORING

Before any moving or opening of containers takes place, direct reading instruments should be used to detect the presence of organic vapors, combustible gases, or above background levels of radiation.

### 1.3.3 SUBSURFACE INVESTIGATION

If there is any reason to suspect the presence of buried containers, some type of non-destructive ground penetrating system should be used to determine the approximate location and depth of such containers. U.S. EPA supplied data will be used.

### 1.3.4 PRELIMINARY CLASSIFICATION

As a precautionary measure, any unlabeled containers should be assumed hazardous until it is learned otherwise. Using the information gathered by visual inspection, monitoring and subsurface investigations, preliminarily classify any containers thought to be radioactive, leaking/deteriorated, under pressure, explosive/shock-sensitive, lab packs, or buried.

### 1.3.5 PLANNING

Based on inspection and preliminary classification, decide if any hazards are present and the appropriate response activity. Determine which drums need to be moved in order to be opened and/or sampled. A preliminary handling plan should be developed dealing with the extent of any necessary container moving or handling and the most appropriate procedures based on the particular hazards revealed during preliminary inspection. The handling plan should be revised as new information comes to light during site operations.

## 1.4 OPENING CONTAINERS

If supplied air respiratory protection is used, place a bank of air cylinders outside the work area and supply air to the operators via airlines and escape SCBAs. Keep personnel at a safe distance from the drums being opened. If possible, monitor for radiation, combustibles and toxics during opening. Use the buddy system.

### 1.4.1 REMOTELY CONTROLLED OPENING DEVICES

If possible, use remotely controlled devices for opening drums. This procedure must be explored first, prior to deciding to open drums manually.

#### 1.4.1.1 BACKHOE SPIKE

The backhoe spike is a metal (bronze) spike attached or welded to a backhoe bucket. It is efficient and advisable for large scale operations. The drums should be in rows with adequate aisle space to allow ease of backhoe movement. Once in rows, drums can be quickly opened by punching holes in the drum tops with the spike. To prevent cross contamination, the spike should be decontaminated after each drum is opened.

#### 1.4.1.2 HYDRAULIC DRUM PIERCER

A hydraulically operated drum piercer consists of a manually operated pump which pressurizes oil through a hydraulic line. A piercing device with a spark-proof metal point is attached to the end of the line and pushed into the drum by the hydraulic pressure. The piercing device can be attached so that the hole is made in the side or top of the drum.

#### 1.4.1.3 PNEUMATIC BUNG REMOVER

Operates by means of compressed air delivered through a high-pressure airline to a pneumatic drill which is adapted to turn a bung fitting. An adjustable bracket has to be attached to the drum before the drill can be operated and must be removed before the sample can be taken.

### 1.4.2 MANUALLY OPERATED OPENING DEVICES

The risks are greater when manually opening drums than when using remotely operated means. When using manual devices, the drums must be positioned to allow easy worker access to the drums.

#### 1.4.2.1 BUNG WRENCH

A bung wrench must be of the non-sparking kind and should be marked as such. Although a non-sparking wrench will prevent sparking between the wrench and drum, it will not prevent sparking between the bung and the threads on the drum. The bung should be turned very slowly to allow pressure to dissipate and reduce the chance of sparking. The small bung should be opened first, as a pressure release. Avoid leaning on the drum while opening.

#### 1.4.2.2 DRUM DEHEADER

A drum deheader can be used when the bung is not removable with a bung wrench. It can be used only with closed-head drums, not on open-top drums. It is used by first positioning the cutting edge just inside the top chime and then tightening the adjustment screw so the deheader is held against the side of the drum.

### 1.4.2.3 HAND PICKS, PICKAXES, AND SPIKES

Hand picks, pickaxes and spikes are not recommended for opening drums because the drum must be struck with too much force, creating great potential for spraying and splashing. Also, drums cannot be opened slowly enough with this method, so any over-pressure can be dangerous. In addition, there is a great hazard using this method on drums with shock-sensitive materials. Use of chisels and firearms as an opening tool is prohibited.

## 1.5 DRUM/SOIL EXCAVATION AND STOCKPILING

### 1.5.1 GENERAL

Drum/soil excavation and stockpiling entails the removal, handling, and staging of buried drums/drum fragments, drum contents and select soils associated with the drums.

The excavation of drums and potentially contaminated soil is a specialized activity which requires a qualified contractor working under a CRA specification (and Contract). The contract will require the contractor to not only direct/conduct the actual field work but may also stipulate the direction/performance of investigative activities. Investigative requirements may include; field analytical/screening and completion of required investigative documentation. The primary function of the CRA representative in such a contract wil! be to observe the activities of the Contractor to insure the requirements of the specification are upheld. This section is presented in terms of this contractual arrangement of responsibilities.

On projects where relatively few drums are known or expected to be removed, as the primary reason for the work or as a contingency activity, CRA personnel may be tasked with directly supervising the work of the contractor as well as completing the investigative activities noted above.

Under no circumstances should a CRA Site Representative allow drum excavation to occur if a drum is unexpectedly encountered in the field and there is no drum excavation work plan/specification in place.

### 1.5.2 PRIOR PLANNING AND PREPARATION

Prior to CRA personnel mobilizing to the field site, the following activities should be completed:

i) Review the latest revision of the Work Plan, HASP and QAPP. Insure your understanding is accurate and complete and that all of your questions have been satisfactorily answered. Of particular importance are:

- drum assessment standards,
- soil/drum screening/removal standards,
- excavation/dewatering/fluid handling,
- soil/drum staging requirements,
- standards for excavated soils to be used as backfill,
- excavation sampling requirements, and
- excavation closure requirements.

ii) Coordinate for use of one of the CRA cascade supplied air system or SCBA if Level B Work is anticipated or possible.

iii) Procure a Site Construction/Remedial Site Support Kit.

iv) Coordinate for (if a CRA responsibility) or insure the completion of the location and marking of any underground utilities with the authority having jurisdiction and local dig safe organization. Complete a Property Access/Utility Clearance data sheet.

v) Insure an accurate/updated site survey exists.

vi) Insure copies of all required permits are available to be posted.

### 1.5.3 FIELD PROCEDURES

i) Site Setup/Preparation

Prior to the start of any intrusive activities at the site, inspect all site support facilities to insure:

- Emergency first aid facilities/equipment and decontamination facilities are in place in accordance with the Contractor's approved Health and Safety Plan.

- all drum/soil staging facilities are properly located and completed. See Section 3.3.4 for additional details.
- proper drum/drum fluid handling equipment is on site and in good working order.
- safety apparel and equipment (monitoring) as specified in the Contractor's Site specific Health and Safety Plan is present and functioning properly (as determined by the Health and Safety Officer).
- all drum excavation areas, as identified by magnetic investigation or other means have been located by survey.
- all work zones (Exclusion Zone, Contaminant Reduction Zone, Support Zone) have been properly delineated.

ii) <u>Equipment</u>

a) <u>Excavating Equipment</u>

Excavation of drums is to be performed using equipment that will minimize potential damage to the drums. Equipment such as backhoe buckets without teeth are to be used. Equipment must be capable of being operated with extreme control.

Excavation equipment must be suitable to safely excavate to the required depth as stated in the work plan.

When drums containing liquids with low flash points (below 100 degrees Fahrenheit) are expected/possible, the portion of all equipment which will contact drums should be positively grounded to prevent static discharge upon contact with a drum. This is particularly important when using equipment with rubber tires.

Where possible, due to site surface/weather conditions, rubber tired equipment should be used to minimize disturbance of the site and to reduce the effort required to completely decontaminate equipment. Rubber tired equipment may not be stable on some surface conditions. Track mounted equipment should be used whenever the potential for unstable base material exists.

Under certain circumstances blast shields may be required on the front of the excavating equipment.

b) Drum Removal Equipment

All handling, moving and transporting of drums should be done with mechanical equipment whenever possible to minimize worker contact with the drums.

Advance consideration must be given to the type of extended reach equipment required to remove drums from deep excavations where personnel entry is not possible due to lack of shoring or stepped sidewalls.

Mechanical drum grapplers are well suited for the removal of large numbers of relatively intact drums (one at a time). Where drums are in poor condition, removal of drums with non-metallic slings manually placed on each drum and then hooked to a dedicated lifting point on the backhoe bucket is appropriate. Manual removal of drums should be considered as a last resort and should not be conducted where entry into the excavation is unsafe.

In shallow excavations or advancing vertical faces, a front end loader may be used to get under the drums.

Separation, nudging or other manual contact with drums should be done with non-sparking hand tools. Portions of equipment that contact drums shall preferably be constructed of non ferrous metals in order to prevent spark generation.

c) Equipment Safety

All handling and transport equipment must be equipped with a Class ABC fire extinguisher and self contained or supplied air respiratory systems if deemed necessary by the Health and Safety Officer. All equipment used for handling and transport of drums must be regularly maintained and repaired. In particular, the ignition manifold and exhaust components must be maintained to prevent backfiring or generation of sparks with the exhaust gases.

Equipment must be decontaminated within the equipment decontamination facilities prior to removal from the Site for use in clean areas.

iii) Drum/Soil Excavation

a) Personnel

During the excavation or handling of drums, a team of personnel specifically trained in the handling of drummed or containerized waste will be designated to perform this task. The team will be located in the Exclusion Zone. The team may carry out other tasks but will be immediately available if a drum is encountered.

This team will be comprised of no fewer than two drum handling personnel as well as a supervisor. During the handling of drummed waste, visual contact is to be maintained among members of the working team at all times. The supervisor is to be located at the limits of the Drum Excavation Area work zone. All team members must be able to communicate with ease among themselves during activities requiring SCBA and during all other activities.

b) Excavation

The overlying soils must be excavated in a controlled manner. Excavation must be performed in such a manner that only the bucket and boom of the excavation equipment will be in contact with contaminated materials, to the extent feasible.

In some situations, drums may be found compacted one atop the other requiring hand excavation to free each drum. Hand excavation may be required as a last resort.

**Note: Safety must never be compromised for speed when separating drums from a drum cluster. Each drum must be excavated individually.**

The excavation should proceed to the limits described in the work plan. However, careful consideration must be given to the depth and slope of the excavation as it progresses to maintain the ability of drum handling personnel to enter the excavation (within specified health and safety limits).

Drum excavations should be backfilled as soon as possible after drum/soil removal activities are completed. Open excavations pose a safety hazard. However, the nature of the work may require the excavation to remain open until analytical results are returned and reviewed.

Backfilled areas should be flagged/staked after completion to assist in completion of a final field survey or future relocation of former drum locations.

c) Soil Screening and Segregation

As required by the work plan, screening of the soil surrounding each drum may be required. Each drum and the soil immediately surrounding it may be screened with an explosimeter, photoionization detector for organic vapors or with a radiological survey instrument. At a minimum, each drum and surrounding soil should be observed for discoloration or other signs indicating leakage of the drum's contents. All screening instruments must be calibrated daily. Backup instruments must be available at the Site at all times, if approved by the Project Manager.

More advanced screening of the drum and soil may be required to include, but not limited to; hydrogen cyanide gas, mercury vapor and PCB screening. These tests may be used for initial segregation of clean soils from contaminated soils as well as to determine the compatibility of mixed soils.

As required by the Work Plan, soils determined to be contaminated, and not suitable for backfill material, should be moved to the soil staging area as they are excavated. This may be accomplished by loading soils directly into the bucket of a payloader or placing soils directly into roll-off containers temporarily staged adjacent to the excavation.

As required by the Work Plan, isolated contaminated soils directly in contact and associated with a leaking/ruptured drum should be removed and placed in the overpack with the drum.

**Note: Careful consideration should be given to the area used for roll-off staging. Selected areas must be on stable, well drained ground with access directly off a haulage road/route designed to support roll-off handling vehicles.**

If roll-off containers are to be used, they must be supplied by an approved firm. Roll-offs should be in good condition. Prior to using each roll-off, the gate seal must be cleaned and resealed by the supplier. Each roll-off must be supplied with a minimum 20 mil poly liner and a protective tarp.

**Helpful Hint: If approved in advance by the receiving disposal facility and Client, it is a good idea to pour several bags of cement directly against the interior side of the roll-off's gate prior to installing the liner. The cement will help to prevent leakage of any water, which collects against the gate.**

Contaminated soils moved to the staging area must be placed on polyethylene sheeting ( minimum of two layers of 20 mil recommended). Soils containing petroleum hydrocarbons which could leach out from the stockpile with time, should have sorbent booms placed around the perimeter of each stockpile.

**Note: Insure stockpiles of differently classified soils are not placed too close together. If placed too close together, the soils may become mixed as the piles settle or as they are pushed around during future loading activities.**

**Note: Insure that soil stockpiles do not exceed a size which can be completely covered by the largest continuous sheet of polyethylene or tarp available. If the size of the stockpiles requires the use of more than one sheet of covering material, overlap sheets to shed precipitation/dew will be used.**

d) <u>Drum Assessment</u>

As each drum is unearthed, its condition must be accessed to determine the best method to remove the drum and to obtain required field data.

Each drum must be accessed and documented prior to being removed. A Field Drum Data Sheet, approved in advance, is to be completed by the contractor for each individual intact drum removed. The data sheet provides spaces for recording field instrument readings taken during the initial screening, a visual description of the drum and its contents. Additionally, a description of any labeling, logos or warning information on the drum must be recorded. The drum's location and the condition of the drum as it appears in the excavation must be recorded on the field data sheet. Some clients may require that photographs of each drum be taken.

CRA personnel may be required to conduct the drum assessment/screening procedures concurrently or in place of the contractor. It is important to remember that all assessment and screening data is considered "evidence" and should be treated accordingly. Appendix C contains a copy of Form SP-31, Drum Removal Field Data Sheet to be used by CRA personnel.

At the close of each work day, drum findings should be plotted on a copy of the field survey. The format for plotting site findings should be approved in advance with the Project Manager.

e) Handling of Drum Liquids

If during the drum assessment a drum is identified to contain liquids which can leak/spill during removal of the drum, its contents are to be pumped or bailed into an appropriate sized repack drum/container prior to removing the drum from the excavation. As required by the Work Plan, any free standing liquid on the ground, adjacent to a drum, and known to have leaked from the drum as a result of the drum removal effort, should be collected. Field compatibility testing of unknown liquids may be required to determine the appropriate container to be used.

**Warning: Unless the liquid contents of each damaged/open drum are known or appropriate compatibility testing has been completed, drum contents must never be randomly mixed in repack drums/containers. Additionally, unknown liquids should not be pumped with electrically driven pumps unless the compatibility/hazards of the liquids are known.**

f) Drum Removal

After each drum has been excavated and assessed, it must be removed from the excavation. Filled or partially filled drums determined to be intact, which can be lifted from the excavation without damage, are to be placed directly into drum overpack containers adjacent to the excavation. Many methods of attaching to and lifting drums exist. The best method for one drum/drum location may not work for another. The Contractor should have an assortment of drum slings and other lifting devices on Site.

**Note: Unless specifically guided by the Work Plan, drum excavation should proceed in a manner which will maintain the proper sloping/stepping of the excavation so that entry by drum handling**

**personnel is not restricted (assuming all other health and safety considerations are within acceptable limits).**

Drums found at excessive depths may have to be removed by equipment with extended reach grapplers. In the case of a severely leaking drum, it is reasonable to attempt to dig up the drum, surrounding soils and released contents in one pass if an excavator of sufficient size is on hand and other drums would not be at risk to damage. Drums, soils and drum contents removed in this way will have to be placed in some sort of contained area temporarily while the drum is accessed and free liquids pumped off.

**Note: The use of powered drum handling equipment, and the increased risk in drum damage from such equipment, must always be weighed against the potential for spillage of drum contents.**

Fifty-five-gallon excavated drums are to be placed in 85-gallon overpack drums. Smaller containers are to be repacked in 85-gallon repack drums with containers of similar type contents. Each overpack drum must be labeled with an identification number as they are overpacked.

As required by the Work Plan, empty drums (drums with no residue - RCRA empty) removed from the excavation should be placed in a covered contained area or roll-off until they can be pressure washed and crushed. Specific procedures for handling empty drums will vary depending on the Work Plan requirements but typically involve triple rinsing with water and removal as scrap metal.

iv) Staging and Handling

All drums and containers removed from the excavation which have been overpacked/repacked are to be transferred to the drum staging pad by the close of the work day. The drums must be secured during transport such that they remain upright.

All overpack and repack drums are to be placed on the drum staging pad and oriented to permit sampling of each individual drum for compatibility and characterization parameters. If known, drums containing liquids should be segregated from drums containing solids. See Section 3.3.4 for additional information regarding the preparation of drum staging areas.

Normally, waste removal does not occur until the drum contents have been sampled, analyzed and the Project Manager has determined the waste classification and disposal facility. Therefore, there may be a significant time lag between completion of the staging activity and removal for disposal. Therefore, it is important that the drum staging area be sturdily constructed and secured.

Each drum must be clearly labeled by a method which enables identification of the drum even after the drum's surface has weathered. Indelible markers and paper labels can be used to label drums if the drum surface is clean. However, drum surfaces can weather over a relatively short span of time leaving the markings and/or labels unreadable. When long term drum staging is anticipated, embossable aluminum tags with stainless steel/copper attachment wires may be suitable. These tags are available pre-numbered. Tags should be wired securely just under the head of the ring bolt. The disadvantage of using such tags is that head rings can be interchanged accidentally if more than one drum is open at a time (i.e., during drum sampling activities).

Drum storage must be performed with proper aisle spacing and labels facing the aisle.

**Note: Drums should be opened and sampled only by experienced personnel specifically trained for the task.**

v) Drum Sampling

a) Presample Considerations

It is important that personal protective equipment, as specified within the Site Health and Safety Plan, be worn or used at all times. Air monitoring must be conducted in accordance with the Site Health and Safety Plan to identify the need to upgrade or downgrade respiratory protection during sampling. Sampling must be (at minimum) conducted in Level B.

**Note: Refer to the Health & Safety FMG#5 on drum handling procedures.**

During the initial inspection, any suspicious looking drums (i.e., swollen, or customized containers or drums labeled as containing hazardous materials - explosives, etc.) must be clearly marked and segregated for special handling. Drums may be deteriorated to the point that they have holes or are crushed to some degree. Drums that leak must be overpacked and the surrounding soil containing released drum contents must also be contained.

Extreme care must be exercised in opening intact drums or other sealed containers in which the contents are unknown or known to be dangerous to sampling personnel. Drums must be grounded prior to opening or sampling. An intact drum with unknown contents that has a badly rusted bung or cover bolt must be entered with a non-sparking penetrating device operated remotely or using a similar method. Hand operated, non-sparking tools may be used to penetrate an intact drum, if the contents of the drum are known and acceptable for such activity.

After the initial opening (if necessary) and visual inspection of the drum contents, drums should be segregated into three classes - solid, sludge or liquid and moved to the portion of the staging pad reserved for the preliminary staging and sampling. Drums must be staged in an upright position. Drums should be further segregated in each class based on similar characteristics or contents.

b) Drum Sampling Procedures for Contained Solids

- Collect representative samples from several depths of the drum, if possible, and composite them in a precleaned stainless steel bowl.
- Sample solids with a stainless steel knife, spoon, trowel or similar method.
- Transfer the sample material into a laboratory provided bottle.

c) Drum Sampling Procedures for Contained Liquid or Sludge

- Choose the appropriate sample method from a variety of devices that include glass thief, coliwasa sampler, sludge judge, bomb sampling, dipstick or bailer.
- Insert the sampling device near the bottom of the drum (or to the predesigned depth as stated in the Work Plan) or until a solid layer is encountered. If a solid layer is encountered, sampling should be reevaluated based on the apparent characteristics of the layer (e.g., sample thief for non-viscous sludge, chisel for dense solid material, etc.). The sample collected should represent the entire column of liquid within the drum.
- Carefully remove the sample device containing liquid from the drum and insert the device end in the sample container. Do not spill liquid on the outside of the sample bottle. Repeat these steps until sufficient volume has been collected for analysis.

Drum covers, bung, etc. must be replaced upon completion of sampling. Drums punctured for entry must be resealed using putty or aluminum foil and duct tape. All drums should be neatly staged and covered in plastic by the end of each work day.

It is acceptable to collect samples from all the drums in one drum group for one composite sample if the contents of each drum in that group are known to be the same. The work plan must followed carefully in order to perform group composite sampling.

vi) Spill Prevention and Response

The handling and transport of drummed waste must be conducted in a controlled and safe manner which will minimize damage to containers, the containerized materials and the environment.

All spill response equipment must be at the excavation site during the progress of the excavation.

vii) Soil Sampling

The Work Plan/specifications of work may require sampling of soils associated with excavated drums. Analytical results from such sampling may be used for waste characterization/compatibility testing in preparation for treatment or disposal of contaminated soils. Additionally, confirmatory soil samples may be taken from the limits of an excavation in order to determine if all affected soils have been removed.

As with drum removal procedures item (iii f), prior consideration must be given to how a sample will be removed from the base or sidewalls of the excavation. Extended reach sampling equipment or use of the excavating equipment (if properly decontaminated) may be required. See Section 4.13, Surficial Soil Sampling, for more detailed information.

viii) Backfilling

The excavation may only be backfilled after approval by the Site Engineer (CRA site representative or responsible contractor). Excavations should be backfilled with approved clean imported fill or native material previously stockpiled which have been deemed suitable based on screening/testing protocols specified in the Work Plan.

**Note: Again, in the case of deep excavations not meeting entry criteria, equipment used for compacting backfill material will have to be approved in**

**advance. Particular attention to compacting standards must be paid in areas where future settlement could cause damage to surface structures/pavements.**

If immediate backfilling is specified and the potential exists for re-excavation in order to remove additional soils, the excavation should be lined with filter fabric or polyethylene sheeting prior to backfilling. This will allow re-excavation to proceed quickly to the limits of the original excavation.

ix) Disposition of Drums/Drum Contents

Typically, drum contents are processed at the Site prior to ultimate disposal. Processing may include sampling, solidification, compositing, and repacking.

Disposal/disposition of drums is variable on a site by site basis; options available include:

- leaving drums on-Site;
- sent off Site as waste similar to the contents; or
- washed, crushed and removed as scrap metal.

The Work Plan must be consulted to determine the exact methods to be used for a given Site.

x) Waste Removal

a) General

The waste manifesting and removal activity will be coordinated by the Project Manager such that all disposal facilities are designated and approved prior to commencing any field activities.

The CRA Site representative will have the responsibility of observing the work and completing the paperwork necessary to maintain records on behalf of the Client during the waste removal activity. This will typically involve compiling notes and collecting copies of forms but not signing manifest forms as noted in Section x (b).

Submittals which are required prior to field startup include:

- Letters of commitment from the disposal facilities;
- Agency approvals (federal and state/province);
- Operating licenses and permits; and
- Transportation routes.

These submittals will have been reviewed and approved by CRA prior to commencing field activities.

b) Waste Manifests

The transportation of contaminated materials to off-Site disposal facilities requires documentation on appropriate Federal and/or State/Provincial manifests, as required. Manifest forms must be consistent with applicable federal regulations. Usually, the Site contractor will prepare and provide CRA with copies of manifests and/or other records for each shipment of material from the Site. The Site Contractor is responsible for maintaining manifests from the time the manifested material leaves the Site to the time of ultimate disposal.

For the purpose of transportation and off-Site disposal, the Client will be considered the generator of all materials disposed of and will sign all manifests prior to removal of contaminated materials from the Site. In no case shall CRA on-Site personnel sign manifest forms on behalf of the Client as a generator unless written authorization is given by a shareholder.

c) Waste Removal

The Contractor is required to load waste containers into licensed haulage vehicles. The type of vehicle may vary according to the waste classification. Also, more than one disposal facility may be specified for various drum groups depending on the results of the waste compatibility and characterization.

Depending upon Site conditions, the Contractor will be required to decontaminate the tires and axles of haulage vehicles upon leaving the Site.

The CRA on-Site representative is required to collect various documents from the Contractor during the waste removal operation. These include:

- Manifests, as discussed in the previous section.
- Weigh scale receipts - Copies of weigh scale receipts must be submitted to CRA on approved forms and must be signed by the weigh scale operator or his designated agent and must include the following:

- location, date and time of weighing;
- measured weights;
- vehicle and container identification;
- shipment identification number; and
- manifest number.

- Certificates of Disposal issued by the disposal facility for each shipment delivered to the disposal facility.

### 1.5.4 FOLLOW-UP ACTIVITIES

i) Drum Excavation Activities

Once the drum excavation and Site restoration activities have been substantially completed, the following tasks need to be completed:

- All drum field data sheets submitted by the Contractor will be submitted to the file in Waterloo.
- The locations and quantity of drums encountered will be plotted on a Site Plan based on surveying notes.
- A summary write up on field activities including such items as; number of excavations completed, a tabulation of drums encountered (i.e., ID number, size, condition, contents, labels, markings, etc.), field procedures used and disposition of all soils, water and waste materials generated and any problems encountered.
- A Photographic Log of Site activities should be compiled (pictures labeled in sequential order) and given to the Project Manager.
- Field book shall be kept at the appropriate CRA office.
- A file of the completed manifests (from the disposal facility) of each shipment shall be kept in the project file.
- Obtain all post field work submittals required of the Contractor.

### 1.5.5 CONTACT INFORMATION

The following CRA personnel may be contacted regarding monitoring Drum/Soil Excavation procedures:

| *Contact* | *Office* | *Phone Number* | *Fax Number* |
|---|---|---|---|
| John Schwaller | Atlanta | (770) 441-0027 | (770) 441-2050 |
| Brian Carter | Baton Rouge | (225) 292-9007 | (225) 292-3614 |
| Walt Pochron | Chicago | (773) 299-9933 | (773) 299-6421 |
| John Evanoff | Houston | (281) 492-8311 | (281) 492-2340 |
| Peter Storlie | Minneapolis | (651) 639-0913 | (651) 639-0923 |
| Brain Webster | Nashville | (615) 315-9934 | (615) 315-9934 |
| Doug Oscar | Niagara Falls | (716) 297-2160 | (716) 297-2265 |
| Jim Hayman | Titusville | (407) 269-9891 | (407) 269-9872 |
| Mike Mateyk | Waterloo | (519) 725-3313 | (519) 725-1394 |

### 1.5.6 COMPLETION CHECKLIST

During the conduct and at the completion of drum/soil excavation and stockpiling activities, Form SP-32, DRUM/SOIL EXCAVATION AND STOCKPILING • COMPLETION CHECKLIST must be completed to document key activities conducted. This form must be signed and filed at the respective field office, regional CRA office and issued to the Project Coordinator.

### 1.5.7 REFERENCES

For additional information pertaining to this topic, the user of this manual may reference the following:

| | |
|---|---|
| ASTM D6063-96 | Guide for Sampling of Drums and Similar Containers by Field Personnel |
| ASTM D5680-95a | Practice for Sampling Unconsolidated Solids in Drums or Similar Containers |
| ASTM D5679-95a | Practice for Sampling Consolidated Solids in Drums or Similar Containers |
| ASTM D5743-95 | Practice for Sampling Single or Multilayered Liquids, With or Without Solids, in Drums or Similar Containers |
| ASTM D5495-94 | Practice for Sampling with a Composite Liquid Waste Sampler (COLIWASA) |

# ATTACHMENT O

# TEST PIT/EXCAVATION SOP

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# 1.0 TEST PIT AND EXCAVATION SOP

## 1.1 TEST PIT/DRUM/SOIL EXCAVATION AND STOCKPILING

Drum/soil excavation and stockpiling entails the removal handling and staging of buried drums/drum fragments, drum contents, and select soils associated with the drums. Ensure regulatory groups (Ohio EPA, USEPA), local hospital, local fire, police departments, and municipal authorities are advised of activities prior to initiation. All drum/soil excavation and stockpiling activities will be performed in Level B personal protective equipment. Under no circumstances will personnel enter a test pit/excavation.

## 1.2 TEST PITS/EXCAVATIONS

1) The excavator will be positioned such that the excavator spoils are deposited downwind of all Site personnel.
2) A sheet of polyethylene will be placed downwind of the excavation to accept the spoils.
3) To the extent practicable, set up the excavation area such that water or liquids which may be excavated, freely drain back into the excavation.
4) The excavation should begin at one location with the excavator backing up (as required) to extend the pit.
5) Drum excavations should be backfilled as soon as possible after test pit and/or soil/drum removal activities are completed and backfilling has been approved by the Engineer. Open excavations pose a safety hazard and will be adequately marked/flagged to ensure visibility to Site personnel.
6) Personnel will remain alert to excavation side wall conditions which typically undermine the ground surface and create unstable soils surrounding the excavation area.
7) Excavations which are not completed at the close of each day's work activities will be required to be barricaded and posted. If rain is anticipated overnight, the excavation may also be required to be lined with polyethylene sheeting to prevent contact between accumulated rainwater and the soils of the excavation, which may otherwise have to be pumped off and treated. A heavy object should be placed at the base of the excavation to form a sump in the liner.

## 1.3 EXCAVATING EQUIPMENT

1) Excavation of drums is to be performed using equipment that will minimize potential damage to the drums; capable of being operated with extreme control, and be suitable to safely excavate to required depth.

2) When drums containing liquids with low flashpoints (<100°F) are expected/possible, the portion of all equipment which will contact drums should be positively grounded to prevent static discharge upon contact with a drum. Ensuring the equipment is grounded is particularly important when using equipment with rubber tires.

3) Rubber tired equipment will be used where possible to minimize disturbance of the Site and to reduce the effort required to completely decontaminate equipment. Track mounted equipment will be used whenever the potential for unstable base material exists.

4) If there is potential for explosion, blast shields will be required on the front of the excavating equipment.

5) Personnel observing or working in the vicinity of the test pit, excavation activities will never stand within the "turning radius" or "reach zone" of the excavation.

# ATTACHMENT P

# HEAVY EQUIPMENT SOP

## HEAVY EQUIPMENT SOP

The hazards associated with the operation of heavy equipment are injury to personnel, equipment damage, and property damage. The potential for injury or damage to personnel and property is due to the size of the equipment, limited visibility of the driver, and the potential overhead hazards leading to crushing, tripping, falls, cuts, or punctures, and the high noise levels created by the equipment.

### General

1. The work area shall be appropriately delineated to prevent non-essential personnel from wandering into the area.
2. Equipment operators shall maintain eye contact with ground personnel at all times, giving ground personnel the right-to-way.
3. Vehicles/equipment paths shall be marked as feasible to prevent personnel from crossing.
4. Equipment shall be outfitted with appropriate safety features, backup alarms, rollover protection, fire extinguishers, etc.
5. Loads shall be lowered and equipment de-energized and secured before any adjustments are made to load, repositioning, etc.
6. Personnel shall be cognizant of excavations, material/debris piles and other equipment in the work area.
7. Work area shall be kept neat and in an orderly state of housekeeping.
8. All underground utilities shall be located prior to excavation; utility companies shall be contacted if necessary. Excavator shall be prohibited from operating on severe inclines or questionable surfaces.
9. Employees shall be prohibited from standing or working in areas where they would be exposed to falling loads. Personnel shall stand away from vehicles during loading. Operators may remain within vehicles cabs during loading as outlined in 29 CFR 1926.601(b)(6) for adequate protection.
10. Equipment operators shall wear appropriate PPE to protect personnel from exposure to potential chemical hazards.
11. Personnel shall be prohibited from reaching into loading operations with arms or legs while in operation.
12. Any adjustments or repairs that need to be made to equipment (or loads) shall be made with the equipment disengaged and shut down. If there is a suspended

load, the load shall be lowered to the ground (or securely braced) before any adjustment can be made to the equipment.

13. Load capacities shall be stenciled onto the equipment and observed during operations.

Maintenance and Repairs

1. All equipment hazards identified shall be controlled.
2. Operators shall not wear loose clothing that might get tangled in the equipment or controls.
3. Appropriate machine/equipment guards shall be in place and intact at all times during operation. When guards require maintenance or replacement, equipment will be shut down and repaired, to be restarted only when guards are replaced and in good condition.
4. Heavy equipment shall be demobilized to a staging area and decontaminated as necessary before performing maintenance or repairs.
5. An equipment repair log shall be maintained and updated on a daily basis or whenever a repair or adjustment is made.
6. Pinching and cutting hazards shall be controlled by prohibiting personnel from reaching into running equipment and by wearing the appropriate PPE. All equipment repairs shall be made while equipment is shut down.
7. Appropriate PPE shall be used to prevent contact with chemicals.

# ATTACHMENT Q

# EQUIPMENT DECONTAMINATION SOP

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## 1.0 EQUIPMENT DECONTAMINATION SOP

The following cleaning procedures are applicable to most programs requiring heavy equipment decontamination:

- remove by hand (i.e., shovel, bar, scraper) excess visible dirt and debris from the equipment paying particular attention to track, cleats, tires, and other irregular surfaces;
- clean the equipment using high pressure/low volume hot water or steam equipment;
- if necessary, clean/scrub the equipment with a solution of soap and water or trisodium phosphate (TSP) and water; and
- final rinse of equipment with high pressure/low volume hot water or steam equipment.

The cleaning procedure for liquid recirculation equipment (i.e., pumps and hoses) shall be as follows:

- all exposed surfaces shall be surface cleaned as described above;
- a solution of soap and water or trisodium phosphate (TSP) and water shall be circulated through the system for 15 minutes or appropriate duration; and
- potable water shall be circulated through the system for 15 minutes or appropriate duration.

Once the heavy equipment is cleaned and approved clean by the Engineer, the wash water, soil debris, and spent protective wear must be containerized, labeled and properly staged in the approved area on the Site.

### 1.1 GENERAL

The following guideline presents decontamination procedures for heavy equipment/vehicles that have been used in areas which are within the exclusion zones or restricted access areas due to chemical presence. Decontamination of equipment and vehicles is required to eliminate spreading of chemical presence and prevent chemical cross-contamination from Site to Site.

Equipment exiting an exclusion zone must adhere to the site FMGs for contaminant reduction zone/decontamination zone protocols. The zone configuration and protocols will vary from Site to Site and will be defined in the Site-specific HASP.

Decontamination methods for heavy equipment include physical removal of dirt/debris, and both physical/chemical means to clean surfaces. The types of chemicals at a Site and their concentration and state will determine the appropriate method of decontamination to be employed.

## 1.2 PRIOR PLANNING AND PREPARATION

Cleaning of heavy equipment is commonly outlined in the Site-specific Work Plan or the contractual documents which apply to the activities being conducted. Consequently, CRA must often oversee and possibly approve the cleaning adequacy of others and does not physically perform the cleaning tasks. Common scenarios which frequently occur are cleaning of backhoes, and dump trucks from soil excavation and drum removal projects or cleaning of a drilling rig and the associated drilling equipment (i.e., augers, rods, split spoons, tools). The following describes preparatory tasks prior to implementation of heavy equipment decontamination:

i) assembly and inventory of necessary cleaning equipment and supplies;

ii) review Work Plan, HASP, and specific equipment cleaning protocols;

iii) check on acquisition, storage and transportation of solvents/potable water source;

*Note: Decontamination procedures must occur in the field, not at a CRA office. CRA is not a waste generator and does not wish to become one.*

iv) evaluate disposition of cleaning fluids upon completion of the work;

v) evaluation of where the cleaning of heavy equipment will be performed. Is the area adequate or is an upgrade required? Figures 3.4 and 3.5 show examples of medium duty and heavy duty decontamination areas.

*Note: CRA personnel often oversee activities such as cleaning/decontamination on behalf of the Site Client. When performing this role, CRA has a responsibility to the Client that the wastes/residue/washwaters generated from these tasks have been properly containerized, labeled and sampled (if necessary). The Client is responsible for the proper disposal/treatment of these* *wastes but CRA may be requested to assist the Client with this waste management aspect. This requires periodic checking and follow-up on these tasks even if they are the responsibility of other contractors or even the Client themselves. As an environmental consultant, CRA has a professional obligation to the Client to report actions which may be environmental violations or waste handling concerns.*

## 1.3 PROCEDURE

The following cleaning procedures are applicable to most programs requiring heavy equipment decontamination:

- Remove by hand (i.e., shovel, bar, scraper) excess visible dirt and debris from the equipment paying particular attention to track, cleats, tires, and other irregular surfaces;
- Clean the equipment using high pressure/low volume hot water or steam equipment;
- Clean/scrub the equipment with water and natural soap (biodegradable-phosphate free, i.e., BIO-T-Max or equivalent) solution; and
- Final rinse of equipment with high pressure/low volume hot water or steam equipment.

The cleaning procedure for liquid recirculation equipment (i.e., drilling pumps and hoses) shall be as follows:

- all exposed surfaces shall be surface cleaned as described above;
- a solution of natural soap (biodegradable-phosphate free, i.e., BIO-T-Max or equivalent) and water shall be circulated through the system for 15 minutes or appropriate duration; and
- potable water shall be circulated through the system for 15 minutes or appropriate duration.

Once the heavy equipment is cleaned and approved clean (by Client or CRA personnel), the washwater, soil debris and spent protective wear must be containerized, labeled and properly staged in the approved area on the Site. The Client is then to be notified in writing by CRA, of the volume, state and condition of the materials to be disposed/treated.

*Note: Proper disposal of waste materials requires careful segregation of waste media. For example: if solvents are utilized for cleaning, they should not be mixed with washwater and should be containerized separately. The impact on disposal costs is greatly influenced if various media (i.e., solvents/washwaters) are mixed. Solids as well must be segregated where possible and prevented from mixing with the washwaters.*

## 1.4 FOLLOW-UP ACTIVITIES

The activities completed for each heavy equipment decontamination shall be documented in writing in the field book. Included in the field book shall be following information:

i) site location, date, time, weather;
ii) equipment use location;
iii) location where decontamination was performed;
iv) personnel performing decontamination;
v) decontamination procedures;
vi) sources of materials (solutions) used for decontamination;
vii) volume of decontamination fluids generated;
viii) location where decontamination fluids have been stored;
ix) individuals approving adequacy of decontamination; and
x) QA/QC sampling performed (if required).

The field book shall be stored in the CRA office.

The washwaters, soil debris and spent protective wear must be properly segregated, containerized, labeled and stored.

At the conclusion of the site program, it is imperative that the Client receive written notification documenting that decontamination fluids have been left at the Site and they are to be properly managed by the Owner/Client. CRA is available to assist the Owner/Client with this waste management.

ATTACHMENT R

SURFICIAL SOIL SAMPLING

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# 1.0 SURFICIAL SOIL SAMPLING

## 1.1 GENERAL

The following guideline focuses on ways to obtain surficial soil samples for chemical analyses. This guideline is not intended to provide the basis for designing a soil sampling program, but instead assumes that a soil sampling program has been designed, a Work Plan has been established and that the sampling team is preparing to mobilize to the field. However, in order to successfully complete a soil sampling program, the sampling team members must have a basic understanding of the various considerations for the design of the soil sampling program. Section 1.2 is intended to provide information required for developing this basic understanding.

Soil sampling procedures may vary from project to project due to different parameters of concern, different guidance provided by the State/Province where the Site is located, or the specific objectives for the project. Therefore, it is essential that the sampling team members carefully review the Work Plan requirements. The primary goal of surface soil sampling is to collect representative samples for examination and chemical analysis (if required).

Preparation activities, sampling procedures, and follow-up activities are discussed in further detail in Sections 1.3, 1.4, and 1.5, respectively.

## 1.2 SOIL SAMPLING CONSIDERATIONS

This section provides a limited discussion of considerations for the design of soil sampling programs in order to provide the sampling team members with a basic understanding of the considerations for design of a soil sampling program.

### General

Areas selected for soil sampling shall be located in order to collect representative soils with the minimum number of samples. Prior to an investigation, a Site visit may eliminate many uncertainties with respect to Site characteristics and result in a more complete soil sampling study. An inspection of the Site should be made to locate pertinent features (e.g., rock outcrops, drainage patterns, surface runoff, surface cover characteristics (e.g., grass, gravel, concrete), wet areas, and fill areas) and to evaluate the relationship between these features and potential sources of contaminants. An understanding of these relationships and conditions are important in developing a sampling plan.

Random, Biased and Grid-Based Sampling

Unless there is a strong indication of contaminant presence, such as staining, then soil sample locations may be randomly selected from several areas within the Site.

If any areas show evidence of contamination, such as staining or vegetative stress, biased samples shall be collected from each area to characterize the contamination present in each area. Background and control samples are also biased, since they are collected in locations typical of non-site impacted conditions.

When soil sampling investigations involve large areas, a grid-based soil sampling program is used. There is no single grid size that is appropriate for all sites. Common grid sizes are developed on 50-foot and 100-foot centers. It is acceptable to integrate several different grid sizes in a single investigation.

For surficial soil sampling programs, it is also important to consider the presence of structures and drainage pathways that might affect contaminant migration. It is sometimes desirable to select sampling locations in low lying areas which are capable of retaining some surface water flow since these areas could provide samples which are representative of historic site conditions (worst case scenario if surface water flow was a concern).

Grab Versus Composite Samples

A grab sample is collected to identify and quantify compounds at a specific location or interval. The sample shall be comprised of no more than the minimum amount of soil necessary to make up the volume of sample dictated by the required sample analyses. Composite samples are a mixture of a given number of subsamples and are collected to characterize the average composition in a given surface area.

Sample Interval

Surficial soils are generally considered to be soil between ground surface and 6 to 12 inches below ground surface. However, for risk assessment purposes, regulatory authorities often consider soil from ground surface to two feet below ground surface to be surficial soil. The exact interval to be considered as surficial soil is often a matter of discussion with the regulatory authorities that review the Work Plan. The sample interval is important to the manner in which the data are ultimately interpreted. Another important factor is the type of soil. If there are different types of soil present at the Site, this may have a bearing on the sample interval. For example, it may be important to separately sample a layer of material with high organic carbon content which overlies a layer of fine grained soil.

## 1.3 PRIOR PLANNING AND PREPARATION

The following activities must be completed prior to undertaking a surficial soil sampling program:

i) Review the work program, project documents and the health and safety requirements with the Project Co-ordinator.

ii) Complete an equipment requisition form and assemble all equipment, materials, log books and forms required. Form SP-16 BOREHOLE INSTALLATION/SOIL SAMPLING EQUIPMENT AND SUPPLY CHECKLIST provides a summary of the typical equipment/materials required for a soil sampling activity.

iii) Obtain a site plan and any previous stratigraphic logs. Determine the exact number and location of samples to be collected and the depths of samples for chemical analysis.

iv) Contact CRA's analytical group to arrange/determine:
   - laboratory;
   - glassware/sample jars;
   - cooler;
   - shipping details;
   - start date; and
   - expected duration.

v) Complete property access/utility clearance data sheet. In most instances, surface *sampling activities will not require utility clearances.*

vi) Determine notification needs with the Project Co-ordinator. Have the regulatory groups, Client, land owner, CRA personnel and laboratory been informed of the sampling event?

vii) Determine the methods for handling and disposal of washwaters and spent decontamination fluids.

## 1.4 PROCEDURE

Soil sampling techniques are dependent upon the sample interval of interest, the type of soil material to be sampled, and the requirements for handling the sample after retrieval. The most common method for collection of surficial soil samples involves the use of a stainless steel trowel. Soil samples may also be collected with spoons and push tubes. In each case, the sampling device must be constructed of an inert material with smooth surfaces which can be readily cleaned. The cleaning protocol involves the use of a sequence of cleaning agents and water designed to remove surface contaminants. The sampling equipment is cleaned between sample locations. A typical surficial soil sampling protocol is outlined below:

i) Surficial soil samples will be collected using a precleaned stainless steel trowel or other appropriate tool. Each sample will consist of soil from the surface to the depth specified within the Work Plan. Sampling in ditches will be done only when there is no water present.

ii) A new pair of disposable gloves will be used at each sample location;

iii) Prior to use, at each sample location, all sampling tools will be decontaminated in accordance with the Work Plan.

iv) A pre-cleaned sampling tool will be used to remove the sample from the layer of exposed soil. The collected soil will be placed directly in a clean, prelabeled sample jar and sealed with a teflon-lined cap. Samples to be split for duplicate analyses will first be homogenized in a precleaned stainless steel bowl; and

v) Samples will be placed in ice or cooler packs in laboratory supplied coolers after collection.

Any surficial debris (i.e., grass cover) should be removed from the area where the sample is to be collected using a separate pre-cleaned device.

In the event that the soil conditions are not as the sampler was led to believe by the Work Plan or if there are unexpected distinct layers of soil present (e.g., a layer of high organic carbon content overlying a layer of fine grained soil), then the sampling personnel should report the conditions to the Project Co-ordinator immediately for resolution. Similarly, if a sampling location is in a gravel or paved area, the sampling personnel should confirm with the Project Co-ordinator whether the surface samples are to be collected from the gravel/pavement subbase material or from the first layer of soil beneath these layers.

Also, the sampling team members should immediately report any conditions to the Project Co-ordinator that they believe may have a negative effect on the quality of the results.

Generally it is not advisable to collect samples containing excessive amounts of large particles such as gravel. Gravel presents difficulties for the laboratory in terms of sample preparation and may not be truly representative of contaminant concentrations in nearby soil.

All conditions at the time of sample collection should be properly documented in the field log book. This should include a thorough description of the sample characteristics, including grain size, color and general appearance, as well as date/time of sampling and labeling information. The location of the sampling point should be described in words and three measurements should be taken to adjacent permanent structures so that the sample location can be readily identified in the field at a future date if necessary. It is often advisable to have a licensed land surveyor accurately survey the locations.

With the exception of VOC analyses, soil samples should be placed in a stainless steel bowl to be homogenized prior to filling sample containers. This step can be bypassed if only one sample container is required to be filled, as long as the laboratory will homogenize the sample upon receipt.

It is important that soil samples be mixed as thoroughly as possible to ensure that the sample is as representative as possible of the sample interval. When round bowls are used for sample mixing, mixing is achieved by stirring the material in a circular motion and occasionally turning the material over. Soil samples collected for volatile organic compounds analyses shall <u>not</u> be mixed. The sample container should be filled completely; no space should remain in the sample containers.

In 1997, EPA adopted new methods for sampling soils for volatile organic compound (VOC) analysis. Method 5035 calls for collecting soil using a coring device. For analysis of low level VOCs (typically 1-200 μg/kg) soil is sealed in a specially prepared vial with a solution of sodium bisulfate. For higher levels of VOCs, the soil is placed in a vial with a volume of methanol. This method increases the complexity of collecting soils and makes it imperative that the sampler and laboratory work closely together.

During the sampling program, the sampling team leader should stay in contact with the CRA chemist assigned to the project such that the CRA chemist can properly inform the contract laboratory with the progress of the work. This includes submitting sample summaries and/or copies of completed chain-of-custody forms to the CRA chemist.

Finally, some CRA QAPPs require a designation of a QA/QC officer for field activities. The sampling team leader may be required to conduct certain field audit activities and at minimum, should be familiar with and responsible for completion of all QA/QC sample activities.

## 1.5 FOLLOW-UP ACTIVITIES

The following activities shall be completed at the conclusion of the field work.

i) Ensure that all sample locations are surveyed such that the sample location could be readily re-established.

ii) Equipment shall be cleaned and returned to the equipment administrator and the appropriate form dated and signed.

iii) Prepare and distribute the Completion Checklist (Form SP-16).

iv) Submit a memo to the Project Coordinator indicating sampling procedures and observations (such as surface staining) and grid layout and all QA/QC documentation.

v) Ensure that the CRA chemist has all relevant information required to track the progress of the sample analysis.

## 1.6 COMPLETION CHECKLIST

At the completion of the soil sampling program, Appendix C - Form SP-16 - BOREHOLE INSTALLATION AND SUBSURFACE SOIL SAMPLING • COMPLETION CHECKLIST must be completed to document activities conducted and serves to remind personnel of the various tasks required. This form must be signed and filed at the respective field office, regional CRA office and issued to the Project Co-ordinator.

## 1.7 CONTACT INFORMATION

The following CRA personnel may be contacted regarding borehole installation and soil sampling procedures or for additional information:

| *Contact* | *Office* | *Phone Number* | *Fax Number* |
|---|---|---|---|
| Bruce Monteith | Atlanta | (770) 441-0027 | (770) 441-2050 |
| Linda McConnell | Baton Rouge | (225) 292-9007 | (225) 292-3614 |
| Walt Pochron | Chicago | (773) 380-9933 | (773) 380-6421 |
| John Evanoff | Houston | (281) 492-8311 | (281) 492-2340 |
| Peter Storlie | Minneapolis | (651) 639-0913 | (651) 639-0923 |
| Doug Oscar | Niagara Falls | (716) 297-6150 | (716) 297-2265 |
| Pam Lewis | Shreveport | (318) 868-3003 | (318) 868-3031 |
| Mike Mateyk | Waterloo | (519) 725-3313 | (519) 725-1394 |

## 1.8 REFERENCES

For additional information pertaining to this topic, the user of this manual may reference the following:


ASTM D4547-91 Practice for Sampling Waste and Soils for Volatile Organics

ASTM D6044-96 Guide for Representative Sampling for Management of Waste and Contaminated Media

ASTM D6051-96 Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities

# ATTACHMENT S

# SEVERE WEATHER

## TABLE OF CONTENTS

## 1.0 SEVERE WEATHER

### 1.1 SCOPE

As most projects are conducted outside, the potential for severe weather must be considered. Thunderstorms, tornadoes, and winter storms can develop quickly, jeopardizing worker safety. The following emergency procedures are to be followed in the event of severe weather.

### 1.2 THUNDERSTORMS AND LIGHTNING

Monitor weather conditions at all times while working. Monitor for a sign of an impending storm such as increased cloudiness, darkened skies, increased wind. If any of these signs are observed, listen to a radio for the latest weather information or contact a local weather reporting service.

When a thunderstorm accompanied by lightning is in the project area, cease work immediately. All powered equipment, such as drill rigs, are to be shut down.

Seek shelter inside nearby buildings or trailers. If there are no buildings nearby, seek shelter inside your vehicle.

If you are caught outside, do not stand beneath tall, isolated trees or telephone poles. Avoid areas projecting above the landscape such as hill tops. In open areas, go to a low place such as a ravine or valley. Stay away from open water, metal equipment, wire fences and metal pipes. If you are in a group of people in the open, spread out, staying several yards apart.

If you are caught in a level field or open area far from shelter and you feel your hair stand on end, lightning may be about to strike you. Drop to your knees and bend forward, putting your hands on your knees. **DO NOT LIE FLAT ON THE GROUND.**

If someone has been struck by lightning, monitor life signs and begin administering mouth-to-mouth resuscitation or cardiopulmonary resuscitation as needed. Send for help. Check conscious victims for burns, especially at the fingers and toes and next to buckles and jewelry. Administer first aid for shock. Do not let the victim walk around.

## 1.3 TORNADOES

Tornadoes usually develop from thunderstorms and normally occur at the trailing edge of the storm. Most tornadoes occur in the months of April, May, June, and July in the late afternoon and early evening hours.

When storms are predicted for the project area, monitor weather conditions on a radio. A tornado watch is issued when favorable conditions exist for the development of a tornado. A tornado warning is issued by the local weather service office whenever a tornado has actually been sighted or is strongly indicated by radar.

If a tornado warning is issued, seek shelter immediately. If there are permanent buildings located on site, go there immediately, moving toward interior hallways or small rooms on the lowest floor.

If a tornado warning is issued and you are in a vehicle or a site trailer, leave and go to the nearest building. If there are no buildings nearby, go in the nearest ditch, ravine, or culvert, with your hands shielding your head.

If a tornado is sighted or a warning issued while you are in open country, lie flat in a ditch or depression. Hold onto something on the ground, such as a bush or wooden fence post, if possible.

Once a tornado has passed the site, site personnel are to assemble at the designated assembly area to determine if anyone is missing. Administer first aid and seek medical attention as needed.

## 1.4 WINTER STORMS

When snow or ice storms are predicted for the project area, site personnel should monitor weather conditions on a radio. A winter storm watch is issued when a storm has formed and is approaching the area. A winter storm warning is issued when a storm is imminent and immediate action is to be taken.

When a storm watch is issued, monitor weather conditions and prepare to halt site activities. Notify the PM of the situation. Seek shelter at site buildings or leave the site and seek warm shelter. If you are caught in a severe winter storm while traveling, seek warm shelter if road conditions prevent safe travel.

<u>If you are stranded in a vehicle during a winter storm</u>:

- STAY IN THE VEHICLE, disorientation comes quickly in blowing and drifting snow;
- wait for help;
- keep a window open an inch or so to avoid carbon monoxide poisoning;
- run the engine and heater sparingly;
- keep watch - do not let everyone sleep at the same time; and
- exercise occasionally.

# ATTACHMENT T

# COMPRESSED GAS CYLINDERS

## TABLE OF CONTENTS

## 1.0 COMPRESSED GAS CYLINDERS

A compressed gas is a gas stored and used at pressures greater than atmospheric pressure. Compressed gas cylinders pose a variety of specific hazards including physical injury, toxicity, fire, explosion and suffocation.

### 1.1 GENERAL COMPRESSED GAS CYLINDER SAFE HANDLING PROCEDURES

- Do not use compressed gas cylinders which do not bear a legible label identifying the contents;
- When not in use, keep valve protection caps on the cylinders at all times; and
- If a leaking cylinder is detected, close the valve, tag, and ensure the cylinder is stored outdoors or a well ventilated area.

### 1.2 TRANSPORT OF COMPRESSED GAS CYLINDERS

- Ensure all cylinder valves are closed, the regulator removed and the protective cap installed before a compressed gas cylinder is moved;
- Use a hand truck, when possible, for moving single cylinders. Do not drag or slide containers;
- Care will be taken to ensure compressed gas cylinders are not dropped. Do not permit cylinders to strike each other or other surfaces forcibly;
- Never use the protective cap as a lifting point for moving a cylinder;
- Ensure cylinders are well secured to prevent bumping, when transporting by truck; and
- Do not transport compressed gas cylinders in a closed vehicle.

### 1.3 REGULATORS

- A regulator is required if the operating system is less than the pressure of a filled bottle;
- Ensure the proper regulator is used for the type of compressed gas cylinder;
- Visually inspect the cylinder valve and regulator before use to ensure they are free of foreign material;

- Ensure the pressure manifold of a gas cylinder to a closed pressure system contains a vent valve, a fill valve and a relief valve unless these features are integral parts of the pressure system;
- A gauge is required unless the system is provided with a gauge indicating system;
- Never use a regulator for oxygen service unless it is clearly specified and marked for oxygen use; and
- When removing a regulator, ensure that the cylinder valve is closed tightly.

## 1.4 SAFE HANDLING FOR OPENING COMPRESSED GAS CYLINDERS

- Install the regulator on the cylinder valve. Open the cylinder valve slowly until the cylinder pressure registers on the regulator. Open the compressed gas cylinder slightly at first, then all the way;
- Do not stand in front, stand to one side, when opening the cylinder valve. Valve outlets should be pointed away from yourself and others; and
- On cylinders equipped with hand valves, use only your hands to open the cylinder valve; never use a hammer, wrench or other tool. If the valve will not open with hand pressure, have the cylinder returned to the supplier.

## 1.5 STORAGE OF COMPRESSED GAS CYLINDERS

- Valve protection caps should be in place when compressed gas cylinders are transported, moved or stored;
- Ensure cylinder valves are closed when work is finished and the cylinders are stored, when the cylinders are empty or the cylinders are being moved;
- When stored, compressed gas cylinders should be secured (chained or strapped) in an upright position at all times;
- Cylinders should not be stored where they can become part of an electrical circuit.
- Store cylinders in dry, well-ventilated areas;
- Keep storage temperature below 125°F;
- Store compressed gas cylinders away from heat sources and combustible materials; and
- Protect compressed gas cylinders stores in the open from weather, dampness, and direct sunlight. Protect cylinders from corrosion and never store cylinders directly on the ground.

ATTACHMENT U

FALL PROTECTION

## TABLE OF CONTENTS

# 1.0 FALL PROTECTION STANDARD OPERATING PROCEDURE

## 1.1 BASIS

The objective of the Fall Protection SOP is to prevent injury to personnel through education, training and fall protection when work is conducted 6 feet (1.8 m) or more above lower levels. At all times will personnel comply with OSHA 29 CFR 1926 Subpart M-Fall Protection.

## 1.2 FALL PROTECTION

1) When personnel are working 6 feet (1.8 m) or greater above lower levels guardrails, safety nets or personal fall arrest systems will be utilized.
2) Personnel will ensure that good housekeeping is performed to minimize the hazard posed by slips and trips and potential falls.
3) When personnel are working at the edge of an excavation greater than 6 feet (1.8 m) guardrails, fences, or barricades will be utilized.
4) Ensure the area surrounding excavations is clearly visible by removing any visual barriers and plant growth.
5) All fall protection systems used on site will comply with OSHA 29 CFR 1926.502-Fall Protection Systems Criteria and Practices. Note: As of January 1, 1998 body belts are not acceptable as part of a personal fall arrest system.
6) All fall protection will be visibly inspected before use for wear, damage and other deterioration. All defective components will immediately be removed from service and tagged.
7) Personnel will be trained to recognize the hazards of falling and in the procedures to be followed in order to minimize these hazards.

# ATTACHMENT V

# HAZARD COMMUNICATION

# TABLE OF CONTENTS

# 1.0 HAZARD COMMUNICATION

## 1.1 BASIS

The objective of the Hazard Communication Program is to prevent illness and/or injury to workers through education and training with respect to the hazards present on site, in accordance with OSHA 29 CFR 1910.1200 Hazard Communication Standard.

## 1.2 SITE INDOCTRINATION

Prior to initiation of site activities, the Site Safety Plan will be presented and explained by the Health and Safety Officer. The site indoctrination provides an opportunity for clarification and questions regarding the Site Safety Plan, to update the Site Safety Plan and a means to communicate the potential hazards present on site. At a minimum the following will be addressed during the site indoctrination:

- Support zone, contaminant reduction zone and exclusion zone delineation;
- Review of site safety procedures, contingency plans and hospital route;
- Required personal protective equipment, respiratory protection and decontamination procedures;
- Potential contaminants present on site and a review of the chemical and physical hazards they present as well as applicable exposure limits; and
- Potential physical hazards on site including a review of the fall protection heat and cold stress SOPs.

## 1.3 SITE SAFETY PLAN ACKNOWLEDGMENT FORM

Prior to entering the site, all individuals conducting work in the contaminant reduction and/or exclusion zone will read and sign the Safety Plan Acknowledgment Form in Attachment Z. By signing the Safety Plan Acknowledgment Form, individuals are recognizing the hazards present on site and the policies and procedures required to minimize exposure or adverse effects of these hazards.

## 1.4 DAILY SAFETY MEETINGS

Daily safety meetings will be held at the start of each shift to ensure personnel understand site conditions and operating procedures, to ensure that personal protective equipment is being used correctly, and to address worker health and safety concerns.

## 1.5 LABELS

All chemical products, including consumer products, shall have warning labels. Manufacturer's labels must be in English, be easily readable, identify the hazardous chemicals of the product, display the appropriate hazard warnings, and display the name and address of the manufacturer or distributor.

Portable containers used by more than one person or for more than one shift shall have a warning label that identifies the contents.

Additional labels besides the manufacturer's label on products in the workplace are not required unless the product is transferred to another container; the new container shall be labeled with the appropriate hazard warnings and identify all hazardous chemicals the products contain.

## 1.6 MATERIAL SAFETY DATA SHEETS (MSDs)

In accordance with the requirements of 29 CFR 1910.1200, the contractor will provide Material Safety Data Sheets (MSDSs) for all chemicals brought on site. The MSDSs will be kept with the HASP at all times, and be available to all site employees and visitors.

It is required that the MSDS contains the following eight mandatory sections:

Section 1.0: contains the name of the product, the manufacturer's name and address, and a phone number to call in case of an emergency.

Section 2.0: lists the name of the hazardous components or chemicals that make up the product; includes the OSHA permissible exposure limits set for working with the chemical on a day-to-day basis.

Section 3.0: lists the physical and chemical characteristics: boiling points, specific gravity, melting point, density solubility, appearance, and odour.

*Section 4.0: contains fire and explosion information,* including the flash point (the temperature at which a flame or spark will ignite vapours given off by the chemical), which will identify the product as flammable or combustible.

Section 5.0: contains reactivity data, explains if the material is stable, and identifies what it might be incompatible with.

Section 6.0: contains health hazard data, explaining which route the chemical will take to enter the body and the symptoms that occur from overexposure. The long term effects, including carcinogenicity (cancer causing) and emergency first aid procedures are also found in this section.

Section 7.0: contains steps to take when a hazardous chemical is spilled, safety precautions for storage and safe handling, and how to dispose of used materials.

Section 8.0: lists the protective clothing, equipment recommendations, and engineering controls (such as ventilation requirements) that protect from overexposure.

ATTACHMENT W

LIQUID TRANSFER PROCEDURES

(TO BE PROVIDED BY CONTRACTOR)

# ATTACHMENT X

# EQUIPMENT REFUELING

## REFUELING

1. Equipments' engines must be shut down and locked/tagged out before any refueling operations are conducted.
2. Appropriate ABC type fire extinguishers shall be available.
3. All ignition sources shall be eliminated.
4. Fuel shall be brought to the equipment using the designated vehicle. Appropriate vehicle safety precautions shall be followed.
5. Appropriate grounding/bonding shall be conducted before transferring fuel.

ATTACHMENT Y

HAZARD CATEGORIZATION (HAZCAT) TESTING

(REFER TO SECTIONS 4.1 AND 4.2 OF THE SAMPLING AND ANALYSIS PLAN)

# ATTACHMENT Z

# SITE SAFETY PLAN ACKNOWLEDGMENT FORM

## SITE SAFETY PLAN ACKNOWLEDGEMENT FORM

I have been informed and understand and will abide by the procedures set forth in the Safety and Health Plan Amendments for the North Sanitary Landfill Site.

| **Printed Name** | **Signature** | **Representing** | **Date** |
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SSP: ______________________ Date: ______________________

C

APPENDIX C

EMERGENCY CONTINGENCY PLAN

(TO BE SUBMITTED AT A LATER DATE)

**EMERGENCY CONTINGENCY PLAN**
**NORTH SANITARY LANDFILL**
**DAYTON, OHIO**
**DECEMBER 2001**

The North Sanitary Landfill (Site) is located at 950 Brandt Pike (formerly 200 Valleycrest Drive), in the City of Dayton, Montgomery County, Ohio. The Site comprises an area of approximately 100 acres that is separated into east and west portions by north-south trending Valleycrest Drive. The eastern portion of the Site comprises approximately 35 acres and the western portion of the Site comprises approximately 65 acres. The Site is owned by Keystone Gravel Company of Dayton, Ohio:

Bieser, Greer, and Landis
c/o Charles Shane
400 National City Center
Dayton, Ohio 45402
(937) 223-3277

The Site is located in a mixed urban, industrial, and residential area. The Site is bordered on the east and northeast by a residential neighborhood, on the north by several residences, and further north by an abandoned demolition landfill. The Site is bordered on the southeast by commercial and residential structures and Valley Pike, and on the southwest by the B&O railroad tracks and residences. The Site is bordered on the west by a residence, Brandt Pike and several industrial facilities, including the Brandt Pike petroleum terminals [comprised of the British Petroleum (formerly Sohio), Shell Oil Company, and Sun Oil facilities], Van Dyne Crotty Inc. industrial cleaner facility, and the Hotop demolition landfill. Approximately 1,500 people live within 1/2 mile of the Site.

The Site was operated as a sand and gravel quarry from before 1935 until the 1970s. In 1966, the Site began accepting waste in the eastern portion of the property. Filling in the eastern portion of the property continued until approximately 1970. In 1970, the landfill began accepting waste in the eastern part of the western portion of the property and continued until approximately 1975. Disposal of foundry sand in parts of the western portion continued until the early 1990s.

As part of the investigation work conducted at the Site, five disposal areas were identified (see Figure 1). Disposal Areas 1, 2, and 5 reportedly received municipal/industrial waste (potentially including household waste and other wastes containing solvents, metals, and other chemicals), while Disposal Areas 3 and 4 reportedly received foundry sand. Based on the area of Disposal Areas 1, 2, and 5 and an average depth of 25 feet of waste material, the Site received approximately 2.2 million cubic yards of municipal/industrial waste.

As part of the investigative activities conducted at the Site, geophysical surveys have been performed to identify the presence of buried metal objects. Test pits were excavated to investigate these areas and determined the presence of buried containers (e.g., drums). The buried containers and associated waste material is being excavated and tested to determine disposal requirements. Drums will be temporarily staged on Site pending making arrangements for disposal. The proposed layout of these facilities is shown on Figure 2. The road layout with evacuation routes and gate locations is shown on Figure 3. The work started in November 1998 and is ongoing. A U.S. EPA/Ohio EPA command post is established within the main staging area located at 950 Brandt Pike.

After hour on-Site security will be utilized to facilitate response to the events listed below and to provide a high visibility presence on Site to act as a deterrent to trespass and vandalism. The phone number of the security firm, Maximum Security, is (937) 256-2820.

The HSO or HSO designate will conduct a safety meeting prior to commencement of work each day. In addition to general safety considerations, these meetings will be used to provide pre-emergency planning and prevention, emergency recognition, and emergency response procedures related to specific Site activities and conditions at that time. On-Site personnel will have the opportunity to provide input and make suggestions or recommendations regarding pre-emergency planning and prevention, emergency recognition and emergency response procedures. A critique of emergency response actions conducted in relation to any actual on-Site emergency or emergency simulation will be provided at the next daily safety meeting.

The following course of action shall be taken, if an emergency situation develops. The HSO or HSO designate shall be notified of any emergency situation as soon as possible, and will implement notification procedures:

1. Evacuate as necessary.
2. Notify the proper emergency services for assistance. See Table 3.1 for telephone numbers. Inform the emergency services personnel of the type of work being performed so that the need for decontamination can be assessed.
3. Notify any other affected personnel at the Site.
4. Contact the Project Manager and the Corporate Health and Safety Manager to inform them of the incident as soon as possible. The Project Manager will notify the appropriate parties including the Owner or Owner's Representative.

5. Prepare a summary report of the incident for the Project Manager and Corporate Health and Safety Manager, as soon as possible after the incident. This document must be filed in the project file.

6. A summary of any emergency response and notification procedures implemented will be provided at the next weekly Site progress meeting by the Site manager. In the event that the Dayton Fire Department, Riverside Fire Department and/or Dayton HAZMAT responds to the emergency, attempts will be made to have a representative from each responding entity present at the next weekly Site progress meeting. The emergency response and notification procedures implemented will be discussed and critiqued and any suggestions for improvement to the procedures will be encouraged.

In the event of a required response by local emergency authorities, the following protocols provide necessary guidance for the following potential response events:

- vandalism/trespass;
- medical emergencies; and
- fire/explosion.

## VANDALISM/TRESPASS

In the event of vandalism/trespass, the City of Dayton Police Department will respond but not enter the Site perimeter. Attempts will be made to communicate with offenders from the Site perimeter's fencing via loudspeaker and to apprehend the offenders following their exit from the Site. Members of the Police Department will immediately advise U.S. EPA OSC Renninger and the contractor's designated representative of any incidents of trespass or vandalism.

During working hours, notification to the police department and U.S. EPA will be made by either the Contractor representative (to be determined) or the CRA representative (Peter Schwarz), or designated alternates. During non-working hours, security personnel will notify the police department, U.S. EPA (Steve Renninger), Contractor representative (to be determined), and Peter Schwarz.

| *During Working Hours* | | *After Working Hours* | |
|---|---|---|---|
| Steve Renninger | (800) 617-1065 (Pager) | Steve Renninger | (800) 617-1065 (Pager) |
| Contractor Representative | (to be determined) | Contractor Representative | (to be determined) |
| Peter Schwarz | (937) 237-8276 | Peter Schwarz | (513) 200-8895 (Cellular) |

A local alternate contact for the Contractor will be designated upon selection of the Contractor.

Inspections of the perimeter fence will be performed on a regular basis (e.g., two to three times per week) to inspect for signs of vandalism or trespassing.

## MEDICAL EMERGENCIES

During normal business hours (7:00 a.m. to 6:00 p.m.) a designated Health and Safety Officer shall meet responding Dayton Fire Department (DFD) crews at the gate of the Site to inform them of current conditions, hazards and anticipated needs. An action plan will be developed and appropriate actions will then be taken.

After normal business hours (6:00 p.m. to 7:00 a.m.), DFD crews will maintain a defensive posture (outside of the fenced perimeter and upwind) and make the appropriate emergency contacts. No offensive actions will be taken without an appropriate risk/benefit analysis. The Contractor's designated representative will be contacted, and if appropriate, will respond to the Site. Emergency contacts when paged will verify the contact by calling (937) 333-3473 (DFD/Riverside dispatch).

Rescue operations, if necessary in the exclusion zone, should be conducted by personnel wearing a minimum of Level "B" personal protective equipment, including SCBA and protective coveralls. If possible, any medical emergencies will be coordinated by decontaminating and removing injured personnel from the exclusion zone. If possible, the victim will be decontaminated prior to arrival of the ambulance service on Site. The victim will be picked up at the staging area at 950 Brandt Pike.

The victim should be decontaminated to the maximum extent possible, paying particular attention to the areas of the body or clothing that were in contact with the contaminants. If the injury is minor, a full decontamination should be completed and first aid administered prior to transport. If the victim's condition is serious, at a minimum, emergency decontamination should be completed. For emergencies requiring transport to a hospital, the victim should be transported to Miami Valley Hospital in Dayton, Ohio. A map showing directions to Miami Valley Hospital from the Site is shown on Figure 4.

During working hours, notification to the fire department and the U.S. EPA will be made by either the Contractor representative (to be determined) or the CRA representative (Peter Schwarz), or designated alternates. During non-working hours, security personnel will notify the fire department, U.S. EPA (Steve Renninger), Contractor representative (to be determined), and Peter Schwarz.

| *During Working Hours* | | *After Working Hours* | |
|---|---|---|---|
| Steve Renninger | (800) 617-1065 (Pager) | Steve Renninger | (800) 617-1065 (Pager) |
| Contractor Representative | (to be determined) | Contractor Representative | (to be determined) |
| Peter Schwarz | (937) 237-8276 | Peter Schwarz | (513) 200-8895 (Cellular) |
| | | Will Armes (Alt. 1) | (513) 200-8888 (Cellular) |
| | | Henry Cooke (Alt. 2) | (513) 200-8905 (Cellular) |

A local alternate contact for the Contractor during non-working hours will be designated upon selection of the Contractor.

## FIRE/EXPLOSION

*For all calls to the Site location, the emergency dispatcher will dispatch the Hazardous Materials* Response Team. Effective immediately, no one is to enter the exclusion zone for fire fighting purposes at this Site without Level "B" protection, including SCBA and Tyvek. The Dayton Fire Department and Riverside Fire Department will be called to evacuate any residences located in the immediate vicinity if necessary (see further below). However, the members of the fire department(s) will not enter the Site but only assess the fire/explosion hazard from a perimeter position. In the event that Site entry is necessary, the HazMat Response team will be called to respond to the fire/explosion incident. All fire fighting for this Site should be attempted from a perimeter position, if possible. The Dayton Fire Department and EMS service will be dispatched; the first-arriving engine officer will assume control. All other personnel will meet at an upwind location and await assignment of duties. Telephone numbers of personnel who should be contacted in the event of an incident are listed on the attached page. At a minimum, the following personnel will be notified:

| | | |
|---|---|---|
| Dayton Fire Department | | (937) 333-3473 |
| Riverside Fire Department | | (937) 333-3473 |
| U.S. EPA On-Scene Coordinator | Steve Renninger | (800) 617-1065 (Pager) |

| | | |
|---|---|---|
| Ohio EPA Emergency Response | | (800) 282-9378 |
| Montgomery County EMA | Dennis Bristow | (937) 854-4822 (Office)<br>(937) 978-1715 (Pager) |
| Contractor's Representative | to be determined | to be determined |
| (Alternate) | to be determined | to be determined |
| CRA Representative | Peter Schwarz | (513) 200-8895 (Cellular) |
| (Alternate 1) | Will Armes | (513) 200-8888 (Cellular) |
| (Alternate 2) | Henry Cooke | (513) 200-8905 (Cellular) |

During working hours, notifications will be made by the Contractor representative (to be determined) or the CRA representative (Peter Schwarz) or designated alternate. During non-working hours, notifications will be made by security personnel, and verified by Contractor's representative (to be determined).

The Contractor will have at least three Summa® canisters, and air sampling pumps with cartridges for metals and particulate air sampling available on Site at all times.

Additionally, the following equipment and materials will be maintained on Site (see Figure 2):

- 600 feet of fire hose;
- AFFF 3 percent foam; and
- soil will be readily available for fire mitigation purposes.

## EVACUATION PROCEDURES

In the event of fire/heavy smoke or toxic gas emission, an evacuation may be necessary and should proceed according to MCLEPC guidelines. The following are anticipated procedures:

1. At the first sign of fire/heavy smoke or toxic gas emission (e.g., due to sudden release of vapors from buried containers), the Contractor's HSO will notify designated U.S. EPA, Ohio EPA, and CRA representatives.
2. The Contractor HSO will then contact the following to comply with notification procedure obligations:
    - Dayton Fire Department (937) 333-3473
    - Riverside Fire Department (937) 333-3473
    - National Spill Response Center (800) 424-8802
    - Ohio EPA Emergency Response (800) 282-9378

3. The Dayton Fire Department will assume control of the situation and will determine if evacuation is necessary.
4. Evacuation affecting City of Riverside residents coordination efforts should be in conjunction with Riverside Fire and Police Departments.

During the above activities, the Contractor HSO will be responsible to collect air monitoring data at downwind locations (wind socks will be established on Site to determine wind direction). U.S. EPA Superfund Technical Assessment and Response Team (START) and Contractor's health and safety personnel will assist with real-time air monitoring using field gas chromatograph Voyager units at predetermined off-Site locations. This information will be provided directly to the on-Site emergency response officials.

The Contractor will have at least three Summa® canisters, and air sampling pumps with cartridges for metals and particulate air sampling available on Site at all times.

## SPILL CONTROL

It is anticipated that potentially hazardous materials which could potentially be subject to a release or spill will be limited to stockpile leachate, treatment system condensate, decontamination fluids, fuels, and lubricating fluids for construction equipment and vehicles. These materials will be stored and transported, as required, in suitable containers designed for that particular use, thereby minimizing the potential for spill or release.

On-Site personnel will be equipped to deal with the type of release or spill which could be encountered at the Site. All work will be performed in such a manner as to minimize or eliminate the potential for a spill or release of potentially hazardous material.

In the event of a spill or release the following procedures will be implemented:

1. on-Site personnel will immediately initiate emergency measures to prevent or contain the spill or release;
2. if a release has occurred, on-Site personnel will immediately begin cleanup of the spill once the source has been eliminated and the spill contained;
3. the HSO or designate will call the appropriate authorities and report the incident including type of spill, type of material spilled, the quantity of material spilled, and procedures being implemented.

# NORTH SANITARY LANDFILL
# DAYTON, OHIO
# LIST OF EMERGENCY CONTACTS

| *Agency* | *Phone Number* | | *Contact* |
|---|---|---|---|
| **LOCAL AGENCY** | | | |
| Dayton Fire Department | *911* | | |
| | (937) 333-3473 | (Dispatch) | Paul Alexander - Chief |
| Dayton Police | 911 | | Lt. Randy Gaine |
| | (937) 222-9511 | | |
| | (937) 333-2677 | | |
| | (937) 333-1520 | (Fax) | |
| Dayton EMS | 911 | | |
| | (937) 224-9241 | (Dispatch) | |
| Riverside Fire Department | (937) 333-3473 | (Dispatch) | Dan Alig - Chief |
| | (937) 252-8052 | (Fax) | |
| Riverside Police | 911 | | |
| | (937) 225-4357 | | |
| Miami Valley Hospital | (937) 208-2650 | | |
| | (937) 223-2151 | | |
| Montgomery County EMA/LEPC | (937) 854-4822 | (Office) | Dennis Bristow |
| | (937) 978-1715 | (Pager) | |
| Montgomery County Health Department | (937) 225-4460 | | Mark Case/Tom Hut |
| Regional Air Pollution Control | (937) 225-4435 | | |
| Dayton Power & Light | (937) 224-6000 | | |
| | (937) 331-9300 | (Emergency) | |
| Poison Control Center | (800) 762-0727 | | |
| Ohio Utilities Protection Service (OUPS) | (800) 362-2764 | | |
| PUCO Hazmat Enforcement Officer | (614) 466-0409 | (Office) | Ron Swegheimer |
| | (614) 647-3138 | (Pager) | |
| | (740) 584-4388 | (Cellular) | |
| City of Dayton | (937) 333-3725 | (Office) | Donna Winchester |
| | (937) 290-0124 | (Pager) | |
| **FEDERAL/STATE** | | | |
| U.S. EPA On-Scene Coordinator | (800) 617-1065 | (Pager) | Steve Renninger |
| | (513) 569-7539 | (Office) | |
| U.S. EPA Region 5 Response (Emergency Only) | (312) 353-2318 | (24-hour number that rings in Chicago or Detroit and can assist or locate the OSC) | |
| National Spill Response Center | (800) 424-8802 | (Emergency only) | |
| ***Ohio EPA Emerg. Response*** | ***(800) 282-9378*** | | |
| Ohio EPA Project Manager | (937) 285-6052 | | Kurt Kollar |
| | (614) 661-9031 | (Pager) | |
| OEPA Southwest District Office (Dayton) | (937) 285-6357 | | |
| Ohio Department of Health | (614) 644-6447 | | Bob Frey |
| Alcohol, Tobacco, and Firearms (ATF) | (800) 424-9555 | | |

**NORTH SANITARY LANDFILL**
**DAYTON, OHIO**
**LIST OF EMERGENCY CONTACTS**

| *Agency* | *Phone Number* | *Contact* |
|---|---|---|
| **COMMAND POST PHONE NUMBERS** | | |
| U.S. EPA Command Post | (937) 235-0694 | Steve Renninger/ John Sherrard (TetraTech) |
| U.S. EPA Fax | (937) 235-5677 | |
| Engineer Trailer (CRA) | (937) 237-8276<br>(937) 237-8336 (Fax) | Peter Schwarz |
| Contractor Trailer | to be determined | to be determined |
| PRP Representative (*de maximis*) | (865) 691-5052<br>(865) 691-6485 (Fax) | Mike Miller/Mike Samples |
| **24-HOUR/WEEKEND** | | |
| Maximum Security | (937) 256-2820 | Larry Richardson |
| CRA | (513) 200-8895 (Cellular) | Peter Schwarz |
| CRA Alternate 1 | (513) 200-8888 (Cellular) | Will Armes |
| CRA Alternate 2 | (513) 200-8905 (Cellular) | Henry Cooke |
| Contractor | to be determined | to be determined |
| **HOLIDAYS** | | |
| Maximum Security | (937) 256-2820 | Larry Richardson |
| CRA | (513) 200-8895 (Cellular) | Peter Schwarz |
| CRA Alternate 1 | (513) 200-8888 (Cellular) | Will Armes |
| CRA Alternate 2 | (513) 200-8905 (Cellular) | Henry Cooke |
| Contractor | to be determined | to be determined |

## SPECIFIC INSTRUCTIONS FOR SITE PERSONNEL AND VISITORS

- All visitors and workers must sign the Site security log book each day upon entering the Site. (This log is located within a mailbox inside the gate.)
- All workers are to undergo safety indoctrination prior to initial work at the Site, and are to be aware of the requirements of their specific site health and safety plan.
- A minimum of Level D protection (hard hat, safety glasses, steel-toe boots) is to be worn at all times, with the exception of the staging area.
- Smoking is NOT permitted anywhere within the site perimeter, with the exception of the staging area.
- A copy of the Emergency Contingency Plan is located within the CRA and Contractor trailers.
- In the event of an emergency, portable air horns will be used to signal the following:

| | |
|---|---|
| 1 Blast: | Attention. Contact the command center. |
| 2 Blasts: | Emergency. Assemble upwind, or at a predetermined location. |
| 3 Blasts: | Severe Emergency. Evacuate site immediately, and meet at designated location. |

All Site operations will cease during an emergency.

D

# APPENDIX D

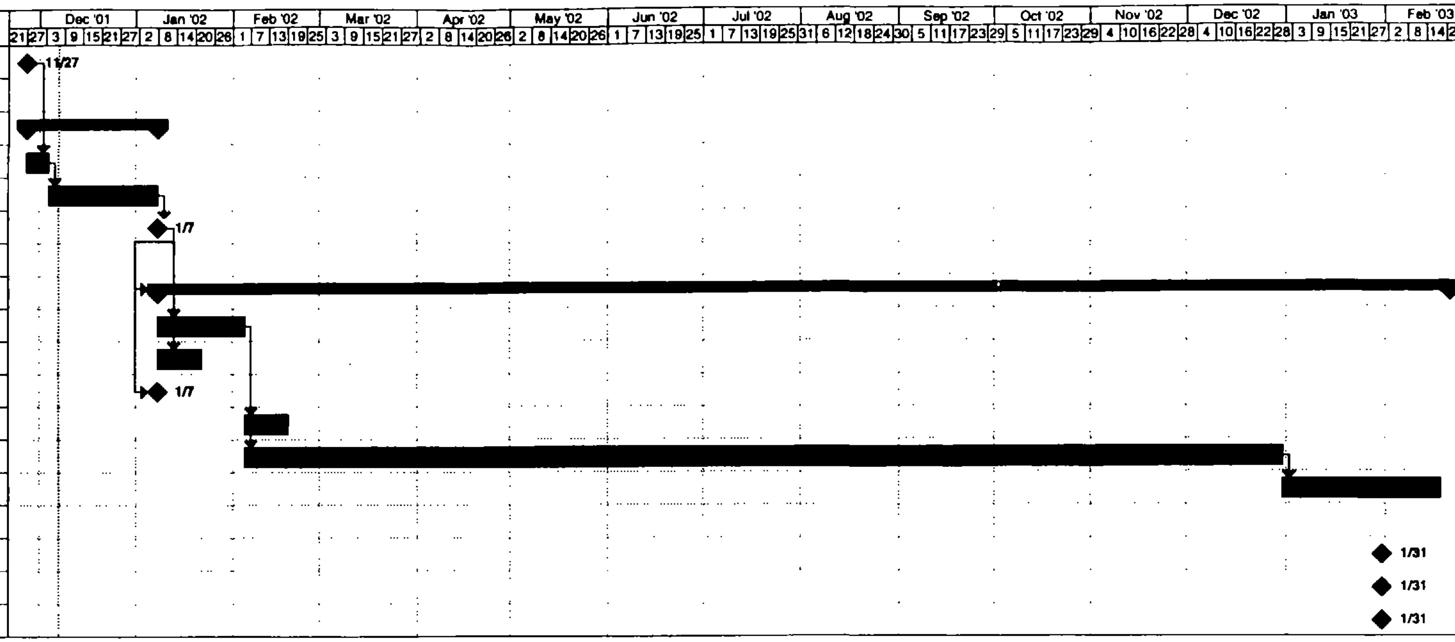
# PROJECT SCHEDULE

REPORT No 33

6351-27Schedule#3 mpp Fri 12/7/01

# PROJECT SCHEDULE
## DISPOSAL AREA 1 REMOVAL ACTION
## NORTH SANITARY LANDFILL
## DAYTON, OHIO

| ID | Task Name | Duration |
|---|---|---|
| 1 | **Approval of Work Plan** | 0 days |
| 2 | | |
| 3 | **Bid Documents** | 42 days |
| 4 | Bid Period | 7 days |
| 5 | Evaluation of Bids | 35 days |
| 6 | Notice of Award | 0 days |
| 7 | | |
| 8 | **Mobilization & Disposal Area 1 Removal Activities** | 408 days |
| 22 | Mobilization to Site | 28 days |
| 23 | Baseline Air Monitoring | 14 days |
| 24 | Submit Emergency Contingency Plan | 0 days |
| 25 | Test Pits | 14 days |
| 26 | Excavation, Drum Removal, and Sampling | 329 days |
| 27 | Final Disposal, Site Cleanup, and Demobilization | 49 days |
| 28 | | |
| 29 | **Work Plans** | 0 days |
| 30 | Submit Addendum for In-Situ VE to the RPM | 0 days |
| 31 | Submit Work Plan for non-VOC Material to the OSC | 0 days |




Project: North Sanitary Landfill
Date: Fri 12/7/01

Task | Milestone | Summary

Notes:
1 Assumes 13 foot excavation and 20,000 drums/ drum carcasses.
2 Assumes no down time for Agency comments during work.
3 If Agency comments affect the scope of work for bid, additional time for bidding and/or bid review may be required

CONESTOGA-ROVERS & ASSOCIATES

E

# APPENDIX E

# QUALITY ASSURANCE PROJECT PLAN

TABLE OF CONTENTS

LIST OF TABLES
(Following Text)

## 1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) activities associated with the Disposal Area 1 Removal Action Work Plan (Work Plan) for the North Sanitary Landfill (Site), also known as the Valleycrest Landfill, located in Dayton, Ohio.

This QAPP has been prepared by Conestoga-Rovers & Associates (CRA) pursuant to the Administrative Order between the U.S. Environmental Protection Agency (U.S. EPA) and certain respondents to the Administrative Order (Respondents). The Administrative Order is provided in Appendix A of the Work Plan.

As required by the Administrative Order, this QAPP concisely describes or references to related Work Plan documents, the QA/QC protocols which will be followed for sampling, chain-of-custody documentation, and laboratory analyses. In addition, the procedures used to validate the analytical data are described herein. The purpose and objective of the QAPP is to ensure that the analytical results are accurate, precise, complete, and representative of the media sampled in order to provide acceptable data for the project.

## 2.0 PROJECT DESCRIPTION AND SCOPE

The project description and scope is provided in Section 1.0 of the Work Plan. In general, the data generated from the sample analyses will be used for two purposes:

i) to facilitate the removal and disposal of buried containers; and

ii) to verify removal of waste material subject to the terms of the Administrative Order by post-excavation sampling and analysis.

Sample analyses for buried containers will consist of performing on-Site hazardous characteristics analyses (also known as HazCat analyses) to identify and categorize compatible waste streams. Containers with similar chemical and physical properties may be bulked together for disposal purposes (e.g., combining similar liquid wastes contained in drums to create a volume suitable for bulk transportation and more cost-effective bulk liquid disposal). Composite samples created for this purpose will be analyzed for RCRA hazardous characteristics [including reactivity, corrosivity (liquids only), ignitability, and toxicity (using the Toxicity Characteristic Leaching Procedure, or TCLP), and polychlorinated biphenyls (PCBs)]. Additional analyses will be performed as required by disposal facilities.

Sample analyses for pooled non-aqueous phase liquids (NAPL), decontamination fluids, excavation dewatering liquids, and used personal protective equipment (PPE) will consist of RCRA hazardous characteristics and PCBs.

Sample analyses for post-excavation sampling of relocated soil and waste material from the drum removal grids will consist of the full TCLP parameter list and PCBs.

In addition to the scope of analytical work described above, air monitoring will be performed. The air monitoring program is discussed further in the Site Safety Plan (SSP) provided in Appendix B of the Work Plan.

Table 2.1 presents the sample matrices expected to be encountered and the parameters to be tested for each matrix.

## 3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

CRA, as technical consultant to the Respondents, has overall responsibilities for the removal action work at the Site. CRA will supervise all field activities. The remedial contractor (to be selected) will perform all sampling activities and will conduct the on-Site HazCat/compatibility testing.

All sample analysis will be performed by Belmont Park Environmental Laboratory (Englewood, OH), Southern Petroleum Laboratory, Inc. (Houston, TX, or Scott, LA), or other approved laboratories.

The laboratories will designate appropriate personnel for the following positions (responsibilities for each position are listed):

Laboratory Project Manager

- ensures all resources of the laboratory are available on an as-required basis; and
- overview of final analytical reports.

Laboratory Operations Manager

- coordinate laboratory analyses;
- supervise in-house chain-of-custody procedures;
- schedule sample analyses;
- oversee data review;
- oversee preparation of analytical reports; and
- approve final analytical reports prior to submission to CRA.

Laboratory QA Officer

- overview laboratory quality assurance;
- overview QA/QC documentation;
- conduct detailed data review;
- approve laboratory corrective actions (if required);
- technical representation of laboratory QA procedures; and
- overview preparation of laboratory standard operating procedures.

Laboratory Sample Custodian

- receive and inspect the incoming sample containers;
- record the condition of the incoming sample containers;
- sign appropriate documents;
- verify the correctness of chain-of-custody documents;
- notify laboratory manager and laboratory supervisor of sample receipt and inspection;
- assign a unique identification number and customer number and enter each into the sample receiving log;
- with the help of the operations manager, initiate transfer of the samples to appropriate lab sections; and
- control and monitor access/storage of samples and extracts.

The remedial contractor's on-Site chemist performing HazCat/compatibility testing will be responsible for maintaining all appropriate chain-of-custody and QA/QC documentation for the samples collected. Upon demobilization from the Site the contractor will provide this documentation to CRA.

The key personnel with QA/QC responsibilities for the Respondents are presented below:

Mike Miller - Project Coordinator - *de maximis*
Mike Samples – Alternate Project Coordinator – *de maximis*

- overview of removal activities;
- final review of all deliverables; and
- participation in discussions with U.S. EPA.

Ian Richardson – Project Manager – CRA

- management of CRA's project team;
- participation in discussions with U.S. EPA;
- overview of field activities;
- preparation and review of reports;
- technical representation of project activities; and
- evidence file custodian.

Matt Elkins – Project QA Officer – CRA

- overview and review field QA/QC;
- overview of laboratory activities;
- review laboratory QA/QC;
- coordinate and review data validation and assessment;
- preparation and review of reports; and
- QA/QC representation of project activities.

Pete Schwarz - Field QA Officer - CRA

- management of field activities and field QA/QC;
- data assessment;
- technical representation of field activities;
- review of field procedures; and
- preparation of reports.

U.S. EPA's On-Scene Coordinator (OSC) is responsible for oversight of the removal action work on behalf of the U.S. EPA. U.S. EPA's OSC for the project is Steven Renninger.

## 4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The level of QA/QC effort provided by the off-Site laboratories will be consistent with the methods from which the analyses are referenced (refer to Section 8.0). Additional post-excavation sample volume will be provided to the laboratory for the purpose of analyzing matrix spike samples required for the TCLP analyses and matrix spike/matrix spike duplicate (MS/MSD) samples required for PCB analyses. Matrix spike samples for TCLP analyses will be designated for each unique post-excavation sample matrix. MS/MSD samples for PCB analyses will be designated at a frequency of one per twenty post-excavation samples.

The level of QA/QC effort for the on-Site HazCat/compatibility testing will consist of analyzing blanks and known reference materials to ensure that the tests are functioning properly. Additional details regarding the on-Site testing are provided in the Sampling and Analysis Plan (SAP) provided as Appendix G of the Work Plan.

The target analytes and targeted quantitation limit are presented in Table 4.1.

## 5.0 SAMPLING PROCEDURES

Sample collection procedures will be consistent with the SAP.

Table 5.1 summarizes the sample container, preservation, holding time, and shipping requirements for the samples to be collected.

## 6.0 SAMPLE CUSTODY AND DOCUMENT CONTROL

The U.S. EPA Region 5 sample custody procedure or the chain-of-custody protocols as described in "NEIC Policies and Procedures", EPA-330/9-78-001-R, revised August 1991 will be followed for samples shipped for off-Site analysis. Sample custody is segregated into three parts: sample collection; laboratory analysis; and final evidence files. Final evidence files, including all originals of laboratory reports, are maintained under document control in a secure area.

A sample or evidence file is in your custody if it:

i) is in your possession;

ii) is in your view, after being in your possession;

iii) is in your possession and you place it in a secured location; or

iv) is in a designated secure area.

### 6.1 SAMPLE LABELING

Each sample will be labeled with a unique sample number that will facilitate tracking and cross-referencing of sample information. The information entered on the sample label will be printed by the field sampler.

### 6.2 FIELD CHAIN-OF-CUSTODY PROCEDURES

The sample packaging and shipment procedures summarized below will insure that the samples will arrive at the laboratory with the chain-of-custody intact. CRA's Field QA Officer will be responsible for oversight of the remedial contractor's field documentation procedures.

#### 6.2.1 FIELD PROCEDURES

1) The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. As few people as possible will handle the samples.
2) All containers will be labeled with unique sample numbers.
3) Sample labels will be completed for each sample using waterproof ink.

### 6.2.2 FIELD LOG SHEETS/DOCUMENTATION

Drum inventory forms and HazCat/compatibility data forms will provide the means of recording drum sampling data collecting activities. Drum inventory forms will be used to record markings, size, contents, etc., and are discussed in Section 3.2 of the SAP. HazCat/compatibility data forms will be used to record the results of the on-Site testing and test bulking.

### 6.2.3 TRANSFER OF CUSTODY AND SHIPMENT PROCEDURES

The sample packaging and shipping procedures summarized below will ensure that the samples arrive at the off-Site laboratory with the chain-of-custody intact:

1) The field sampler is personally responsible for the care and custody of the samples until they are transferred to another person or the laboratory. As few people as possible will handle the samples.
2) All sample containers will be identified by using sample labels which include the date of collection and analyses to be performed.
3) Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions.
4) Samples will be accompanied by a properly completed chain-of-custody form. The sample identification numbers will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving the samples will sign and record the date and time on the form. The chain-of-custody form documents sample custody transfers from the sampler to another person, to the laboratory, or to/from a secure storage area.
5) Samples will be properly packaged for shipment (see Table 5.1) and dispatched to the laboratory for analysis with a separate signed chain-of-custody form enclosed in and secured to the inside top of each sample cooler. Shipping coolers will be secured with custody tape or seals for shipment to the laboratory.
6) Whenever samples are collocated (split) with a government agency or other entity, that entity will be required to prepare its own chain-of-custody form.
7) All sample shipments will be accompanied by the chain-of-custody form identifying its contents. The chain-of-custody form documents the transfer of samples from the time of collection to receipt at the laboratory. Each person

relinquishing custody of the samples retains a copy of the form to document the transfer of the samples.

8) If the samples are sent by common carrier, a bill of lading will be used and copies will be retained as permanent documentation. Commercial carriers are not required to sign the chain-of-custody form as long as the form is sealed inside the sample cooler and the custody tape or seals remain intact.

9) Samples will usually be transported or shipped to the laboratory the same day the samples are collected in the field.

## 6.3 LABORATORY CHAIN-OF-CUSTODY PROCEDURES

The sample custodian will assign a unique number to each incoming sample for use in the laboratory. The unique number and customer number will then be entered into the sample receiving log. The laboratory date of receipt will also be noted.

Each laboratory's custody procedures and document control will be carried out using their standard log-in and documentation procedures.

## 6.4 STORAGE OF SAMPLES

Each laboratory's sample custodian will be responsible for storing the samples in the appropriate location(s). All samples will be stored within an access-controlled location and will be maintained properly preserved (see Table 5.1) until completion of all analytical work or, at a minimum, for 30 days after receipt of the final report.

## 6.5 FINAL EVIDENCE FILES CUSTODY PROCEDURES

Evidential files for the entire project will be maintained by CRA and will consist of the following:

i) project plan;

ii) project log books;

iii) field data records;

iv) sample identification documents;

v) chain-of-custody documents;

vi) correspondence;

vii) references, literature;

xiii) final data packages;

xiv) miscellaneous - photos, maps, drawings, etc.; and

xv) project reports.

The evidential file materials will be the responsibility of the evidence file custodian (CRA's Project Manager) with respect to maintenance and document removal and will be stored in a secured, limited access area.

The laboratories will be responsible for maintaining analytical logbooks and laboratory data. Raw laboratory data files will be inventoried and maintained by the laboratory for a period of 6 years following completion of the actions specified under the Administrative Order. Each laboratory's document control personnel will be responsible for document control.

## 7.0 CALIBRATION PROCEDURES AND FREQUENCY

Calibration procedures and frequencies will be those specified in the methods of analysis.

## 8.0 ANALYTICAL PROCEDURES

The analytical procedures used by the off-Site laboratories will be those specified in Table 8.1.

On-Site HazCat/compatibility testing and composting strategies for RCRA hazardous characteristics and PCBs are described in detail in Sections 4.1 and 4.2, respectively, of the SAP.

## 9.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

The internal quality control checks and frequencies for RCRA hazardous characteristics and PCB analyses will be consistent with those specified in the analytical methods. The internal QC checks for HazCat analyses will consist of checking for positive and negative results using standards and blanks on a daily basis when the analyses are being performed.

## 10.0 DATA REDUCTION, VALIDATION, AND REPORTING

The data reduction, validation, and reporting requirements for post-excavation samples being analyzed for TCLP parameters and PCBs follow:

1. Raw data produced and checked by the responsible analyst is turned over for independent review by another analyst.
2. The area supervisor reviews the data for attainment of quality control criteria established by the QAPP.
3. The area supervisor will decide whether any sample reanalysis is required.
4. Upon completion of all reviews and acceptance of the raw data by the supervisor, a report will be generated and sent to the laboratory Project Manager.
5. The laboratory Project Manager will complete a thorough inspection of all reports.
6. Upon acceptance of the preliminary reports by the laboratory Project Manager, final reports will be generated and signed by the laboratory Operations Manager or his designee.
7. A thorough review of a percentage of all data packages is performed by the laboratory Quality Assurance Officer or his designee.

The data from post-excavation samples analyzed for TCLP parameters and PCBs will be validated using the relevant criteria from the U.S. EPA guidance document "National Functional Guidelines for Organic Data Review", February 1994.

## 11.0 PERFORMANCE AND SYSTEM AUDITS

Internal performance and system audits will be the responsibility of each off-Site laboratory's QA Officer. External performance and system audits will be the responsibility of U.S. EPA.

## 12.0 PREVENTIVE MAINTENANCE

Preventive maintenance procedures will be consistent with the off-Site laboratories' standard procedures and the methods referenced in Section 8.0.

## 13.0 SPECIFIC ROUTINE PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

The specific routine procedures to assess data precision, accuracy, and completeness will be consistent with the off-Site laboratories' standard procedures, the methods referenced in Section 8.0, and the data validation guidance specified in Section 10.0.

## 14.0 CORRECTIVE ACTION

Corrective action procedures for the laboratory analyses will be consistent with each laboratory's standard procedures and the methods specified in Sections 4.1 and 4.2 of the SAP. Corrective action procedures for field procedures may be necessary when the sample network is changed (i.e., more/less samples, sampling locations other than those specified) or when sampling procedures and/or field analytical procedures require modification due to unexpected conditions. In general, the field sampling team may identify the need for corrective action. The field sampling team, in consultation with the Field QA Officer, will recommend a corrective action. The Field QA Officer will approve the corrective action which will be implemented by the field team. It will be the responsibility of the Field QA Officer to ensure the corrective action has been implemented.

The CRA QA Officer may identify the need for corrective action during either data validation or data assessment. Potential types of corrective action may include resampling by the field team or re-injection/reanalysis of samples by the laboratory.

These actions are dependent upon the ability to mobilize the field team and whether the data to be collected is necessary to meet the required quality assurance objectives (e.g., the holding time for samples is not exceeded). When CRA's QA Officer identifies a corrective action situation, CRA's Project Manager will be responsible for approving the implementation of corrective action, including resampling, during data assessment.

## 15.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Quality assurance reports to management (including U.S. EPA) will be included with monthly progress reports when validated data from sampling and analysis activities are available.

These reports will include:

i) assessment of data quality objectives (i.e., data accuracy, precision, and completeness);

ii) revisions to the QAPP (if any); and

iii) QA problems, corrective actions taken, and resolutions.

The CRA QA Officer will be responsible within the organizational structure for preparing these reports. The final report for the project will also include a separate QA section which will summarize data quality information contained in the periodic QA/QC reports to management.

**TABLE 4.1**

**TARGETED QUANTITATION LIMITS**
**SUSPECTED BURIED CONTAINER REMOVAL ACTION**
**NORTH SANITARY LANDFILL**
**DAYTON, OHIO**

| *Analysis* | *Parameter* | *Targeted Quantitation Limits* [1] |
|---|---|---|
| TCLP VOCs (mg/L) | Benzene | 0.025 |
| | 2-Butanone (MEK) | 0.050 |
| | Carbon Tetrachloride | 0.025 |
| | Chlorobenzene | 0.025 |
| | Chloroform | 0.025 |
| | 1,2-Dichloroethane | 0.025 |
| | 1,1-Dichloroethene | 0.070 |
| | Tetrachloroethene | 0.025 |
| | Trichloroethene | 0.025 |
| | Vinyl chloride | 0.050 |
| TCLP SVOCs (mg/L) | 1,4-Dichlorobenzene | 0.05 |
| | 2,4-Dinitrotoluene | 0.05 |
| | Hexachlorobenzene | 0.05 |
| | Hexachlorobutadiene | 0.05 |
| | Nitrobenzene | 0.05 |
| | Pentachlorophenol | 0.25 |
| | Pyridine | 0.10 |
| | 2,4,5-Trichlorophenol | 0.25 |
| | 2,4,6-Trichlorophenol | 0.05 |
| | o-Cresol | 0.05 |
| | m&p-Cresols | 0.10 |
| TCLP Pesticides (mg/L) | Lindane | 0.0005 |
| | Chlordane (technical) | 0.005 |
| | Endrin | 0.0005 |
| | Heptachlor | 0.0005 |
| | Heptachlor epoxide | 0.0005 |
| | Methoxychlor | 0.001 |
| | Toxaphene | 0.02 |
| TCLP Herbicides (mg/L) | 2,4-D | 0.5 |
| | 2,4,5-TP (Silvex) | 0.1 |

**TABLE 4.1**

**TARGETED QUANTITATION LIMITS**
**SUSPECTED BURIED CONTAINER REMOVAL ACTION**
**NORTH SANITARY LANDFILL**
**DAYTON, OHIO**

| *Analysis* | *Parameter* | *Targeted Quantitation Limits* [1] |
|---|---|---|
| TCLP Metals (mg/L) | Silver | 0.5 |
| | Arsenic | 0.5 |
| | Barium | 10 |
| | Cadmium | 0.1 |
| | Chromium | 0.5 |
| | Lead | 0.5 |
| | Selenium | 0.25 |
| | Mercury | 0.002 |
| Hazardous Characteristics | Corrosivity as pH | 0.1 SU |
| | Ignitability as Flashpoint | Ambient °C |
| | Reactive Cyanide | 250 mg/kg |
| | Reactive Sulfide | 500 mg/kg |
| PCBs - water (μg/L) | Aroclor 1016 | 0.5 |
| | Aroclor 1221 | 0.5 |
| | Aroclor 1232 | 0.5 |
| | Aroclor 1242 | 0.5 |
| | Aroclor 1248 | 0.5 |
| | Aroclor 1254 | 1.0 |
| | Aroclor 1260 | 1.0 |
| PCBs - waste (μg/L) | Aroclor 1016 | 330 |
| | Aroclor 1221 | 330 |
| | Aroclor 1232 | 330 |
| | Aroclor 1242 | 330 |
| | Aroclor 1248 | 330 |
| | Aroclor 1254 | 660 |
| | Aroclor 1260 | 660 |

Note:

1 The targeted quantitation limits for solids are based on wet weight. The quantitation limits calculated by the laboratory on a dry weight basis will be higher. Sample quantitation limits are highly matrix dependent and targeted quantitation limits may not be achievable for all samples.

TABLE 5.1

SAMPLE CONTAINER, PRESERVATION, HOLDING TIME, AND SHIPPING REQUIREMENTS
SUSPECTED BURIED CONTAINER REMOVAL ACTION
NORTH SANITARY LANDFILL
DAYTON, OHIO

| *Matrix* | *Analyses* | *Sample Containers* [1] | *Preservation* [2] | *Maximum Holding Time from Sample Collection* [3] | *Volume of Sample* | *Shipping* | *Normal Packaging* |
|---|---|---|---|---|---|---|---|
| *Containerized Waste* | | | | | | | |
| | HazCat | One 250-mL glass jar | store in cool place | As soon as possible | Fill to shoulder of jar | Analysis on-Site | Cooler or Fiberboard Box |
| *Solids* | | | | | | | |
| | TCLP VOCs | Two 4-ounce glass jars | Iced | 14 days for extraction; 14 days after extraction for analysis | Fill completely | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | TCLP SVOCs, Pesticides, Herbicides | One 500-mL glass jar | Iced | 14 days for TCLP extraction; 7 days after TCLP extraction for preparative extraction; 40 days after preparative extraction for analysis | Fill to shoulder of jar | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | TCLP Metals | One 4-ounce jar | Iced | 180 day for extraction; (mercury - 28 days) 180 days after extraction for analysis (mercury - 28 days) | Fill to shoulder of jar | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | RCI[4] | One 500-mL glass jar | Iced | as soon as possible | Fill to shoulder of jar | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | PCBs | One 4-oz. glass jar | Iced | 14 days for extraction 40 days after extraction for analysis | Fill to neck of jar | Federal Express Priority 1 | Bubble Wrap or Foam Chips |

TABLE 5.1

SAMPLE CONTAINER, PRESERVATION, HOLDING TIME, AND SHIPPING REQUIREMENTS
SUSPECTED BURIED CONTAINER REMOVAL ACTION
NORTH SANITARY LANDFILL
DAYTON, OHIO

| *Matrix* | *Analyses* | *Sample Containers*[1] | *Preservation*[2] | *Maximum Holding Time from Sample Collection*[3] | *Volume of Sample* | *Shipping* | *Normal Packaging* |
|---|---|---|---|---|---|---|---|
| *Liquids* | | | | | | | |
| | TCLP VOCs | One 125-mL septum top glass bottle | Iced | 14 days for extraction;<br>14 days after extraction for analysis | Fill completely | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | TCLP SVOCs, Pesticides, Herbicides | Two 1-liter glass bottle per analysis | Iced | 14 days for TCLP extraction;<br>7 days after TCLP extraction for preparative extraction;<br>40 days after preparative extraction for analysis | Fill to neck of bottle | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | TCLP Metals | One 1-liter glass bottle | Iced | 180 day for extraction;<br>(mercury - 28 days)<br>180 days after extraction for analysis<br>(mercury - 28 days) | Fill to neck of bottle | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | RCI | Two 1-liter glass bottles | Iced | as soon as possible | Fill to neck of bottle | Federal Express Priority 1 | Bubble Wrap or Foam Chips |
| | PCBs | Two 1-L amber glass bottles per analysis | Iced | 7 days for extraction<br>40 days after extraction for analysis | Fill to neck of bottle | Federal Express Priority 1 | Bubble Wrap or Foam Chips |

Notes:

1 Where possible, analyses will be combined into the minimum number of sample containers with respect to sample preservation requirements.
Samples collected for laboratory analysis will be stored in coolers with ice following collection.

2 Samples requiring refrigeration will be shipped in coolers containing bagged, cubed ice. Following laboratory receipt and log-in, these samples will be stored at 4° ± 2°C.

3 Maximum holding times presented are technical holding times and are based on the time elapsed from sample collection.

4 RCI - Reactivity, corrosivity (liquids only), ignitability

## TABLE 8.1

## ANALYTICAL METHODS
## SUSPECTED BURIED CONTAINER REMOVAL ACTION
## NORTH SANITARY LANDFILL
## DAYTON, OHIO

| | *Parameter*[1] | *Preparation Method*[2] | *Analysis Method* |
|---|---|---|---|
| *Solids* | | | |
| | TCLP Preparation | SW-846 1311 | NA |
| | TCLP VOCs | SW-846 5030A | SW-846 8260B |
| | TCLP SVOCs | SW-846 3520C | SW-846 8270C |
| | TCLP Pesticides | SW-846 3520C | SW-846 8081A |
| | TCLP Herbicides | SW-846 8151A | SW-846 8151A |
| | TCLP Metals (except mercury) | SW-846 3010A | SW-846 6010B |
| | TCLP Mercury | SW-846 7470A | SW-846 7470A |
| | Reactivity - Cyanide | SW-846 Chapter 7.3 | SW-846 Chapter 7.3 |
| | Reactivity - Sulfide | SW-846 Chapter 7.3 | SW-846 Chapter 7.3 |
| | Ignitability | SW-846 1030 | SW-846 1030 |
| | PCBs | SW-846 3520C | SW-846 8082 |
| *Liquids* | | | |
| | TCLP Preparation | SW-846 1311 | NA |
| | TCLP VOCs | SW-846 5030A | SW-846 8260B |
| | TCLP SVOCs | SW-846 3520C | SW-846 8270C |
| | TCLP Pesticides | SW-846 3520C | SW-846 8081A |
| | TCLP Herbicides | SW-846 8151A | SW-846 8151A |
| | TCLP Metals (except mercury) | SW-846 3010A | SW-846 6010B |
| | TCLP Mercury | SW-846 7470A | SW-846 7470A |
| | Reactivity - Cyanide | SW-846 Chapter 7.3 | SW-846 Chapter 7.3 |
| | Reactivity - Sulfide | SW-846 Chapter 7.3 | SW-846 Chapter 7.3 |
| | Corrosivity | SW-846 9040B | SW-846 9040B |
| | Ignitability | SW-846 1010 | SW-846 1010 |
| | PCBs | SW-846 3550B | SW-846 8082 |

Notes:

[1] VOCs - Volatile Organic Compounds.
SVOCs - Semivolatile Organic Compounds.
PCBs - Polychlorinated biphenyls.

[2] SW-846 - Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, 3rd edition with promulgated Updates I through III, November 1986.

F

# APPENDIX F

## DISPOSAL AREA 1 GEOPHYSICAL DATA EVALUATION

## TABLE OF CONTENTS

## LIST OF FIGURES
(Following Text)

## 1.0 INTRODUCTION

Three areas at the North Sanitary Landfill in Dayton, Ohio, were geophysically surveyed during the period of May 18 to 29, 1998 under the direction of the U.S. EPA. The survey areas were selected by U.S. EPA and Ohio EPA and are referred to as:

- Disposal Area 1;
- Disposal Area 5; and
- Tanker Area

In the first two areas the purpose of the survey was to determine if large amounts of buried metallic wastes were present which may represent areas of concentrated drum disposal.

The Tanker Area corresponded to an area where it was suspected that a tanker trailer(s) was disposed/buried within the landfill.

To date, investigation/removal activities related to Disposal Area 5 and the Tanker Area have been completed. A summary of the geophysical survey for the investigation of Disposal Area 1 is presented herein.

### 1.1 GEOPHYSICAL COORDINATE GRID SYSTEM

A cartesian coordinate system was established in the field by the geophysical survey crew as a series of north-south oriented survey lines based on northing and easting coordinates (presented on Figure F-1). The geophysical data plots are based on this coordinate system.

A series of survey stakes were then installed in the ground at various locations in Disposal Area 1. The locations of these stakes (of which the geophysical survey system coordinates were recorded) were then surveyed in the Universal Transverse Mercator (UTM) coordinate system using a geographical positioning system (GPS). The general overall survey plan of the Site is based on the UTM coordinate system.

To place the geophysical survey grid system onto the overall Site plan, the stake locations were plotted based on the UTM coordinate system, and then the geophysical grid was fitted to provide a 'best-fit' to the stake locations and coordinates.

## 2.0 GEOPHYSICAL METHODS

The following provides a brief discussion of the three geophysical methods utilized by U.S. EPA for investigation of Disposal area 1, namely magnetometer, EM31, and EM61 instruments.

### Magnetometer

A magnetometer responds to ferromagnetic material such as steel and iron but does not respond to non-ferrous materials such as aluminum. The magnetometer instrument utilizes one or two sensors that measure the total magnetic field at the earth's surface. The **total magnetic field** (typically the bottom sensor readings are used) is comprised of the earth's regional magnetic field plus any local magnetic fields (which may be positive or negative contributions) caused by ferromagnetic objects or electromagnetic sources. To obtain **vertical magnetic gradient** data, two sensors are located at a fixed vertical distance apart on a staff. Vertical magnetic gradient readings are then calculated as the difference in the total magnetic field readings of the top and bottom sensors divided by the vertical separation between the sensors.

A base station may be utilized to monitor the diurnal variations which are mainly caused by the 'solar wind' and are commonly less than 100 nT (nanoTeslas or gammas) in magnitude. Magnetic storms can cause variations of several thousand nT, but are relatively infrequent. A base station should be located in a magnetically quiet area nearby that is not underlain or located near metallic or electrical sources. A base station may also be used to determine the approximate value of the regional total magnetic field. Although no base station data was provided, the regional total magnetic field at the Site is estimated to be approximately 54,500 nT, based on total magnetic field values collected from quiescent portions of the three areas.

Approximations of depth to a subsurface source is typically estimated as being the width (in profile) at one-half of the amplitude of the total magnetic field anomaly (i.e., the anomaly being the magnetic deflection from the background magnetic field value). Another way to estimate depth to a source is based on the total magnetic field anomaly divided by the gradient. Both methods require constants based on the expected size and shape of the anomaly. These depth calculations are valid for single sources. With multiple sources (considered to be the case for the majority of anomalies identified during this investigation), the depth estimates based on the above-mentioned calculations are complicated as the magnetic profile of any one source is usually combined with that of other nearby sources. As well, these depth calculation methods require that the magnetic profile be conducted directly overtop of the object. With the line spacings utilized during this survey (typically 40 or 20 feet between survey lines), there is the probability that the source is located at some position between the survey lines and the depth would be over-estimated, i.e., the lateral distance would be construed as greater depth.

Based on a nomogram published in a magnetometer manual[1], typical sources such as a single drum would produce a total magnetic field response of approximately 100 nT at a distance of 5 feet and approximately 5 nT at 20 feet. Much larger sources produce much larger anomalies; for example, one ton of iron may produce a total magnetic field anomaly of approximately 1,000 nT at a distance of 10 feet and only 50 nT at a distance of 40 feet. Field experience indicates that the total magnetic field response may vary substantially due to various factors including the configuration/orientation of the object, the degree of breakdown of the object, depth of burial, and remanent magnetism within the object.

In the case of a single, elongate buried steel object (i.e., a dipole) oriented north-south, the total magnetic field anomaly typically consists of a positive component slightly to the south of the object, and a negative component immediately to the north of the object. A vertical steel source (i.e., which may respond as a monopole) typically produces a single positive monopole anomaly directly over the source. As well, irregular sources (or clusters of smaller steel objects) may produce a positive anomaly with no significant corresponding negative component. Also, certain shapes and orientations of source objects may produce predominantly negative anomalies.

The vertical magnetic gradient anomaly is typically more 'resolved' as compared to the corresponding total field anomaly which is often larger/broader. Therefore, the magnetic gradient anomaly is often useful for providing a more detailed estimate of an anomaly source location. As well, the magnetic gradient data may provide an indication of the relative depth of a source object. The magnetic gradient (or rate of magnetic anomaly fall-off) is greater when close to the source and lesser with increasing distance away form the source (for a given source object). Therefore, for a given total field anomaly strength/amplitude, a high gradient indicates the object is at a relatively shallower depth as compared to a low gradient which would indicate a relatively greater depth of burial.

1 Applications Manual For Portable Magnetometers. 1973. S. Brenier.

Geonics EM31

The EM31 electromagnetic instrument uses an electromagnetic field to induce electromagnetic fields into the subsurface. The transmitter and receiver are mounted on opposite ends of a boom approximately 13 feet long. The EM31 measures (in the frequency domain) both the apparent **terrain conductivity** (the bulk electrical conductivity of the soil and pore fluid) and the **in-phase response** (metal detection modes). The value recorded represents a bulk measurement of the subsurface hemispheric volume (of approximately 15 feet radius) beneath the boom.

The terrain conductivity for dry sandy soils is relatively low, approximately 10 mS/m, while for wet clayey soils the terrain conductivity is higher, approximately 30 to 50 mS/m or higher. Shallow, highly conductive groundwater may also contribute to produce elevated conductivity readings. Much higher terrain conductivity values are commonly noted in areas which contain an abundance of metallic objects.

The in-phase response of the EM31 detects metallic objects, both ferrous and non-ferrous (i.e., aluminum). Strong in-phase responses (due to inductive lag phase shifts) generally indicate large singular objects or multiple objects in good contact with each other. Strong positive in-phase responses may indicate a large fraction of disseminated metallics or various pieces of metallic debris in the subsurface. Negative in-phase and/or terrain conductivity responses may occur over large metallic objects due to strong phase shift effects of the instrument's electromagnetic signal.

Geonics EM61

The EM61 consists of two electromagnetic coils stacked vertically. In general, the response (which is in the time domain) from the upper coil is attributed largely to surficial sources and is subtracted from the lower coil response to remove surficial effects and be left with a response **(EM61 differential data)** attributed to non-surficial (i.e., deeper) metallic objects. The instrument is designed to negate the terrain conductivity effects and only respond to metallic objects (both ferrous and non-ferrous). The EM61 is designed to minimize cultural interference effects from nearby objects at ground surface and therefore largely responds only to source objects located partially or completely beneath the instruments coils. Therefore, the instrument does not detect objects greater than approximately 5 to 10 feet laterally away. The EM61 response is relative and is recorded in millivolts. The maximum depth of investigation of the EM61 is considered to be approximately 10 to 13 feet.

## 3.0 DATA PRESENTATION

The geophysical data received from the U.S. EPA for Disposal Area 1 consists of color contour plots of the total magnetic field data, EM31 terrain conductivity data, and EM31 in-phase data. In addition, data files for vertical magnetic gradient were provided and EM61 survey line profiles were presented for several survey lines.

The magnetometer data did not include any base station information to evaluate diurnal variations or to approximate the regional total magnetic field. The total magnetic field data for Ottawa, Canada were reviewed for the period of May 18 to 29, 1998 and noted to be quiet with diurnal variations of less than 50 nT, with the exceptions of May 23, 24, and 25, 1998 which had diurnal variations of less than 100 nT. This is not considered to adversely affect the usability of the data. The regional total magnetic field was approximated based on areas with little change in total magnetic field and low gradients. These areas are likely to be slightly affected by minor amounts of metallic debris as these areas are located within the landfilled portion of the Site.

The EM31 data contained several areas of very high terrain conductivity, occasional negative terrain conductivity areas, and both high positive and high negative in-phase response.

The EM61 data consisted of the bottom coil readings and differential values along several survey lines.

Each geophysical survey method completed in Disposal Area 1 was conducted along the survey traverse lines but covered somewhat different portions of the area.

The geophysical survey results are presented as a series of colour contour plots for each survey method as follows:

| | |
|---|---|
| Figure F-2 | Total Magnetic Field Intensity - Disposal Area 1 (Plot supplied by U.S. EPA) |
| Figure F-3 | Vertical Magnetic Gradient - Disposal Area 1 (Plot generated by CRA) |
| Figure F-4 | EM31 In-phase - Disposal Area 1 (Plot supplied by U.S. EPA) |
| Figure F-5 | EM31 Terrain Conductivity - Disposal Area 1 (Plot supplied by U.S. EPA) |

These figures are followed by two plots on which the interpreted anomalies are indicated:

| | |
|---|---|
| Figure F-6 | Total Magnetic Field Intensity Anomalies - Disposal Area 1 |
| Figure F-7 | EM31 In-phase Anomalies - Disposal Area 1 |

## 4.0 EVALUATION OF GEOPHYSICAL SURVEY RESULTS

In general, the geophysical survey data were collected along north-south traverse lines spaced 40 feet apart, although in certain portions of the survey area, certain data were collected along 20-foot traverse lines spacing. The generally coarse survey (traverse) line spacings provides limited definition and lateral resolution/positioning of the anomalies/targets, i.e., it is not possible to accurately determine the location of the anomalies/targets laterally between the survey traverse lines. As well, the coarse survey line spacing precludes calculating meaningful/ confident quantitative estimates of the target depths.

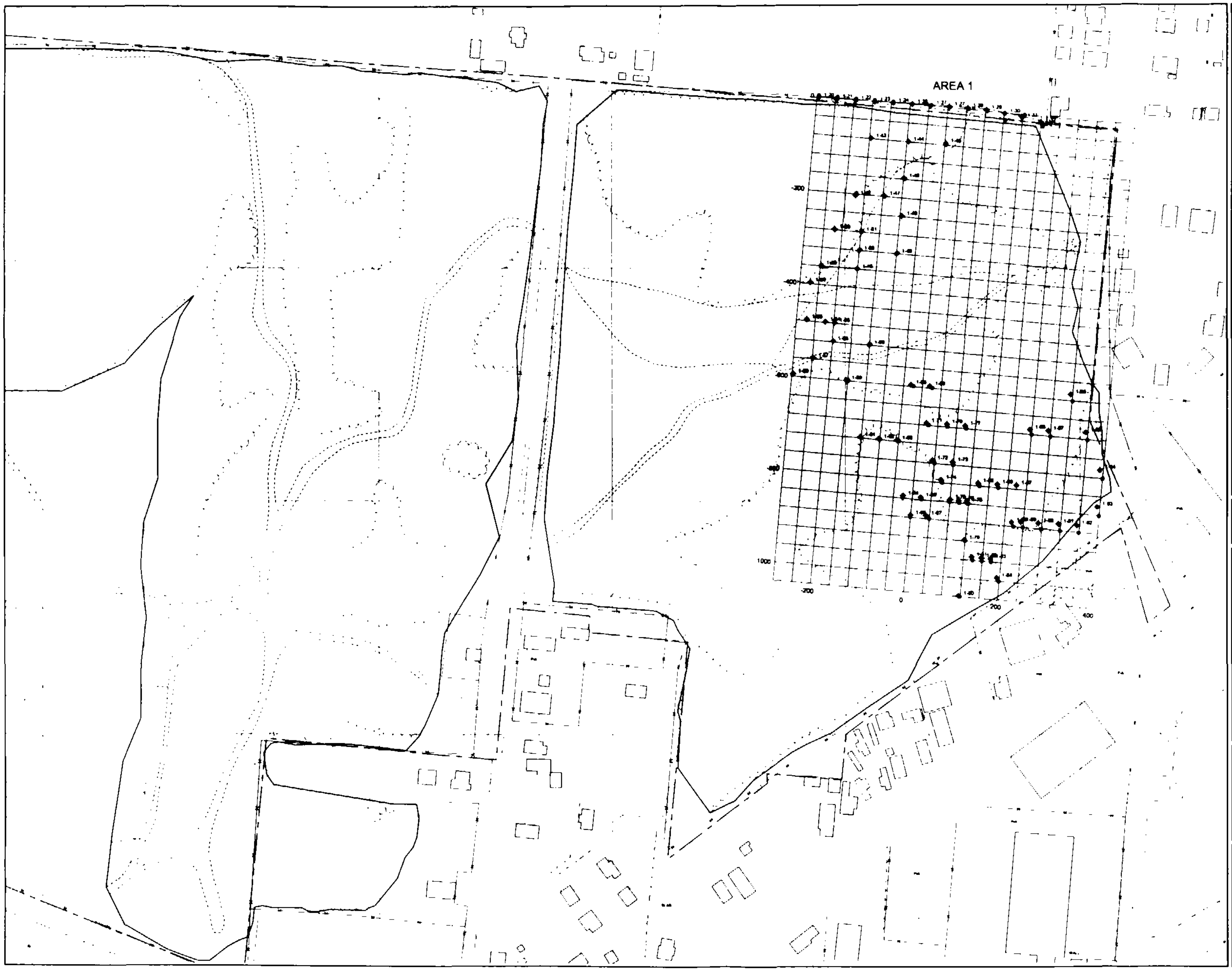
It is recognized that landfills typically contain considerable amounts of ferromagnetic objects/debris within the general refuse. These objects would produce a high level of background 'magnetic noise' which greatly reduces the ability to detect, resolve, and identify drums. It is not possible to distinguish isolated drums from other objects of steel construction such as household appliances (etc.) or construction/demolition wastes. Similarly, concentrations of buried drums would respond similarly to areas where general metallic wastes were segregated and landfilled. As such, it is not considered feasible to attempt to locate individual drums in view of the background interference (i.e., numerous 'non-drum' metallic objects) and the relatively coarse data spacing/resolution.

Several very strong total magnetic field anomalies were noted in Disposal Area 1. These generally correspond to strong EM31 in-phase anomalies. The locations of these anomalies are shown on Figures F-6 and F-7. The north/western portion of the survey area contains several strong anomalies that may be due to large subsurface objects (note that multiple metallic objects in good physical contact may respond similarly to large individual objects). This is in an area noted to have drums visible at the ground surface. Several large positive EM31 in-phase anomalies are observed in the southern portion of Disposal Area 1, where a greater area was surveyed with the EM31.

Since the survey was intended primarily to detect large concentrations of metallic objects (i.e., clusters of drums), the major anomalies are the primary targets of interest. Many magnetometer stations showed localized strong anomalies; i.e., those with high gradients and high total magnetic field changes within a very short distance. These are considered to represent isolated objects at very shallow depths and are not considered to represent large clusters of drums.

## 4.1 SUMMARY COMPILATION OF GEOPHYSICAL ANOMALY LOCATIONS

The anomalies identified above for the Disposal Area 1 survey are compiled together on Figure F-8.




LEGEND

PROPERTY BOUNDARY

SITE DISPOSAL AREAS

40 FOOT SITE GRID

REFERENCE GRID STAKE LOCATION BASED ON GPS UTM COORDINATES

REFERENCE GRID STAKE LOCATION BASED ON GEOPHYSICAL SURVEY COORDINATES

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY

DRAWING STATUS

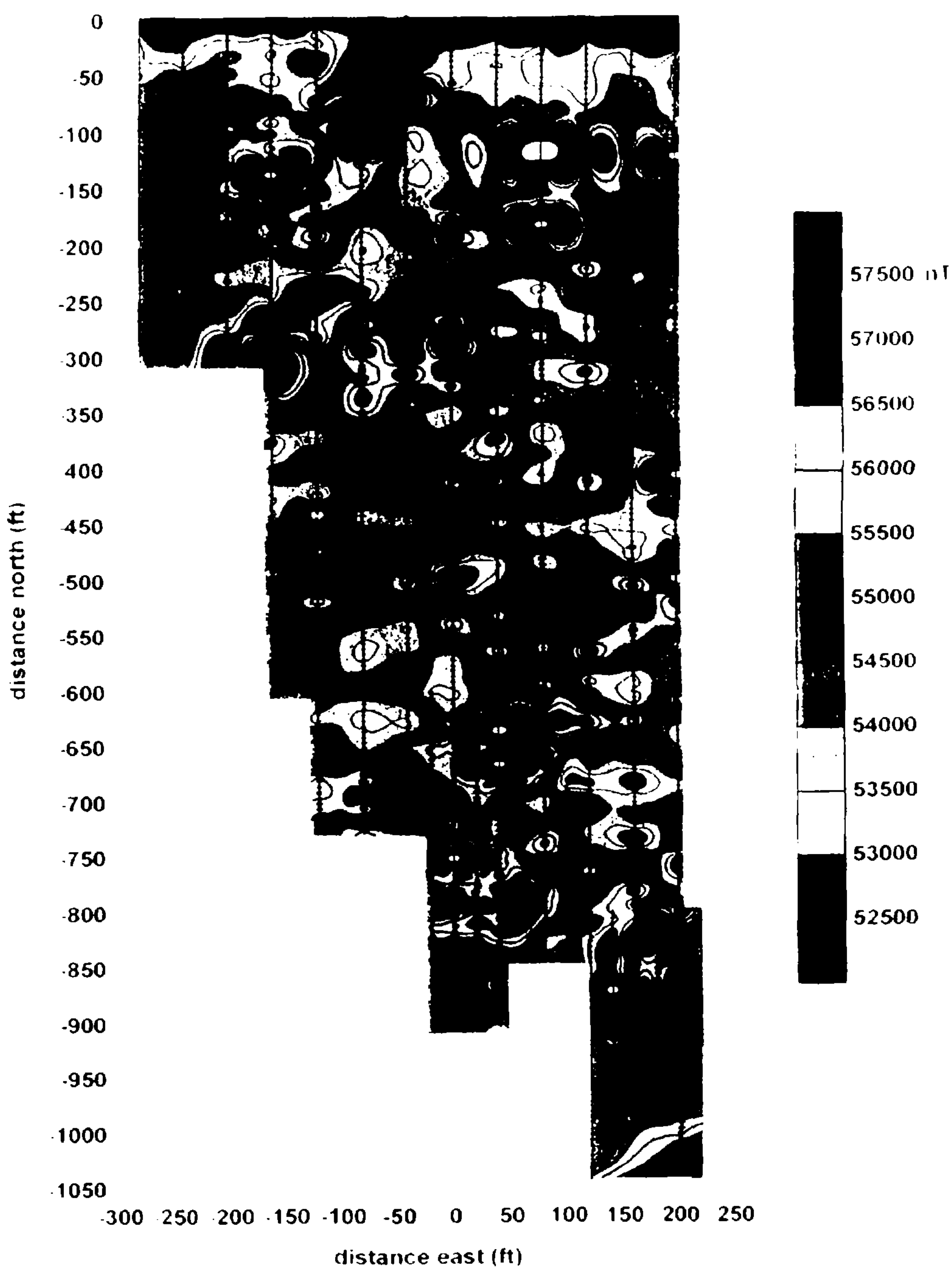
NORTH SANITARY LANDFILL
DAYTON, OHIO

SURVEY AEA

REFERENCE GRID LOCATIONS - DISPOSAL AREA 1

CONESTOGA-ROVERS & ASSOCIATES

| Project Nº | Report Nº | Drawing Nº |
|---|---|---|
| 06351-27 | 033 | F 1 |

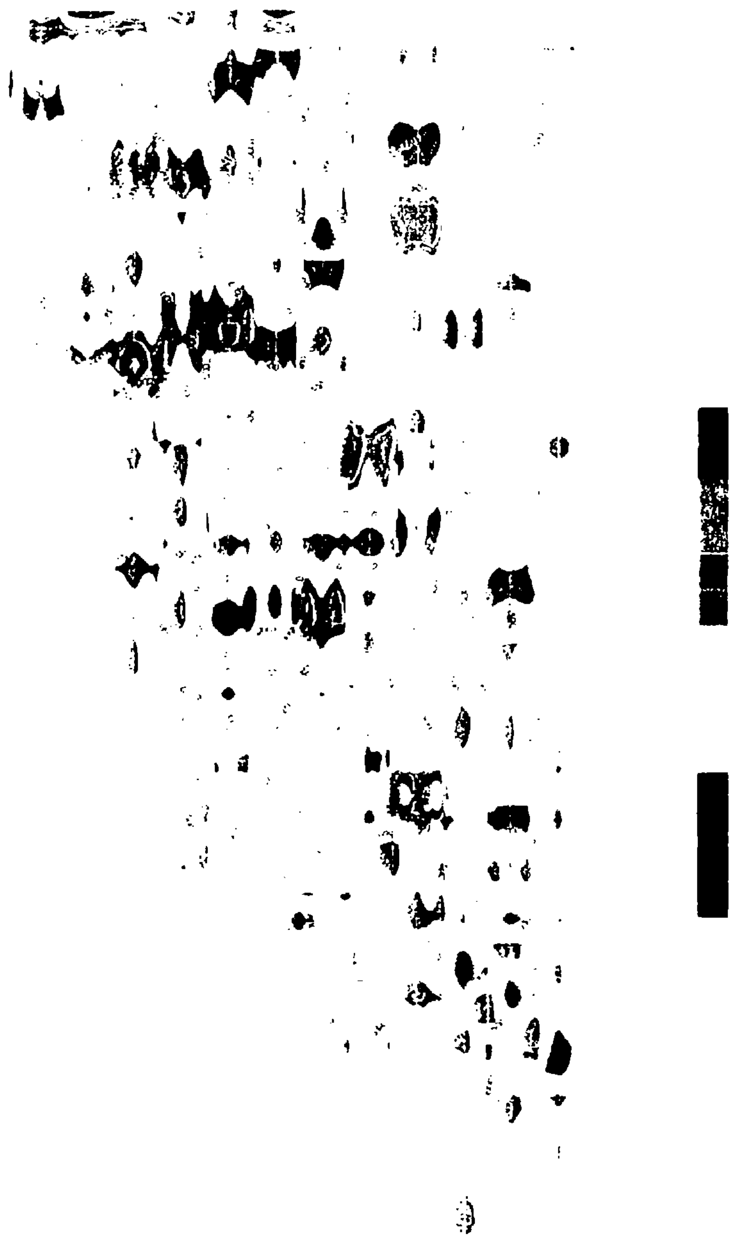



USEPA/ERTC/REAC
June 1, 1998

figure F-2

TOTAL MAGNETIC FIELD INTENSITY-DISPOSAL AREA 1
NORTH SANITARY LANDFILL
*Dayton, Ohio*

06351-27(033)GN-WA008 SEP 04/2001

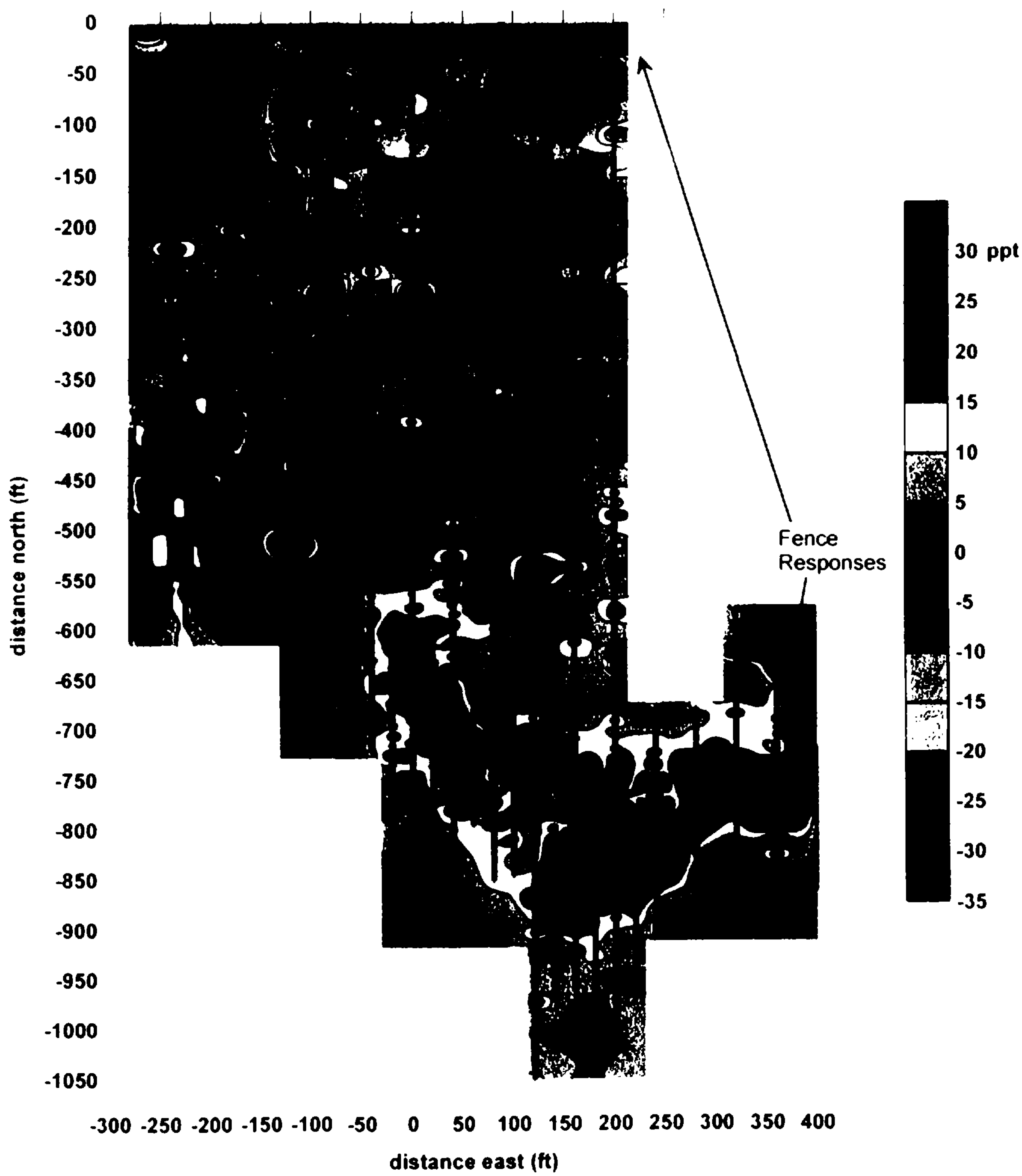


USEPA/ERTC/REAC
June 1, 1998

figure F-3

VERTICAL MAGNETIC GRADIENT-DISPOSAL AREA 1
NORTH SANITARY LANDFILL
*Dayton, Ohio*

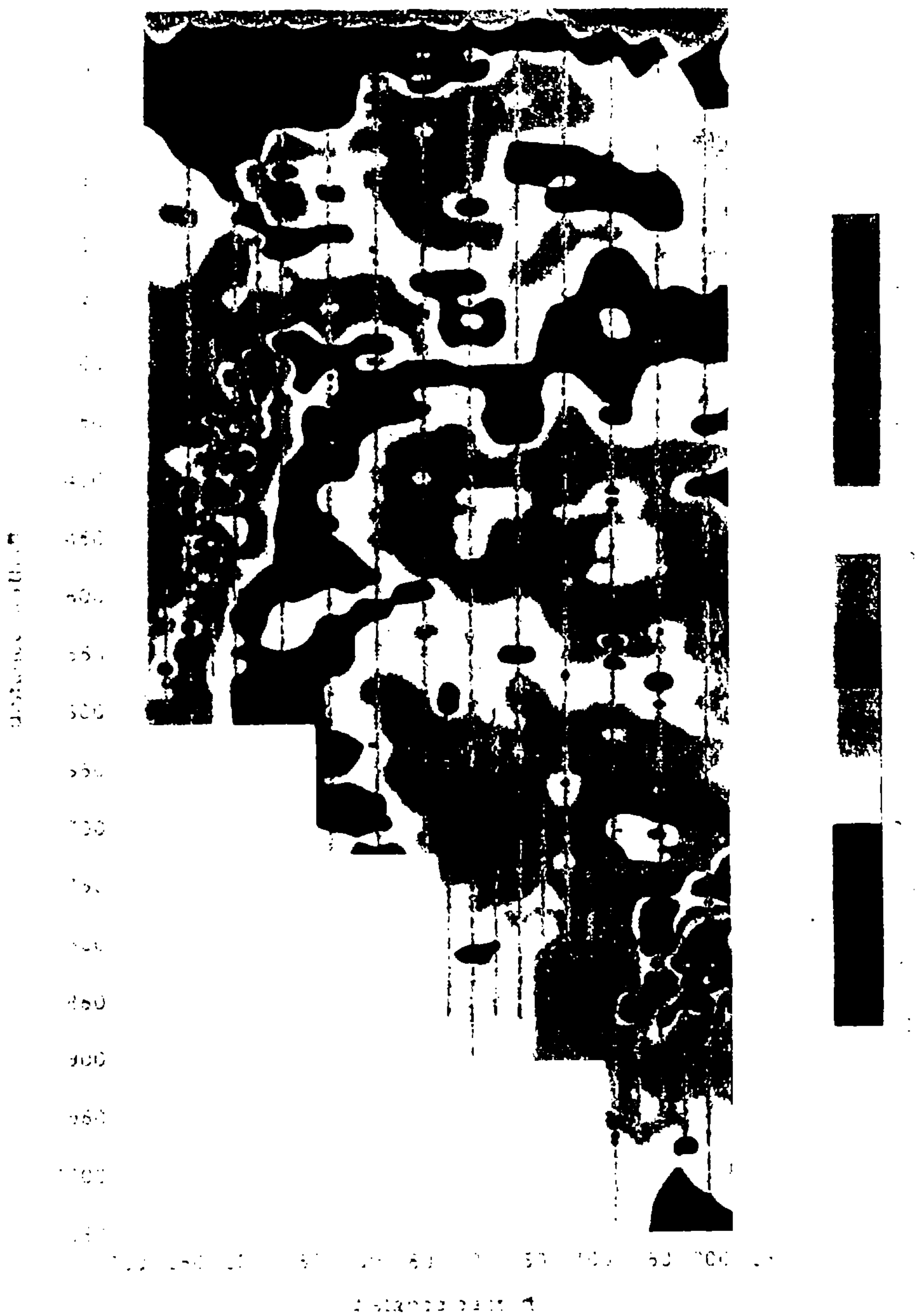
CRA




USEPA/ERTC/REAC
May 27, 1998

figure F-4

EM31 IN-PHASE-DISPOSAL AREA 1
NORTH SANITARY LANDFILL
*Dayton, Ohio*

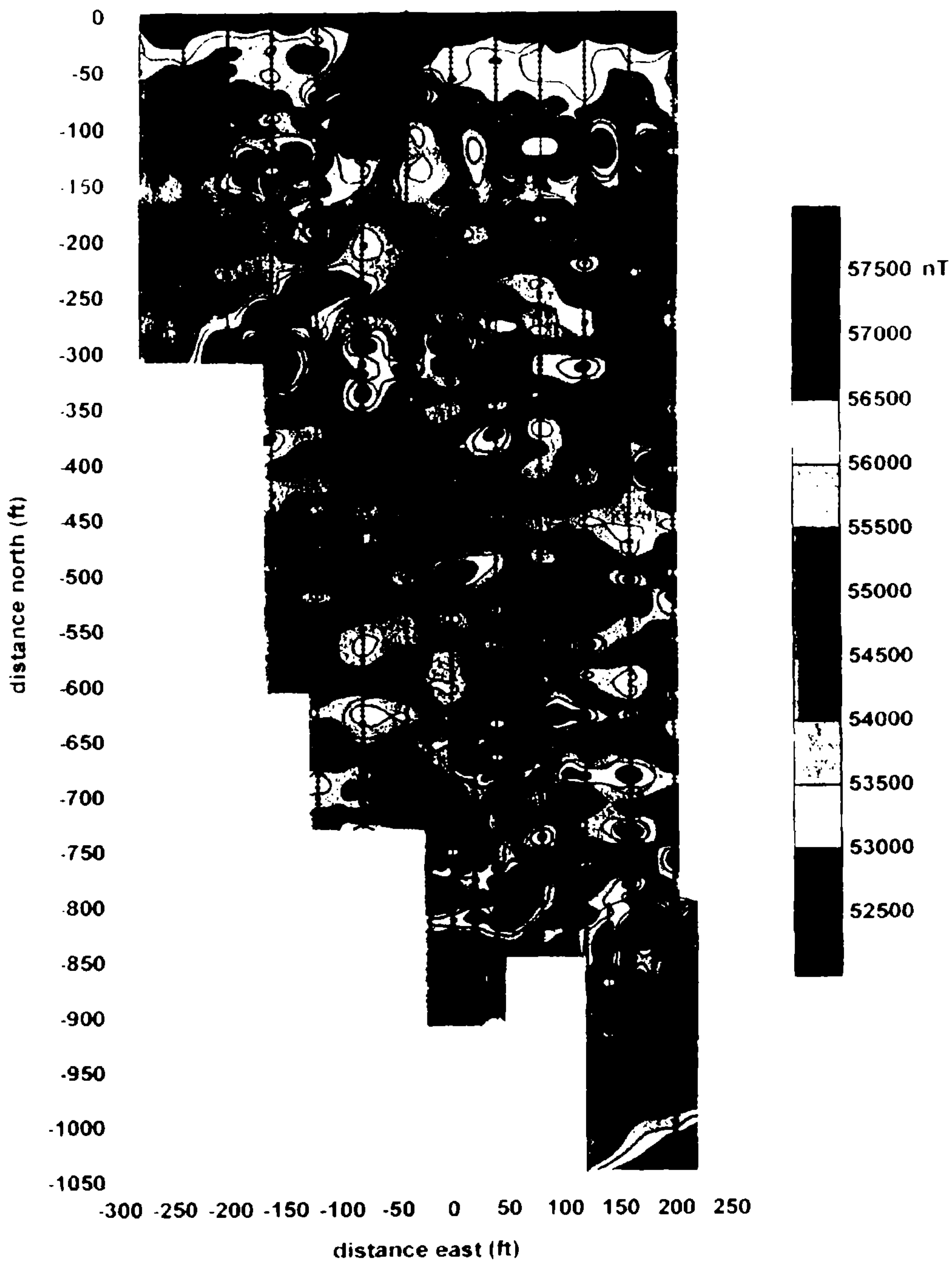


USEPA/ERTC/REAC
May 26, 1998

figure F-5

EM31 TERRAIN CONDUCTIVITY-DISPOSAL AREA 1
NORTH SANITARY LANDFILL
*Dayton, Ohio*

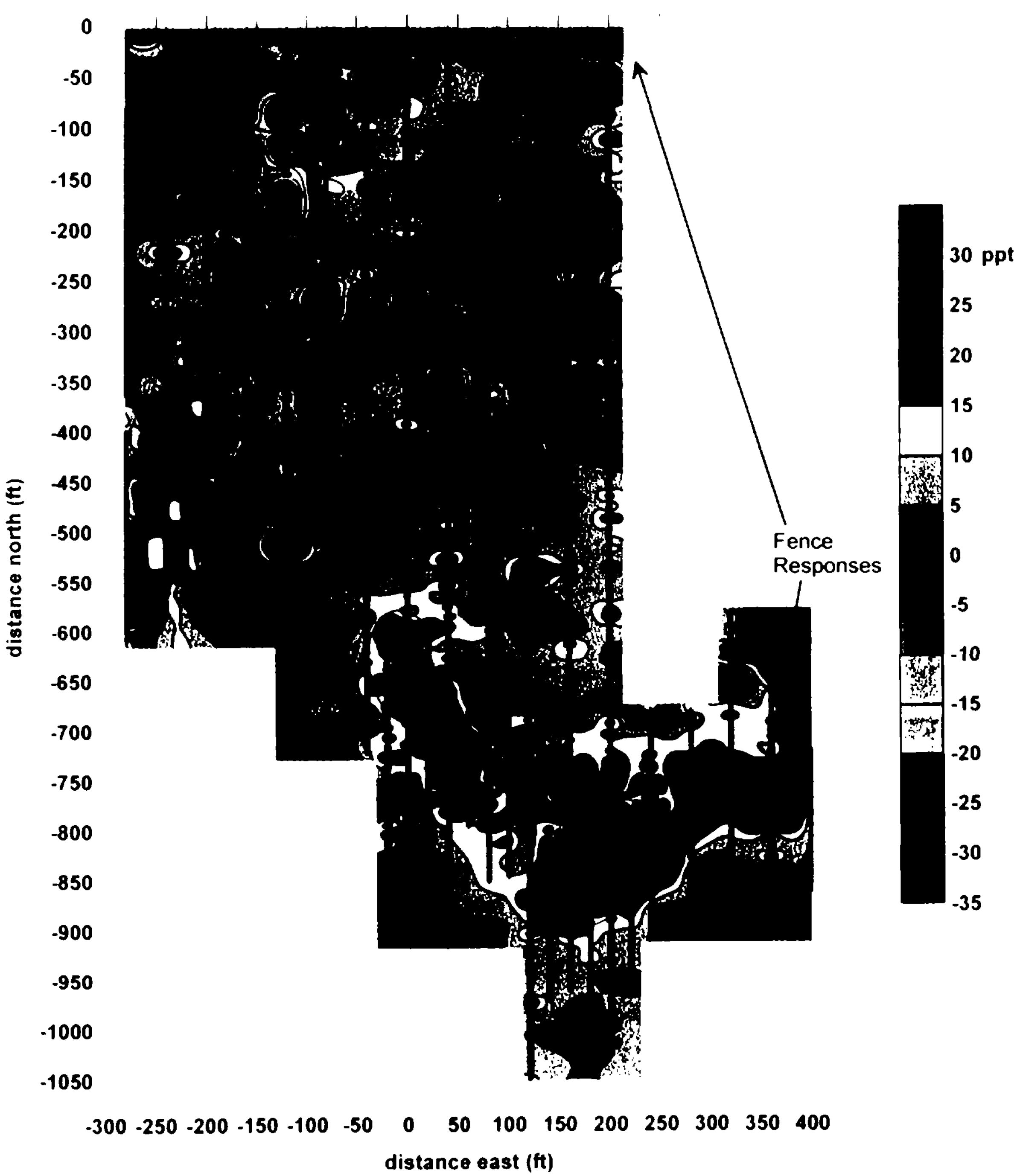
06351-27(033)GN-WA011 SEP 04/2001




USEPA/ERTC/REAC
June 1, 1998

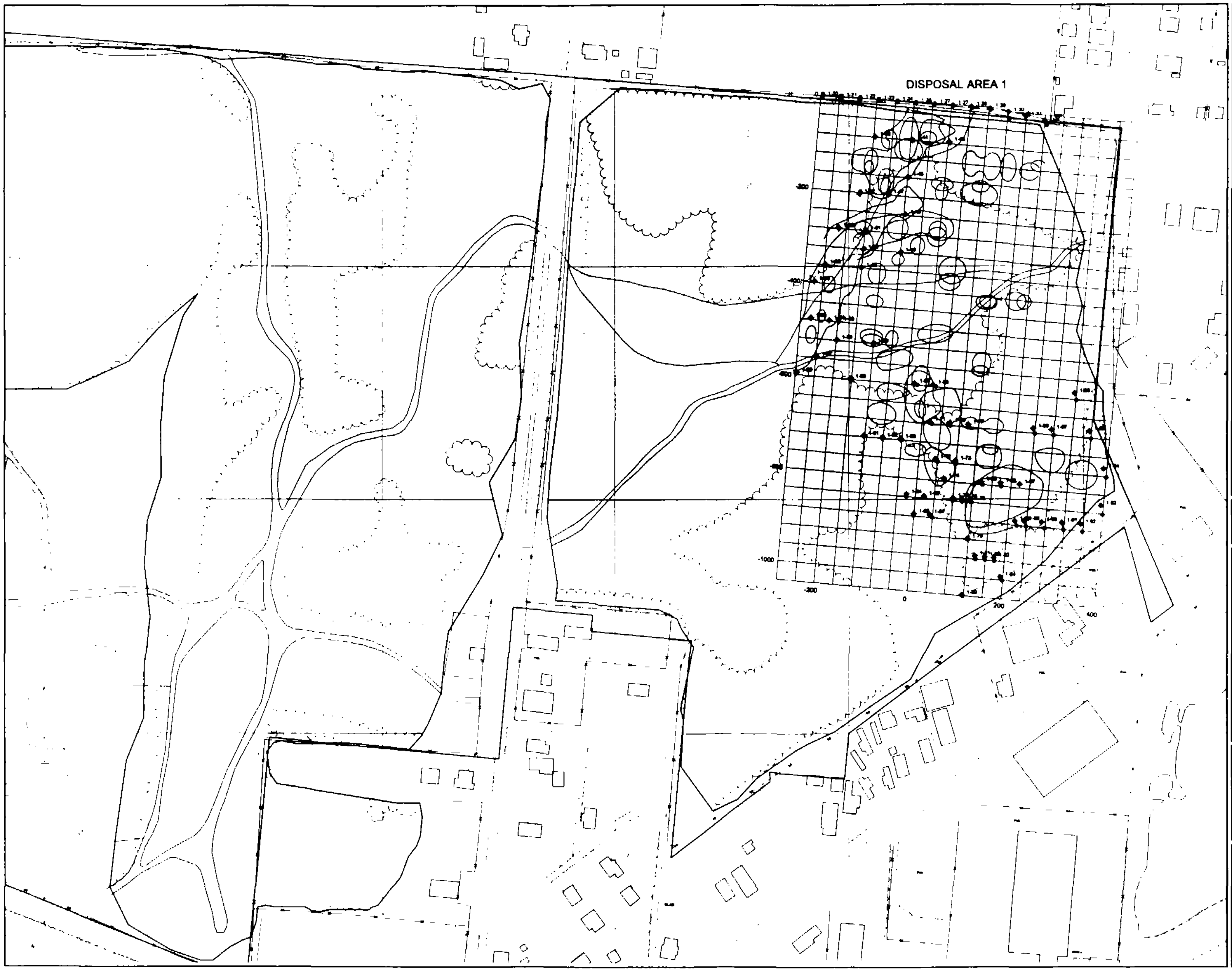
figure F-6

TOTAL MAGNETIC FIELD INTENSITY
ANOMALIES-DISPOSAL AREA 1
NORTH SANITARY LANDFILL
*Dayton, Ohio*




USEPA/ERTC/REAC
May 27. 1998

figure F-7
EM31 IN-PHASE ANOMALIES-DISPOSAL AREA 1
NORTH SANITARY LANDFILL
*Dayton, Ohio*




LEGEND

PROPERTY BOUNDARY

SITE DISPOSAL AREAS

GEOPHYSICAL ANOMALY LOCATION

REFERENCE GRID STAKE LOCATION

REFERENCE GRID STAKE LOCATION

SCALE VERIFICATION

DRAWING STATUS

NORTH SANITARY LANDFILL
DAYTON, OHIO

SUMMARY COMPILATION OF DISPOSAL AREA 1
GEOPHYSICAL ANOMALY LOCATIONS

CONESTOGA-ROVERS & ASSOCIATES

PHOTOGRAPHY DATED APRIL

| Project Nº | Report Nº | Drawing Nº |
| --- | --- | --- |
| 06351-27 | 033 | F-8 |

G

# APPENDIX G

# SAMPLING AND ANALYSIS PLAN

TABLE OF CONTENTS

# 1.0 INTRODUCTION

## 1.1 PURPOSE

The purpose of the Sampling and Analysis Plan (SAP) is to specify the objectives, procedures, and quality assurance/quality control (QA/QC) requirements necessary to collect and analyze samples of waste material from the North Sanitary Landfill (Site) in Dayton, Ohio. Waste materials potentially present at the Site include containerized solids and liquids (e.g., drums), non-aqueous phase liquids (NAPL), and other waste materials.

This SAP has been prepared by Conestoga-Rovers & Associates (CRA) pursuant to the Administrative Order between U.S. Environmental Protection Agency (U.S. EPA) and certain respondants to the Administrative Order (Respondents). The Administrative Order is provided in Appendix A of the Disposal Area 1 Removal Action Work Plan (Work Plan).

## 1.2 OBJECTIVES

The objectives of the SAP are to obtain data to characterize containerized waste material, NAPL, and other waste material, and to determine if off-Site disposal will be required. In addition, the SAP will ensure that the necessary QA/QC procedures are followed during sampling and analysis to ensure data validity.

## 2.0 FACILITY DESCRIPTION

The North Sanitary Landfill, also known as the Valleycrest Landfill, is located at 950 Brandt Pike in Dayton, Ohio and occupies approximately 102 acres. From 1966 to 1975, commercial, industrial, institutional, and other wastes were disposed of at the North Sanitary Landfill.

Additional details regarding the facility are provided in the Work Plan.

## 3.0 WASTE SAMPLING

### 3.1 SITE PREPARATION

Prior to beginning intrusive excavation work, existing decontamination facilities in the contaminant reduction zone (CRZ) will be evaluated and upgraded as necessary.

### 3.2 DRUM SAMPLING TECHNIQUES

Drums to be sampled include drums containing liquid contents (regardless of the condition of the drum), and intact drums (drums with no holes, tears, or punctures, and are not crushed to less than 75 percent of their original volume). Drums other than those identified above, including drums with PRP information, may be sampled at the sole discretion of the Respondants.

All drums identified for sampling will be placed in overpack drums, on a drum sampling tray, or on polyethylene sheeting prior to sampling. Drums will be inspected prior to opening. The sampling team will determine the size, type, and construction of the drum. Any markings or labels will be recorded.

Drum label recognition will be used to determine if a container should be opened. Containers displaying the following labels will not be opened:

- radiation, or DOT radioactive symbol;
- explosives, or DOT explosive symbol; and
- poisonous gases, or poisonous liquids.

The following steps will be taken upon discovery of any of the above drums:

- do not open the drum;
- evacuate the area; and
- notify local authorities.

These containers will be reported to on-Site officials, the Site Manager, and U.S. EPA when discovered. The Site Manager will contact appropriate experts regarding containers of these materials, if encountered. Procedures for further reducing potential hazards, sampling/analyzing container contents, handling and disposal of the container, and QA/QC procedures for preserving sample integrity will be obtained from the appropriate experts at the time that they are retained to manage the container(s). This information will be provided to U.S. EPA prior to the commencement of any response action related to the container(s) in question.

Drums will be opened by loosening bungs or ring bolts manually. Under most circumstances this will allow sufficient access to the contents for sampling. Drums with lids or bungs which are rusted and/or are unable to be opened manually will be opened by alternative methods. These methods may include:

- pneumatic deheading (commercial drum deheader);
- remote punching (utilizing non-sparking pierce point on backhoe);
- manual punching (performed by personnel in Level B PPE utilizing non-sparking instruments); and
- sample collection through existing holes (if present).

A survey of the opened drum will be conducted by the sampling team as the sample is being collected. A drum inventory form will be completed as the sample is being collected. Parameters to be recorded include:

- drum type;
- drum size;
- drum number assigned;
- drum condition (i.e., ability to be shipped without overpacking);
- contents - physical state (i.e., solid, liquid, liquid-phase layered, sludge, semi-solid, combination, lab-pack);
- contents - physical properties (i.e., color, thickness, texture);
- results of field screening;
- drum classification (i.e., intact, liquid, debris, empty, PRP)
- labeling or marking; and
- specific Site information relating to sampling conditions.

Solid and semi-solid materials will be collected by scooping the material into the sample container with clean disposable sampling equipment. Hardened resins may need to be broken with a hammer and chisel or cut with a knife. A representative sample is often not achievable when the solid material cannot be penetrated. In these cases, sampling technicians will sample within the top 6 inches of the drum, and a trowel or similar device will be used to dig into material to look for variation in the container contents below 6 inches.

Where multi-colored or distinct differences in the sample matrix exists, sampling technicians will collect aliquots of each portion and combine them in the same container. Hardened resins will be assumed to be uniform, and sampling technicians will collect a sample from the top 6 inches.

Liquids or loose sludges will be sampled using either a 4-foot glass tube (thief), or a glass coliwasa. The sampling device is slowly lowered into the liquid material. After the bottom of the drum or resistance is felt, a suction is created by placing a cork, or gloved thumb over the top end of the device. The device is withdrawn and the contents placed into the sample container. This process is repeated until the appropriate sample volume is achieved.

Sludges and semi-solids may need to be sampled by forcing the device into the material. Generally, the sludge or semi-solid will be trapped within the tubing and may be released by breaking it into the containers with pliers.

Wide mouth glass sample containers will be used for sample collection. A minimum of four ounces of sample will be collected. The sample containers will be wiped to remove extraneous sample material from the surface of the container. All containers will be labeled with the drum number, and date and time of collection.

Some wastes may be dangerous to sample after the container has been opened, or the survey may reveal the potential for highly hazardous substances such as:

- small chemical containers (labpack drums);
- gauze, blood, body parts, or other infectious wastes;
- compressed gases;
- rapid evolution of fumes, mists, or smoke; and
- detonating caps, ammunition, or similar explosive devices.

In the event that any of the above wastes are discovered, the following steps will be taken:

- labpack drums - a chemist or other qualified individual will be contacted to identify the materials and supervise repackaging if required;

- gauze, blood, body parts, or other infectious wastes - local authorities and law enforcement agencies will be called upon before packaging the materials in the appropriate containers for transportation and disposal. All personnel involved in such an operation will be required to have Hepatitis vaccinations and training in Blood Borne Pathogens;
- compressed gases - compressed gas containers will be left in place until further identification can be made; and
- detonating caps, etc. - the local law enforcement "bomb squad" will be notified and requested to handle removal and detonation.

## 3.3 NAPL SAMPLING

NAPL will be sampled using either a 4-foot glass tube (thief) or a glass coliwasa. The sampling device will be lowered into the container of NAPL to its full length or until resistance is felt. A suction will then be created by placing a cork, or gloved thumb over the top end of the device. The sampling device will then be withdrawn and the contents placed into the sample container(s).

## 3.4 POST-EXCAVATION SAMPLING

Following the removal of drums, NAPL, and relocation of waste material during the excavation of removal grids and test pits, post-excavation sampling will be conducted at each full-scale removal area. One 5-point composite sample will be submitted for analysis from each 50-foot by 50-foot grid.

The procedure for post-excavation sampling is as follows:

- one 5-point composite sample will be collected from each 50-foot by 50-foot grid, from within the middle third of the depth to which excavation extended in that grid. The locations of the grab samples are shown on Figure 3.2 of the Work Plan;
- a track-mounted drill rig will be used to facilitate sample collection once 10 grids have been backfilled and completed. The drill rig will use a hollow-stem auger (HSA) to drill to a depth immediately above the middle third area. A split spoon will be placed in the HSA and driven 18 inches (or until refusal) into the waste material. The split spoon will then be removed from the HSA, opened, and the waste material collected and placed in a 5-gallon steel pail.

- at each location, a sample of the material will be collected and placed into a clean 16 ounce sample jar and sealed. The sample containers will then be stored in cooled conditions (with ice or at 4°C) prior to transport to the laboratory where the sample will be composited under controlled conditions and analyzed within the appropriate holding times. Sample holding times will begin when the samples are collected in the field; and
- materials excavated in order to facilitate sample collection will be backfilled upon completion of sample collection activities.

## 3.5 BULKED DEBRIS SAMPLING

All excavated drums that are not intact, not empty, and that do not contain liquids, will be transferred directly to a mixing/shredding box located at the waste bulking pad. Drums in the mixing/shredding box will be ripped open and the material will be mixed. The material will then be transferred to a roll-off container. One 5-point composite sample will be collected from each container filled. The locations of the grab samples are shown on Figure 3.1 of the Work Plan.

## 3.6 WASTEWATER SAMPLING

Containerized wastewater will be sampled using either a 4-foot glass tube (thief) or a glass coliwasa. The sampling device will be lowered into the container of decontamination water to its full length. A suction will then be created by placing a cork, or gloved thumb over the top end of the device. The sampling device will then be withdrawn and the contents placed into the sample container(s).

## 3.7 SPLIT SAMPLE COLLECTION

Split samples will be collected for U.S. EPA from all drums containing liquids, and any additional media requested by U.S. EPA. In addition, hazard categorization (HazCat) results will be available on Site for U.S. EPA.

## 3.8 PERSONNEL TRAINING

All employees collecting samples at the Site will have successfully completed the training requirements for hazardous waste site work in accordance with

29 CFR 1910.120. In addition, sampling technicians will have reviewed the procedures in this plan with a trained and experienced supervisor. All personnel will have been instructed on the sampling procedures by a qualified, capable supervisor.

## 4.0 ANALYTICAL PROCEDURES

### 4.1 HAZARDOUS WASTE CATEGORIZATION PROCEDURES

Samples of drum contents and liquids will be evaluated to determine their chemical hazards (HazCat) and the suitability for commingling. The HazCat testing will be accomplished on Site, under the supervision of an experienced chemist. The HazCat testing involves the use and manipulation of very small amounts of sample material under specific test procedures. Testing will be completed on each sample. A small aliquot will be withdrawn from the sample container and tested. It is possible to test the same aliquot for different parameters, based upon the experience of the chemist.

**Water Solubility:** Each layer of waste within the sampling container will be tested for water solubility. A gram sized aliquot of sample is removed from the sample container and placed on a spot plate, weigh boat, or in a test tube. A milliliter of water is added to the sample. The following observations are made:

- soluble, partially soluble, or insoluble;
- high or low density;
- bubbling, fizzing, popping, or effervescence;
- fume or mist generation;
- heat generation; and
- fire evolution.

The abbreviations S, PS, or I will be used to designate soluble, partially soluble, or insoluble, respectively. These abbreviations will be recorded onto the compatibility log sheet.

**Reactivity Testing:** The procedure for water solubility is followed. A sample is considered water reactive when contact with water causes:

- bubbling, fizzing, popping, or effervescence;
- fume or mist generation;
- heat generation; or
- fire evolution.

A + or - symbol will be logged onto the compatibility log sheet.

**pH:** The sample will be tested for pH by using pH test strips. The pH testing will be done after completion of water solubility testing. The pH of a solid material will be determined using the solution from the water solubility test. A numerical designation of the pH value will be entered onto the compatibility log sheet.

**Hexane Solubility:** Each layer of waste within the container will be tested for hexane solubility. A gram sized aliquot of sample is removed from the sample container and placed on a watch plate, weigh boat, or in a test tube. A milliliter of hexane is added on the top of the sample. The following observations are made:

- soluble, partially soluble, or insoluble; and
- high or low density.

The abbreviations S, PS, or I will be used to designate soluble, partially soluble, or insoluble respectively. These abbreviations will be recorded onto the compatibility log sheet.

**Oxidizers:** The sample will be tested for oxidizing properties using a starch/iodide test strip. The starch iodide test strip will be placed directly into the water solubility test solution. A blue color change indicates that the material is an oxidizer. A + or - will be used to indicate a positive or negative response and will be entered onto the compatibility log sheet.

**Peroxide:** The sample will be tested for peroxide by using peroxide test strips. The peroxide testing will be done after completion of the oxidizer test. Peroxide testing of a solid material will be conducted on the water solubility test solution. A + or - will be used to indicate a positive or negative response and will be entered onto the compatibility log sheet.

**Sulfide:** The sample will be tested for free sulfide by using a sulfide test strip. The sulfide test strip is premoistened with acetic acid. A black precipitate forms on the test strip changing it to dark brown/black in color. The chemist may elect not to premoisten the test strip after quality control samples of known sulfide bearing spike samples have been run to demonstrate validity. Sulfide testing of a solid material will be collected on the water solubility test solution. A + or - will be used to indicate a positive or negative response and will be entered onto the compatibility log sheet.

**Cyanide:** *Samples will be tested for the presence of cyanide using the free cyanide spot* test described in Method 4500-$CN^-$ K of "Standard Methods for the Examination of

Water and Wastewater". This test will be used only for aqueous (water soluble) waste samples with a pH greater than 4. If the sample (or water solubility test solution for solid samples) pH is greater than 10, an aliquot must be neutralized using a 10 percent HCl solution to a pH of approximately 8. The test consists of placing three drops of aqueous waste sample (or water solubility test solution for solid samples) into the cavity of a spot plate and adding three drops each of pyridine-barbaturic acid and chloramine-T. A positive result for free cyanide is characterized by the formation of a pink or red color.

**Ignition Test:** A small aliquot of sample will be tested for ignitability using an open cup flame test at room temperature. The flame test will involve slowly placing a match over the sample. Instant flame formation from the match to the sample surface indicates a flammable material.

If ignition does not occur instantly, the chemist will slowly bring the flame closer to the sample to warm the sample surface. Materials will light based upon their degree of flammability relative to the flash point. Samples igniting rapidly will be marked positive (+) for ignitability. Samples requiring slight warming will be marked positive for ignitability. Samples which require prolonged flame contact to ignite will be recorded as non-flammable but combustible.

**Halogen Test:** A small aliquot of sample will be tested for halogen content by the Beilstein test. A small trace of material is placed in contact with a copper wire. The copper wire containing the sample residue is heated over a propane torch flame until the copper has turned red.

A positive test for chlorine and other halogenated compounds is a green flame during the test method. The copper wire will be reused after all residue has been combusted and the copper test area submerged into distilled water.

**PCB Screening:** Samples will be tested for PCBs at an off-Site laboratory. Ten representative grab samples from a group of ten drums or waste samples will be combined into one composite sample, and analyzed for total PCBs. If the results of the sample analysis indicate that the concentration of total PCBs is 50 ppm or greater, the material represented by the composite sample will be bulked only with other similar material for which PCB screening indicates PCB concentrations of 50 ppm or greater.

## 4.2 TEST BULKING AND DISPOSAL PARAMETERS

Based upon the individual HazCat results and PCB results for samples of drum contents and liquids, a test bulking sequence will be developed for the samples. Samples with similar chemical properties will be commingled together. The Site Manager and the chemist will determine the number of bulk groups to be composited based on chemical compatibility, PCB, and HazCat results.

After waste composite groups have been determined, the chemist will review the number of samples anticipated for each composite group. This determination will be used to estimate the volume of material from each sample to be removed. The goal will be to conduct the test bulking with enough waste material to be able to submit the composite sample for waste profile testing.

Test bulking will be accomplished by withdrawing a small amount of material from each container and mixing it by manually stirring the composite with other compatible waste. A thermometer will be used during compositing to measure temperature rise in the composite. Visual observations will be made to determine whether off-gassing, phase change, or other indicators of chemical reactions are occurring.

Evidence of a chemical reaction will indicate that two or more chemicals within the composite are incompatible with one another. The chemist conducting the test bulking will review HazCat results to determine if the cause of the reaction can be determined. The chemical test bulking will be discontinued until consultation with the project manager. The Site Manager and chemist will decide whether test bulking will be continued.

After completion of the test bulk, a composite sample of each waste stream (maximum of 100 grab samples composited) will be submitted to the laboratory to perform analysis for waste characterization. These tests will include ignitability, corrosivity, reactivity for cyanide and sulfides, TCLP analysis (VOCs, SVOCs, metals, pesticides, and herbicides), and PCBs.

## 4.3 TEST PARAMETERS FOR OTHER WASTE SAMPLES

Samples of bulked debris and wastewater will be analyzed for TCLP parameters (VOCs, SVOCs, metals, pesticides, and herbicides), reactivity, corrosivity, ignitability, and PCBs.

Samples of waste material from the excavated areas (post-excavation samples) will be analyzed for TCLP parameters and PCBs.

Post-treatment samples will be analyzed for TCLP VOCs.

## 5.0 QUALITY ASSURANCE /QUALITY CONTROL

QA/QC procedures will be consistent with procedures described herein and additionally as described in the Quality Assurance Project Plan (QAPP) provided as Appendix E of the Work Plan.

### 5.1 CONTAINER PREPARATION

Sample containers will be pre-cleaned by the laboratory or purchased pre-cleaned. Sample containers will be inspected for damaged lids, cracks, or similar defects.

### 5.2 SAMPLE PRESERVATION AND SHIPPING

Duplicate sample volume will be collected for all samples of drum contents. One sample volume will be used for HazCat analysis and PCB screening, as soon as practical after the sample has been collected. The second sample volume will be held for test bulking use, pending receipt of the results of the HazCat analysis and PCB screening. The holding time for the second sample volume will begin at the time that the sample container is opened.

Samples collected for off-Site analysis will be stored in cooled conditions (with ice or at 4°C). Samples will be shipped via overnight courier or hand delivered to the laboratory using chain-of-custody protocols.

### 5.3 RECORDKEEPING AND DOCUMENTATION

Records to document the sample collection and analysis process will be kept. The information to be recorded includes:

- Drum inventory forms;
- Chain-of-Custody forms;
- HazCat results;
- Test bulk sequences; and
- Analysis data.

## 5.4 ON-SITE AND OFF-SITE QA/QC

HazCat analysis is primarily conducted by spot tests or indicator strips. These tests are qualitative in nature and, as a result, a subjective determination is made by a trained, experienced chemist. In order to validate the HazCat process, strips will be used within their shelf life. The lot number and expiration dates of the test strips and reagents will be recorded where such lot numbers and expiration dates exist.

Spot test and indicator strip procedures will be tested daily for both positive and negative test results using materials known to elicit positive results (e.g., cyanide solution) and negative results (e.g., distilled water). In addition, samples with positive results for highly hazardous materials such as cyanide, oxidizers, peroxides, and water reactivity may be retested at the discretion of the chemist to confirm the positive result.

Samples for off-Site analysis will be analyzed by a qualified, certified laboratory and standard laboratory QA/QC protocols to be followed.