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PARCEL 22 REMOVAL ACTION WORK PLAN

BAILEY'S BRANCH AND PLEASANT RUN REMOVAL ACTION BEDFORD, INDIANA

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LIST OF ACRONYMS / SHORT FORMS

AAQMP	-	Ambient Air Quality Monitoring Plan
AOC	-	Administrative Order by Consent
Bailey's Branch Creek	-	Bailey's Branch Creek of Pleasant Run
Bedford Facility	-	General Motors Corporation Powertrain Bedford Facility
bgs	-	Below Ground Surface
CA	-	Corrective Action
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	-	cubic feet per second
CRA	-	Conestoga-Rovers & Associates
CZ	-	Clean Zone
DNAPL	-	Dense Non-Aqueous Phase Liquid
EZ	-	Exclusion Zone
fps	-	feet per second
GC / MD	-	Chromatographic / Multi-Detector
GM	-	General Motors Corporation
HASP	-	Health and Safety Plan
HEC	-	Hydraulic Engineering Center
HMS	-	Hydraulic Modeling System
IDEM	-	Indiana Department of Environmental Management
IDNR	-	Indiana Department of Natural Resources
LNAPL	-`	Light Non-Aqueous Phase Liquid
mg / kg	-	milligram per kilogram
NPDES	-	National Pollutant Discharge Elimination System
OMMP	-	Operation Maintenance and Monitoring Plan
OSHA	-	Occupational Safety & Health Administration
Parcel 22	-	158 Broomsage Road in Lawrence County, Indiana
PCBs	-	Polychlorinated Biphenyls
PRG	-	Preliminary Remediation Goal
PUF	-	Polyurethane Foam
QA / QC	-	Quality Assurance / Quality Control
QAPP	-	Quality Assurance Project Plan

LIST OF ACRONYMS / SHORT FORMS

RA Certification Report	-	Remedial Action Detection Construction Certification Report
RA	-	Removal Action
RAS	-	River Analysis System
RCRA	-	Resource Conservation and Recovery Act
SAP	-	Sampling and Analysis Plan
Site	-	Parcel 22 at GM Powertrain Facility
SOPs	-	Standard Operating Procedures
SOW	-	Scope of Work
TSCA	-	Toxic Substances Control Act
TSP	-	Total Suspended Particulates
U.S. ACE	-	United States Army Corp of Engineers
U.S. EPA	-	United States Environmental Protection Agency
UCL	-	upper confidence limit
USGS	-	United States Geologic Survey
WMP	-	Waste Management Plan
Work Plan	-	Interim Measures Work Plan

1.0 INTRODUCTION

This Parcel 22 Removal Action Work Plan (Work Plan) presents the Scope of Work (SOW) to be completed as a Removal Action (RA) for the property located at 158 Broomsage Road in Lawrence County, Indiana (referred to as Parcel 22 or Site). Conestoga-Rovers & Associates Inc. (CRA) has prepared this Work Plan on behalf of General Motors Corporation (GM) in accordance with the Administrative Order by Consent (AOC) for the Site under Comprehensive Environmental Response, Compensation, and Recovery Act (CERCLA), and also in accordance with the requirements of the Toxic Substances Control Act (TSCA) and consistent with the Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) work conducted pursuant to the Performance Based Agreement (effective March 20, 2001, as amended) executed between the United States Environmental Protection Agency (U.S. EPA) and GM for the GM Bedford Facility (Bedford Facility or Facility).

The Parcel 22 location is presented on Figure 1.1. A Site plan is presented on Figure 1.2. An aerial photograph of Parcel 22 is presented on Figure 1.3.

1.1 GENERAL

The purpose of this Work Plan is to provide an overview of the current conditions and to provide the details related to the implementation of the RA for Parcel 22. The Work Plan summarizes the information obtained during Site investigation activities conducted by GM, including:

- a review of regional geology and hydrogeology;
- a review of geologic, hydrogeologic, and hydraulic conditions at Parcel 22; and
- summary of existing conditions and information relating to the nature and extent of polychlorinated biphenyl (PCB) impacts at Parcel 22.

This Work Plan includes the following elements:

i) field delineation of the extent of areas requiring excavation based on PCB concentrations;
ii) Site preparation activities;
iii) construction support facilities;
iv) environmental controls;

v) Site safety and contingency plans;

vi) soil excavation, handling, and backfilling;

vii) transportation and staging requirements;

viii) quality assurance project plans; and

ix) RA schedule.

1.2 WORK PLAN ORGANIZATION

The remainder of this Work Plan is organized as follows:

Section 2.0 – Review of Existing Conditions
This section presents a description of Parcel 22 and a review of previous Parcel investigations that have formed the basis for this Work Plan.

Section 3.0 – Removal Action Scope of Work
This section presents a description of the SOW for the RA to be completed under this Work Plan.

Section 4.0 - Stream Flow Modeling and Monitoring
This section presents the stream flow modeling and the proposed monitoring to be conducted during implementation of the RA.

Section 5.0 - Approvals
This section outlines the United States Army Corp of Engineers (U.S. ACE) approval requirements for construction within the flood plain as well as other approval requirements.

Section 6.0 – Reporting
This section presents the reporting activities required under the Work Plan.

Section 7.0 – Project Team
This section presents the Project Team and organizational structure for implementation of the activities required under the Work Plan.

Section 8.0 – Project Schedule
This section presents the schedule for implementation of the activities required under the Work Plan.

Section 9.0 – References

This section presents references cited in the Work Plan.

Also included in this Work Plan are the Development of the Risk Based Cleanup Criteria for PCBs in Appendix A, a Health and Safety Plan (HASP) in Appendix B, a Sampling and Analysis Plan (SAP) in Appendix C, a Waste Management Plan (WMP) in Appendix D, an Ambient Air Quality Monitoring Plan (AAQMP) in Appendix E, and Hydrologic Modeling tables in Appendix F.

The existing Quality Assurance Project Plan (QAPP) (CRA, July 18, 2001) for the Bedford Facility has been modified in accordance with the AOC to incorporate the removal activities and will be used during the implementation of the Parcel 22 RA.

2.0 REVIEW OF EXISTING CONDITIONS

2.1 REGIONAL ENVIRONMENTAL SETTING

The following sections summarize information on environmental conditions in the regional area of Bedford, Indiana.

2.1.1 REGIONAL GEOLOGY

2.1.1.1 OVERBURDEN

Parcel 22 lies within an area of Indiana that was not glaciated (driftless area) during the last glacial period on the North American continent. The maximum progression of the Illinoisan Glacial advance (the furthest advance of the Laurentide Ice Sheet) lies to the west, north, and east of the immediate region surrounding the Parcel. Consequently, the surficial geology of the area generally consists of a relatively thin layer of unconsolidated deposits of sand, clay, and chert produced by the weathering of limestone bedrock (regolith, which is more commonly referred to as terre rosa in this area due to its reddish color) and wind-deposited silty material, known as loess. Thicker deposits of proglacial outwash, lake sediment, and recent colluvium occur along the major stream valleys. The surficial deposits range in thickness from zero feet along bedrock outcrops to approximately 100 feet thick along Salt Creek and the East Fork of the White River.

2.1.1.2 BEDROCK

The bedrock within the region is near the eastern margin of a structure known as the Illinois Basin. The bedrock formations in this area generally dip to the west at approximately 20 to 25 feet per mile. The Cincinnati Arch lies to the east of the Illinois Basin and covers much of Indiana (Indiana Geological Survey, www.adamite.igs.indiana.edu/index.htm, 2001).

Two regional structures are within the vicinity of the Parcel, the Leesward Anticline and the Mt. Carmel fault. The Leesward Anticline is located to the north and east of Bedford and plunges to the south-southeast. The Mt. Carmel fault is a normal fault with the downthrown side located to the west of the fault. This fault is located to the north and east of the Bedford Facility and truncates the Leesward Anticline on its western side.

The Mt. Carmel fault generally acts as a hinge line, with gentler dips to the west of the fault and slightly steeper dips to the east (Melhorn and Smith, 1959).

Bedrock within the immediate vicinity of the Parcel consists of the lower beds of the Middle Mississippian St. Louis Limestone (the oldest formation within the Blue River Group) and is only approximately 25 feet thick in the immediate vicinity of the Parcel (Melhorn and Smith, 1959). Immediately underlying the St. Louis Limestone, and outcropping to the east of the Parcel, are the Salem Limestone and the Harrodsburg Limestone, respectively. These two Mississippian formations make up most of the Sanders Group. The Salem Limestone is approximately 70 to 80 feet thick, where preserved, and the Harrodsburg Limestone is approximately 80 to 90 feet thick in the area (Melhorn and Smith, 1959).

The Borden Group, which underlies the Sanders Group and outcrops further to the east, consists of approximately 500 to 800 feet of siltstone and shale, interbedded with some sandstone and minor limestone. The New Providence Shale formation makes up the bottom of the Borden Group, and is approximately 200 feet thick.

The Sanders and Blue River Groups have been described to consist mostly of carbonates, with minor amounts of chert, shale, siltstone, anhydrite, gypsum, and calcareous sandstone. A thin bed of brown dolomitic limestone commonly marks the bottom of the St. Louis Limestone. The Salem Limestone, which is more massively bedded limestone, is known as the Indiana Limestone, the Bedford Limestone, or the Oolitic Limestone and is quarried as fine building stone. However, some horizons may contain geodes, joints and solution fractures, which render the formation less suitable for quarrying. The Salem Limestone is approximately 25 to 30 feet thick in the vicinity of the Parcel (Fenelon, Bobay et al., 1994).

Numerous joints and fractures are present in these formations with master sets trending east-west within the St. Louis Limestone, with minor sets 90 degrees to the master sets (Powell, 1976 and 2001). Karst topography is present near the top of the St. Louis limestone. Numerous sinkholes can be observed on the United States Geologic Survey (USGS) topographic quadrangles approximately 5 to 10 miles to the west of the Parcel. Several caverns have been mapped in Lawrence County, including one of the largest mapped caverns in the United States, the Blue Springs Cavern, located approximately five miles southwest of the City of Bedford. Other mapped caverns in the area include the Shiloh Cave, the No Sweat Cave, the Dog Hill Cave, the Donnehue Cave, and the Salt Creek Cave. Other unmapped caverns within close proximity to the Parcel include: Mouse Hole Cave; Eighteenth Street Cave; and Armstrong Caves I and II (Etzel, 1982).

2.1.2 REGIONAL HYDROGEOLOGY

Groundwater resources are found in Lawrence County along the valleys of the major rivers or streams and within the thick Mississippian carbonate aquifer system (within the western portion of Lawrence County) and the Silurian-Devonian carbonate bedrock aquifer (within the eastern portion of Lawrence County).

There are two basic types of aquifers: consolidated and unconsolidated. Unconsolidated aquifers in Lawrence County generally occur along the Salt Creek and the East Fork of the White River within the proglacial outwash deposits, glaciolacustrine deposits, and recent alluvium. The tops of unconsolidated aquifers are often exposed to the surface or have a very thin covering of non-aquifer material, generally comprised of silt and clay (Fenelon, Bobay et al., 1994).

Groundwater flow within the consolidated (carbonate) aquifers takes place along the joints, fractures, and bedding planes that eventually may become enlarged by solution to cave passages or Karst features. Recharge to a Karst system occurs through surface openings that vary in scale from narrow, solutionally widened joints to large sinkholes. Discharge typically occurs through springs, which are solutionally widened joints or bedding planes, but may be enlarged, to sizable cave openings. Most groundwater within this aquifer system discharges to the major rivers, to underground rivers, and to springs (Etzel, 1982).

2.1.3 REGIONAL HYDROLOGY

Most of the rivers in the East Fork White River Basin drain to the southwest. According to USGS Water Resources Division, the current stream flow recorded at the East Fork White River gauging station, located 7.8 miles southeast of Bedford in Lawrence County, is 4,210 cubic feet per second (cfs). There are eighteen total watersheds in Lawrence County.

Major tributaries to the East Fork White River include the Muscatatuck River, Salt Creek, Driftwood River, Flatrock River, and the Big Blue River. Drainages in the East Fork White River Basin include the Lost River, Sugar Creek, Graham Creek, Clifty Creek, Big Creek, Indian Creek, White Creek, Brandywine Creek, and the Little Blur River.

Rivers in the eastern half of the East Fork White River Basin have a subparallel drainage. Those rivers include the Sugar Creek, Big Blue River, Little Blur River, Flatrock River, Clifty Creek, Sand Creek, Vernon Forth, Graham Creek, and the East Fork White River from Medora to Jonesville.

Drainage of the Mitchell Plain in the central Lawrence County, northeast Orange County, and Monroe County is different from the rest of the East Fork White River Basin. In the streams that flow across the Mitchell Plain, surface water is intercepted by sink holes and diverted underground into the groundwater system or subterranean channels.

2.2 PARCEL DESCRIPTION

2.2.1 PHYSICAL SETTING

Parcel 22 is located on Bailey's Branch Creek of Pleasant Run (Bailey's Branch Creek). Bailey's Branch Creek flows from the south, generally northward from Parcel 22, and discharges to Pleasant Run. Pleasant Run subsequently discharges to Salt Creek.

Parcel 22 is an approximately 4.5 acre Parcel of land currently used as a single family rural residential property. The residence is located on the west side of Bailey's Branch Creek. The majority of Parcel 22 appears to be located within the limits of the floodplain of Bailey's Branch Creek. The floodplain area is generally forested. A clearing exists in the area of the residence on Parcel 22.

2.2.2 PARCEL HYDROLOGIC SETTING

Bailey's Branch Creek receives flow from a number of unnamed ditches and drains located upstream of Parcel 22. Discharge sources to these drains and Bailey's Branch Creek include a National Pollutant Discharge Elimination System (NPDES) permitted discharge from the Bedford Facility, surface water drainage from surrounding upland areas, and groundwater discharges from bedrock outcrop formations. The discharge from the Bedford Facility is a continuous contribution to the creek's discharge. Flows from the surrounding upland areas and groundwater discharge are generally tied to storm events and are intermittent in nature.

At the downstream edge of Parcel 22 there is a bridge over Broomsage Road. The bridge opening consists of an arch approximately 25 feet wide and 7 feet high (above low water) at it's highest point. The width of the bridge is approximately 50 feet under

Broomsage Road. At high discharges the bridge causes some back water that could lead to partial flooding of Parcel 22.

Hydrologic and hydraulic models for Bailey's Branch Creek water shed were developed by CRA to model storm events, and the accurate prediction of flooding (at the request and direction of Indiana Department of Natural Resources (IDNR) and flow velocities for areas of interest at the Site. Section 4.0 further describes the stream flow modeling.

The flow restriction on the creek due to the bridge at Broomsage Road does result in flooding of portions of Parcel 22 during significant storm events. The extent of any flooding is dependent on storm duration and intensity. Once flooding occurs and then subsides, lower flow velocities in the floodplain areas does result in deposition of suspended material on the floodplain.

2.3 SITE CHARACTERIZATION ACTIVITIES

Surficial soil and sediment sampling has been completed within the floodplain areas of Parcel 22. All data presented herein has been validated in accordance with the approved QAPP (CRA, November 5, 2001). Figure 2.1 identifies the sampling locations. PCBs were identified at varying concentrations across the floodplain area of Parcel 22. Generally, higher PCB concentrations are present near Bailey's Branch Creek. PCB concentrations generally decrease as the distance from Bailey's Branch Creek increases, as well as decreasing as elevation above the creek increases.

Figure 2.2 presents the distribution of PCBs within Parcel 22 based upon surficial (0-4 inch interval) sampling completed to date. The data is summarized in Table 2.1. A total of 12 locations within Parcel 22 have been sampled at depths between 4 inches and 2 feet below ground surface (bgs). The analytical data for samples within the 4-inch to 2-foot bgs interval are also presented in Table 2.1 and on Figure 2.2. Figure 2.2 also presents PCB data from split samples collected by Indiana Department of Environmental Management (IDEM). The area that has been sampled to date encompasses approximately 3 acres of Parcel 22.

2.3.1 ADDITIONAL SAMPLING ACTIVITIES

Prior to implementation of the Parcel 22 RA, additional sampling will be completed in the following locations for PCB analysis:

- two samples will be collected from the surficial soil beneath the house;
- three surficial soil samples will be collected from the perimeter of the house; and
- select areas of Parcel 22 not previously sampled, primarily on the north and east sides of the Parcel will be sampled. Samples from these areas will be collected utilizing the methodology used to collect the original investigative samples.

2.4 EVALUATION OF APPLICABLE REGULATIONS

This section provides a review of applicable regulations which must be considered in implementing the RA for Parcel 22.

2.4.1 CLEANUP CRITERIA

U.S. EPA Region IX has developed a risk-based Preliminary Remediation Goal (PRG) for PCBs in soil (U.S. EPA 2001). Using conservative assumptions about potential residential exposures to soil and based on a lifetime incremental cancer risk of 10^{-5}, the U.S. EPA-derived PRG for PCBs is 2.2 milligram per kilogram (mg/kg). This PRG has been used as a conservative screening criterion for the ongoing RCRA CA project, in advance of deriving a Site-specific risk-based cleanup criteria for the project to allow the expedited investigation and evaluation work to continue.

A Site-specific risk-based soil cleanup level has been calculated for residential use. This cleanup criterion evaluates Site-specific factors and accounts for current and reasonably foreseeable potential exposures. Utilizing the Site-specific factors and potential exposures, a Site-specific risk-based cleanup criterion of 2 mg/kg was developed for residential land use. The basis for the 2 mg/kg soil cleanup level is discussed in detail in Appendix A as an appropriate Site-specific level for these parcels. The discussion in Appendix A also shows that estimates of cancer and non-cancer risks associated with exposures to soil with a statistically representative concentration of 2 mg/kg would be well within the ranges that U.S. EPA has established as acceptable for the protection of human health. Therefore, remedies that achieve the soil cleanup level of 2 mg/kg would be protective of human health under CERCLA, RCRA, and Section 761.61(c) of TSCA.

The cleanup criterion selected by U.S. EPA in the AOC for floodplain soils at the Site is 1.8 mg/kg total PCBs, based on the IDEM default residential cleanup criteria for unrestricted use (IDEM, February 2001). The 1.8 mg/kg criterion is also consistent with the Site-specific risk-based cleanup criterion presented in Appendix A. Therefore, it will be utilized as the final cleanup criterion in this Work Plan for floodplain soils within the Site and located off the plant property. The AOC also identifies a cleanup criterion of 1 mg/kg total PCBs for creek sediment and stream bank material at the Site based on application at other CERCLA sites and is considered to be conservatively protective at this Site based on ecological exposure pathways. Stream bank material is defined as the material located horizontally to a distance 2 feet from the edge of the stream channel, and vertically down to the top elevation of the streambed following sediment removal.

3.0 REMOVAL ACTION SCOPE OF WORK

This section presents the rationale and sequence of tasks for the RA. CRA, as designated in the AOC, will direct and generally oversee activities on behalf of GM during the implementation of the RA, including collection and management of related data, and development and preparation of the Final Construction Certification Report. The Project Coordinator designated in the AOC, will provide overall project management and coordination between GM, CRA, the plant, U.S. EPA, and IDEM. The implementation of the RA activities will be conducted by Sevenson Environmental Services, Inc.

The U.S. EPA and IDEM will be notified of the name and qualifications of any proposed contractor and significant subcontractors who will conduct activities at Parcel 22 at least 5 business days prior to each contractor beginning activities, or as otherwise agreed to by the U.S. EPA.

Following review of the Work Plan by the U.S. EPA, and in coordination with the Cleanup of Upstream Parcels, and procurement of the necessary approvals, access agreement and contractors, the RA field activities will be initiated at Parcel 22 and include the activities specified below. The work areas are shown on Plan C-03. These activities include:

- temporary relocation of the residents;
- sealing of the house to prevent dust entry during Site activities;
- utility locates;
- provision of site security including monitoring of the house exterior;
- mobilization of construction facilities, Site trailer(s), material, equipment, and personnel necessary to perform the work;
- provision and maintenance of construction facilities and temporary controls;
- site preparation including:
  - emergency first aid facility,
  - fire suppression equipment,
  - construction of decontamination facilities,
  - break facilities,
  - the provision of temporary utilities,
  - construction of access roads,
  - clearing and grubbing of existing vegetation (as required),

  - work zone identification, and
  - construction of temporary staging facilities at the GM Powertrain facility;
- implementation of environmental controls;
- implementation of a Site-specific Health and Safety Plan;
- bypass pumping of the creek (during berm construction);
- implementation of stormwater controls (berms and drainage swales);
- removal of and handling of sediment deposits in creek bed and stream bank soils to bedrock or 1 mg/kg PCBs while creek is diverted;
- soil excavation, handling, and backfilling including:
  - layout of initial excavation limits including areas of PCB concentrations equal to or exceeding 50 mg/kg, and areas between 1.8 mg/kg and 50 mg/kg,
  - excavation of soils within these areas as necessary to achieve 1.8 mg/kg using the procedures described in Section 3.7.4,
  - layout of verification sampling grid,
  - collection of soil verification samples for PCBs (where residual soil remains),
  - additional excavation/verification sampling, as necessary, to meet the cleanup goal, and
  - backfilling/grading, and restoration of excavated areas with appropriate material;
- transportation to a U.S. EPA approved off-Site disposal facility for soil and sediment equal to or exceeding 50 mg/kg of PCBs:
  - if direct loading for off-Site disposal is not practical, move soil and sediment to a temporary staging area prior to off-Site disposal;
- for soils less than 50 mg/kg PCB, transportation to either a U.S. EPA approved off-Site disposal facility or to an on-Site interim staging facility. If transported to an interim staging facility, soils may be stored for a period consistent with the terms of the AOC;
- removal of miscellaneous debris (e.g., tree stumps, rocks), and staging and/or disposal at appropriate off-site facilities (as required);
- fugitive air emissions monitoring;
- ambient air quality monitoring;
- water management;
- stream monitoring;
- RA closeout activities including:

- cleanup / restoration of support areas,
- restoration of excavation areas,
- final decontamination of construction equipment and facilities,
- management of waste waters; and

- demobilization of construction facilities and equipment from the Site.

These tasks are discussed in detail in the following sections.

3.1 PROPERTY ACCESS/COMMUNICATION WITH OWNER

Prior to implementing the RA for Parcel 22, an access agreement will be obtained from the owner of Parcel 22 to provide access during RA implementation. The property owner will be offered the option of being temporarily relocated during RA activities due to the proximity of the residence to work areas.

Communication with the Parcel owner prior to the implementation of the RA on Parcel 22 will include the following:

- prior notice and scheduling of temporary relocation of the owner and the owner's family during the work activities at Parcel 22;
- review of work activities to be completed at Parcel 22 including identification of anticipated work areas;
- review of trees / significant vegetation which requires clearing to complete the RA. Those trees required to be cleared will be marked in the field and reviewed with the owner prior to clearing, however, additional vegetation may need to be cleared as the actual cleanup progresses;
- review with the owner of a map identifying preliminary planting locations and types to replace cleared vegetation;
- periodic updates of work progress and anticipated completion;
- review of restoration activities (e.g. tree planting);
- scheduling for owner to move back to their residence at the completion of RA activities at Parcel 22;
- follow-up visits during re-establishment of vegetation to address outstanding issues and make repairs as necessary; and
- following completion of the removal action, additional activities will be required which may include periodic monitoring to confirm the completion of the physical

removal activities, monitoring of revegetation, monitoring and maintenance of the source control measures if installed, and monitoring of seeps and springs.

3.2 SITE SECURITY

A temporary fence will be placed around the active work areas and used as a security fence during the RA construction period. A fence will also be placed around the septic system drainfield and the house for security purposes once the residents are temporarily re-located. The contractor will be responsible for maintaining security at all times during the RA construction activities. The contractor will inspect, maintain, and repair the fencing, as necessary, to ensure protection of the public and security of the Parcel. The fence will be removed at the conclusion of the RA. The proposed location of the security fence is shown on Plan C-03.

Access gates into the Parcel will be kept closed and locked to prevent uncontrolled and/or unauthorized access to the Parcel. The access gates will be locked at all times when the Parcel is unattended.

During active soil handling, or until soil materials are removed from the Parcel, security will be provided including:

i) Limit vehicular access to the Parcel to authorized vehicles and personnel only.

ii) Provide initial screening of all Site personnel and visitors. A list of authorized personnel and the name of their employer and documentation of appropriate health and safety training will be available at the Parcel.

iii) Maintain a security log in which documentation is provided of all Parcel personnel, visitors and deliveries, and any security incidents. This log will include the date, name, address, company, time in and time out for each employee and visitor. If unauthorized personnel are observed on the Parcel and refuse to vacate the premises, appropriate law enforcement officials will be contacted for appropriate legal actions.

iv) Maintain a visitor log at the Parcel. Visitors will not be allowed to enter without the knowledge and approval of CRA. All visitors will be required to complete health and safety training in accordance with the HASP prior to gaining access to the secured areas.

v) Check that all installations are secure and intact on a daily basis. If warning signs are removed, the situation will be brought to the attention of the GM Project Manager and will be rectified at the earliest possible opportunity.

3.3 CONSTRUCTION SUPPORT FACILITIES

The following sections outline the required construction support facilities for the Parcel. The construction facilities layout is presented on Plan C-03. Additional space is available for construction facilities on Parcel 76, located across Broomsage Road from Parcel 22. GM is the current owner of Parcel 76. A gravel working area will be constructed on the portions of Parcel 76 to be utilized for support facilities.

3.3.1 SITE OFFICE

CRA office trailers in place at the Bedford Facility may also be used by CRA, GM and the U.S. EPA to support the RA, as required.

3.3.2 EMERGENCY FIRST-AID FACILITY

The contractor will be required to supply and maintain a first-aid facility, which complies with the requirements of 29 CFR 1910.141, during the RA.

3.3.3 FIRE SUPPRESSION EQUIPMENT

The contractor will be required to provide necessary fire suppression equipment to ensure the safety of Site personnel and protection of the owner's property. Details of the fire suppression equipment are provided in the HASP (Appendix B). Coordination will be established with the local Fire Department to respond to emergencies.

3.3.4 DECONTAMINATION FACILITIES

Prior to commencing work in the Exclusion Zone (EZ) at the Parcel, the contractor will be required to supply and operate a personnel hygiene/decontamination facility. The contractor will also maintain an equipment decontamination pad at the Parcel. Any collected sediment will be characterized for PCB concentration and staged in the staging area, or disposed of off-Site, as appropriate, based on PCB concentration.

3.3.4.1 PERSONNEL HYGIENE/DECONTAMINATION FACILITY

The contractor will be required to supply and operate a personnel hygiene/decontamination facility that complies with the requirements of 29 CFR 1910.141.

Wastewater from the personnel hygiene/decontamination facility will be pumped to designated storage tanks. The collected water will be characterized and properly disposed of using the GM facility wastewater treatment facility or at an appropriate off-Site facility.

3.3.4.2 EQUIPMENT DECONTAMINATION FACILITY

The contractor will be required to supply and operate an equipment decontamination facility. The contractor will have sufficient pumping equipment and piping to pump all wastewater from the decontamination pad to contractor-supplied wastewater storage tank(s) for treatment at the GM facility or disposal off-Site.

All equipment leaving the EZ will be decontaminated on the decontamination pad using high-pressure, low-volume hot water and non-phosphate detergent (or equivalent), if necessary, and will be inspected by CRA prior to entering the Clean Zone (CZ).

Sediments collected on the decontamination pad will be collected, characterized for PCBs, and either disposed of off-Site at an appropriate commercial facility or staged on-Site, as provided in Section 3.0. Water from the decontamination facility will be disposed of as discussed in Section 3.12.

3.3.5 PORTABLE SANITARY FACILITIES

Portable toilet facilities will be provided and maintained by the contractor in an area outside the EZ. Sanitary wastes will be removed and disposed of off-Site on a periodic basis in accordance with applicable laws and regulations.

3.3.6 UTILITIES

The contractor will be required to locate and verify the capacity of all aboveground and underground utilities prior to commencing field activities.

Temporary utilities necessary for the completion of the RA will be provided by the contractor either by temporary tie-in to existing utilities, or by provision of temporary facilities (e.g., generators, water tanks, etc.).

3.3.7 ACCESS ROADS/PARKING

Access roads will be constructed, as necessary, to allow for access and loading of material onto transportation vehicles and provide a route for transportation vehicles to pass through the decontamination area prior to leaving the Parcel.

The contractor's excavation operation will be organized to minimize the contamination of imported granular material used for the construction of access roads. Imported granular materials used for the construction of access roads, if any, which contacts contaminated soil will be excavated and either disposed off-Site or staged with the <50 mg/kg PCB material at the GM Facility in accordance with this Work Plan.

Sufficient space for parking for Site personnel will be established by the contractor at suitable locations either on-Site, or at Parcel 76.

3.4 CLEARING AND GRUBBING

The areas required for construction facilities, access, and the excavation area will be cleared to the extent required to implement the RA. It is anticipated that most or all of the trees in the work areas will be required to be cleared. Prior to initiating the removal on a Parcel, trees in areas known to require removal will be marked and identified to the property owner. Additional clearing beyond that anticipated may be conducted without prior owner notification, as necessary to complete the removal on the Parcel. Cleared above grade vegetation will be removed or chipped on-Site and used to support Site restoration activities or other uses. Above-grade vegetation is defined as vegetation located 1-foot or more above grade. Tree stumps and below-grade vegetation removed from areas where PCB concentrations are ≥50 ppm will be transported off-Site with the ≥50 mg/kg PCB materials. All additional stumps and below-grade vegetation will be staged or disposed of off-Site as <50 mg/kg wastes. Chipped material designated for re-use will be sampled and analyzed for PCBs to ensure the chipped vegetative material designated for re-use meets cleanup goals. One 5-point composite sample will be collected for each 25 tons of chipped vegetation for PCB analysis.

3.5 ENVIRONMENTAL CONTROLS

3.5.1 FUGITIVE PARTICULATE CONTROL

The contractor will implement fugitive particulate control measures in accordance with the provisions of the Indiana Administrative Code Title 326 Article Rule 4 (Fugitive Dust Emissions) and the Ambient Air Quality Monitoring Plan (Appendix E). The particulate control measures will be designed to limit the emissions of total suspended particulates (TSPs) which are likely to remain airborne and be carried out of the work areas (Parcel 22 and the soil staging area).

During the performance of the RA, the contractor will be responsible for the control of fugitive particulates generated by excavation, transportation, and backfilling of soil. This may involve the following:

- maintaining fugitive air emissions control measures such as a water misting system to prevent the generation of fugitive air emissions;
- use of potable water for fugitive air emissions controls;
- the contractor will not use any chemical means for dust and particulate control with out prior review by the U.S. EPA;
- use appropriate covers on all trucks hauling impacted or unimpacted material; and
- in the event that the contractor's dust control is not sufficient to control dust from the Site, work will be stopped and changes to the operations made prior to resuming work.

3.5.2 EROSION CONTROL

The contractor will plan and execute construction methods to minimize the amount of soil that requires excavation to be exposed at one time. In areas where slopes exceed 5 percent grade, the contractor will insure soil erosion control through the use of siltation fences, straw bales, riprap, sod, or erosion mats, as directed by CRA to prevent erosion and migration of silt, mud, sediment, and other debris off of the Parcel or to other areas of the Parcel. Silt fences and/or straw bales will be placed in ditches and along perimeter areas, including adjacent to Bailey's Branch Creek, to prevent sediments from migrating from the Site. Plan C-04 outlines the erosion control methods for the Site.

3.5.3 STORMWATER CONTROL

Stormwater controls, including drainage swales to control run-on from adjacent properties, will be constructed prior to initiating significant excavation of the Parcel (Plans C-05 and C-08). Currently identified springs have been sampled and are non-detect for PCBs and will be routed to the creek. These springs and any additional springs encountered will be addressed in accordance with the Site Source Control Work Plan.

The swale constructed along the western side of Parcel 22 will be left as a permanent diversion swale. Limited excavation of impacted material will be completed in order to remove impacted material along the berm alignment to allow berm construction. Bypass pumping of the creek, as identified on Plan C-06, will be completed during excavation and backfilling activities to ensure impacted soils are not transported downstream. During the period in which the bypass is being completed, sediment (including loose rocks) will be removed from the creek bed and staged with the excavated soil materials. Construction of stormwater controls prior to initiating excavation will control the potential for off-Site releases. A hydrologic model for the Bailey's Branch Creek flow system, was developed by CRA to determine stormwater control requirements for the Parcel. A summary of the model is provided in Section 4.0.

The contractor will be required to control stormwater runoff in order to meet the following requirements:

i) prevent surface water runoff from flowing from contaminated areas to clean areas;

ii) minimize stormwater entering the Parcel from adjacent properties and ponding on-Site in excavated areas through use of temporary and permanent earthen berms/swales and/or proper grading and by expediting backfilling of excavations; and

iii) ensure that RA activities do not impact stormwater runoff quality to Bailey's Branch Creek.

Storm water from off-Site flowing toward the Parcel, will be redirected around the Site through the use of berms/swales and culverts (e.g., under driveway) to minimize potential for storm water to come in contact with potentially contaminated materials at the Parcel. In general, storm water in the vicinity of the Parcel flows from adjacent properties toward the Parcel. Surface water and/or stormwater runoff that comes in contact with potentially contaminated material will be considered contaminated water that the contractor shall handle in accordance with Section 3.12.

The contractor will be required to contain and collect stormwater from the decontamination pad by providing curbing and positive drainage to a collection sump. This stormwater will be transferred from the sump to the contractor's temporary storage tank. All wastewater will be managed according to the wastewater management requirements provided in Section 3.12.

3.6 SITE-SPECIFIC HEALTH AND SAFETY AND CONTINGENCY AND EMERGENCY RESPONSE PLAN

A Site-specific HASP meeting the requirements of the AOC is required to ensure that all remedial construction activities are performed safely and in accordance with applicable regulatory requirements, and that all persons on-Site, the general public, and the environment are protected from exposure to Site-related material during implementation of the RA construction activities at the Site. Each contractor involved in RA construction activities at the Site will be required to develop, implement, and maintain their own Site-specific HASP for activities they will perform at the Site. A HASP covering the activities of CRA and CRA Services is provided in Appendix B.

The basis for the HASP is the Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926). The HASP also reflects the U.S. EPA guidance's regarding procedures required to insure safe operations at sites containing hazardous or toxic materials.

The HASP addresses the following:

i) worker medical surveillance;

ii) worker training and site orientation;

iii) Site Safety Officer designation and responsibilities;

iv) work areas designations;

v) the planned movement of labor, equipment, and materials from and between work areas as work progresses;

vi) personnel and equipment decontamination facilities including planned disposal of decontamination waters and wastes;

vii) air monitoring program(s) for the various work areas;

viii) personal protective equipment to be used;

ix) personal hygiene and decontamination procedures;

x) respirator protection program and procedures;

xi) emergency and first-aid equipment;

xii) dust and particulate emission controls;

xiii) monitoring and mitigation of worker heat and cold stress;

xiv) safety meetings;

xv) site communications and posted notices; and

xvi) site security.

A confined space entry program will be developed if confined space entry is required to implement this RA.

The HASP will be maintained at the Site at all times during the performance of the RA and will be made available to all Site personnel and visitors permitted to enter the exclusion zone.

In addition, the HASP includes emergency response activities and contingency planning, as necessary, to ensure that there are specific sets of standard operating procedures (SOPs) to be followed for different types of emergencies. The emergency response activities have been designed to safeguard on-Site personnel, the public, and the environment in the event of an emergency.

The on-Site contingency and emergency response plan includes SOPs for the following potential emergencies:

i) injury to on-Site personnel;

ii) detecting gases or vapors at stop work levels as defined in the HASP in an excavation area;

iii) fire on the Site;

iv) the unlikely event of a leak of toxic gases from unknown sources such as rupturing of compressed gas cylinders or gas lines during excavation;

v) severe weather events and/or flooding; and

vi) utility breakage (e.g., high pressure gas line).

3.7 SOIL EXCAVATION, HANDLING AND BACKFILLING

3.7.1 TEMPORARY STAGING FACILITY CONSTRUCTION

Excavated floodplain soil materials containing <50 mg/kg PCBs and selected for on-Site staging will be transported and staged at a temporary staging facility constructed at the Bedford Facility as shown on Plans C-01 and C-09. The temporary staging facility meets TSCA requirements and consists of a bermed and lined area with a sump to collect stormwater runoff. The temporary staging facility will be fenced and signed. Any water run-off from the staged materials will be collected, characterized, and disposed of as outlined in Section 3.12. Following the completion of daily activities, as well as the completion of the RA, the staging facility containing <50 ppm PCB-contaminated soils and sediment will be covered to prevent contact with water and precipitation pending final disposition of the soil, as approved by U.S. EPA.

GM may elect to defer construction of the temporary staging facility to a later phase of the RA. In this event, <50 mg/kg PCB material will be transported off-Site for disposal at an approved RCRA Subtitle D landfill.

3.7.2 SOIL EXCAVATION

The limits of on-Site soil excavation have been established based on the delineation of the extent of PCBs above the clean-up criteria. Under 50 mg/kg PCB and ≥50 mg/kg PCB materials will be kept segregated at all times. Plan C-06 outlines the initial limits of excavation, subject to subsequent confirmation testing. The volumes of material anticipated to be excavated from Parcel 22 are summarized on Table 3.1. The layout of the initial excavation limits will be established prior to removal activities. The contractor will be required to perform Site excavation activities according to the following requirements:

i) perform tasks in an orderly and safe manner such that the movement and double handling of materials is minimized;

ii) schedule all excavations and movement of soils such that materials with a PCB concentration greater than or equal to 50 mg/kg are removed first followed by areas with lower concentrations;

iii) to the extent possible, excavation should proceed from upstream to downstream and where possible, proceed from high ground to lower areas to prevent stormwater runoff being directed from an impacted area to a remediated area;

iv) grade excavation areas to direct stormwater runoff away from excavations;

v) excavate around remaining trees in areas which exceed the cleanup level as outlined on Plan C-06;

vi) repair any part of the septic system or other utilities that is damaged or removed during the excavation;

vii) carry out measures necessary for dust emission control from excavation, soil handling, and transportation activities; and

viii) coordinate in-creek sediment removal with soil removal (see Section 3.8).

The scheduling of excavation activities will be coordinated so that activities may be completed promptly following construction of stormwater controls based on weather/seasonal conditions.

To the extent possible, excavation activities will begin by removal of materials from areas identified to contain PCBs at concentrations at or exceeding 50 mg/kg proceeding generally from upstream to downstream on the Parcel. This ≥50 mg/kg PCB material will be transported for off-Site landfilling. Following removal of these materials, remaining designated excavation areas identified to contain material with PCB concentrations below 50 mg/kg will then be excavated from generally upstream to downstream on the Parcel in a manner designed to meet the final cleanup criteria for the remaining soils as described further in Section 3.7.4. Control measures, in the form of the berms and silt curtains in the stream, will be used to prevent sediment runoff from entering the Bailey's Branch Creek as discussed in Section 3.5.2. The initial depth and extent of the excavations have been established based on the delineation activities completed at the Parcel.

Following the excavation of soil to the initial limits identified, verification sampling will be completed. The strategy and sequencing for excavation and verification sampling of the soils, is as follows:

1) Remove and clear all miscellaneous surface debris in and around the areas to be excavated;

2) All soils will be excavated from the discrete depth intervals to the limits of excavation established based on the delineation activities;

3) The material which is determined during the delineation activities to contain concentrations of PCBs of greater than or equal to 50 mg/kg will be excavated and directly loaded into a transportation unit or placed into a loader bucket to take to a staging pad where it will be temporarily staged pending transfer to

transportation units for transportation off-Site for disposal. The staging pad will be located in an area outside the floodplain. The staging pad will be lined and constructed in accordance with TSCA requirements. Staging of the ≥50 mg/kg PCB material, if necessary, is anticipated to be required for a period of less than 2 weeks, until sufficient quantity of material exists to transport for off-Site disposal. In general, it is anticipated that ≥50 mg/kg PCB material and <50 mg/kg PCB material will not be staged on the same pad at the same time. However, if this is required, the material will be kept separated on the pad. Any material becoming intermixed will be handled and disposed as ≥50 mg/kg PCB material. Staging of the excavated material will allow excess water to drain out of the material. This water will be collected in a sump on the pad, trucked or pumped to the treatment system, and treated. Any material which is determined to require cleanup, and contain concentrations of PCBs less than 50 mg/kg but greater than or equal to the cleanup criteria, will be excavated, and either directly loaded into a transport vehicle or where insufficient soil volume or work space exists to immediately load a transport vehicle, the material may be placed on a staging pad located in an area outside the immediate removal area. This staging pad, if required, will be bermed and lined. Staging of the under 50 mg/kg PCB material, if necessary, is anticipated to be required for a period of less than 2 weeks. Once loaded, transportation units will transport the under 50 mg/kg PCB material to the temporary staging facility at the GM Powertrain Facility where it will be staged pending a determination of final disposition pursuant to the AOC, or the material will be transported directly to an off-Site landfill;

4) Once the limits of the initial excavation, determined based on the delineation, have been reached, verification soil samples will be collected in accordance with the SAP (Appendix C) from excavation sidewalls and base to determine if remaining soils meet or exceed the specified cleanup criteria on a statistical basis. U.S. EPA will be notified a minimum of 24 hours prior to each sampling event. The specific protocols for determining the number and location of the verification samples is provided in Section 3.7.4. The verification samples may be split with the U.S. EPA or IDEM representatives, at the discretion of the U.S. EPA/IDEM;

5) The horizontal and vertical limits of excavation will be extended, if necessary, in the areas where verification soil samples indicate that remaining soils are above specified cleanup criteria on a statistical basis (see Section 3.7.4). The horizontal and vertical extent of additional excavation will be determined by CRA's representative, in consultation with U.S. EPA, based upon an evaluation of soil conditions, the locations of samples which exceed the specified cleanup criteria, and their respective concentrations;

6) Any groundwater encountered during excavation and any surface water that enters the excavation will be collected for disposal at an appropriate facility as discussed in Section 3.11, as needed; and

7) Repeat steps 3), 4), and 5) until verification soil sampling demonstrates that remaining soils are statistically at or below specified cleanup criteria.

The contractor will only be allowed to backfill material that meets the cleanup criteria and has been demonstrated to meet the verification and cleanup criteria and all quality assurance requirements of the project QAPP.

3.7.3 SOIL HANDLING

Soil handling will be kept to a minimum to minimize potential fugitive emissions. Soil handling will be limited to necessary screening/segregation of debris that may not be directly placed into transportation units. Whenever possible, the contractor will place excavated soil directly into transportation units to minimize fugitive emissions and multiple handling. Care will be taken when transporting soil off-Site to prevent soil tracking.

Prior to initiating the excavation activities, a temporary staging facility may be constructed in the location identified on Plan C-01 and as discussed in Section 3.7.1. Alternatively, construction and use of the temporary staging pad may be deferred until a later phase of the removal action. Plan C-09 and Plan C-10 presents the construction details for the staging facility. The staging area will consist of a bermed and lined area with a sump to collect storm water runoff. The staging facility will be covered at the end of each day of staging with tarps. A 40-mil liner will be placed over the stockpile area as a long-term cover, after all materials are staged.

3.7.4 SOIL CLEANUP GOALS/VERIFICATION SAMPLING

Throughout the soil excavation phase, verification sampling will be conducted to evaluate the limits of the excavation and confirm cleanup goals are met. Soil samples collected from the non-industrial parcels will be analyzed for PCBs to determine if the applicable cleanup criterion for PCBs of 1.8 mg/kg has been achieved on a 95 percent UCL of the mean basis throughout each approximate ½ acre grid of the affected area of the property. A rapid turnaround time for PCB analysis will be utilized for all verification sample analysis to minimize the time that the excavated area is required to remain open.

The proposed procedure for floodplain soils within the non-industrial parcels involves the following steps:

1) For each 200 foot section of creek, an approximate ½-acre area will be surveyed along the creek. The area will be approximately 100 feet wide and 200 feet long oriented lengthwise, roughly parallel to the creek. If the excavation limit is extended beyond the limits of the ½-acre area by more than 50 feet in each direction, an additional ½-acre area will be added to provide coverage for the additional acreage. If the excavation limits extend less than 50 feet beyond the limit of the ½ acre, the area will be extended to include the entire excavated area. Each area will be subdivided into 8 blocks. The approximately 50 by 50 foot blocks may be enlarged to meet the geometry of the creek or the contaminated area. Figures 3.1 and 3.2 identify the layout of the verification sampling grid on the Site. Where the excavation width is less than 150 feet, the verification sampling grid will be centered on the excavation rather than the creek.
2) Within each ½-acre area, excavate soil from locations where existing site characterization data show PCBs at concentrations exceeding 1.8 mg/kg. Excavation will be conducted to the extent appropriate to achieve a 95% UCL of 1.8 mg/kg based on post-excavation samples for the ½-acre area. Post-excavation samples will consist of a 5-point composite sample collected from the top 4” of the ground surface at each of the eight blocks. Blocks excavated entirely to bedrock will be considered to have zero residual PCBs in soil for calculating the 95% UCL soil PCB concentration.
3) Where the depth of the outermost side wall of the excavation is greater than 6 inches, soil samples will also be collected from the side walls for every 50 linear foot section as a 5-point composite sample with sample aliquots collected approximately every 10 linear feet of sidewall.
4) In each ½-acre area, composite sample analyses will be reviewed to ensure that no composite result exceeds 5 mg/kg PCBs. Should any result exceed this limit, additional excavation will be performed in the corresponding block. If no composite sample exceeds 1.8 mg/kg, then the ½-acre area meets the cleanup criterion and no further excavation will be necessary.
5) If one or more composite samples exceed 1.8 mg/kg (and no composite sample exceeds 5 mg/kg), then the 95% UCL on the mean of the composite sample concentrations will be calculated using all composite samples (base and sidewall samples) collected from each of the ½-acre areas.

The 95% UCL will be calculated using a nonparametric bootstrap method, since the verification sample concentrations may not be normally or lognormally distributed. Current U.S. EPA guidance recommends the use of nonparametric methods (including nonparametric bootstrap methods) in favor of methods recommended in older guidance, especially for situations where the probability distribution of a data set is not normal or is difficult to identify (U.S. EPA 2002).

The nonparametric methods do not rely on assumptions about the distribution of the data and are reliable for a wide range of distributions including normal and lognormal data. Bootstrap procedures are robust nonparametric methods that can be used to construct approximate confidence limits for the population mean. In these procedures, repeated samples are drawn with replacement from a given set of observations to produce samples that are the same size as the given set of observations. The process is repeated a large number of times (e.g., thousands) to ensure adequate accuracy.

Among the different variations of the bootstrap procedures method, the bias-corrected and accelerated (BCa) percentile method is generally considered to be the most robust and reliable for calculating confidence intervals when the underlying distribution of the data is unknown or difficult to verify (Efron and Tibshirani 1998). For this reason, the BCa method will be used for calculating the 95% UCLs for each ½-acre area. In addition, GM will provide the results of 95% UCL calculations using the "simple" bootstrap percentile method at U.S. EPA's request.

If the 95% UCL on the mean is at or below 1.8 mg/kg, the area meets the cleanup criterion and will be backfilled and re-vegetated. If the 95% UCL exceeds 1.8 mg/kg, additional excavation and re-sampling will be performed at the grid(s) with the highest PCB concentration(s) as necessary to achieve a 95% UCL of 1.8 mg/kg. Sample collection procedures outlined in the SAP (Appendix C) will be followed. Quality Assurance/Quality Control (QAQC) procedures will be followed for all soil sample analysis as outlined in the QAPP. All laboratory analytical results will be validated in accordance with the QAPP; however, preliminary data will be used to evaluate verification samples. Any sample location with analytical results determined to be unusable during data validation will be re-sampled and analyzed, and the 95% UCL will be recalculated using the new data.

3.7.5 BACKFILLING/FINAL GRADING

Excavations will be backfilled with imported clean fill from an off-Site source. Fill material will be characterized prior to importation to ensure it is acceptable, based on PCB analysis. Fill material will be placed in excavations to below existing grade outside the excavation limits and compacted using appropriate compaction equipment as directed by CRA's representative. The remaining thickness will be backfilled with topsoil. Topsoil will also be added to unexcavated areas to provide efficient drainage upon final grading. The final grading will be constructed during completion of the RA to match the existing grades outside the limits of excavations and promote appropriate surface water drainage. Following completion of backfilling activities, the disturbed areas will be restored with vegetation native to the area. Appropriate erosion controls will be utilized until the vegetation has been established to provide erosion control.

Once an excavation area has been determined to meet the cleanup goal, the excavation will be backfilled as soon as is practical. Following backfilling, restoration activities for that area will be completed as soon as practical. However, some restoration activities, such as tree planting and some re-seeding may need to be completed in the appropriate season (to promote/allow growth).

3.8 CREEK SEDIMENT REMOVAL AND HANDLING

Coincident with soil excavation as presented in Section 3.7, creek sediments will be removed. Creek sediment removal includes, as necessary to meet the 1 mg/kg PCB cleanup criteria, removal of creek bank soils located horizontally within 2 feet of these creek banks and vertically from ground surface down to the depth of sediment removed. The creek flow will be temporarily diverted around the work zone. It is anticipated that the length of the diversion will typically be 50 ft to 100 ft, although the contractor may elect to utilize longer diversions up to 500 feet. Once the creek flow diversion has been implemented, sediments will be removed as discussed below.

3.8.1 SEQUENCE

Creek sediments will be removed within a work zone after the impacted soil excavation is completed from the adjacent areas.

3.8.2 CREEK FLOW DIVERSION

A hydrologic model has been developed by CRA for the Bailey's Branch Creek flow system. This model has been utilized to determine creek diversion options for the areas requiring excavation. Section 4 presents a summary of the stormwater model for Bailey's Branch Creek.

The stormwater model developed for the Site will be utilized to determine flows for bypass pipe sizing and to design temporary or permanent creek bypass channels. Within the upper reaches of Bailey's Branch and along other tributaries insufficient floodway width, and the presence of bedrock at or near the ground surface, make the re-channelization of the creek in these areas impractical.

The creek would be divided into manageable sections and the flow diverted around each section, moving upstream to downstream. Diversion would be completed either by bypass pumping, or gravity diversion piping. Under either of these methods, the upstream and downstream ends of the area to be cleaned up would be isolated by temporary berms across the creek. The creek flow will pond on the upstream side of the upstream dam where an inlet to the diversion pipe or pump intake would be placed. The flow would then be diverted around the active work area and re-introduced to the creek downstream of the second diversion berm. The second diversion berm is constructed to prevent backflow into the work area and contain any potential releases from the work area.

Creek excavation and restoration activities in areas being diverted by this method would be completed in a manner that would allow the flow from significant storms to bypass the work areas without causing mobilization of impacted materials from the work area. This is accomplished by ensuring restoration of disturbed areas to protect the creek channel on a daily basis.

3.8.3 REMOVAL METHODS

Sediment will be removed from the dry creek bed using small earth moving equipment or by manual labor.

3.8.4 SEDIMENT HANDLING

Sediment handling will be kept to a minimum to minimize potential fugitive emissions. Whenever possible, the contractor will place removed sediment directly into transportation units to minimize fugitive emissions and multiple handling. Care will be taken when transporting sediment from the active work zones to prevent soil tracking.

3.8.5 VERIFICATION

For verification that cleanup criteria have been met in the creek channel, each 100-foot section of creek in which material removal is completed will be evaluated as follows:

1) Creek Bed Verification Sampling - A 5-point composite sample will be collected consisting of sediment samples at approximate 20-foot spacing from the creek bed. In the event that insufficient remaining deposits of sediment are present in the creek bed to collect a 5-point composite, the number of sample points may be reduced accordingly. In the event the entire creek bed within the 100-foot section consists of bedrock without sediment deposits, the creek in that 100-foot section will not require verification.
2) Creek Bank Verification Sampling - A 5-point composite sample will be collected from each side of the creek bank consisting of soil samples at approximate 10-foot spacing along 50-foot lengths. Alternatively, the creek bank soil may be removed to a distance of 2 feet horizontally from the creek bank, to the depth of the creek excavation without the need for verification sampling.
3) The results of each composite sample will be compared directly to the cleanup criteria for the creek (1 mg/kg PCBs).

Additional material removal and re-sampling will be completed if the cleanup criteria is exceeded in a composite sample.

Sample collection procedures outlined in the SAP (Appendix C) will be followed. QAQC procedures will be followed for all sample analysis as outlined in the QAPP. All laboratory analytical results will be validated in accordance with the QAPP.

3.8.6 RESTORATION

A Restoration Plan, which will include mitigation plans, if required, will be developed as part of the detailed design phase of the project.

The Restoration Plan will be prepared to support requirements from U.S. ACE, IDEM, and IDNR for work in floodways and the creek channel.

The Restoration Plan may include any, or all, of the following components as appropriate based on Site-specific delineation:

- re-vegetation with native plant species to the extent possible, review with the Parcel owner; and
- habitat improvements in on-Site locations.

3.9 TRANSPORTATION AND STAGING

This section describes the procedures to be employed during the RA to ensure compliance with appropriate federal, state, and local regulations for any material that is removed, transported, and staged. Procedures outlined in the Site WMP (Appendix D) will be followed for the transportation, staging, and disposal of materials from the Parcel.

A material tracking form will be used to track the movement of each load of excavated material. Transport vehicles appropriately licensed to transport applicable materials will be utilized to transport material over public roads.

During the transportation activities, the contractor shall ensure that the transportation is conducted in compliance with federal, state, and local regulation concerning shipping materials, including the following:

- that the number for each transport vehicle/container is displayed visibly;
- that the received box of the transport vehicle/container is clean of loose debris or foreign material prior to loading;
- for vehicles transporting impacted material that the receiving box or container will be lined with a minimum of one layer of 6-mil polyethylene sheeting continuous along the bottom and sides. The liner shall be placed on the floor, run up the sides, and draped over the sideboards. The liner will be neatly pushed into the corners to prevent tearing during loading and transport. If the contractor can demonstrate that the receiving box is of leakproof construction, an impermeable cover is placed over the container, and that the receiving box or container is made of materials which can be decontaminated, then the lining requirements can be waived;

- that the materials are loaded in a manner which will not damage the properly placed polyethylene liner; and
- following loading, the liner will be folded over the loaded materials prior to securing with an approved tarpaulin in a manner to prevent loss of materials or fugitive dust emissions.

Flag persons shall be employed as required to ensure safe entrance to and exit from public roadways.

Prior to leaving the Site, each transport vehicle which has entered the exclusion zone will be decontaminated. The decontamination will be conducted to remove all material on the tires and axles and material on the vehicle resulting from loading operations. Transportation vehicles will also be decontaminated following off-loading at the staging area.

Material removed from the Site shall be transported directly to the staging facility with out change to either the route or mode of transportation. The transportation shall be conducted to comply with the requirements outlined in the WMP. Transport vehicles will be marked and placarded in accordance with applicable regulations as outlined in the WMP.

The contractor shall prepare daily reports summarizing all materials transported from Parcel 22 to the staging areas including total volume of material transported, and descriptions of the materials transported with material tracking forms. Notification of receipt of material will be conducted through signed material tracking forms. Any material transported off-Site for disposal will be manifested, as appropriate, and the signed manifests tracked.

3.10 FUGITIVE AIR EMISSIONS MONITORING

The contractor will be required to monitor for fugitive air emissions from soil excavation, handling, and backfilling operations as well as operations at the staging areas. Air monitoring at the work zone boundary locations will be monitored in accordance with Section 12.0 of the HASP. If the perimeter monitoring Total Suspended Particulates (TSP) concentrations, identified in Section 2.0 of the AAQMP presented as Appendix E, are exceeded at the Parcel or staging area boundaries, particulate measures will be employed. The TSP criteria is 67 percent in excess of the upwind ambient TSP air concentration.

Control measures may include:

- minimizing work areas;
- reducing levels or types of activity at the Site until the weather becomes more suitable;
- spraying areas with paper mulch for odors and/or dust control; and
- spraying areas with foam to control odors and/or dust.

The contractor will conduct boundary monitoring at the Parcel and the staging area to establish a baseline (i.e., background) to evaluate the impacts of Site activities on air quality prior to initiating RA activities. The baseline monitoring shall be conducted before initiating excavation activities on a regular basis for a minimum of 3 days.

3.11 AMBIENT AIR QUALITY MONITORING

CRA will undertake a perimeter air monitoring program to evaluate potential public exposure to fugitive air emissions resulting from the RA at the Parcel. The perimeter air monitoring program is in addition to air monitoring for contractor health and safety, including personnel monitoring being conducted by the contractor as described in Section 3.9.

Perimeter air monitoring will consist of TSP and PCBs as outlined in the AAQMP presented in Appendix E. TSP sampling will be completed using U.S. EPA's Reference Method for Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method) (40 CFR Part 50 Appendix B).

PCB sampling will be completed utilizing U.S. EPA Method TO-4A [Compendium Method TO-4A Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High-Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD), January 1999]. Action levels to determine when mitigation measures are necessary are provided in Sections 2.4 and 3.4 of the AAQMP.

3.12 WATER MANAGEMENT DURING CONSTRUCTION

The contractor will provide an on-Site surface water runoff collection and on-Site storage system for the following:

i) surface water and/or stormwater contacting disturbed work areas;

ii) water collected from construction dewatering;

iii) groundwater entering excavation areas;

iv) surface water collected from the temporary soil stockpile facility; and

v) wastewater from the personnel and equipment decontamination facilities.

Dense non-aqueous phase liquid (DNAPL) and light non-aqueous phase liquid (LNAPL) are not anticipated to be present in water collected from the above mentioned sources. However, as a precaution, all collected water may be pumped through an oil/water separator prior to transportation to the GM Powertrain wastewater treatment facility or approved off-Site facility. If DNAPL or LNAPL is encountered it will be placed into a tank for temporary storage. Once a sufficient volume of water has been collected and characterized, as required by the Facility NPDES permit, the water will be transported for disposal in the GM Powertrain wastewater treatment facility or at an approved off-Site facility. All transport, storage, and disposal methods outlined in the WMP will be followed for collected DNAPL and LNAPL, in the unlikely event any is collected.

4.0 STREAM FLOW MODELING AND MONITORING

To design work protection, such as temporary channels or levees, it is necessary to know the discharge along the creeks. There is no stream stage or discharge gage on either Bailey's Branch or Pleasant Run and therefore this information was generated using numerical models. Two types of models were used; the first model converts rainfall data into discharge-with-time from the tributaries; and the second model combines and routes those discharges from the tributaries down the creeks to the mouth of Pleasant Run.

The hydrologic and hydraulic modeling described herein was submitted to IDNR in support of Application #FW-22139 in a report entitled "Hydraulic Modeling of Upstream Portion of Bailey's Branch Creek and Pleasant Run Watershed", dated February 2003. Subsequently the hydraulic modeling, which was described in the previous report and which covered the entire Pleasant Run creek watershed, was truncated to include just those portions relevant to the proposed works within Parcel 22. This modified hydraulic model was described in a letter to IDNR dated March 12, 2003.

4.1 DISCHARGE DETERMINATION (HYDROLOGIC MODELING)

The expected flood elevations, and the floodway and flood fringe limits were determined for the 100-year rainfall event. Bailey's Branch Creek is a tributary of Pleasant Run, which in turn flows into Salt Creek. There is no stream stage or discharge gage on either Bailey's Branch or Pleasant Run. Therefore, the discharge for the 100-year event was estimated by the following three methods:

- IDNR, Division of Water Estimate;
- Detailed Hydrologic Modeling; and
- Regression Equations.

4.1.1 DIVISION OF WATER ESTIMATE

In a letter dated May 29, 2002, IDNR, Division of Water estimated the 100-year frequency discharge upstream of the Broomsage Road culvert to be at about 1,500 cfs. Results of CRAs modeling concur with this discharge as described herein and submitted to EPA / IDEM in the submission on March 27, 2003.

4.1.2 DETAILED HYDROLOGIC MODELING

Discharge was determined by converting rainfall to discharge using the numerical model HEC-HMS. HEC-HMS (Hydrologic Engineering Center – Hydrologic Modeling System) is a model produced by the U.S. ACE. HEC-HMS accepts rainfall and watershed data and gives discharge-with-time (hydrographs) within the watershed sub-catchments.

The hydrologic model was constructed by subdividing the entire Pleasant Run and Bailey's Branch Creek watershed into sub-catchments and assigning values to the characteristics of each sub-catchment such as area, slope, dimensions soil type and type of vegetative cover. Then a network of stream channels was constructed that reflects how flow is routed from each of the sub-catchments to the next downstream sub-catchment, or in the main channel, and eventually to the mouth of the stream. Rainfall events, in the form of specific, individual storm events, were input to the model. The output from the model is discharge from each sub-catchment as a function of time. Additional junctions were inserted in HMS to correspond to locations in RAS where tributaries would contribute discharge. The discharge data are shown in Table 1 and Table 2 of Appendix F and the flow routing logic is shown on Figure 2 of Appendix F.

HEC-HMS was run for various return period events and discharge from each tributary and basin was determined.

4.1.3 REGRESSION EQUATIONS

CRA also estimated discharges at other frequencies and locations along Bailey's Branch Creek and Pleasant Run Watershed. Regression Equations were used to validate the detailed hydrologic modeling , as outlined in "Techniques for Estimating Magnitude and Frequency of Floods On Streams in Indiana", Dale R. Glatfelter, U.S. Geological Survey, Water-Resources Investigation Report 84-4134, 1984. Using the methods described, we estimated the 100-year frequency discharge at the Broomsage Road culvert to be about 1,555 cfs.

4.1.4 STREAM FLOW MODELING

Once discharge from each of the sub-catchments and tributaries was determined the river flow model HEC-RAS (Hydrologic Engineering Center - River Analysis System) was used to calculate stage and discharge along the entire creek. HEC-RAS is a model produced by the U.S. ACE.

The main inputs to HEC-RAS, in addition to discharge along the stream, were cross-sections, hydraulic roughness (Mannings "n" values) and special geometries such as fills, bridges and culverts. Geometry is input at cross-sections. The model output is water elevation (stage) at each cross-section, as well as average velocity at each cross-section. These values of stage, velocity and slope can be used in other modeling, such as sediment deposition and transport modeling.

The geometry of the channels was determined in part from a 2-foot contour map developed for this project. For each cross-section the hydraulic roughness parameter, Mannings "n", was assigned separately for the main channel and each of the two overbank portions of the cross-section. The July 2002 field visit showed that the main channel of each cross-section was devoid of vegetation, but that the overbank portions were heavily vegetated. Above Mile Point (MP) 3.988 Bailey's Branch has a rock bed and mud/gravel banks; for this section Mannings "n" was taken as 0.060. Below MP 3.988 Bailey's Branch has mud banks with a gravel bed with some rock; for this section Mannings "n" for the main channel was taken as 0.035. Three sections, at about MP 4.291, were assigned an overbank "n" value of 0.061. All other overbank areas, the value of Mannings "n" was assumed to be 0.080.

There is a culvert within the proposed reach of the Parcel 22 work area under Broomsage Road. This culvert was measured during the July 2002 field visit, and surveyed in detail, where accessible, in November 2002. The Broomsage Road culvert is a corrugated galvanized steel arch section with concrete and fill over the steel section. At this location the road curves to the east (in upstream direction towards the stream right bank) and is canted slightly. The curvature is shown on Drawing 1, with the cant also derived from this map. The culvert is approximately the same length as the road surface width (approximately 58 feet), and the road surface appears to be about two feet above the top of the steel arch. The steel arch is marked with what appears to be a date of 11/27/70. The base of the culvert opening is approximately 25 feet wide by 8 feet high at the middle of the arch. The base of the culvert appears to be native rock partially covered by loose sand, gravel, and rock, which is found in the stream bed on both sides of the culvert. The thalweg is on the west (left) side of the culvert. The main barrel is aligned with the channel direction upstream of the culvert, however the edges of the culvert section are aligned with the road surface. The upstream headwall of the culvert was not accessible at the time of our field survey.

The approach fill and culvert itself appear to be a significant blockage to flow within the floodplain of Bailey Branch Creek at discharges greater than approximately 1,300 cfs. The culvert under Broomsage Road, and the related fill, causes significant backwater, locally during high precipitation events (i.e., flooding). Because the slope of the creek is relatively steep at about 1 percent, the effect of the backwater is restricted to within a few hundred feet upstream of the culvert.

4.1.5 MODELING RESULTS

Table 2 of Appendix F shows a summary of predicted discharges for various return period events at four locations. The IDNR has previously estimated the 100-year discharge at the Broomsage Road Bridge as being 1,500 cfs, whereas the detailed HMS modeling conducted herein estimates the 100-year discharge to be about 1,580 cfs at the same location. The 100-year frequency discharge at the Broomsage Road culvert using the USGS Regression Equations was estimated to be about 1,555 cfs. These three estimates can be considered equivalent. The present estimate of the 1 percent discharge within the work area at Parcel 22 is 1580 cfs.

During an event as severe as the 1 percent event, water depths in the Parcel 22 water depths may reach nine feet above the streambed and cover the entire width of the stream valley floor to a depth of about two feet. Water velocities in the middle of the stream in this reach could average about 8 to 10 fps, with lower velocities at the perimeter of the stream channel. The average water velocity through the culvert under Broomsage Road would exceed about 7 fps. In this reach, almost all loose material would be moving, including rock up to 1-foot in diameter.

4.2 STREAM FLOW MONITORING

Stream monitoring will be conducted before, during and after remediation efforts so as to document the impact, if any, of remediation work on stream geometry within the work site, and stream flow and sediment transport in the stream immediately downstream of the work site. The monitoring will be used also to determine the degree of rehabilitation of the stream bed that may be required, if any.

Changes in stream geometry will be documented by two surveys. There will be a pre-remediation survey completed during mobilization, consisting of a survey of the creek profile at the stream centerline and a survey of the bottom-width and top-of-bank locations at about 100 ft intervals. Within the approximate 800 feet of the Parcel 22 reach, including the culvert, about 10 cross-sections will surveyed. The post-remediation survey will be done at the same locations, along the centerline of the creek and at the same cross-sections.

Recording turbidity and stream flow gages will be installed about 100 feet from the downstream limit of the work site. The gages will be installed prior to the start of remediation work. The turbidity gage will detect increases in sediment concentration in the water column. The stream flow gage, placed at the same location as the turbidity gage, will be a water level gage, which will detect and document increases in discharge caused by rainfall events. Correlation between the turbidity gage and the flow gage will be done to determine if any increase in turbidity is due to natural causes.

The turbidity and water level gages will be removed after the post-remediation survey is complete.

5.0 APPROVALS

While developing the design for this work as part of an Interim Measure associated with the RCRA Corrective Action for the Facility, CRA contacted the Louisville District office of the U.S. ACE regarding necessary approvals and approval review timeframes for the Parcel 22 work. U.S. ACE indicated that an approval will be required under Section 404 for the placement of fill within the floodplain during restoration. The approval will provide details on berm construction, excavation methods, erosion control, surface water management, and restoration. In addition, an approval from IDNR for filling in the floodplains is required. The floodplains subject to IDNR's jurisdiction are those along waterways having a drainage area of at least one square mile. The drainage area above Parcel 22 is approximately 1.6 square miles. The request for approval has been submitted for Parcel 22.

Approvals for soil erosion and stormwater control are required from IDNR, Department of Soil Conservation.

Although there are no required approvals for road use from Lawrence County or the City of Bedford, CRA will advise the County and City engineers of work progress. Any significant damage to the road system, related to the remediation, will be repaired.

6.0 REPORTING

Weekly construction meetings will be conducted at the Site during active Site operations. Anticipated participants would include the CRA oversight engineer, the contractor superintendent, and the Site Health and Safety Officer. Meetings may also include the GM Project Manager, and U.S. EPA and IDEM representatives. Minutes of the weekly meetings will be prepared by CRA and distributed to the U.S. EPA and GM within one week following each meeting.

6.1 PROGRESS REPORTS

Progress reports will be submitted monthly on the 15th day of the following month, to document the progress of the work as required under the AOC. These progress reports will be submitted until termination of the field activities. The progress reports will contain the following:

- a description of all significant developments during the reporting period;
- a description of work performed and any problems encountered;
- a summary, including daily and cumulative totals, of all material excavated, staged, and disposed during the reporting period;
- final validated 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.

6.2 OPERATION, MAINTENANCE, AND MONITORING PLANS

Consistent with the AOC, an interim Operation Maintenance and Monitoring Plan (OMMP) will be submitted within 30 business days after the completion of the work described in this Work Plan. The interim OMMP will identify the operation, maintenance, and monitoring activities necessary to ensure the long-term integrity of the work completed under this Work Plan. The interim OMMP shall be implemented pending approval of a final OMMP for the Site to be submitted as part of the Final Removal Action Construction Certification Report, described in the following section. The Final OMMP will combine the requirements of all interim OMMPs generated pursuant to the AOC.

6.3 FINAL RA CONSTRUCTION CERTIFICATION REPORT

A Final Removal Action Construction Certification Report (RA Certification Report) will be submitted to U.S. EPA for review 90 calendar days after the completion of all RA activities on the creek, receipt of all manifests and final validated analytical data, and as required by the AOC. The RA Certification Report will conform to the requirements of Section 300.165 of the NCP and will contain the following:

- a description of the nature and extent of the contamination at the Site;
- a summary of actions taken to complete the RA;
- a listing of quantities and types of materials removed off-Site for staging or disposal;
- a summary of any field observations made during sampling activities;
- a summary of the analytical results of all sampling and analyses performed including verification sampling and statistical analysis of verification sampling data;
- a listing of the ultimate destinations of the materials removed;
- copies of all material tracking forms and manifests (if required for material disposed of off-Site) for the materials removed;
- a final OMMP prepared for the Site consistent with the requirements of the AOC; and
- appendices containing relevant documentation generated during the RA.

The RA Certification Report will include the start and completion dates of total removal activity.

The RA Certification Report will include the following certification signed by a person who supervised or directed the preparation of the report:

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

7.0 PROJECT TEAM

A generalized Project Team organization chart is presented on Figure 7.1. The designated Project Coordinator designated in the AOC will coordinate all activities with the U.S. EPA, IDEM, CRA, GM, and the contractor. CRA has been retained by GM to provide oversight and third party certification that the construction activities conducted at the Site are in accordance with the Work Plan. CRA will coordinate with subcontractors and project laboratories to provide additional technical support to the Project Team during the implementation of the Work Plan. Contractors and subcontractors will be retained to perform various tasks as indicated on the project organization chart.

8.0 PROJECT SCHEDULE

A project schedule is presented on Figure 8.1. The schedule presents project tasks in a sequence that will expeditiously implement Parcel 22 RA activities. These activities will:

1) minimize the potential threat of direct human contact with hazardous substances and/or impacted soil; and

2) return the full use of the property to its owner(s).

9.0 REFERENCES

CRA, Quality Assurance Project Plan (QAPP), November 5, 2001.

Efron, B. and R.J. Tibshirani. 1998. An Introduction to Bootstrap, Chapman & Hall / CRC, Boca Raton, 1998.

Etzel, J.E., 1982, Geological History of Bedford Plant Site Area, unpublished report provided to General Motors.

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Powell, R.L., 1966, Caves, Speleology and Karst Hydrology, Reprinted from The Indiana Sesquicentennial Volume NATURAL FEATURES OF INDIANA, Indiana Academy of Science, State Library, Indianapolis, Indiana.

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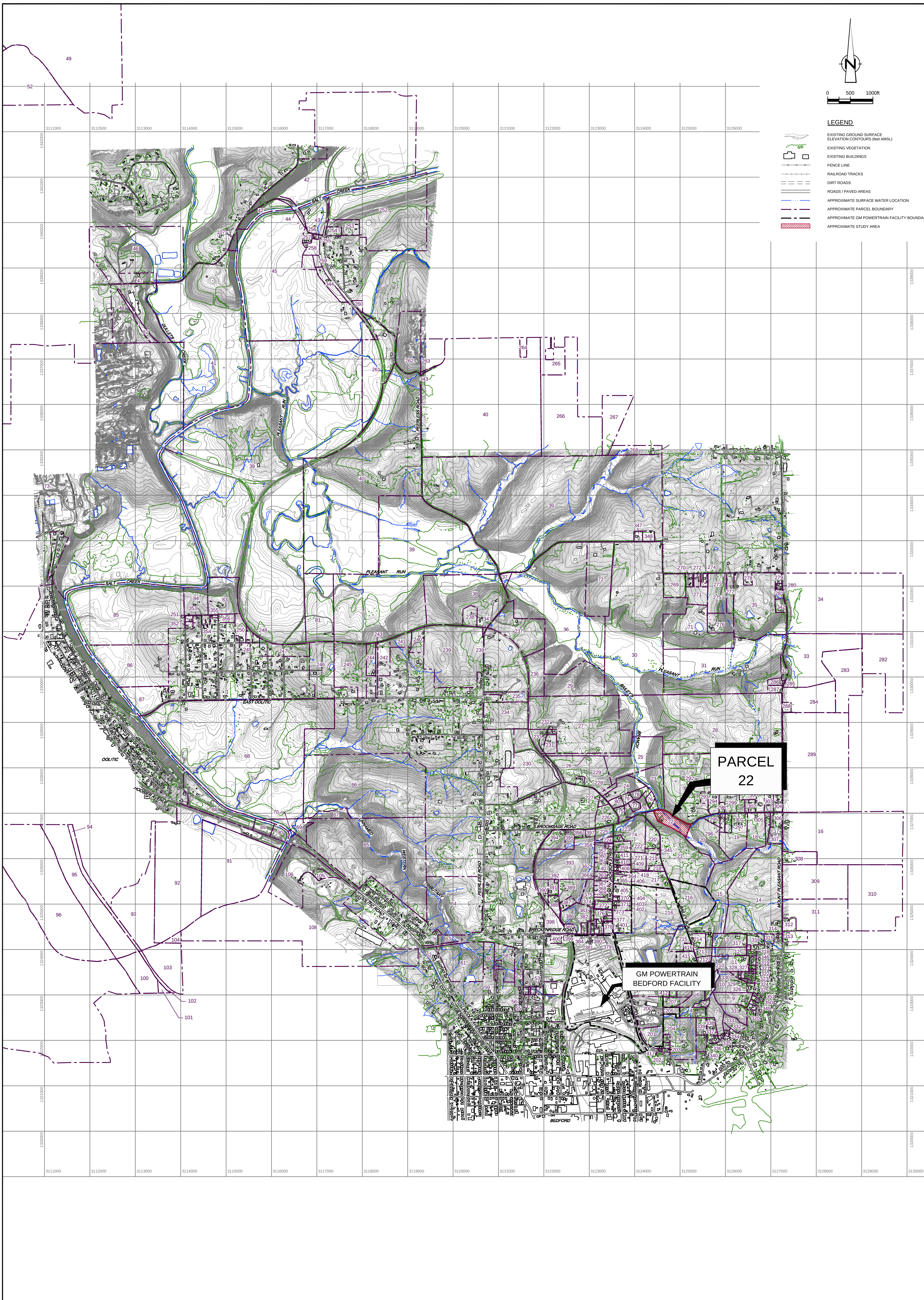
U.S. Environmental Protection Agency (U.S. EPA). 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10. December.



Nº	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

GM POWERTRAIN
BEDFORD PLANT

REMOVAL ACTION WORK PLAN

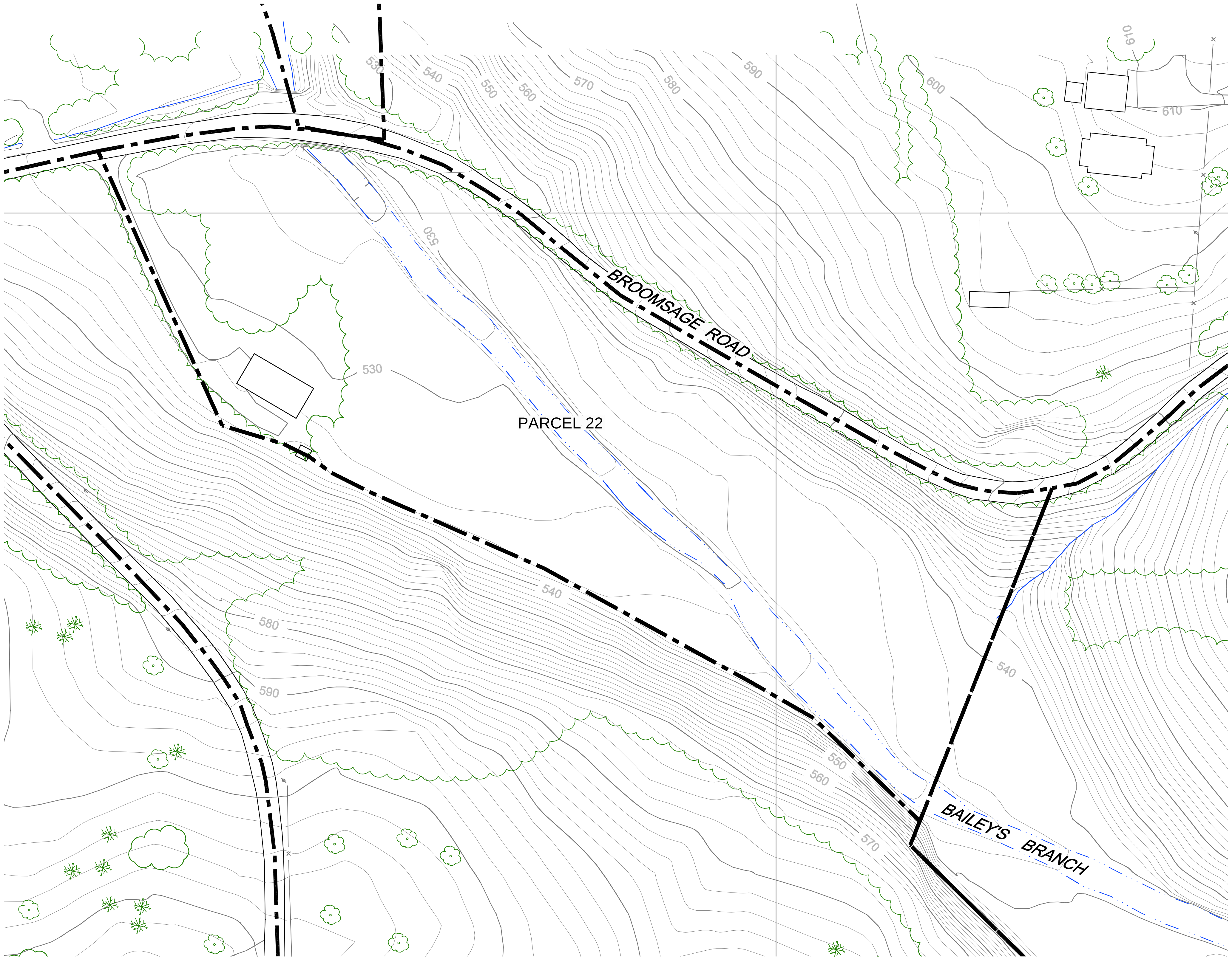
SITE LOCATION

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J. McGUIGAN	J. DANIEL	JUNE 20003	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
AS SHOWN	13968-00	018	figure 1.1

13968-00(018)GN-WA016 JUN 20/2003



N

0 50 100ft

LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE PARCEL BOUNDARY

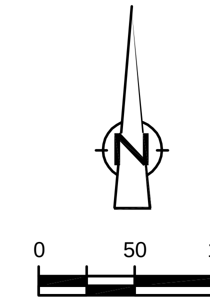
NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

figure 1.2

SITE PLAN
PARCEL 22
REMOVAL ACTION WORK PLAN
Bedford, Indiana

13968-00(018)GN-WA001 JUN 20/2003



LEGEND

- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE PARCEL BOUNDARY
- ESTIMATED 100 YEAR FLOODWAY

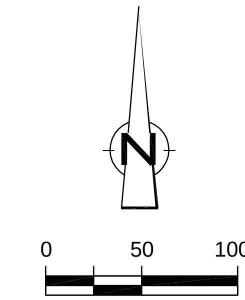
NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

figure 1.3

AERIAL PHOTOGRAPH
PARCEL 22
REMOVAL ACTION WORK PLAN
Bedford, Indiana

13968-00(018)GN-WA020 JUN 20/2003



LEGEND

EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)

EXISTING VEGETATION

EXISTING BUILDINGS

FENCE LINE

RAILROAD TRACKS

DIRT ROADS

ROADS / PAVED AREAS

APPROXIMATE SURFACE WATER LOCATION

APPROXIMATE PARCEL BOUNDARY

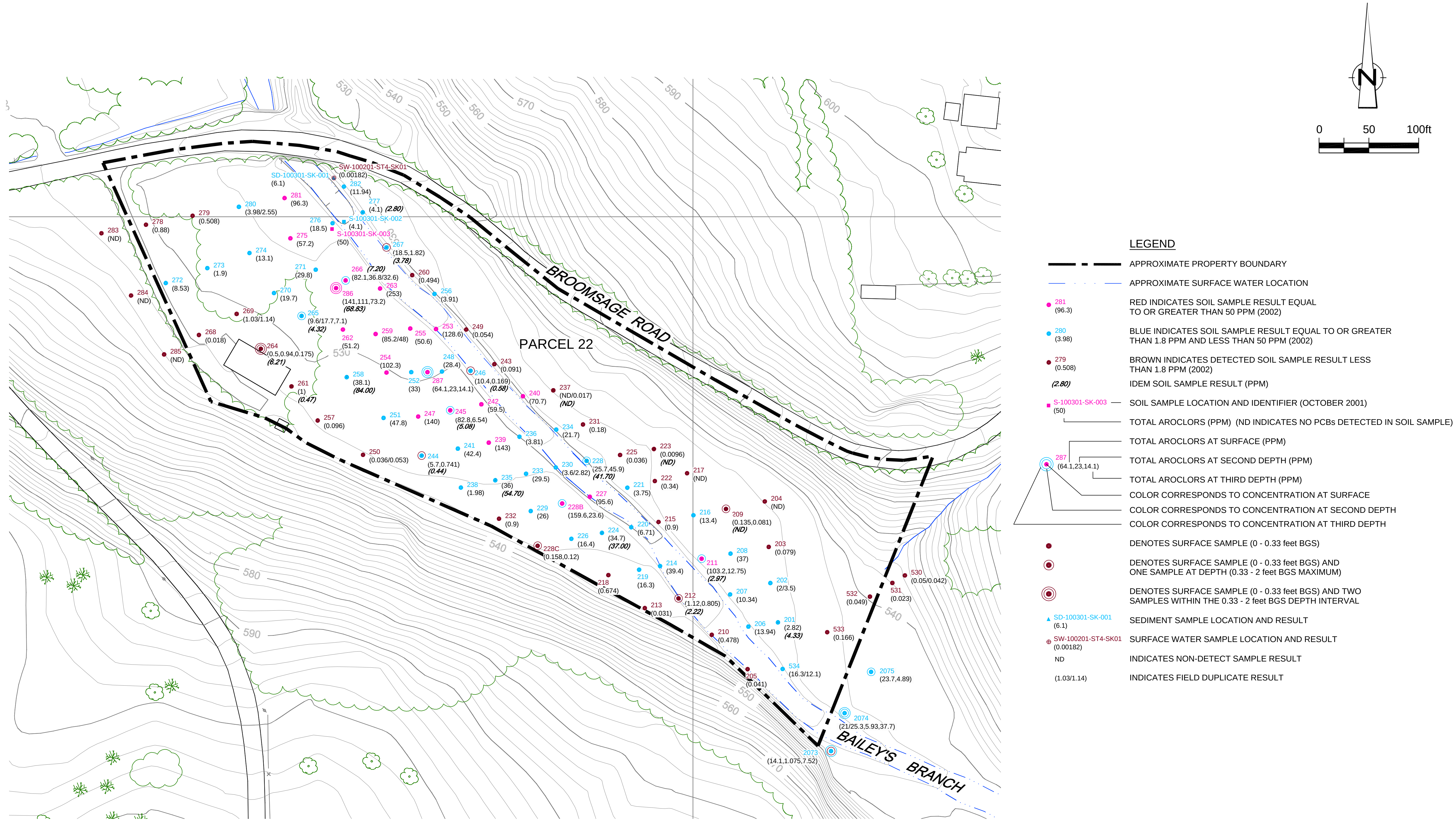
SOIL SAMPLE LOCATION (2002)

NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

figure 2.1

SOIL SAMPLE LOCATIONS
PARCEL 22
REMOVAL ACTION WORK PLAN
Bedford, Indiana

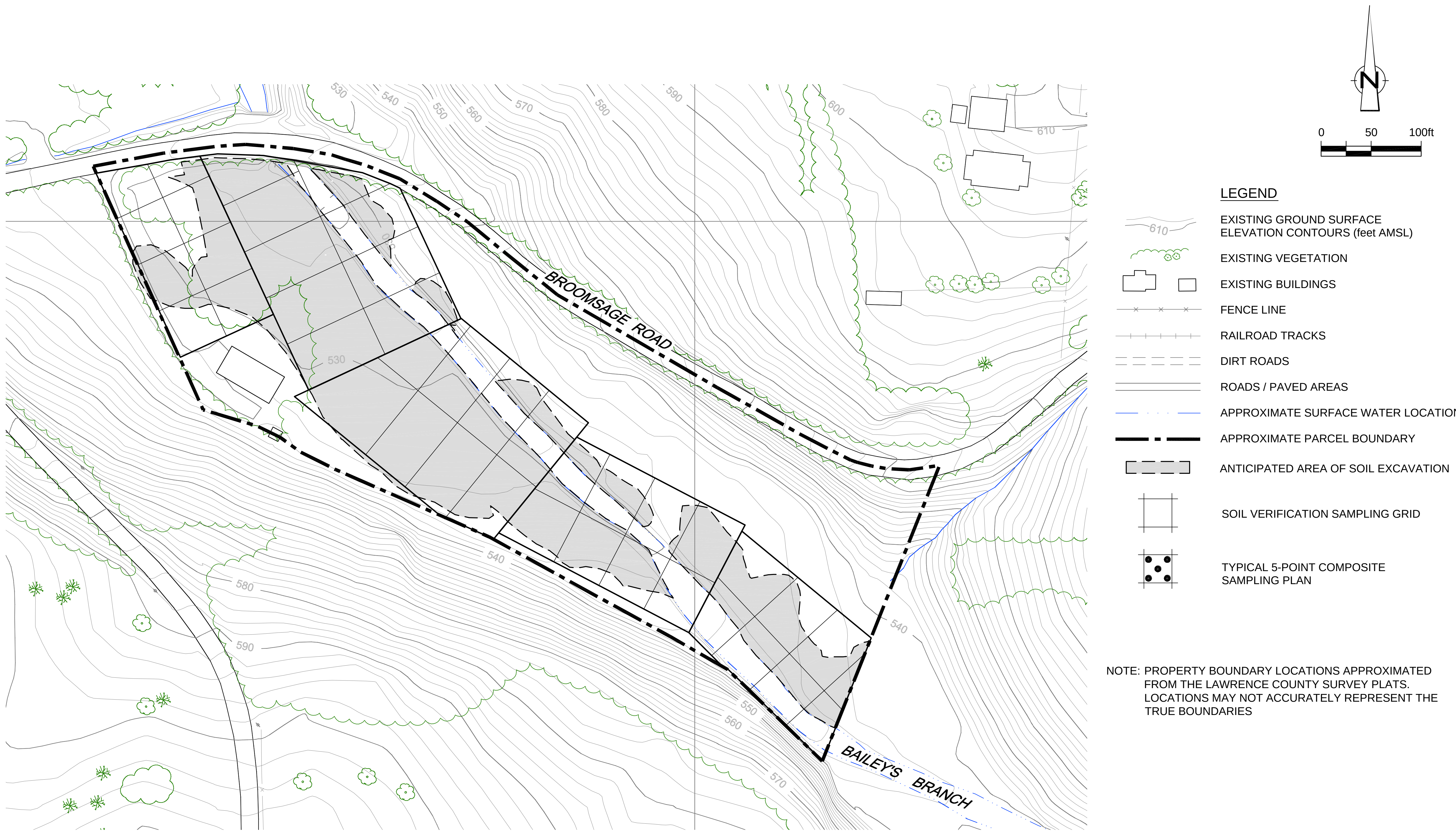


NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES.

figure 2.2

TOTAL PCB CONCENTRATIONS IN SOIL SAMPLES
PARCEL 22
REMOVAL ACTION WORK PLAN
Bedford, Indiana

13968-00(018)GN-WA017 JUN 20/2003



NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

SOURCE: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

figure 3.1

SOIL VERIFICATION SAMPLING GRID
PARCEL 22
REMOVAL ACTION WORK PLAN
Bedford, Indiana

13968-00(018)GN-WA030 JUN 20/2003

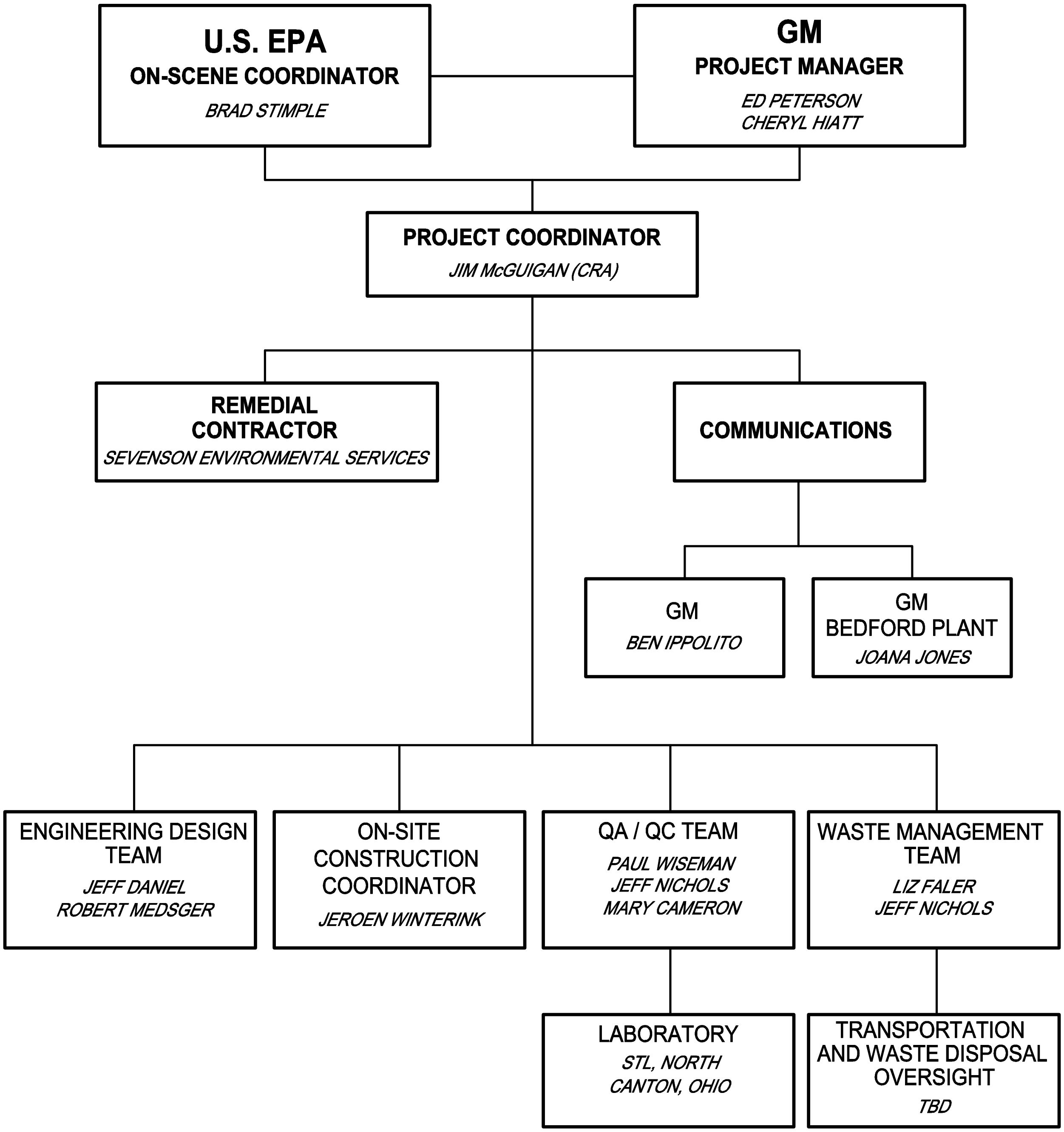
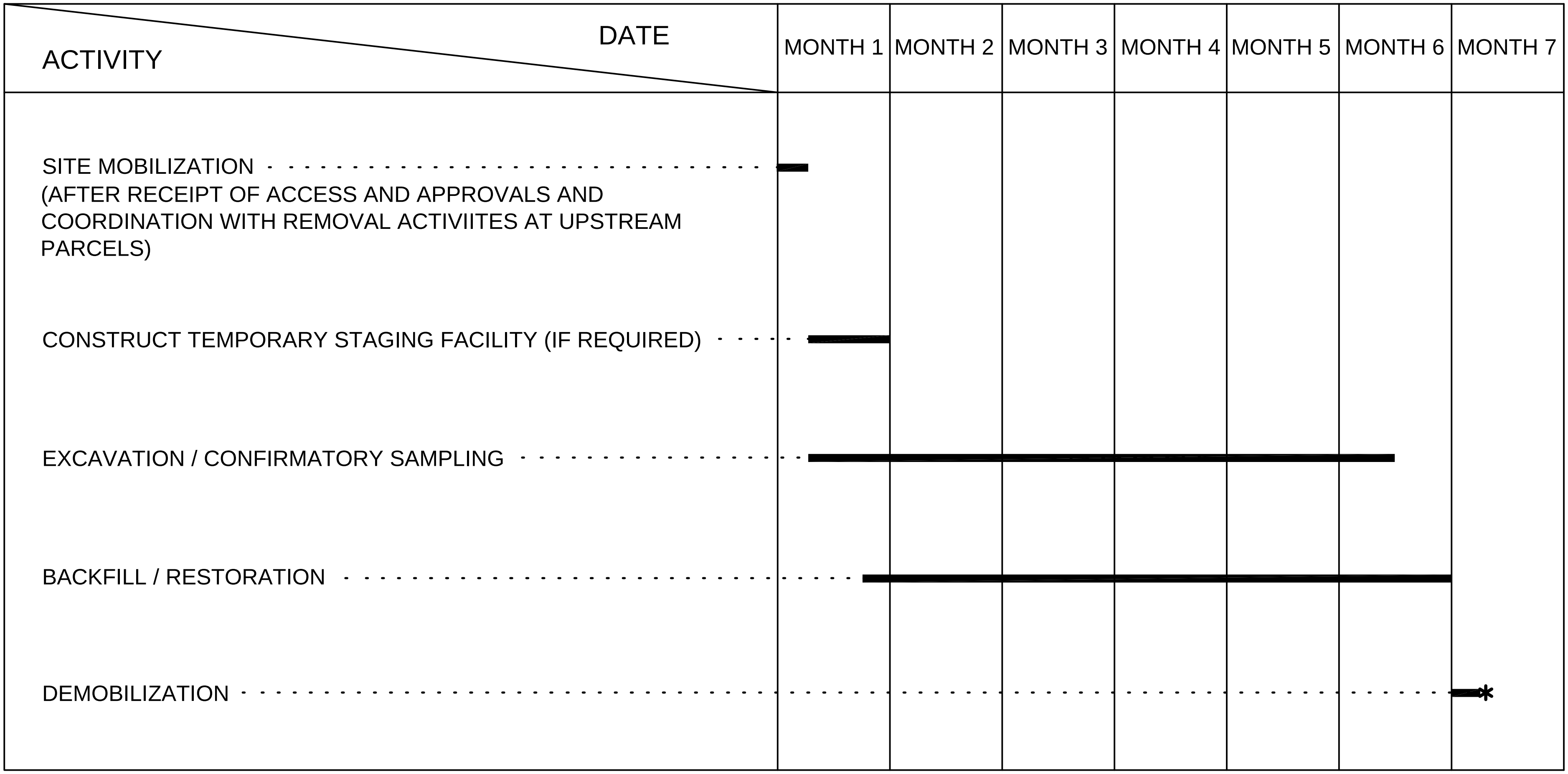


figure 7.1

PROJECT TEAM ORGANIZATION
PARCEL 22
REMOVAL ACTION WORK PLAN
Bedford, Indiana

13968-00(018)GN-WA029 JUN 20/2003



LEGEND

▬ CONTINUOUS ACTIVITY

* MAJOR MILESTONE

NOTES

SCHEDULE FOR IMPLEMENTATION AND COMPLETION IS DEPENDENT UPON THE FOLLOWING FACTORS:

a) OBTAINING ACCESS FROM PROPERTY OWNERS (INCLUDING RELOCATION, AS NEEDED);
b) OBTAINING APPROVAL/CONCURRENCE FROM U.S. EPA/IDEM ON APPROACH FOR AFFECTED PARCELS;
c) OBTAINING APPROVALS FROM IDEM/IDRN/USACOE FOR CONSTRUCTION ACTIVITIES WITHIN WETLANDS AND FLOOD PLAINS, NPDES DISCHARGES, AND AIR EMISSIONS;
d) OBTAINING OTHER LOCAL, STATE, AND FEDERAL APPROVALS (e.g. SOIL EROSION CONTROL);
e) OBTAINING CONCURRENCE FROM USFWS RELATED TO "INDIANA BAT" HABITAT ISSUES WITHIN THE AFFECTED AREAS;
f) WEATHER CONDITIONS (e.g. DRY VS. WET WEATHER, FLOODING, ETC.);
g) RESTORATION OF REMEDIATED PROPERTIES MAY CONTINUE BEYOND THE REFERENCED SCHEDULE, AS REQUIRED; AND
h) NEW INFORMATION WHICH WOULD SUBSTANTIVELY AFFECT THE WORK.

figure 8.1

PROJECT SCHEDULE
PARCEL 22
REMOVAL ACTION WORK PLAN
Bedford, Indiana

13968-00(018)GN-WA019 MAY 11/2003

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***201***	***202***	***202***	***203***	***204***	***205***	***206***
Sample ID:		***S-22-011402-LM-201***	***S-22-011402-LM-202***	***S-22-011402-LM-202A***	***S-22-011402-LM-203***	***S-22-011402-LM-204***	***S-22-011402-LM-205***	***S-22-011402-LM-206***
Sample Date:		***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
				dupl of S-22-011402-LM-202				
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (430)	ND (460)	ND (480)	ND (46)	ND (44)	ND (50)	ND (830)
Aroclor-1221 (PCB-1221)	µg/kg	ND (430)	ND (460)	ND (480)	ND (46)	ND (44)	ND (50)	ND (830)
Aroclor-1232 (PCB-1232)	µg/kg	ND (430)	ND (460)	ND (480)	ND (46)	ND (44)	ND (50)	ND (830)
Aroclor-1242 (PCB-1242)	µg/kg	ND (430)	ND (460)	ND (480)	ND (46)	ND (44)	ND (50)	ND (830)
Aroclor-1248 (PCB-1248)	µg/kg	2300	1800	3500	79	ND (44)	41 J	13000
Aroclor-1254 (PCB-1254)	µg/kg	ND (430)	ND (460)	ND (480)	ND (46)	ND (44)	ND (50)	ND (830)
Aroclor-1260 (PCB-1260)	µg/kg	520	200 J	ND (480)	ND (46)	ND (44)	ND (50)	940
Sum of Detected PCBs (ND=0)	ug/Kg	2,820	2,000 J	3,500	79	0	41 J	13,940
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***207***	***208***	***209***	***209***	***210***	***211***	***211***
Sample ID:		***S-22-011402-LM-207***	***S-22-011402-LM-208***	***S-22-011402-LM-209***	***S-22-011702-LM-209A***	***S-22-011402-LM-210***	***S-22-011402-LM-211***	***S-22-011702-LM-211A***
Sample Date:		***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/17/2002***	***1/14/2002***	***1/14/2002***	***1/17/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0.33-2)***	***(0-0.33)***	***(0-0.33)***	***(0.33-2)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (820)	ND (2400)	ND (44)	ND (49)	ND (100)	ND (820)	ND (8700)
Aroclor-1221 (PCB-1221)	µg/kg	ND (820)	ND (2400)	ND (44)	ND (49)	ND (100)	ND (820)	ND (8700)
Aroclor-1232 (PCB-1232)	µg/kg	ND (820)	ND (2400)	ND (44)	ND (49)	ND (100)	ND (820)	ND (8700)
Aroclor-1242 (PCB-1242)	µg/kg	ND (820)	ND (2400)	ND (44)	ND (49)	ND (100)	ND (820)	ND (8700)
Aroclor-1248 (PCB-1248)	µg/kg	9500	37000	81	110	410	12000	96000
Aroclor-1254 (PCB-1254)	µg/kg	ND (820)	ND (2400)	ND (44)	ND (49)	ND (100)	ND (820)	ND (8700)
Aroclor-1260 (PCB-1260)	µg/kg	840	ND (2400)	ND (44)	25 J	68 J	750 J	7200 J
Sum of Detected PCBs (ND=0)	ug/Kg	10,340	37,000	81	135 J	478 J	12,750 J	103,200 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***212***	***212***	***213***	***214***	***215***	***216***	***217***
Sample ID:		***S-22-011402-LM-212***	***S-22-011702-LM-212A***	***S-22-011402-LM-213***	***S-22-011402-LM-214***	***S-22-011402-LM-215***	***S-22-011402-LM-216***	***S-22-011402-LM-217***
Sample Date:		***1/14/2002***	***1/17/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***
Sample Depth:		***(0.33-2)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (200)	ND (210)	ND (47)	ND (4300)	ND (200)	ND (910)	ND (45)
Aroclor-1221 (PCB-1221)	µg/kg	ND (200)	ND (210)	ND (47)	ND (4300)	ND (200)	ND (910)	ND (45)
Aroclor-1232 (PCB-1232)	µg/kg	ND (200)	ND (210)	ND (47)	ND (4300)	ND (200)	ND (910)	ND (45)
Aroclor-1242 (PCB-1242)	µg/kg	ND (200)	ND (210)	ND (47)	ND (4300)	ND (200)	ND (910)	ND (45)
Aroclor-1248 (PCB-1248)	µg/kg	720	1000	31 J	36000	760	12000	ND (45)
Aroclor-1254 (PCB-1254)	µg/kg	ND (200)	ND (210)	ND (47)	ND (4300)	ND (200)	ND (910)	ND (45)
Aroclor-1260 (PCB-1260)	µg/kg	85 J	120 J	ND (47)	3400 J	140 J	1400	ND (45)
Sum of Detected PCBs (ND=0)	ug/Kg	805 J	1,120 J	31 J	39,400 J	900 J	13,400	0
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***218***	***219***	***220***	***221***	***222***	***223***	***224***
Sample ID:		***S-22-011402-LM-218***	***S-22-011402-LM-219***	***S-22-011402-LM-220***	***S-22-011402-LM-221***	***S-22-011402-LM-222***	***S-22-011402-LM-223***	***S-22-011402-LM-224***
Sample Date:		***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (210)	ND (2200)	ND (820)	ND (460)	ND (240)	ND (45)	ND (4300)
Aroclor-1221 (PCB-1221)	µg/kg	ND (210)	ND (2200)	ND (820)	ND (460)	ND (240)	ND (45)	ND (4300)
Aroclor-1232 (PCB-1232)	µg/kg	ND (210)	ND (2200)	ND (820)	ND (460)	ND (240)	ND (45)	ND (4300)
Aroclor-1242 (PCB-1242)	µg/kg	ND (210)	ND (2200)	ND (820)	ND (460)	ND (240)	ND (45)	ND (4300)
Aroclor-1248 (PCB-1248)	µg/kg	590	15000	5900	3400	ND (240)	9.6 J	32000
Aroclor-1254 (PCB-1254)	µg/kg	ND (210)	ND (2200)	ND (820)	ND (460)	340	ND (45)	ND (4300)
Aroclor-1260 (PCB-1260)	µg/kg	84 J	1300 J	810 J	350 J	ND (240)	ND (45)	2700 J
Sum of Detected PCBs (ND=0)	ug/Kg	674 J	16,300 J	6,710 J	3,750 J	340	9.6 J	34,700 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***225***	***226***	***227***	***228***	***228***	***228B***	***228B***
Sample ID:		***S-22-011402-LM-225***	***S-22-011402-LM-226***	***S-22-011402-LM-227***	***S-22-011702-LM-228D***	***S-22-011702-LM-228E***	***S-22-011402-LM-228B***	***S-22-011702-LM-228BA***
Sample Date:		***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/17/2002***	***1/17/2002***	***1/14/2002***	***1/17/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0.33-2)***	***(0.33-2)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (49)	ND (2300)	ND (8300)	ND (2100)	ND (4100)	ND (4000)	ND (21000)
Aroclor-1221 (PCB-1221)	µg/kg	ND (49)	ND (2300)	ND (8300)	ND (2100)	ND (4100)	ND (4000)	ND (21000)
Aroclor-1232 (PCB-1232)	µg/kg	ND (49)	ND (2300)	ND (8300)	ND (2100)	ND (4100)	ND (4000)	ND (21000)
Aroclor-1242 (PCB-1242)	µg/kg	ND (49)	ND (2300)	ND (8300)	ND (2100)	ND (4100)	ND (4000)	ND (21000)
Aroclor-1248 (PCB-1248)	µg/kg	36 J	15000	88000	23000	42000	22000	150000
Aroclor-1254 (PCB-1254)	µg/kg	ND (49)	ND (2300)	ND (8300)	ND (2100)	ND (4100)	ND (4000)	ND (21000)
Aroclor-1260 (PCB-1260)	µg/kg	ND (49)	1400 J	7600 J	2700	3900 J	1600 J	9600 J
Sum of Detected PCBs (ND=0)	ug/Kg	36 J	16,400 J	95,600 J	25,700	45,900 J	23,600 J	159,600 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***228C***	***228C***	***229***	***230***	***230***	***231***	***232***
Sample ID:		***S-22-011402-LM-228C***	***S-22-011702-LM-228CA***	***S-22-011402-LM-229***	***S-22-011402-LM-230***	***S-22-011402-LM-230A***	***S-22-011402-LM-231***	***S-22-011402-LM-232***
Sample Date:		***1/14/2002***	***1/17/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***
Sample Depth:		***(0.33-2)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
						dupl of S-22-011402-LM-230		
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (41)	ND (50)	ND (2100)	ND (410)	ND (410)	ND (46)	ND (410)
Aroclor-1221 (PCB-1221)	µg/kg	ND (41)	ND (50)	ND (2100)	ND (410)	ND (410)	ND (46)	ND (410)
Aroclor-1232 (PCB-1232)	µg/kg	ND (41)	ND (50)	ND (2100)	ND (410)	ND (410)	ND (46)	ND (410)
Aroclor-1242 (PCB-1242)	µg/kg	ND (41)	ND (50)	ND (2100)	ND (410)	ND (410)	ND (46)	ND (410)
Aroclor-1248 (PCB-1248)	µg/kg	120	120	24000	3200	2500	180	770
Aroclor-1254 (PCB-1254)	µg/kg	ND (41)	ND (50)	ND (2100)	ND (410)	ND (410)	ND (46)	ND (410)
Aroclor-1260 (PCB-1260)	µg/kg	ND (41)	38 J	2000 J	400 J	320 J	ND (46)	130 J
Sum of Detected PCBs (ND=0)	ug/Kg	120	158 J	26,000 J	3,600 J	2,820 J	180	900 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***233***	***234***	***235***	***236***	***237***	***237***	***238***
Sample ID:		***S-22-011402-LM-233***	***S-22-011402-LM-234***	***S-22-011402-LM-235***	***S-22-011402-LM-236***	***S-22-011402-LM-237***	***S-22-011402-LM-237A***	***S-22-011402-LM-238***
Sample Date:		***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
							dupl of S-22-011402-LM-237	
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (2300)	ND (2100)	ND (4500)	ND (380)	ND (47)	ND (46)	ND (430)
Aroclor-1221 (PCB-1221)	µg/kg	ND (2300)	ND (2100)	ND (4500)	ND (380)	ND (47)	ND (46)	ND (430)
Aroclor-1232 (PCB-1232)	µg/kg	ND (2300)	ND (2100)	ND (4500)	ND (380)	ND (47)	ND (46)	ND (430)
Aroclor-1242 (PCB-1242)	µg/kg	ND (2300)	ND (2100)	ND (4500)	ND (380)	ND (47)	ND (46)	ND (430)
Aroclor-1248 (PCB-1248)	µg/kg	27000	19000	33000	3400	ND (47)	17 J	1700
Aroclor-1254 (PCB-1254)	µg/kg	ND (2300)	ND (2100)	ND (4500)	ND (380)	ND (47)	ND (46)	ND (430)
Aroclor-1260 (PCB-1260)	µg/kg	2500	2700	3000 J	410	ND (47)	ND (46)	280 J
Sum of Detected PCBs (ND=0)	ug/Kg	29,500	21,700	36,000 J	3,810	0	17 J	1,980 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***239***	***240***	***241***	***242***	***243***	***244***	***244***
Sample ID:		***S-22-011402-LM-239***	***S-22-011402-LM-240***	***S-22-011402-LM-241***	***S-22-011402-LM-242***	***S-22-011402-LM-243***	***S-22-011402-LM-244***	***S-22-011702-LM-244A***
Sample Date:		***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/17/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0.33-2)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (22000)	ND (4200)	ND (4300)	ND (4200)	ND (41)	ND (83)	ND (440)
Aroclor-1221 (PCB-1221)	µg/kg	ND (22000)	ND (4200)	ND (4300)	ND (4200)	ND (41)	ND (83)	ND (440)
Aroclor-1232 (PCB-1232)	µg/kg	ND (22000)	ND (4200)	ND (4300)	ND (4200)	ND (41)	ND (83)	ND (440)
Aroclor-1242 (PCB-1242)	µg/kg	ND (22000)	ND (4200)	ND (4300)	ND (4200)	ND (41)	ND (83)	ND (440)
Aroclor-1248 (PCB-1248)	µg/kg	130000	66000	37000	54000	91	650	5000
Aroclor-1254 (PCB-1254)	µg/kg	ND (22000)	ND (4200)	ND (4300)	ND (4200)	ND (41)	ND (83)	ND (440)
Aroclor-1260 (PCB-1260)	µg/kg	13000 J	4700	5400	5500	ND (41)	91	700
Sum of Detected PCBs (ND=0)	ug/Kg	143,000 J	70,700	42,400	59,500	91	741	5,700
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		*245*	*245*	*246*	*246*	*247*	*248*	*249*
Sample ID:		*S-22-011402-LM-245*	*S-22-011702-LM-245A*	*S-22-011402-LM-246*	*S-22-011702-LM-246A*	*S-22-011402-LM-247*	*S-22-011402-LM-248*	*S-22-011402-LM-249*
Sample Date:		*1/14/2002*	*1/17/2002*	*1/14/2002*	*1/17/2002*	*1/14/2002*	*1/14/2002*	*1/14/2002*
Sample Depth:		*(0.33-2)*	*(0-0.33)*	*(0.33-2)*	*(0-0.33)*	*(0-0.33)*	*(0-0.33)*	*(0-0.33)*
Parameter	*Unit*							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (800)	ND (5000)	ND (42)	ND (850)	ND (9300)	ND (4200)	ND (42)
Aroclor-1221 (PCB-1221)	µg/kg	ND (800)	ND (5000)	ND (42)	ND (850)	ND (9300)	ND (4200)	ND (42)
Aroclor-1232 (PCB-1232)	µg/kg	ND (800)	ND (5000)	ND (42)	ND (850)	ND (9300)	ND (4200)	ND (42)
Aroclor-1242 (PCB-1242)	µg/kg	ND (800)	ND (5000)	ND (42)	ND (850)	ND (9300)	ND (4200)	ND (42)
Aroclor-1248 (PCB-1248)	µg/kg	5800	76000	140	9000	130000	25000	54
Aroclor-1254 (PCB-1254)	µg/kg	ND (800)	ND (5000)	ND (42)	ND (850)	ND (9300)	ND (4200)	ND (42)
Aroclor-1260 (PCB-1260)	µg/kg	740 J	6800	29 J	1400	10000	3400 J	ND (42)
Sum of Detected PCBs (ND=0)	ug/Kg	6,540 J	82,800	169 J	10,400	140,000	28,400 J	54
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		*250*	*250*	*251*	*252*	*253*	*254*	*255*
Sample ID:		*S-22-011402-LM-250*	*S-22-011402-LM-250A*	*S-22-011402-LM-251*	*S-22-011402-LM-252*	*S-22-011402-LM-253*	*S-22-011402-LM-254*	*S-22-011402-LM-255*
Sample Date:		*1/14/2002*	*1/14/2002*	*1/14/2002*	*1/14/2002*	*1/14/2002*	*1/14/2002*	*1/14/2002*
Sample Depth:		*(0-0.33)*	*(0-0.33)*	*(0-0.33)*	*(0-0.33)*	*(0-0.33)*	*(0-0.33)*	*(0-0.33)*
			dupl of S-22-011402-LM-250					
Parameter	*Unit*							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (42)	ND (42)	ND (4800)	ND (4200)	ND (21000)	ND (8900)	ND (4000)
Aroclor-1221 (PCB-1221)	µg/kg	ND (42)	ND (42)	ND (4800)	ND (4200)	ND (21000)	ND (8900)	ND (4000)
Aroclor-1232 (PCB-1232)	µg/kg	ND (42)	ND (42)	ND (4800)	ND (4200)	ND (21000)	ND (8900)	ND (4000)
Aroclor-1242 (PCB-1242)	µg/kg	ND (42)	ND (42)	ND (4800)	ND (4200)	ND (21000)	ND (8900)	ND (4000)
Aroclor-1248 (PCB-1248)	µg/kg	36 J	41 J	43000	30000	120000	95000	47000
Aroclor-1254 (PCB-1254)	µg/kg	ND (42)	ND (42)	ND (4800)	ND (4200)	ND (21000)	ND (8900)	ND (4000)
Aroclor-1260 (PCB-1260)	µg/kg	ND (42)	12 J	4800	3000 J	8600 J	7300 J	3600 J
Sum of Detected PCBs (ND=0)	ug/Kg	36 J	53 J	47,800	33,000 J	128,600 J	102,300 J	50,600 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:
J = The reported laboratory result is qualified as an estimated value
* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***256***	***257***	***258***	***259***	***259***	***260***	***261***
Sample ID:		***S-22-011102-LM-256***	***S-22-011102-LM-257***	***S-22-011102-LM-258***	***S-22-011102-LM-259***	***S-22-011102-LM-259A***	***S-22-011102-LM-260***	***S-22-011102-LM-261***
Sample Date:		***1/11/2002***	***1/11/2002***	***1/11/2002***	***1/11/2002***	***1/11/2002***	***1/11/2002***	***1/11/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
						dupl of S-22-011102-LM-259		
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (480)	ND (47)	ND (4900)	ND (4300)	ND (4400)	ND (88)	ND (91)
Aroclor-1221 (PCB-1221)	µg/kg	ND (480)	ND (47)	ND (4900)	ND (4300)	ND (4400)	ND (88)	ND (91)
Aroclor-1232 (PCB-1232)	µg/kg	ND (480)	ND (47)	ND (4900)	ND (4300)	ND (4400)	ND (88)	ND (91)
Aroclor-1242 (PCB-1242)	µg/kg	ND (480)	ND (47)	ND (4900)	ND (4300)	ND (4400)	ND (88)	1000
Aroclor-1248 (PCB-1248)	µg/kg	3500	96	34000	80000	45000	430	ND (91)
Aroclor-1254 (PCB-1254)	µg/kg	ND (480)	ND (47)	ND (4900)	ND (4300)	ND (4400)	ND (88)	ND (91)
Aroclor-1260 (PCB-1260)	µg/kg	410 J	ND (47)	4100 J	5200	3000 J	64 J	ND (91)
Sum of Detected PCBs (ND=0)	ug/Kg	3,910 J	96	38,100 J	85,200	48,000 J	494 J	1,000
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***262***	***263***	***264***	***264***	***264***	***265***	***265***
Sample ID:		***S-22-011102-LM-262***	***S-22-011102-LM-263***	***S-22-011102-LM-264***	***S-22-011402-LM-264A***	***S-22-011402-LM-264B***	***S-22-011102-LM-265***	***S-22-011702-LM-265A***
Sample Date:		***1/11/2002***	***1/11/2002***	***1/11/2002***	***1/14/2002***	***1/14/2002***	***1/11/2002***	***1/17/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0.33-0.67)***	***(0.67-1)***	***(0.33-2)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (4200)	ND (24000)	ND (85)	ND (200)	ND (42)	ND (810)	ND (860)
Aroclor-1221 (PCB-1221)	µg/kg	ND (4200)	ND (24000)	ND (85)	ND (200)	ND (42)	ND (810)	ND (860)
Aroclor-1232 (PCB-1232)	µg/kg	ND (4200)	ND (24000)	ND (85)	ND (200)	ND (42)	ND (810)	ND (860)
Aroclor-1242 (PCB-1242)	µg/kg	ND (4200)	ND (24000)	ND (85)	ND (200)	ND (42)	ND (810)	ND (860)
Aroclor-1248 (PCB-1248)	µg/kg	47000	240000	500	830	150	7100	8700
Aroclor-1254 (PCB-1254)	µg/kg	ND (4200)	ND (24000)	ND (85)	ND (200)	ND (42)	ND (810)	ND (860)
Aroclor-1260 (PCB-1260)	µg/kg	4200	13000 J	ND (85)	110 J	25 J	ND (810)	900
Sum of Detected PCBs (ND=0)	ug/Kg	51,200	253,000 J	500	940 J	175 J	7,100	9,600
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***265***	***266***	***266***	***266***	***267***	***267***
Sample ID:		***S-22-011702-LM-265B***	***S-22-011102-LM-266***	***S-22-011102-LM-266A***	***S-22-011702-LM-266B***	***S-22-011102-LM-267***	***S-22-011702-LM-267A***
Sample Date:		***1/17/2002***	***1/11/2002***	***1/11/2002***	***1/17/2002***	***1/11/2002***	***1/17/2002***
Sample Depth:		***(0-0.33)***	***(0.33-2)***	***(0.33-2)***	***(0-0.33)***	***(0.33-2)***	***(0-0.33)***
		dupl of S-22-011702-LM-265A		***dupl of S-22-011102-LM-266***			
Parameter	***Unit***						
PCBs							
Aroclor-1016 (PCB-1016)	µg/kg	ND (2100)	ND (3900)	ND (3700)	ND (8800)	ND (420)	ND (2200)
Aroclor-1221 (PCB-1221)	µg/kg	ND (2100)	ND (3900)	ND (3700)	ND (8800)	ND (420)	ND (2200)
Aroclor-1232 (PCB-1232)	µg/kg	ND (2100)	ND (3900)	ND (3700)	ND (8800)	ND (420)	ND (2200)
Aroclor-1242 (PCB-1242)	µg/kg	ND (2100)	ND (3900)	ND (3700)	ND (8800)	ND (420)	ND (2200)
Aroclor-1248 (PCB-1248)	µg/kg	16000	35000	31000	76000	1600	16000
Aroclor-1254 (PCB-1254)	µg/kg	ND (2100)	ND (3900)	ND (3700)	ND (8800)	ND (420)	ND (2200)
Aroclor-1260 (PCB-1260)	µg/kg	1700 J	1800 J	1600 J	6100 J	220 J	2500
Sum of Detected PCBs (ND=0)	ug/Kg	17,700 J	36,800 J	32,600 J	82,100 J	1,820 J	18,500
PCBs (dissolved)							
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L						

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***268***	***269***	***269***	***270***	***271***	***272***	***273***
Sample ID:		***S-22-011002-LM-268***	***S-22-011002-LM-269***	***S-22-011002-LM-269A***	***S-22-011002-LM-270***	***S-22-011002-LM-271***	***S-22-011002-LM-272***	***S-22-011002-LM-273***
Sample Date:		***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
				dupl of S-22-011002-LM-269				
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (46)	ND (92)	ND (230)	ND (4400)	ND (2200)	ND (930)	ND (420)
Aroclor-1221 (PCB-1221)	µg/kg	ND (46)	ND (92)	ND (230)	ND (4400)	ND (2200)	ND (930)	ND (420)
Aroclor-1232 (PCB-1232)	µg/kg	ND (46)	ND (92)	ND (230)	ND (4400)	ND (2200)	ND (930)	ND (420)
Aroclor-1242 (PCB-1242)	µg/kg	ND (46)	ND (92)	ND (230)	ND (4400)	ND (2200)	ND (930)	ND (420)
Aroclor-1248 (PCB-1248)	µg/kg	18 J	910	1000	18000	27000	7800	1700
Aroclor-1254 (PCB-1254)	µg/kg	ND (46)	ND (92)	ND (230)	ND (4400)	ND (2200)	ND (930)	ND (420)
Aroclor-1260 (PCB-1260)	µg/kg	ND (46)	120	140 J	1700 J	2800	730 J	200 J
Sum of Detected PCBs (ND=0)	ug/Kg	18 J	1,030	1,140 J	19,700 J	29,800	8,530 J	1,900 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***274***	***275***	***276***	***277***	***277***	***278***	***279***
Sample ID:		***S-22-011002-LM-274***	***S-22-011002-LM-275***	***S-22-011002-LM-276***	***S-22-011002-LM-277***	***S-22-011102-LM-277***	***S-22-011002-LM-278***	***S-22-011002-LM-279***
Sample Date:		***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/11/2002***	***1/10/2002***	***1/10/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (830)	ND (4800)	ND (2300)	ND (830)	ND (2000)	ND (230)	ND (43)
Aroclor-1221 (PCB-1221)	µg/kg	ND (830)	ND (4800)	ND (2300)	ND (830)	ND (2000)	ND (230)	ND (43)
Aroclor-1232 (PCB-1232)	µg/kg	ND (830)	ND (4800)	ND (2300)	ND (830)	ND (2000)	ND (230)	ND (43)
Aroclor-1242 (PCB-1242)	µg/kg	ND (830)	ND (4800)	ND (2300)	ND (830)	ND (2000)	ND (230)	ND (43)
Aroclor-1248 (PCB-1248)	µg/kg	12000	53000	17000	3600	5900	770	450
Aroclor-1254 (PCB-1254)	µg/kg	ND (830)	ND (4800)	ND (2300)	ND (830)	ND (2000)	ND (230)	ND (43)
Aroclor-1260 (PCB-1260)	µg/kg	1100	4200 J	1500 J	500 J	520 J	110 J	58
Sum of Detected PCBs (ND=0)	ug/Kg	13,100	57,200 J	18,500 J	4,100 J	6,420 J	880 J	508
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

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TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***280***	***280***	***281***	***282***	***283***	***284***	***285***
Sample ID:		***S-22-011002-LM-280***	***S-22-011002-LM-280A***	***S-22-011002-LM-281***	***S-22-011002-LM-282***	***S-22-011002-LM-283***	***S-22-011002-LM-284***	***S-22-011002-LM-285***
Sample Date:		***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***	***1/10/2002***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***
			dupl of S-22-011002-LM-280					
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (420)	ND (420)	ND (22000)	ND (2200)	ND (44)	ND (44)	ND (46)
Aroclor-1221 (PCB-1221)	µg/kg	ND (420)	ND (420)	ND (22000)	ND (2200)	ND (44)	ND (44)	ND (46)
Aroclor-1232 (PCB-1232)	µg/kg	ND (420)	ND (420)	ND (22000)	ND (2200)	ND (44)	ND (44)	ND (46)
Aroclor-1242 (PCB-1242)	µg/kg	ND (420)	ND (420)	ND (22000)	ND (2200)	ND (44)	ND (44)	ND (46)
Aroclor-1248 (PCB-1248)	µg/kg	3600	2300	90000	11000	ND (44)	ND (44)	ND (46)
Aroclor-1254 (PCB-1254)	µg/kg	ND (420)	ND (420)	ND (22000)	ND (2200)	ND (44)	ND (44)	ND (46)
Aroclor-1260 (PCB-1260)	µg/kg	380 J	250 J	6300 J	940 J	ND (44)	ND (44)	ND (46)
Sum of Detected PCBs (ND=0)	ug/Kg	3,980 J	2,550 J	96,300 J	11,940 J	0	0	0
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L µg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***286***	***286***	***286***	***287***	***287***	***287***	***530***
Sample ID:		***S-22-011402-LM-286***	***S-22-011402-LM-286A***	***S-22-011402-LM-286B***	***S-22-011402-LM-287***	***S-22-011402-LM-287A***	***S-22-011402-LM-287B***	***S-00-012802-JW-530***
Sample Date:		***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/14/2002***	***1/28/2002***
Sample Depth:		***(0.33-0.67)***	***(0.67-1)***	***(0-0.33)***	***(0-0.33)***	***(0.33-0.67)***	***(0.67-1)***	***(0-0.33)***
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (8500)	ND (8600)	ND (25000)	ND (4500)	ND (2100)	ND (2100)	ND (49)
Aroclor-1221 (PCB-1221)	µg/kg	ND (8500)	ND (8600)	ND (25000)	ND (4500)	ND (2100)	ND (2100)	ND (49)
Aroclor-1232 (PCB-1232)	µg/kg	ND (8500)	ND (8600)	ND (25000)	ND (4500)	ND (2100)	ND (2100)	ND (49)
Aroclor-1242 (PCB-1242)	µg/kg	ND (8500)	ND (8600)	ND (25000)	ND (4500)	ND (2100)	ND (2100)	ND (49)
Aroclor-1248 (PCB-1248)	µg/kg	100000	68000	130000	55000	20000	12000	32 J
Aroclor-1254 (PCB-1254)	µg/kg	ND (8500)	ND (8600)	ND (25000)	ND (4500)	ND (2100)	ND (2100)	ND (49)
Aroclor-1260 (PCB-1260)	µg/kg	11000	5200 J	11000 J	9100	3000	2100	18 J
Sum of Detected PCBs (ND=0)	ug/Kg	111,000	73,200 J	141,000 J	64,100	23,000	14,100	50 J
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L µg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:
J = The reported laboratory result is qualified
as an estimated value
* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location:		***530***	***531***	***532***	***533***	***534***	***534***	***ST4-S2***
Sample ID:		***S-00-012802-JW-530A***	***S-00-012802-JW-531***	***S-00-012802-JW-532***	***S-00-012802-JW-533***	***S-00-012802-JW-534***	***S-00-012802-JW-534A***	***S-100301-SK-002***
Sample Date:		***1/28/2002***	***1/28/2002***	***1/28/2002***	***1/28/2002***	***1/28/2002***	***1/28/2002***	***10/3/2001***
Sample Depth:		***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	***(0-0.33)***	
		Duplicate					***dupl of S-00-012802-JW-534***	
Parameter	***Unit***							
PCBs								
Aroclor-1016 (PCB-1016)	µg/kg	ND (49)	ND (44)	ND (46)	ND (43)	ND (830)	ND (850)	ND (840)
Aroclor-1221 (PCB-1221)	µg/kg	ND (49)	ND (44)	ND (46)	ND (43)	ND (830)	ND (850)	ND (840)
Aroclor-1232 (PCB-1232)	µg/kg	ND (49)	ND (44)	ND (46)	ND (43)	ND (830)	ND (850)	ND (840)
Aroclor-1242 (PCB-1242)	µg/kg	ND (49)	ND (44)	ND (46)	120	ND (830)	ND (850)	ND (840)
Aroclor-1248 (PCB-1248)	µg/kg	24 J	23 J	33 J	ND (43)	15000	11000	4100
Aroclor-1254 (PCB-1254)	µg/kg	ND (49)	ND (44)	ND (46)	ND (43)	ND (830)	ND (850)	ND (840)
Aroclor-1260 (PCB-1260)	µg/kg	18 J	ND (44)	16 J	46	1300	1100	ND (840)
Sum of Detected PCBs (ND=0)	ug/Kg	42 J	23 J	49 J	166	16,300	12,100	4,100
PCBs (dissolved)								
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	-	-	-	-
Sum of Detected PCBs (ND=0)	ug/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	µg/L							

NOTES:

J = The reported laboratory result is qualified
as an estimated value

* = The reported results are in "ug/L"

TABLE 2.1

SUMMARY OF PCB DATA FOR SURFICIAL SOIL SAMPLES
PARCEL 22
BEDFORD, INDIANA

Sample Location: *Sample ID:* *Sample Date:* *Sample Depth:*		*ST4-S3* *S-100301-SK-003* *10/3/2001*	*ST4* *SD-100301-SK-001* *10/3/2001* *(4-)*	*SPRING_WELL 1* *GW-22-010902-LM-001** *1/9/2002*	*ST4-W1* *SW-100201-ST4-SK01** *10/2/2001*
Parameter	***Unit***				
PCBs					
Aroclor-1016 (PCB-1016)	µg/kg	ND (3900)	ND (440)	ND (0.20)	ND (0.2) UJ
Aroclor-1221 (PCB-1221)	µg/kg	ND (3900)	ND (440)	ND (0.20)	ND (0.2) UJ
Aroclor-1232 (PCB-1232)	µg/kg	ND (3900)	ND (440)	ND (0.40)	ND (0.4) UJ
Aroclor-1242 (PCB-1242)	µg/kg	ND (3900)	ND (440)	ND (0.20)	1.5 J
Aroclor-1248 (PCB-1248)	µg/kg	50000	6100	ND (0.20)	ND (0.2) UJ
Aroclor-1254 (PCB-1254)	µg/kg	ND (3900)	ND (440)	ND (0.20)	ND (0.2) UJ
Aroclor-1260 (PCB-1260)	µg/kg	ND (3900)	ND (440)	ND (0.20)	ND (0.2) UJ
Sum of Detected PCBs (ND=0)	ug/Kg	50,000	6,100	0	1.5 J
PCBs (dissolved)					
Aroclor-1016 (PCB-1016), dissolved	µg/L	-	-	-	ND (0.2) UJ
Aroclor-1221 (PCB-1221), dissolved	µg/L	-	-	-	ND (0.2) UJ
Aroclor-1232 (PCB-1232), dissolved	µg/L	-	-	-	ND (0.4) UJ
Aroclor-1242 (PCB-1242), dissolved	µg/L	-	-	-	0.32 J
Aroclor-1248 (PCB-1248), dissolved	µg/L	-	-	-	ND (0.2) UJ
Aroclor-1254 (PCB-1254), dissolved	µg/L	-	-	-	ND (0.2) UJ
Aroclor-1260 (PCB-1260), dissolved	µg/L	-	-	-	ND (0.2) UJ
Sum of Detected PCBs (ND=0)	ug/L µg/L	N/A	N/A	N/A	0.32 J

NOTES:

J = The reported laboratory result is qualified as an estimated value

* = The reported results are in "ug/L"

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TABLE 3.1

VOLUME BY PARCEL OF IMPACTED SOIL ≥ 1.8 PPM
UPSTREAM PARCELS
BEDFORD, INDIANA

	Depth Interval				
Parcel	***0-0.33 ft***	***0.33-1 ft***	***1-1.5 ft***	***1.5-2 ft***	***Total Parcel Volume***
P003	135	179	109	86	**510**
P004	98	58	42	80	**279**
P005	50	-	-	-	**50**
P006	24	-	-	-	**24**
P007	29	-	-	-	**29**
P008	131	136	51	34	**353**
P010	45	58	7	0	**111**
P011	130	19	11	9	**170**
P012	19	-	-	-	**19**
P022	1,238	2,064	828	774	**4,903**
P205	50	77	-	45	**172**
P401	16	0	0	0	**16**
					6,635

Note: All volumes reported in cubic yards.

TABLE 5.1

SUMMARY OF
PERMITTING REQUIREMENTS
UPSTREAM PARCELS
GM POWERTRAIN BEDFORD
REMOVAL ACTION
BEDFORD, INDIANA

Agency	*Potential Permit Required*	*Contact Person*	*Address, Phone #*	*Applicable Regulations*	*Criteria*	*Permit Required ? / Status*		
						Parcels 3-8, 10, 205	Area N & E of AOI 4, Parcels 215, 216	Parcels 11, 12
IDNR (Div of Water)	Flood Control Permit	Becky Davis	402 W. Washington St. Room W264, Indianapolis, IN 46204 317-232-4160	Flood Control Act	Floodplains (100 year floodway) that have a drainage area of at least 1 square mile	No	No	No
IDNR (Div of Water, F&W)	Flood Control Permit	Daniel Gautier	553 E. Miller Drive Bloomington, IN 47401	Flood Control Act	Floodplains (100 year floodway) that have a drainage area of at least 1 square mile	No	No	No
IDNR (Soil Conservation)	Rule 5	Sharon Hall	1931 Liberty Dr., Bloomington, IN 47403 812-334-4325	Rule 5	Area disturbed greater than 5 acres	Yes/authorization granted	Yes/to be submitted	Yes/to be submitted
IDNR (Div of Reclamation)	Surface Mining Permit	David Phillips	Rural Route 2, Box 129 Jasonville, IN 47438 812-665-2207	Surface Mining Control and Reclamation Act	The Division of Reclamation looks at project and the type of materials being excavated	No	No	No
USACE	Section 404; Nationwide General Permit	Gerry Newell	Louisville District, P.0. Box 59, Louisville, KY 40201 502-315-6683	Clean Water Act	Work is in jurisdictional wetlands or other waters	Yes/authorization granted	Yes/to be submitted	Yes/to be submitted
USFW	Fish and Wildlife	Lori Pruitt	620 South Walker Street Bloomington, Indiana 47403 (812)334-4261 *211	Endangered Species Act	Impacts to the Indiana Bat as a result of clearing trees	Yes/in process	Yes/tree cutting has been approved	Yes/tree cutting has been approved
IDEM (Office of Water Mmgt)	Regional General Permit (RGP); 401 Certification	Marty Maupin	100 N. Senate Ave. P.0. Box 6015 Indianapolis, IN 46206 317-233-2471	Clean Water Act	Work is in jurisdictional wetlands or other waters	Yes/ authorization granted	Yes/to be submitted	Yes/to be submitted
IDEM	NPDES	Joe Gwin	100 N. Senate Ave. P.0. Box 6015 Indianapolis, IN 46206 317-233-8769	Clean Water Act	Authorization to treat water through facility wastewater treatment plant	Yes	Yes	Yes
IDEM (Air)	Air	Nisha Sizemore	100 N. Senate Ave. P.0. Box 6015 Indianapolis, IN 46206 317-233-8356	Clean Air Act	-	-	-	-
Lawrence County Engineer	Permits or notification for impacts to infrastructure (roads, sewers, bridges, powerlines, culverts, etc.)	Bob Dillon	R. #10, Box 1122 Bedford, IN 47421 812-665-2207	-	-	No; inspect roads prior to implementation. Restore damaged roads	No; inspect roads prior to implementation. Restore damaged roads	No; inspect roads prior to implementation. Restore damaged roads
City of Bedford	Utilities/Streets	Myra Wilson, Planning Director Viv Bowden, Utilitiies Director John Dalton, Street Commissioner	812-279-6555	-	-	No; inspect roads prior to implementation. Restore damaged roads	No; inspect roads prior to implementation. Restore damaged roads	No; inspect roads prior to implementation. Restore damaged roads

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APPENDIX A

DEVELOPMENT OF RISK BASED CLEANUP CRITERIA FOR PCBs

APPENDIX A

SOIL CLEANUP LEVEL FOR PCBs
PARCEL 22

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LIST OF ATTACHMENTS

APPENDIX A

SOIL CLEANUP LEVEL FOR PCBs
PARCEL 22

This appendix provides the basis for selecting a soil cleanup level of 2 mg/kg total PCB Aroclors for the remediation of soil at Parcel 22 based on residential use. The discussion explains how the soil cleanup level is protective of human health and is consistent with both EPA's risk reduction goal for RCRA corrective action and the risk-based disposal requirements under TSCA at 40 CFR 761.61(c).

1.0 INTRODUCTION

The PCBs soil cleanup level of 2 mg/kg is designed to be protective of high-end residential exposure of children and adults. High-end exposures are exposures not expected to be exceeded by a large portion (at least 90%) of the population, and are characterized by conservative assumptions about the nature, magnitude, frequency, and duration of exposure. For residential exposures to chemicals in soil, EPA recommends that soil cleanup levels be protective of high-end exposures via incidental ingestion, dermal contact, and inhalation of vapors and airborne soil particles. EPA also has developed conservative exposure factors for characterizing high-end exposures via these routes of exposure, including soil contact rates (e.g., soil ingestion rates, dermal contact rates), exposure frequency, and exposure period. In addition, potential high-end exposure via consumption of homegrown produce is evaluated, although this exposure pathway does not exist at Parcel 22 currently and the proposed interim measures is not expected to make this pathway more likely in the future. The equations and assumptions that are used to characterize high-end exposure to PCBs at the soil cleanup level of 2 mg/kg are discussed in Sections A2.1 and A2.2, respectively.

The health risks associated with these exposures are evaluated using EPA-derived cancer and noncancer toxicity values, which quantitatively express EPA's conservative assumptions about human health effects of PCBs. These toxicity values are discussed in Section A2.3. The cancer and noncancer risks associated with exposure to PCBs at the soil cleanup level of 2 mg/kg are discussed in relation to EPA's risk reduction goal in Section A2.4. This discussion shows that the PCB soil cleanup level achieves cancer and noncancer risk estimates that are well within ranges that EPA considers acceptable for RCRA corrective action. Because the cancer and noncancer risk estimates are within these acceptable ranges, the cleanup level also will not pose an unreasonable risk of injury pursuant to 40 CFR 761.61(c). Therefore, remedies that achieve the soil cleanup level would be considered protective of human health under both RCRA corrective action and TSCA.

2.0 TECHNICAL DISCUSSION

2.1 RISK AND EXPOSURE EQUATIONS

The equations for calculating the cancer and noncancer risks that correspond to the PCB soil cleanup level of 2 mg/kg are shown in Attachment A1. These equations are based on standard risk and dose equations recommended in EPA guidance (1989, 1996b). The dose terms for the ingestion and dermal routes of exposure are based on a "child-to-adult" approach in which the doses are estimated for individuals who might live at a residence as a child and continue to live there as an adult. In this approach, exposure factors appropriate for children are used for an exposure period of 6 years, and then exposure factors appropriate for adults are used for the remainder of the exposure period (EPA 1996b). EPA recommends this approach to account for childhood exposures via soil ingestion and dermal contact, which are generally higher than adult exposures, due to factors such as children's higher tendency for hand-to-mouth behavior, lower body weight, and higher ratio of skin surface area to body weight. This approach also avoids combining child-only exposures with toxicity values that are based on lifetime exposures (discussed in Section A2.3), which could place undue emphasis on childhood exposures (EPA 1993). Potential exposure via consumption of homegrown produce is also evaluated using this approach.

A dose term is not explicitly calculated for the inhalation route of exposure, because the cancer risk estimate for inhalation is calculated directly from estimated air concentrations and an inhalation unit risk factor (URF), as shown in the inhalation risk equation in Attachment A1. The equations for estimating the concentrations of PCBs in air from volatilization and windblown dust (shown in Attachment A1) are the same as those recommended by EPA for deriving conservative residential soil screening levels (EPA 1996b). The inhalation URF is discussed in Section A2.3.

2.2 EXPOSURE FACTORS

The exposure factors used in the equations for estimating the dose for each route of exposure and their basis are discussed below.

Soil Ingestion Rates

Incidental soil ingestion rates of 200 mg/day and 100 mg/day are used for characterizing high-end exposure of children and adults to soil, respectively. EPA has recommended the use of these values for evaluating high-end residential exposures (EPA 1991a). More recent EPA guidance that is based on a more comprehensive review of the scientific literature indicates that 100 mg/day and 50 mg/day can be used for characterizing high-end exposure of children and adults to soil , respectively (EPA 1997b). The effects of the more recent EPA guidance on estimates of cancer and noncancer risks via soil ingestion are illustrated in Section A2.4.

Dermal Contact Rates

The dermal contact rate is the product of the exposed skin surface area and the soil-to-skin adherence factor. Exposed skin areas of 2,800 cm^2 and 5,700 cm^2 are used for characterizing the high-end exposed skin areas for children and adults, respectively. These values are based on the head, hands, forearms, lower legs, and feet of children being exposed to soil and the head, hands, forearms, and lower legs of adults being exposed. This assumes a barefoot child with a short sleeve shirt and short pants, and an adult with short sleeve shirt and short pants. These exposed areas comprise approximately 25% of the total skin surface area of the body.

Soil-to-skin adherence factors of 0.2 mg/cm^2 and 0.07 mg/cm^2 are used for characterizing the high-end soil adherence for children and adults, respectively. The use of these values for evaluating high-end residential exposures is recommended in recent EPA draft guidance (EPA 2001b).

Dermal Absorption Fraction

The dermal absorption fraction of 14% is used as a highly conservative estimate of absorption of PCBs from soil, as recommended in recent EPA draft guidance (EPA 2001b). This value is based on animal tests under conditions that are unlikely for most actual residential exposures. For example, soil with PCBs was affixed to the skin of test animals for 24 hours, which is much longer than the length of time soil would likely remain on a person's skin according to data compiled by EPA (1997b). More recent animal tests conducted by the same investigators that EPA cites for the 14% absorption fraction found that significantly lower absorption of chemicals can be expected for soil contact times of 8 hours and even 16 hours (i.e., from more than 100-fold to 5-fold lower). The conservatism in using the 14% value is magnified when combined with the assumption that 25% of the body is covered with soil, as discussed above. Also, existing EPA guidance recommends 6% as an upper-bound absorption fraction for all PCBs and Aroclors (EPA 1992). The effects of using a 6% value on estimates of cancer and noncancer risks via dermal contact are illustrated in Section A2.4.

Produce Consumption Rates

The consumption rate for homegrown produce is estimated as a portion of the total dietary intake of aboveground and belowground produce from all sources. EPA data on produce intakes are categorized by produce types, which include fruits, vegetables, exposed, and protected. These categories and examples of produce belonging to these categories are shown in Table A2-3 of Attachment A2.

According to EPA guidance (1998), the total dietary intake of exposed aboveground produce is 0.00042 and 0.0003 kg dry weight per kg body weight per day for children and adults, respectively, and the total dietary intake of belowground produce is 0.00022 and 0.00014 kg dry weight per kg body weight per day for children and adults, respectively. Another component of the total dietary intake is consumption of protected aboveground produce, which includes certain fruits and vegetables (EPA 1997b, Appendix 13A). However, the fruits in this produce category are not likely to grow in Indiana, so the consumption rate for protected aboveground produce is based on the consumption of protected vegetables. The total dietary intake of these protected vegetables is 0.00012 and 0.00009 kg dry weight per kg body weight per day for children and adults, respectively, which represent approximately 15% of the total intake of protected fruits and vegetables (EPA 1997b, Table 13-64).

EPA (1998) recommends that, when assessing high-end exposures via consumption of homegrown produce, the assessment should assume that home gardens supply 25% of the total dietary intake of produce. This assumption is conservative because home gardens typically cannot supply this much produce due to factors that include limitations on the variety of produce that can be homegrown, the size of home gardens, and the length of the growing season. The homegrown produce intake rates estimated using this approach are consistent with the produce intake data in the Exposure Factor Handbook (EPA 1997b), as illustrated in Attachment A2 which compares the above homegrown produce intakes with those in the Exposure Factors Handbook for the Midwest.

Exposure Frequency

An exposure frequency of 350 days per year is used for evaluating high-end residential exposure of children and adults (EPA 1991a). This exposure frequency assumes daily exposure at the residence, except for two weeks per year away from home (e.g., while on vacation). This assumed frequency is highly conservative for Indiana where the seasonal climate would be expected to reduce the extent of exposures to soil during parts of the year (e.g., during winter when the extent of contact with soil would be lower).

Exposure Duration

An exposure duration of 30 years is used for evaluating high-end residential exposures. This exposure duration is the 95th percentile number of years that individuals live at one residence (EPA 1991a). For evaluating child-to-adult exposures, the 30-year exposure duration is divided into a 6-year period of childhood exposure and a 24-year period of adult exposure.

Body Weights

The body weights of 15 kg and 70 kg are the standard EPA-recommended body weights for assessing exposure for children and adults, respectively (EPA 1989).

Averaging Time

The averaging time for evaluating cancer risk is equal to a lifetime of 70 years, and the averaging time for evaluating noncancer risk is equal to the exposure duration (EPA 1989).

All the exposure factors discussed above are EPA-recommended values for characterizing high-end exposures of residential receptors. As such, the use of these exposure factors is conservative, and is expected to significantly overestimate actual exposures.

2.3 TOXICITY VALUES

EPA has developed cancer and noncancer toxicity values for quantitative assessment of health risks associated with exposure to PCBs. These toxicity values are discussed below.

Cancer

EPA classifies PCBs as a "probable human carcinogen". This means EPA has determined that there is sufficient evidence that PCBs can cause cancer in animals, but there is inadequate evidence that PCBs can cause cancer in humans. For some chemicals classified as probable human carcinogens, EPA has developed a cancer slope factor (SF) from animal data to characterize the potential for the chemical to cause cancer in humans. The SF represents a 95% upper confidence bound on the probability of getting cancer over a lifetime per unit dose. For PCBs, EPA has developed a range of SFs ranging from 0.07 to 2 per mg/kg/day based on data from studies with rodents. The SF of 2 per mg/kg/day is the most conservative value, and is the one used in the calculations shown in Attachment A1.

To provide conservative estimates of inhalation risk, the SF of 2 per mg/kg/day is converted to an inhalation URF according to EPA guidance (1997a). Specifically, the SF is multiplied by a breathing rate of 20 m^3/day and divided by a body weight of 70 kg, which gives an URF of 0.57 per mg/m^3.

Noncancer

The types of noncancer health effects that can result from exposure to a chemical generally depends on whether the exposure is long-term (chronic), intermediate-term (subchronic), or short-term (acute). Because residential exposures are considered long-term, chronic noncancer toxicity values, or chronic reference doses (RfDs) are used to estimate noncancer risk. A chronic RfD is an estimate of the daily exposure that can be experienced by the general human population (including sensitive subgroups) over a lifetime without an appreciable risk of deleterious effects (EPA 1989). For oral exposures, EPA has developed two chronic RfDs for PCBs: 7×10^{-5} mg/kg/day for Aroclor 1016 and 2×10^{-5} mg/kg/day for Aroclor 1254. The RfDs for Aroclor 1016 and Aroclor 1254 include uncertainty factors (or safety factors) of 100 and 300, respectively. The oral RfD of 2×10^{-5} mg/kg/day is the more conservative value, and is the one used in the calculations shown in Attachment A1. The same oral RfD is used for the dermal route, following EPA draft guidance (EPA 2001b). EPA has not derived an inhalation reference concentration (RfC) for PCBs.

EPA's more detailed discussion of the basis for these toxicity values is provided in its Integrated Risk Information System (IRIS).

2.4 RISK REDUCTION GOAL

EPA's risk reduction goal for RCRA corrective action is to reduce the threat from lifetime site-related exposures such that the risk of cancer to an individual falls in the range from 10^{-6} to 10^{-4}, and the noncancer hazard index (HI) does not exceed 1. Media cleanup levels that achieve this risk reduction goal are considered protective of human health (EPA 1996a). Since EPA uses the same goal for other federal cleanup programs

(EPA 1991b), PCB soil cleanup levels that achieve this goal also would satisfy the TSCA goal of no unreasonable risk of injury under 40 CFR 761.61(c).

Using the soil cleanup level of 2 mg/kg as the concentration term in the equations in Attachment A1, along with the exposure factors and toxicity values discussed in Sections A2.2 and A2.3, estimates of cancer and noncancer risks are as follows:

	Cancer Risk	*Hazard Quotient*
Incidental Soil Ingestion	6×10^{-6}	0.4
Dermal Contact with Soil	3×10^{-6}	0.2
Inhalation of Vapor	7×10^{-7}	–
Inhalation of Particulates	2×10^{-10}	–
Consumption of Homegrown Produce	2×10^{-6}	0.1

Hazard quotients for the inhalation pathways were not calculated because EPA has not derived an inhalation RfC for PCBs, as noted in Section A2.3. These cancer and noncancer risk estimates are well within EPA's acceptable ranges. In fact, the cancer risk estimates are within the lowest 10% of the 10^{-6} to 10^{-4} risk range, and the noncancer hazard quotients (HQs) are all less than half the limit of 1.

The cancer and noncancer risk estimates for the ingestion and dermal routes in the above table correspond to soil ingestion rates of 200 mg/day and 100 mg/day and a dermal absorption fraction of 14%, which are the upper ends of the ranges for these exposure factors discussed in Section A2.2. If the lower ends of the ranges of soil ingestion rates and dermal absorption fraction were used, the estimates would drop to a cancer risk of 3×10^{-6} and HQ of 0.2 for the ingestion route (based on 100 mg/day and 50 mg/day) and a cancer risk of 1×10^{-6} and HQ of 0.07 for the dermal route (based on 6% absorption).

As discussed in Sections A2.2 and A2.3, these estimates are based on a number of exposure and toxicity assumptions that are individually conservative, and in combination are expected to overestimate actual high-end risks. In addition, it should be recognized that the above risk estimates "double-count" exposures among individual exposure routes. For example, the estimates of ingestion and dermal contact risks conservatively assume a constant PCB soil concentration, notwithstanding the depletion of PCBs via volatilization and wind erosion as assumed in calculating the inhalation risks. If the actual rates of volatilization and wind erosion were the same as those assumed in the inhalation risk calculations, approximately half the mass of PCBs in the top four to six inches of soil would be depleted over the assumed exposure period of 30 years. This means that the concentration of PCBs used in the soil ingestion and dermal risk calculations could have been reduced by approximately 50%, which in turn would reduce the cancer and noncancer risk estimates for these routes by approximately 50% (EPA 1990). Similarly, the risk calculations for homegrown produce consumption could have been based on a 50% lower PCB soil concentration. This shows that if risk calculations were to properly account for the conservation of mass across exposure pathways, the estimates of cumulative cancer and noncancer risks across the exposure pathways would be approximately 6×10^{-6} and 0.4, respectively.

The calculations discussed above show that potential high-end residential exposures to soil with PCBs at 2 mg/kg clearly would not pose any unacceptable risk. Therefore, remedies that achieve the soil cleanup level of 2 mg/kg would be protective of human health under both RCRA and TSCA.

3.0 REFERENCES

The references below include references that are cited in Attachments A1 and A2.

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ATTACHMENT A1

RISK AND DOSE CALCULATIONS

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1.0 CALCULATION OF RISK

Cancer Risk

The cancer risk associated with potential exposure to PCBs via ingestion and dermal contact is estimated by multiplying an estimate of the lifetime average daily dose (LADD) for these exposure routes by the cancer slope factor (SF) of 2 per mg/kg/day, as follows:

$$Risk = LADD \cdot SF$$

The cancer risk associated with potential exposure to PCBs via inhalation is estimated using an estimate of the PCB concentration in air (C_{air}) and an inhalation unit risk factor (URF) of 0.57 per mg/m^3, as follows:

$$Risk = C_{air} \cdot URF \cdot \frac{EF \cdot ED}{AT}$$

where EF is exposure frequency, ED is exposure duration, and AT is averaging time. The equations used to calculate the PCB concentration in air are discussed below.

Noncancer Risk

The noncancer hazard quotient (HQ) associated with potential exposure to PCBs via ingestion and dermal contact is estimated by dividing an estimate of the average daily dose (ADD) for these exposure routes by the reference dose (RfD) of 2 x 10^{-5} mg/kg/day, as follows:

$$HQ = \frac{ADD}{RfD}$$

A noncancer HQ associated with potential exposure to PCBs via inhalation is not calculated because EPA has not derived a reference concentration (RfC) for PCBs.

2. CALCULATION OF DOSE

Incidental Ingestion of Soil

The dose equation for estimating LADD and ADD is as follows:

$$Dose = \frac{C_s \cdot CF \cdot EF}{AT} \cdot \left[\frac{IR_{1-6} \cdot ED_{1-6}}{BW_{1-6}} + \frac{IR_{7-31} \cdot ED_{7-31}}{BW_{7-31}} \right]$$

where:

C_s	=	concentration of PCBs in soil, 2 mg/kg
CF	=	conversion factor, 10^{-6} kg/mg
EF	=	exposure frequency, 350 day/yr
AT	=	averaging time, 25,550 days and 10,950 days for cancer and noncancer risk calculations, respectively
IR_{1-6}	=	ingestion rate for ages 1 to 6, 100 to 200 mg/day
IR_{7-31}	=	ingestion rate for ages 7 to 31, 50 to 100 mg/day
ED_{1-6}	=	exposure duration from ages 1 to 6, 6 yr
ED_{7-31}	=	exposure duration from ages 7 to 31, 24 yr
BW_{1-6}	=	body weight for ages 1 to 6, 15 kg
BW_{7-31}	=	body weight for ages 7 to 31, 70 kg

Dermal Contact with Soil

The dose equation for estimating LADD and ADD is as follows:

$$Dose = \frac{C_s \cdot ABS_d \cdot CF \cdot EF}{AT} \cdot \left[\frac{AF_{1-6} \cdot SA_{1-6} \cdot ED_{1-6}}{BW_{1-6}} + \frac{AF_{7-31} \cdot SA_{7-31} \cdot ED_{7-31}}{BW_{7-31}} \right]$$

where:

ABS_d	=	dermal absorption fraction, 6% to 14%
AF_{1-6}	=	soil-to-skin adherence factor for ages 1 to 6, 0.2 mg/cm^2
AF_{7-31}	=	soil-to-skin adherence factor for ages 7 to 31, 0.07 mg/cm^2
SA_{1-6}	=	exposed skin surface area for ages 1 to 6, 2,800 cm^2/day
SA_{7-31}	=	exposed skin surface area for ages 7 to 31, 5,700 cm^2/day

Consumption of Homegrown Produce

The following dose equation is used for estimating LADD and ADD for consumption of both aboveground and belowground homegrown produce:

$$Dose = \frac{C_v \cdot EF \cdot FC}{AT} \cdot \left[IR_{1-6} \cdot ED_{1-6} + IR_{7-31} \cdot ED_{7-31} \right]$$

where:

C_v	=	concentration of PCBs in homegrown aboveground and belowground produce, 0.02 and 0.0029 mg/kg, respectively
FC	=	fraction of total dietary intake of produce that is homegrown, 0.25
IR_{1-6}	=	total dietary intake of aboveground and belowground produce for ages 1 to 6, 0.00054 and 0.00022 kg dry weight per kg body weight per day, respectively
IR_{7-31}	=	total dietary intake of aboveground and belowground produce for ages 7 to 31, 0.00039 and 0.00014 kg dry weight per kg body weight per day, respectively

The equations used to calculate the PCB concentration in homegrown aboveground and belowground produce are discussed below.

3. ESTIMATION OF AIR CONCENTRATIONS

The concentration of PCBs in air from volatilization and wind erosion is estimated using the following screening-level emission and air dispersion models. It is calculated by multiplying the flux of PCBs from volatilization and wind erosion by an air dispersion factor.

Vapor Emission from Soil

The flux of PCBs (Aroclor 1254) from volatilization is estimated using a model used by EPA for conservative screening-level analysis (EPA 1996b). This approach conservatively assumes that a chemical is present in the soil to an infinite depth. The flux is calculated as follows:

$$J_v = 2\, C_s\, \rho_b \sqrt{\frac{D_E}{\pi T}} \cdot \frac{kg}{10^3\, g} \cdot \frac{10^4\, cm^2}{m^2}$$

$$D_E = \frac{D_G\, H + D_L}{\rho_b\, K_d + \theta_w + \theta_a\, H}$$

$$D_G = D_{air} \cdot \frac{\theta_a^{10/3}}{n^2}$$

$$D_L = D_{water} \cdot \frac{\theta_w^{10/3}}{n^2}$$

where:

J_v	=	average PCB flux from vapor over period T, 2 x 10^{-7} mg/m^2-s
C_s	=	concentration of PCBs in soil, 2 mg/kg
ρ_b	=	soil bulk density, 1.5 g/cm^3
D_E	=	effective diffusion coefficient, 3.4 x 10^{-8} cm^2/s
T	=	exposure interval, 946,080,000 s
D_G	=	effective gas-phase diffusion coefficient, 0.0064 cm^2/s
D_L	=	effective liquid-phase diffusion coefficient, 4.8 x 10^{-8} cm^2/s
H	=	Henry's law constant, 0.1
K_d	=	soil-to-water partition coefficient, 1.26 x 10^4 L/kg (based on K_{oc} of 1.26 x 10^6 L/kg and f_{oc} of 0.01)
D_{air}	=	diffusion coefficient in air, 0.08 cm^2/s
D_{water}	=	diffusion coefficient in water, 5 x 10^{-6} cm^2/s
θ_a	=	air-filled soil porosity, 0.28 L/L

θ_w = water-filled soil porosity, 0.15 L/L
n = total soil porosity, 0.43 L/L

The values for soil characteristics and PCB physical/chemical properties are from EPA guidance (EPA 1996b, 1998).

Particulate Emission from Soil

The flux of PCBs from windblown dust is estimated using a model for wind erosion of surface soil known as the "unlimited reservoir" model (EPA 1996), which is given by:

$$J_{10} = C_s \cdot 0.036\,(1 - G)\left(\frac{U_m}{U_t}\right)^3 F(x)\left(\frac{kg}{10^3\,g}\right)\left(\frac{hour}{3600\,\mathrm{sec}}\right)$$

where:
J_{10} = annual-average PCB flux from airborne respirable soil particles, 4.2 x 10^{-11} mg/m^2-s
C_s = concentration of PCBs in soil, 2 mg/kg
0.036 = correlation coefficient for the respirable fraction
G = fraction of ground surface covered by vegetation, 0.5
U_m = mean annual wind speed, 4.2 m/s
U_t = friction velocity at 7 meters, 11 m/s
F(x) = tabulated function of x = U_m/U_t, 0.083

This equation calculates the emission flux of respirable soil particles, which are 10 μm in diameter and smaller (i.e., PM_{10}). The values of the parameters in this equation are from EPA guidance.

Air Dispersion

A conservative estimate of the annual-average concentration of PCBs in air is calculated by summing the volatilization and wind erosion fluxes and then multiplying by an air dispersion factor (i.e., an air concentration normalized to an unit flux). For Parcel 22, the air dispersion factor is calculated for an approximately 3-acre area (which is the area bounded by soil samples) using air dispersion modeling results that EPA has developed for conservative non-site-specific screening-level analysis (EPA 2001a). The air dispersion factor is approximately 15 mg/m^3 per mg/m^2-s, based on the average of EPA's dispersion factors for the two geographic regions nearest Indiana (i.e., Chicago, IL and Cleveland, OH). Multiplying this dispersion factor by the sum of the volatilization and wind erosion fluxes (2 x 10^{-7} mg/m^2-s) gives an air concentration of approximately 3 x 10^{-6} mg/m^3.

4.0 ESTIMATION OF PRODUCE CONCENTRATIONS

Aboveground Produce

The concentration of PCBs (Aroclor 1254) in aboveground produce is conservatively estimated following EPA guidance (1998) on the estimation of chemical concentrations in aboveground produce resulting from root uptake, as follows:

$$C_{ag} = C_s \cdot Br_{ag}$$

where:
C_{ag} = concentration in aboveground produce due to root uptake, 0.02 mg/kg-plant dry weight
C_s = concentration of PCBs in soil, 2 mg/kg
Br_{ag} = plant-soil bioconcentration factor for aboveground produce, 0.01, unitless

The plant-soil bioconcentration factor Br_{ag} is calculated using the following correlation, which is recommended by EPA (1998):

$$\log Br_{ag} = 1.588 - 0.578(\log K_{ow})$$

where:
Kow = octanol-water partition coefficient for PCBs (Aroclor 1254), 1.61 x 106, unitless

These calculations are expected to overestimate the concentration of PCBs in aboveground produce; experiments have found little if any translocation of lipophilic organic compounds, such as PCBs, from roots to aboveground parts of vegetables (Briggs et al. 1982).

Belowground Vegetables

The concentration of PCBs (Aroclor 1254) in belowground vegetables is conservatively estimated following EPA guidance (1998) on the estimation of chemical concentrations in root vegetables, as follows:

$$C_{rv} = C_S \cdot Br_{rv} \cdot VG_{rv}$$

where:
C_{rv} = concentration in root vegetables, 0.0029 mg/kg-plant dry weight
C_s = concentration of PCBs in soil, 2 mg/kg
Br_{rv} = plant-soil bioconcentration factor for root vegetables, 0.144, unitless

VG_{rv} = correction factor for root vegetables, 0.01

Derivation of the plant-soil bioconcentration factor Br_{rv} and the root vegetable correction factor VG_{rv} in the above equation is discussed below.

The plant-soil bioconcentration factor Br_{rv} is calculated using the following correlation, which is recommended by EPA (1998):

$$BR_{rv} = \frac{RCF}{K_d} = \frac{10^{(-1.52+0.77\cdot\log K_{ow})} + 0.82}{K_d}$$

where:
RCF = root concentration factor, 1.82×10^3 L-water/kg-plant
K_d = soil-water partition-coefficient for PCBs (Aroclor 1254), 1.26×10^4 L/kg

The soil-water partition-coefficient K_d is estimated as the product of the soil organic carbon fraction f_{oc} and the soil-organic carbon partition coefficient K_{oc}. A value of 0.01 is used for f_{oc} as recommended by EPA (1998).

EPA (1998) presents several correlations for estimating K_{oc} from K_{ow} for organic compounds with a wide range of physical and chemical properties. Among these correlations, the following (Equation A-3-6 in EPA 1998) provides the best match to the experimental measurements of K_{oc} for PCBs reported in the literature (EPA 1994):

$$\log K_{oc} = 0.983(\log K_{ow}) + 0.0002$$

Using a K_{ow} of 1.61×10^6 for Aroclor 1254 in this correlation gives a K_{oc} of 1.26×10^6 L/kg for PCBs.

The root vegetable correction factor VG_{rv} of 0.01 is recommended in EPA guidance (1998) to correct Br_{rv} for root uptake of lipophilic organic compounds such as PCBs (i.e., compounds with log K_{ow} greater than 4). This factor corrects Br_{rv} for the fact that root uptake of these compounds would be limited to the skin or the peel of roots and root vegetables (Briggs et al. 1982, O'Connor et al. 1990). Because typical root vegetables are bulky (e.g., potato, carrot) and typical preparation techniques for such vegetables include washing, peeling, and cooking, the residual concentration of lipophilic compounds on such vegetables would be much lower than predicted by Br_{rv} alone (EPA 1998).

ATTACHMENT A2

HOMEGROWN PRODUCE INTAKE RATES

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1. TOTAL DIETARY INTAKE OF PRODUCE

Table A2-1 shows that the total dietary intake of produce discussed in Section A2.2 is consistent with the typical total dietary intake of produce reported in EPA's Exposure Factors Handbook.

Table A2-1
Total Dietary Intake of Produce for Adults

	Intakes Discussed in Section A2.2		Typical Per Capita Intake: Midwest Region	
Produce Category [1]	kg/kg BW/day (dry weight) [2]	g/kg BW/day (as consumed) [3]	g/kg BW/day (as consumed) [4]	Reference (EPA 1997b)
Exposed Fruits	0.00015	1.5	1.4	Table 9-7
Exposed Vegetables	0.00015	1.5	0.8	Table 9-9
Protected Vegetables	0.00009	0.9	0.3	Table 9-10
Root Vegetables	0.00014	1.4	0.9	Table 9-11
Total Vegetables	--	**3.8**	**3.4**	Table 9-4

[1] See Table A2-3 for examples of produce belonging to these categories.

[2] Values are those recommended by EPA (1998); the exposed aboveground produce intake of 0.0003 kg/kg BW-day is divided equally into intakes for exposed fruits and exposed vegetables (EPA 1997b, Tables 13-61 and 13-63).

[3] Conversion is done by multiplying the intake based on dry weight by 10,000, which includes multiplying by 1,000 to convert from kg to gram and dividing by 0.1 to convert from dry weight to as consumed weight. The conversion factor of 0.1 is based on a typical moisture content of 90% from the moisture data for various types of produce in Table 9-27 (EPA 1997b) for the types of produce most frequently grown in home gardens as identified in Table 13-2 (EPA 1997b).

[4] Values are medians (50th percentiles), except means are shown where medians are not available.

2. HOMEGROWN PRODUCE INTAKES

Table A2-2 shows that multiplying the total dietary intake of produce by 25% as discussed in Section A2.2 gives estimates of homegrown produce intakes that are consistent with the typical homegrown produce intakes reported in EPA's Exposure Factors Handbook.

Table A2-2
Estimates of Homegrown Produce Intakes for Adults

Produce Category	Total Dietary Intake g/kg BW/day (as consumed) [5]	Homegrown Intake g/kg BW/day (as consumed) [6]
Exposed Fruits	1.5	0.38
Exposed Vegetables	1.5	0.38
Protected Vegetables	0.9	0.23
Root Vegetables	1.4	0.35
Total Vegetables	**3.8**	**0.96 [7]**

[5] Values are from Table A2-1.

[6] Values are calculated by multiplying the total dietary intake by 0.25, as recommended by EPA (1998).

[7] This number can be compared with the distribution of "consumers only" intakes for the Midwest in Table 13-15 (EPA 1997b), which is based on data from a short-term survey (over a 7-day period) so that the central portion of the distribution is the most appropriate for assessing long-term exposures, according to EPA (1997b).

3. PRODUCE CATEGORIES

Table A2-3 shows examples of common vegetables and fruits that belong to the various produce categories as reported in EPA's Exposure Factors Handbook (1997b).

Table A2-3
Examples of Produce Belonging to EPA Produce Categories

Exposed Aboveground Produce	Exposed Fruits	apples, apricots, berries, cherries, grapes, peaches, pears, plums, strawberries
	Exposed Vegetables	beans (snap, green, yellow), broccoli, cabbage, cauliflower, cucumber, lettuce, okra, peppers, tomatoes, zucchini
Protected Aboveground Produce	Protected Fruits	bananas, citrus fruits, cantaloupe, honeydew, papayas, pineapples, watermelons
	Protected Vegetables	beans (lima, soy), corns, peas, melons, pumpkins, squash
Belowground Produce	Root Vegetables	beets, carrots, onions, potatoes, radishes, turnips

Source: EPA (1997b) Appendix 13A.

APPENDIX B

HEALTH AND SAFETY PLAN (HASP)

July 18, 2003

SITE HEALTH AND SAFETY PLAN (HASP)

BAILEY'S BRANCH AND PLEASANT RUN REMOVAL ACTION

BEDFORD, INDIANA

JULY 2003
REF. NO. 13968 (18) APPB
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LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AOC	Administrative Order by Consent
APR	Air Purifying Respirator
CRA	Conestoga-Rovers & Associates
Creek Areas	Portions of the creek and floodplains on Pleasant Run and its tributaries
CRZ	Contaminant Reduction Zone
EZ	Exclusion Zone
Facility	General Motors Corporation Powertrain Bedford Facility
GM	General Motors Corporation
HASP	Site Health and Safety Plan
HSO	Health and Safety Officer
IDLH	Immediate Danger to Life and Health
IH	Industrial Hygienist
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
PELs	Permissible Exposure Limits
PPE	Personal Protective Equipment
RA	Removal Action
RCRA	Resource Conservation and Recovery Act
RELs	Recommended Exposure Limits
SOW	Scope of Work
SZ	Support Zone
U.S. EPA	United States Environmental Protection Agency
USCG	United States Coast Guard

1.0 GENERAL

A Removal Action (RA) will be implemented on portions of the creek and floodplains associated with Bailey's Branch Creek, Pleasant Run and its tributaries (Creek Areas), under an Administrative Order by Consent (AOC) authorized by the U.S. Environmental Protection Agency and General Motors Corporation (GM). The activities outlined in the Scope of Work (SOW) will involve oversight of construction activities and verification sampling within and outside the limits of the GM Powertrain Bedford Facility (Facility) located in Bedford, Indiana. Other activities to be completed as part of the RA include the construction and operation of a temporary soil staging area at the Facility for contaminated material excavated from the Creek Areas. During this program, personnel may come in contact with soil, sediment, groundwater, surface water, and other materials/debris that may contain hazardous materials. This Health & Safety Plan (HASP) has been developed to minimize the potential for exposures to field personnel involved in the oversight of the RA for the Creek Areas.

All Project activities at the Site will be conducted in accordance with provisions of an approved Site-specific HASP. The applicability of this HASP extends to personnel who will be on Site, including, Conestoga-Rovers & Associates (CRA) employees, and visitors to the Site. Certain activities at this Site where personnel will not have the potential for contact with contamination and no potential for exposure exists will be exempt from all provisions of the standard (29CFR1926.65 or 29CFR1910.120), including the medical and training requirements. Contractors and subcontractors who will be working at the Site will be required to develop a HASP based on their specific scope of work. The contractor's HASP must meet the applicable requirements of this HASP, which has been prepared by CRA. A contractor or subcontractor may adopt the provisions contained in this HASP as part of its own HASP, but must still provide a written SOW that details their activities and health and safety procedures that will be implemented as part of their activities

A copy of this HASP and employer specific Standard Operating Procedures (SOP) will be maintained on Site whenever activities are in progress. Contractor SOPs for similar activities must meet or exceed any referenced CRA SOP.

This HASP is designed to ensure the following:

i) that field personnel are not adversely exposed to the constituents of concern as well as the physical and biological hazards present;

ii) that public welfare or the environment are not adversely impacted by migration of contaminated materials due to work activities; and

iii) that operations, procedures, and equipment will meet the requirements of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, and the applicable subparts of 29 CFR 1926 and 29 CFR 1910.

For the purpose of this HASP, all activities carried out in the Creek Areas involving contact with potentially contaminated materials will be considered contaminated operations requiring personal protective equipment (PPE).

RA operations at the Creek Areas will be conducted in accordance with the provisions of the HASP. Cost and/or scheduling considerations will not be considered as justification for modifying this plan.

1.1 PROJECT ORGANIZATION

There is the potential for several contractor(s) to be working on Site. The selected contractor(s) will be responsible for providing both a Site Superintendent and a Health and Safety Officer (HSO) to direct their activities. These individuals will be responsible for ensuring that all contract specifications are met, including those related to Site health and safety. The names of these individuals will be presented in the HASPs of each contractor. This may be the same individual if so qualified. All contractor personnel working at the Site will report to the CRA Site Representative, and in keeping with OSHA requirements, are required to comply with all procedures referenced in this HASP, the contractor HASP, the CRA Health and Safety Program.

CRA will have an individual on Site acting as their Site Representative. This individual will be responsible for overseeing other contractors and for ensuring that all contract specifications are met, including those related to Site health and safety.

2.0 FACILITY CHARACTERIZATION AND HAZARD ANALYSIS

The Creek Areas are located in Bedford and Lawrence County, Indiana. The location of the Creek Areas is identified on Figure B.1 of this HASP. The properties which make up the Creek Areas include residential, agricultural, vacant land, and industrial uses. The Bedford Facility is located at 105 GM Drive, in Bedford, Indiana as depicted on Figure B.1. The Facility is located in a commercial and industrial setting. A Facility plan is included as Figure B.2 of this HASP.

The Bedford Facility is an active facility and has been operating as an aluminum foundry since 1942. Current products include transmission cases, engine blocks, and pistons.

Based on previous sampling, the constituent of concern at the Creek Areas is polychlorinated biphenyls (PCBs). The health effects related to PCBs are presented in Table B.1 of this HASP.

The activities to be performed as part of the SOW may include:

- oversight of staging area construction at the Bedford Facility, and placement of designated materials excavated from the Creek Areas;
- oversight of RA activities at the Creek Areas including mobilization and set-up, site clearing (removal of trees), temporary fencing, survey layout of excavation areas, construction of stormwater controls (berms, swales, and culverts), excavation of contaminated materials, transportation of materials to the staging area, backfilling, and restoration;
- perimeter air monitoring at the Creek Areas and at the soil staging area; and
- sampling activities.

Risks associated with these activities will be minimized by implementing engineering controls, safe work practices, and the proper use of PPE. Table B.3 summarizes the potential hazards associated with activities at the Creek Areas and the Facility covered by this HASP.

3.0 ACTIVITY HAZARD/RISK ANALYSIS AND GENERAL SAFETY PRACTICES

This section identifies the general hazards associated with specific Site activities and presents the documented or potential health and safety hazards that exist at the Site. Every effort will be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against by use of engineering controls and/or PPE. Table B.3 presents the anticipated hazards/risks and appropriate precautions.

In addition to the chemical hazards presented in Section 2 of this HASP, physical and biological hazards including potential heat and cold stress, hazards presented by the use of heavy equipment, tree cutting, overhead and underground utility hazards, hazards presented by confined spaces and excavations, snakes, poison ivy, poison oak, mosquitoes, bees, wasps, uneven terrain, slippery surfaces, and the use of decontamination equipment, exist at the Site. It will be the responsibility of the HSO and Site personnel to identify the physical and/or biological hazards posed by the various Site activities and implement preventative and corrective action.

3.1 CHEMICAL EXPOSURE

Preventing exposure to toxic chemicals is a primary concern. Chemical substances can enter the unprotected body by inhalation, skin absorption, ingestion, or through a puncture wound (injection). A contaminant can cause damage at the point of contact or can act systematically, causing a toxic effect at a part of the body distant from the point of initial contact. The chemical constituents of concern at the Site are outlined in Table 1.

Chemical exposures are generally divided into two categories: acute and chronic. Symptoms resulting from acute exposures usually occur during or shortly after exposure to a sufficiently high concentration of a contaminant. The concentration required to produce such effects varies widely from chemical to chemical. The term "chronic exposure" generally refers to exposures to "low" concentrations of a contaminant over a long period of time. The "low" concentrations required to produce symptoms of chronic exposure depend upon the chemical, the duration of each exposure, and the number of exposures. For a given contaminant, the symptoms of an acute exposure may be completely different from those resulting from chronic exposure.

For either chronic or acute exposure, the toxic effect may be temporary and reversible, or may be permanent (disability or death). Some chemicals may cause obvious symptoms such as burning, coughing, nausea, tearing eyes, or rashes. Other chemicals may cause health damage without any such warning signs (this is a particular concern for chronic exposures to low concentrations). Health effects such as cancer or respiratory disease may not become evident for several years or decades after exposure. In addition, some toxic chemicals may be colorless and/or odorless, may dull the sense of smell, or may not produce any immediate or obvious physiological sensations. Thus, a worker's senses or feelings cannot be relied upon in all cases to warn of potential toxic exposure.

The effects of exposure not only depend on the chemical, its concentration, route of entry, and duration of exposure, but may also be influenced by personal factors such as the individual's smoking habits, alcohol consumption, medication use, nutrition, age, and sex.

An important exposure route of concern at the Site is inhalation. The lungs are extremely vulnerable to chemical agents. Even substances that do not directly affect the lungs may pass through lung tissue into the bloodstream, where they are transported to other vulnerable areas of the body. Some toxic chemicals present in the atmosphere may not be detected by human senses (i.e., they may be colorless, odorless, and their toxic effects may not produce any immediate symptoms). Respiratory protection is therefore extremely important if there is a possibility that the work site atmosphere may contain such hazardous substances. Chemicals can also enter the respiratory tract through punctured eardrums. Where this is a hazard, individuals with punctured eardrums should be medically evaluated specifically to determine if such a condition would place them at an unacceptable risk and preclude their working at the task in question.

Direct contact of the skin and eyes by hazardous substances is another important route of exposure. Some chemicals directly injure the skin. Some pass through the skin into the bloodstream where they are transported to vulnerable organs. Skin absorption is enhanced by abrasions, cuts, heat, and moisture. The eye is particularly vulnerable because airborne chemicals can dissolve in its moist surface and be carried to the rest of the body through the bloodstream (capillaries are very close to the surface of the eye). Wearing protective equipment, not using contact lenses in contaminated atmospheres (since they may trap chemicals against the eye surface), keeping hands away from the face, and minimizing contact with liquid and solid chemicals can help protect against skin and eye contact.

Although ingestion should be the least significant route of exposure at the Site, it is important to be aware of how this type of exposure can occur. Deliberate ingestion of chemicals is unlikely, however, personal habits such as chewing gum or tobacco, drinking, eating, smoking cigarettes, and applying cosmetics at the Site may provide a route of entry for chemicals.

The last primary route of chemical exposure is injection, whereby chemicals are introduced into the body through puncture wounds (i.e., by stepping or tripping and falling onto contaminated sharp objects). Wearing safety shoes, avoiding physical hazards, and taking common sense precautions are important protective measures against injection.

3.2 GENERAL PRACTICES

Additional general safety practices to be implemented are as follows:

i) at least one copy of this HASP and the contractor HASP must be at the project Site, in a location readily available to all personnel, and reviewed by all project personnel prior to starting work;

ii) all Site personnel must use the buddy system (working in pairs or teams) when performing work within an EZ;

iii) food, beverages, or tobacco products must not be present or consumed in the EZ and CRZ. Cosmetics must not be applied within these zones;

iv) emergency equipment such as eyewash, fire extinguishers, etc., must be removed from storage areas and staged in readily accessible locations;

v) contaminated waste, debris, and clothing must be properly contained and legible and understandable precautionary labels must be affixed to the containers;

vi) removing contaminated soil from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited;

vii) containers must be moved only with the proper equipment, and must be secured to prevent dropping or loss of control during transport; and

viii) visitors to the Site must be instructed to stay outside the EZ and CRZ and remain within the SZ during the extent of their stay. Visitors must be cautioned to avoid skin contact with surfaces that are contaminated or suspected to be contaminated.

3.2.1 BUDDY SYSTEM

All on-Site personnel must use the buddy system while performing work within the EZ. Visual contact must be maintained between crew members at all times, and crew members must observe each other for signs of chemical exposure, heat, or cold stress. Indications of adverse effects include, but are not limited to:

i) changes in complexion and skin coloration;
ii) changes in coordination;
iii) excessive salivation and papillary response; and
iv) changes in speech pattern.

Team members must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures. Employees must inform their partners or fellow team members of non-visible effects of exposure to toxic materials. The symptoms of such exposure may include:

i) headaches;
ii) dizziness;
iii) nausea;
iv) blurred vision;
v) cramps; and
vi) irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, pre-arranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

3.3 HEAT STRESS

Heat stress is caused by a number of interacting factors including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat Rashes: Are one of the most common problems in hot work environments. Commonly known as prickly heat , a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat Cramps: Are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much and too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3 percent NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat Exhaustion: Occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache; vertigo; weakness; thirst; and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat Stroke: Is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict.

Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

Heat Stress Safety Precautions: Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described below.

Adjusted Temperature[1]	*Work-Rest Regimen Normal Work Ensemble*[2]	*Work-Rest Regimen Impermeable Ensemble*
90°F (32.°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5° to 90°F (30.8°C to 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° to 87.5°F (28.1° to 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° to 82.5°F (25.3° to 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° to 77.5°F (30.8° to 32.2°C)	After each 150 minutes of work	After each 120 minutes of work

Notes:

(1) Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F=ta °F + (13 x percent sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulk shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows).

(2) A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

In order to determine if the work rest cycles are adequate for the personnel and specific Site conditions, additional monitoring of individual's heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one-third and maintain the same rest period.

Additional one or more of the following control measures can be used to help control heat stress and are mandatory if any Site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

i) Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day;

ii) on-Site drinking water will be kept cool (50 to 60°F);

iii) a work regimen that will provide adequate rest periods for cooling down will be established, as required;

iv) all personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps;

v) cooling devices such as vortex tubes or cooling vests should be used when personnel must wear impermeable clothing in conditions of extreme heat;

vi) employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary;

vii) a shaded rest area must be provided. All breaks should take place in the shaded rest area;

viii) employees must not be assigned to other tasks during breaks;

ix) employees must remove impermeable garments during rest periods. This includes Tyvek® garments; and

x) all employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

Note: Additional information can be referenced in the CRA Health and Safety SOP for Heat Stress.

3.4 COLD STRESS

Cold stress is similar to heat stress in that it is caused by a number of interacting factors including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. 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 (37°C), can be life threatening. A drop in core temperature to 95°F (35°C) 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 and insulating capabilities of clothing. The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the body's core 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.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 95°F (35°C). This must be taken as a sign of danger to the employees on site, and cold exposures should be immediately terminated for any employee when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

3.4.1 PRE-DISPOSING FACTORS FOR COLD STRESS

There are certain pre-disposing factors that make an individual more susceptible to cold stress. It is the responsibility of the project team members to inform the HSO 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.

Pre-disposing 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 workloads 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 that 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.

3.4.2 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 physiological 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.
- 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.

It may not be practically feasible to implement all the above prevention measures. Follow the guidelines given below when the ambient air temperature is below 0°F (-18°C):

- dress warmly;
- replenish fluids and electrolytes at regular intervals;
- provide shelter from the cold; and
- adjust work/rest schedules.

3.4.3 FIRST AID GUIDELINES FOR COLD STRESS

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

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°C 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.

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.

Note: Additional information on cold stress can be found within the CRA Health and Safety SOP for Cold Stress.

3.5 EXCAVATION AND TRENCHING

Site activities may involve excavation and trenching of impacted material. It is the responsibility of the Site Representative and Site Supervisor to implement the following components of the CRA Excavation and Trenching Activities as they relate to project activities:

i) that all excavations are completed in accordance with an approved contractor's SOP;

ii) that the proper protective materials and equipment are available to complete the excavation and/or trenching procedures;

iii) complete all inspections of the excavation as required; and

iv) submit any contractor's Excavation and Trenching SOP to CRA's Industrial Hygiene Group for review prior to initiating excavation activities.

Excavation and trenching operations require pre-planning to determine whether sloping or shoring systems are required, and to develop appropriate designs for such systems. Also, the estimated location of all underground installations must be determined before digging/drilling begins.

If there are any nearby buildings, walls, sidewalks, tress, or roads that may be threatened or undermined by the excavation, where the stability of any of these items may be endangered by the excavation, they must be removed or supported by adequate shoring, bracing, or underpinning.

Excavations may <u>not</u> go below the base of footings, foundations, or retaining walls, unless they are adequately supported or a person who is registered as a Professional Engineer (PE) has determined that they will not be affected by the soil removal. OSHA recommends using civil engineers or those with licenses in a related discipline and experience in the design and use of slopping and shoring systems. PE qualifications must be documented in writing.

Personnel required to enter or work in the excavation at any time must be protected from the hazards of cave-ins. This requires the use of sloping and/or shoring systems that comply with State and Federal OSHA standards.

An approved contractor's Excavation and Trenching SOP will be followed during all excavation activities and provides detailed information regarding such activities.

3.6 DRILLING ACTIVITIES

Drilling operations taking place may include the drilling of boreholes and the installation of monitoring wells. Drilling and sampling activities present several potential hazards. Minimizing these hazards requires strict adherence to safe operating procedures.

Drillers will be responsible for the safe operation of the drill rig as well as adhering to the Site-specific HASP and employer-specific SOPs. These are to be maintained at the Site whenever drilling activities are in progress. The driller must ensure that all safety and drilling equipment is found to be in good condition and is used properly. Each day prior to the start of work, the drill rig and associated equipment will be inspected by the driller.

Physical hazards associated with drilling activities include: slips, trips and falls; noise, lifting of heavy objects; pinch points and sharp objects; caught between/against hazards; overhead hazards; underground/above ground utilities; wire rope/alloy chain failure; moving or backing vehicles; hazards associated with heavy equipment operation; hazards associated decontamination equipment; and the improper use of hand tools.

3.7 SAMPLING AND INSPECTION ACTIVITIES

Activities associated with the sample collection and inspection tasks include collection of soil, groundwater, surface water, and sediment samples at the Creek Areas. Physical hazards associated with sampling/inspection activities may include: severe weather; working from an elevated surface; slips, trips and falls; sharp objects; confined spaces; lifting heavy objects; noise; electrical safety; heat/cold stress; moving or backing vehicles; and use of hand tools.

Sediment and surface water sampling will involve sampling in/near Creek Areas. Life vests and/or tie-lines will be required when performing these sampling activities as footing may be treacherous at times. Additional caution must be observed when performing these tasks after/during a rain event and/or during a warm period in the winter/early spring.

3.8 CONFINED SPACES

A confined space provides the potential for unusually high concentrations of contaminants, explosive atmospheres, oxygen deficient atmospheres, limited visibility, and restricted movement. This section establishes requirements for safe entry into, continued work in, and safe exit from confined spaces. Additional information regarding confined space entry can be found in 29 CFR 1926.21, 29 CFR 1910.146, and NIOSH-106. Entry into a confined space will only be undertaken after remote methods have been tried and found not to be successful. Such work will follow the guidelines presented in the CRA Health and Safety Confined Space SOP or an approved contractor's Confined Space Entry SOP. The contractor's SOP must minimally meet the requirements set forth in the CRA Confined Space SOP.

3.9 FALL HAZARDS

Site personnel may be exposed to fall hazards greater than six feet above another surface and where there are no barriers in place to protect them. These hazards may be found in the following activities: working from elevated surfaces, near excavations, or on equipment, etc.

It is the contractor's responsibility to identify and control all fall hazards posed by the various Site activities. This information will be included in the Contractor's Site-specific HASP and will include procedures to implement preventative and corrective actions. The contractor will provide and document the necessary training on fall protection to affected employees.

3.10 BIOLOGICAL HAZARDS

Biological hazards may include poison ivy, poison oak, snakes, thorny bushes and trees, ticks, mosquitoes, and other pests.

3.10.1 TICK-BORNE DISEASES

Lyme Disease, Erlichiosis, and Rocky Mountain Spotted Fever (RMSF) are diseases transmitted by ticks and occur throughout the United States during spring, summer, and fall.

Lyme Disease: The disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Few cases have been identified in other states.

Erlichiosis: The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin. Few cases have been identified in other states.

These diseases are transmitted primarily by the Deer Tick, which is smaller and redder than the common Wood Tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, swelling and pain in the joints, and eventually, arthritis. Symptoms of Erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever: This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death if untreated, but if identified and treated promptly, death is uncommon.

Control: Tick repellent containing diethyltoluamide (DEET) should be used in tick-infested areas, and pants legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

3.10.2 POISONOUS PLANTS

Poison ivy, poison sumac and poison oak may be present in the work area. Personnel should be alerted to its presence, and instructed on methods to prevent exposure.

Control: The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water, and observed for signs of reddening.

3.10.3 POISONOUS SNAKES

The possibility of encountering snakes (cottonmouths and rattlesnakes) exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snakebites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control: To minimize the threat of snake bites and insect hazards, all personnel walking through vegetated areas must be aware of the potential for encountering snakes, and the need to avoid actions promoting encounters, such as turning over logs, etc. In areas where snakes may be encountered, affected personnel are required to wear leather work gloves and snakeproof chaps and/or snakeproof boots. Additionally, a snake bite kit is to be readily available at all times. If a snake bite occurs, an attempt should be made to kill the snake for identification. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

3.11 NOISE

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing.

The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on Site.

Control: All personnel must wear hearing protection with a Noise Reduction Rating (NRR) of at least 20 when noise levels exceed 85 dBA. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All Site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

3.12 SANITARY FACILITIES

Site sanitation will be maintained according to OSHA and Department of Health requirements.

3.12.1 BREAK AREA

Breaks must be taken in the SZ, away from the active work area after Site personnel go through decontamination procedures. There will be no eating, drinking, or chewing gum or tobacco in the area other than the SZ. Smoking is not permitted anywhere within the Facility.

3.12.2 POTABLE WATER

The following rules apply for all project field operations:

i) an adequate supply of potable water will be provided at each work Site. Potable water must be kept away from hazardous materials, contaminated clothing, and contaminated equipment;

ii) portable containers used to dispense drinking water must be capable of being tightly closed, and must be equipped with a tap dispenser. Water must not be drunk directly from the container, nor dipped from the container;

iii) containers used for drinking water must be clearly marked and not used for any other purpose; and

iv) disposable cups must be supplied, and both a sanitary container for unused cups and a receptacle for disposing of used cups must be provided.

3.12.3 TRASH COLLECTION

Trash collected from the CRZ will be separated as potentially contaminated waste. Trash collected in the support and break areas will be disposed of as non-hazardous waste. Trash receptacles will be set up in the CRZ and in the SZ.

3.13 ELECTRICAL HAZARDS

Electricity may pose a particular hazard to Site workers due to the use of portable electrical equipment. When electrical work is needed, it must be performed by a qualified electrician in accordance with the CRA Health and Safety SOP for Electrical Safety.

General electrical safety requirements include:

a) all electrical wiring and equipment must be a type listed by Underwriters Laboratory (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency;

ii) all installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or United States Coast Guard regulations;

iii) portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle;

iv) tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM;

v) live parts of wiring or equipment must be guarded to prevent persons or objects from touching them;

vi) electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching;

vii) all circuits must be protected from overload;

viii) temporary power lines, switch boxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage;

ix) plugs and receptacles must be kept out of water unless of an approved submersible construction;

x) all extension outlets must be equipped with ground fault circuit interrupters (GFCIs);

xi) attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment;

xii) extension cords or cables must be inspected prior to each use, and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire; and

xiii) flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

3.14 LIFTING HAZARDS

Back strain or injury may be prevented by using proper lifting techniques. The fundamentals of proper lifting include:

i) consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone;

ii) the hands and the object should be free of dirt or grease that could prevent a firm grip;

iii) gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces;

iv) fingers must be kept away from points, which could crush or pinch them, especially when putting an object down;

v) feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear;

vi) the load should be kept as low as possible, close to the body with the knees bent;

vii) to lift the load, grip firmly and lift with the legs, keeping the back as straight as possible;

viii) a worker should not carry a load that he or she cannot see around or over; and

ix) when putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

3.15 CLEARING

Site personnel engaged in site clearing (tree cutting, etc.) will be trained in the identification and protective measures pertaining to poisonous plants, harmful insects and animals. All equipment used in site clearing operations will be provided with the proper safety features and personal protective equipment as per OSHA regulations and the CRA Health and Safety SOP for Light Equipment. Prior to initiating clearing activities, Attachment B3 - Safety Inspection Checklist for Clearing/Grubbing should be completed by the competent person.

4.0 BASIS

The Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, CFR, Parts 1910 and 1926 (29 CFR 1910 and 1926) including the amended sections in 29 CFR 1910.120 and current Recommended Exposure Limits (RELs) as provided by the National Institute for Occupational Safety and Health (NIOSH) provide the basis for this HASP. Some of the specifications within this section are in addition to OSHA regulations and reflect the positions of the United States Environmental Protection Agency (USEPA), the American Conference of Governmental Industrial Hygienists (ACGIH) and the United States Coast Guard (USCG) regarding procedures required to ensure safe operations at potential hazardous waste sites.

The safety and health of the public and field personnel and the protection of the environment will take precedence over cost and schedule considerations for all project work.

5.0 RESPONSIBILITIES AND ADMINISTRATION

The following individuals are designated to carry out stated job responsibilities for the onsite engineer, CRA, related to this project.

CRA Project Manager:	James McGuigan
Construction Manager:	Ashley Valentine
Project Industrial Hygienist:	Jeff Maranciak
Oversight Personnel	TBD

A field individual will be designated as the Health and Safety Officer (HSO). The HSO will supervise the implementation of the HASP and will be responsible for all decisions regarding operations and work stoppages due to health and safety considerations. The HSO will have prior experience in working at hazardous waste sites.

The responsibilities of the HSO are as follows:

i) be responsible for controlling and maintaining access to the work area;

ii) be responsible for implementation of the HASP at the initiation of field work;

iii) conduct the pre-entry safety briefing for all field personnel with regard to the HASP and other safety requirements to be observed during field sampling, including:

  a) potential hazards,

  b) personal hygiene principles,

  c) PPE,

  d) respiratory protection equipment usage, and

  e) emergency response procedures.

iv) review and modify the HASP as more information becomes available concerning the hazardous materials involved;

v) supervision and enforcement of safety equipment usage;

vi) supervision and inspection of equipment cleaning;

vii) personnel training in safety equipment usage and emergency procedures;

viii) monitoring of the health and safety program under direction of an industrial hygienist;

ix) suspend work activity if unsafe working conditions develop;

x) inform employees, nearby workers, and visitors of the nature of chemical exposure risk as required by the "Right-to-Know" Law;

xi) recommend a medical examination when required for an employee;

xii) coordination of the Emergency Response Plan (Section 16.0);

xiii) assure that safety equipment is provided, maintained and accessible to field personnel;

xiv) maintain a log with a sign in/out sheet for personnel performing activities and visitors entering the work areas;

xv) assure that employees comply with the "buddy system" while working at the Facility and in the Creek Areas;

xvi) investigate all accidents, injuries, illnesses, spills, fires, incidents, and near misses; and

xvii) ensure all contractors and subcontractors have an adequate Health and Safety Plan in place prior to commencement of work.

6.0 MEDICAL SURVEILLANCE

In accordance with the requirements detailed in 29 CFR 1926.65 and 29 CFR 1910.134, all Site personnel who will come in contact with potentially contaminated materials will have received, within one year prior to starting field activities, medical surveillance by a licensed physician or physician's group.

Medical records for all on-Site personnel will be maintained by their respective employers. The medical records will detail the tests that were taken and will include a copy of the consulting physician's statement regarding the tests and the employee's suitability for work.

The medical records will be available to the employee or his designated representative upon written request, as outlined in 29 CFR 1910.1020.

Each employer will provide certifications to their on-Site HSO that their personnel involved in Site activities will have all necessary medical examinations prior to commencing work which requires respiratory protection or potential exposure to hazardous materials. Personnel not obtaining medical certification will not perform work within contaminated areas.

Interim medical surveillance will be completed if an individual exhibits poor health or high stress responses due to any Site activity or when accidental exposure to elevated concentrations of contaminants occur.

7.0 TRAINING

All field personnel shall complete training sessions in accordance with 29 CFR 1910.120(e). This training shall consist of a minimum of 40 hours of instruction and three days of actual field experience under the direct supervision of a trained, experienced supervisor. Documentation will be maintained in the Site trailer stating that all field personnel have complied with this regulation.

Prior to commencing work activities, a pre-entry safety briefing will be conducted. Topics covered during the pre-entry safety briefing will include:

i) health and safety hazards;
ii) level of PPE required;
iii) safe use of equipment;
iv) decontamination procedures; and
v) emergency response procedures.

CRA personnel who attend this briefing will sign the HASP Acknowledgment Form presented as Attachment B1. Any visitors to the Facility entering the exclusion zone will be required to undergo the same training program discussed above and will be required to sign a Visitor's Signoff Sheet (Attachment B1) certifying they have completed the appropriate training and have read this HASP.

All personnel working on the RA at the Creek Areas shall attend daily safety ("tailgate") meetings during RA implementation. These meetings will be conducted by the HSO, and will cover specific health and safety issues, field activities, changes in field conditions, and a review of topics covered in the pre-entry briefing. Topics discussed in the safety meetings will be documented along with the signatures of personnel who attend.

8.0 WORK AREAS

As required, specific work areas (defined below) will be delineated by temporary fencing or a flagged line.

a) Exclusion Zone (EZ) - This zone will include all areas where potentially contaminated soil or materials are to be handled and all areas where contaminated equipment or personnel travel.

b) Contaminant Reduction Zone (CRZ) - This zone will occur at the interface of the EZ and Support Zone (SZ) and will provide access for the transfer of construction materials and field equipment to the EZ, the decontamination of vehicles prior to leaving the EZ, the decontamination of personnel and clothing prior to entering the SZ, and for the physical segregation of the SZ and EZ.

c) Support Zone (SZ) - This area is the portion of the work area defined as the area outside the zone of significant air and soil contamination. The SZ will be clearly delineated and procedures implemented to prevent active or passive migration of contamination from the work area.

9.0 PERSONAL PROTECTIVE EQUIPMENT

Engineering controls and work practices designed to reduce and maintain employee exposure at or below the Permissable Exposure Limits (PELs) for the constituents of concern (Table B.1) will be implemented. Whenever engineering controls and work practices are not feasible, a reasonable combination of engineering controls, work practices, and PPE shall be used to reduce and maintain employee exposure at or below the PELs for the contaminants of concern.

All field personnel shall be equipped with PPE appropriate for the nature of work being completed. All safety equipment and protective clothing shall be kept clean, well-maintained, and their integrity intact.

Safety equipment and apparel as required will be Level D, Modified Level D and Level C PPE (as determined by the action levels set forth in Section 10.0) within the Exclusion Zone. Any decision regarding the adjustment of PPE levels will be made by the Project Manager, in conjunction with the Project Industrial Hygienist (IH).

Level D PPE

Type	*Properties*	*Item*
Foot protection	Steel-toe/reinforced shank	Boots
Head protection	Meets ANSI Z89.1 standard	Hard hat
Hand protection	Puncture/tear resistant	Leather/cotton gloves
Eye protection	Meets ANSI Z87.1 standard	Glasses/goggles with side shields

Modified Level D PPE

Type	*Properties*	*Item*
Foot protection	Steel-toe/reinforced shank	Boots
Foot protection	Chemical resistant (latex)	Overboots
Head protection	Meets ANSI Z89.1 standard	Hard hat
Hand protection	Chemical resistant (nitrile)	Inner gloves
Hand protection	Chemical resistant, puncture/ tear resistant (nitrile)	Outer gloves
Eye protection	Meets ANSI Z87.1 standard	Glasses/goggles with side shields
Body protection	Chemical resistant (tyvek)	Coverall

Level C PPE

Type	*Properties*	*Item*
Foot protection	Steel-toe/reinforced shank	Boots
Foot protection	Chemical resistant (latex)	Overboots
Head protection	Meets ANSI Z89.1 standard	Hard hat
Hand protection	Chemical resistant (nitrile)	Inner gloves
Hand protection	Chemical resistant, puncture/ tear resistant (nitrile)	Outer gloves
Eye protection	Meets ANSI Z87.1 standard	Glasses/goggles with side shields
Body protection	Chemical resistant (tyvek)	Coverall
Respiratory protection	NIOSH approved	Full-face/half-face air-purifying respirator with organic vapor/ acid gas/HEPA filter

Additional PPE guidelines to be implemented include:

i) prescription eyeglasses in use at the Bedford Facility will be safety glasses with side shields;

ii) protective gloves (leather palm) will be worn over nitrile gloves by field personnel involved in drilling activities;

iii) during periods of respirator usage, respirator cartridges and filters will be changed daily, or upon breakthrough, whichever occurs first;

iv) field personnel who have not passed a respirator fit test will not be permitted to enter or work in the EZ;

v) personnel required to wear a respirator will not be permitted to have beards, long sideburns, or mustaches that interfere with the proper fit of the respirator;

vi) all used PPE will be decontaminated or discarded at the end of each work day; and

vii) duct tape will be used to ensure that disposable coveralls and gloves are tightly secured when personnel are working within the EZ.

10.0 RESPIRATOR PROGRAM

Prior to arriving at the Creek Areas or the Facility, all field personnel will have received training in the use of, and have been fit tested for a full-facepiece respirator. The written respiratory program that complies with 29 CFR 1910.134 is included as Attachment B2 to this HASP (copies of the certifications will be kept on file at the field trailer).

During intrusive activities (i.e. excavating), a photo-ionization detector (PID) will be used to monitor for organic vapors and some inorganic gases and a particulate monitor will be used to monitor particulate concentrations present in the breathing space. Background concentrations will be established prior to commencing work activities at each work location.

Sustained (greater than 5 minutes) air monitoring action levels to determine the level of respiratory protection necessary during field activities will be:

Sustained Photoionization Organic Vapor Reading Above Background	*Protection Level*
0 - 10 ppm	Level D, Modified Level D
10 - 125 ppm	full-facepiece air purifying respirator (Level C)
>125 ppm	shut down activities

Sustained Particulate Reading Above Background	*Protection Level*
0 - 0.5 mg/m^3	Level D, Modified Level D
0.5 - 2.5 mg/m^3	full-facepiece air purifying respirator (Level C)
>2.5 mg/m^3	shut down activities

Work will be stopped and the work area will be allowed to vent if monitoring indicates that organic vapors are present at concentrations which present Immediate Danger to Life and Health (IDLH) conditions, or in excess of the protection factor afforded by the air purifying respirator (whichever is lower). The action level to shut down activities has been decreased to a reasonable level for the work being conducted.

Air monitoring should continue, at a safe distance, if operations are stopped due to action level exceedences, to determine if a threat to the surrounding community exists.

11.0 JUSTIFICATION

The activities associated with the SOW are not expected to cause field personnel to be exposed to the constituents of concern in concentrations exceeding their respective PELs or RELs. The action levels have been calculated low enough so that the accuracy and sensitivity of the air monitoring equipment would not cause the field personnel to be inadvertently overexposed to the constituents of concern, even in a worst case scenario.

These action levels assume that all NIOSH criteria for using an air purifying respirator (APR) have been met. An APR can typically be worn in concentrations of up to 10 times the PEL for a given contaminant. Because of differences in sensitivities with direct reading instruments, a 50 percent safety factor is included when determining action levels. Therefore, the calculation to determine when a respirator should no longer be used is presented below (for a constituents of concern with PELs of 25 ppm and 0.5 mg/m^3):

- 25 ppm (PEL) x 10 (protection factor) x 0.5 (50% safety factor) = 125 ppm; and
- 0.5 mg/m^3 (PEL) x 10 (protection factor) x 0.5 (50% safety factor) = 2.5 ppm.

The primary routes of exposure of contaminants to individuals performing field remediation tasks include direct contact, ingestion, and inhalation. The risk of exposure due to direct contact and ingestion will be minimized through the proper use of PPE as described in Section 9.0 and by exercising ordinary caution during sampling activities. In order to minimize exposure by the inhalation pathway, the respirator and air monitoring programs discussed in Sections 10.0 and 13.0 will be undertaken.

12.0 PERSONAL HYGIENE

All personnel performing or supervising work within the EZ shall observe and adhere to the personal hygiene-related provisions of this section.

Personnel found to be disregarding the personal hygiene-related provisions of this HASP will, at the discretion of the HSO, be barred from the Parcel/Facility.

The following equipment/facilities are available for the personal hygiene of CRA personnel:

i) suitable disposable outerwear, gloves, respiratory protection and footwear on a daily basis for the use of field personnel;

ii) disposal containers for used disposable outerwear; and

iii) potable water and a suitable sanitation facility.

The following regulations will be enforced for all personnel actively participating in the RA implementation:

i) personnel will wear appropriate PPE when in the EZ;

ii) used disposable outerwear will not be reused if deemed to be unsuitable to provide the necessary protection, and when removed, will be placed inside disposal containers provided for that purpose;

iii) smoking, eating, and drinking will be prohibited within the EZ. These activities will be permitted only within designated areas; and

iv) personnel will thoroughly cleanse their hands, face, neck area, and other exposed areas before smoking, eating, or drinking, and before leaving the CRZ.

13.0 AIR MONITORING

This section of the HASP presents the requirements for conducting air monitoring at the Site. The air monitoring program is designed to ensure protection for both personnel working on Site and the surrounding community. The on-Site monitoring program will be conducted by the contractor who is performing work on Site and will consist of monitoring Site personnel exposures.

Air quality will be monitored at the initiation of each work activity and periodically thereafter.

The air monitoring program will consist of monitoring with a PID and a particulate monitor. Operation and calibration procedures will be according to manufacturers' instructions. Calibration and maintenance records will be kept in the field log.

Identification of volatile organic vapor or particulate levels in excess of the action levels cited in Section 10.0 shall be reported to the HSO who, in conjunction with the Project IH, will determine when PPE should be upgraded or operations be shut down and restarted.

If work is stopped because action levels have been exceeded, air monitoring will continue from a safe distance to determine if there is a threat to the surrounding community.

The contractor shall also implement a personnel air monitoring program for those employees who have the highest risk of potential for exposure to chemicals present on Site. This monitoring will be done in compliance with 1926.65(h). Samples will be collected during startup of intrusive activities, where personnel would face potential exposure, for the purpose of verifying the adequacy of personal protection and to document the actual exposure level to the selected chemical compound. The number and frequency of sampling events will be determined by the HSO. Appropriate NIOSH methodology will be followed and all samples are to be sent to an American Industrial Hygiene Association (AIHA) accredited laboratory. Results for all personnel air sampling will be posted for all project personnel to review.

Perimeter air monitoring will be completed as identified in the Ambient Air Quality Monitoring Plan.

14.0 COMMUNICATIONS

Emergency numbers including the police department, fire department, ambulance, hospital, and appropriate regulatory agencies (Table B.3) will be prominently posted near the site office telephone(s).

To ensure familiarity with the hospital route, all personnel covered under this HASP will drive the route to the hospital, prior to the initiation of field activities.

15.0 EMERGENCY AND FIRST AID EQUIPMENT

Safety equipment will be available for use by field personnel and will be located and maintained in the SZ. The safety equipment will include, but is not limited to, the following:

i) a portable emergency eye wash;

i) two 20- pound ABC type dry chemical fire extinguishers;

ii) fire blanket;

iii) two SCBA units (as necessary for excavation activities);

iv) portable air horn; and

vi) a first-aid kit for a minimum of 20 personnel.

16.0 EMERGENCY RESPONSE PLAN

Prior to commencing work activities, CRA will ensure that all of field personnel are briefed on emergency procedures. The emergency procedures are intended to provide immediate response to a serious occurrence such as injury, explosion or fire. A list of emergency contact numbers is presented as Table B.3 of this HASP.

In the event of injury to field personnel, the HSO is responsible for the following:

i) evacuate all personnel upwind;

ii) exit work area;

iii) contact the designated hospital and describe the injury;

iv) decontaminate personnel if possible, and administer appropriate first aid. If personnel cannot be decontaminated, alert hospital to possible problems of contamination;

v) transport personnel to the medical facility along a pre-defined route (Figure B.3); and

vi) notify GM personnel.

If a spill occurs related to the jobsite activities, the following procedure will be followed:

i) notify the HSO, Site Superintendent, and Site Representative;

ii) evacuate immediate area of spill;

iii) determine the needed level of PPE;

iv) don required level of PPE and prepare to make entry to apply spill containment and control procedures;

v) no entry will be made until atmosphere is less than 20 percent of the LEL; and

vi) absorb or otherwise clean up the spill and containerize the material, sorbent, and affected soils.

The Site Superintendent and Site Representative have the authority to commit resources as needed to contain and control released material and to prevent its spread to off-Site areas.

Releases from drums containing solid wastes will be placed into approved containers and covered. Each container will be labeled as to its contents. Solid spills from haulage units will be placed back into haulage units.

In the event that a drum or container of liquid is spilled on Site outside of the EZ, a 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, with the use of a portable hand pump, into a repack drum. 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 occurred on soil, the visibly affected soil will be excavated to limits based on a visual determination of spill contamination with the concurrence of the on-Site Client Representative. The absorbent and excavated material will be drummed or otherwise appropriately contained.

17.0 EQUIPMENT AND PERSONNEL DECONTAMINATION

In general, everything that enters the EZ at this Site must either be decontaminated or properly discarded upon exit from the EZ. All personnel, including any State and local officials must enter and exit the EZ through the CRZ. Prior to demobilization, potentially contaminated equipment will be decontaminated on a wash pad (decontamination pad) which has a built in sump and the equipment will be inspected by the HSO and Site Representative 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 EZ until disposal arrangements are made.

The type of decontamination solution to be used is dependent on the type of chemical hazards. The decontamination solution for heavy equipment and for any reusable PPE is Liqui-nox soap. The Material Safety Data Sheets (MSDSs) for Liqui-nox and any other chemical containing products brought to the Site will be maintained on Site by the HSO. Tap water may be used from any municipal water treatment system. The use of an untreated water supply is not an acceptable substitute.

17.1 EQUIPMENT DECONTAMINATION PROCEDURES

All equipment that comes in contact with potentially impacted material must be decontaminated within the CRZ by a pressure water cleaner upon exit from the EZ. Decontamination procedures should include: knocking soil/mud from machines; water brush scrubbing using a solution of water and Liqui-nox; and a final water rinse. Personnel shall wear Level C or Modified Level D protection, as determined by the HSO, when decontaminating equipment. Runoff and sediments will be collected and stored until proper disposal arrangements have been made. Following decontamination and prior to exit from the EZ, the HSO shall be responsible for ensuring that the item has been sufficiently decontaminated. This inspection shall be included in the Site log. Additionally, sampling and monitoring equipment are to be sufficiently decontaminated.

All equipment used for the collection of samples for chemical analysis will be cleaned according to the procedures identified in the RA Work Plan.

17.2 PERSONNEL DECONTAMINATION PROCEDURES

Personnel decontamination will be completed in accordance with the CRA Health and Safety SOP or an approved contractor's SOP for personnel decontamination. The selected contractor(s) will provide and implement their SOP for going through personnel decontamination. The general guidelines for a typical Level C decontamination line are described below:

i) upon entering the CRZ, rinse contaminated materials from boots or remove contaminated boot covers;

ii) clean reusable protective equipment;

iii) remove protective garments, equipment, and respirator. All disposable clothing should be placed in a covered container which is labeled;

iv) wash hands, face, and neck or shower (if necessary);

v) proceed to clean area and dress in clean clothing; and

vi) clean and disinfect respirator for next use.

18.0 RECORDKEEPING

The HSO shall establish and maintain records of all necessary and prudent monitoring activities as described below:

i) name and job classification of the employees involved on specific tasks;

ii) records of fit testing and medical surveillance results for Site personnel;

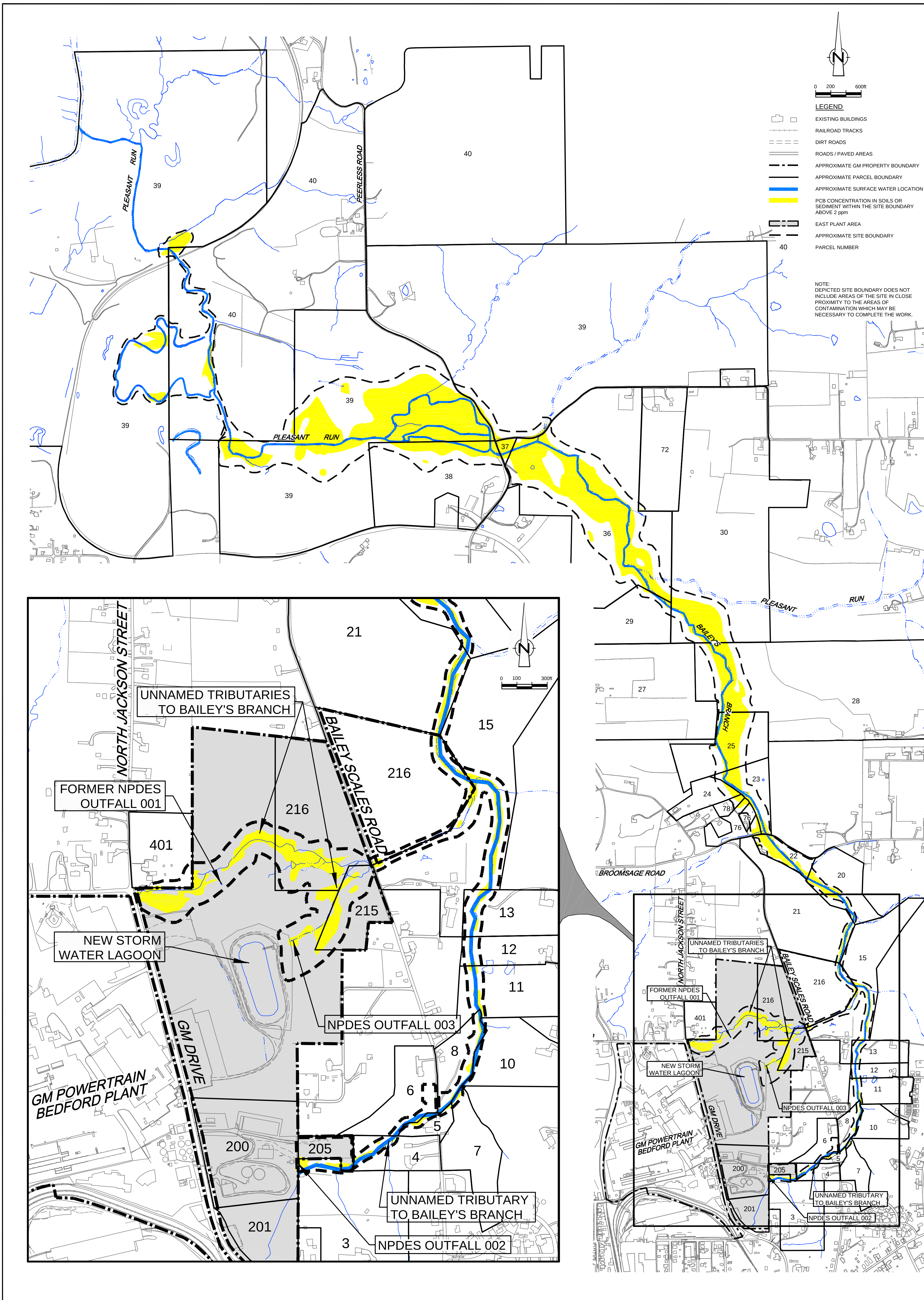
iii) records of all OSHA training certification for Site personnel;

iv) records of training acknowledgment forms and daily safety meetings;

v) emergency report sheets describing any incidents or accidents;

vi) air monitoring equipment calibrations; and

vii) air monitoring data.



Nº	Revision	Date	Initial

SCALE VERIFICATION
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

CREEK AREA
REMOVAL ACTION

REMOVAL ACTION WORK PLAN

FACILITY LOCATION MAP

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI. APRIL 2001

Project Manager:	Reviewed By:	Date:	
J. McGUIGAN	J. DANIEL	MAY 2002	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
AS SHOWN	13968-00	018	figure B.1

13968-00(018)GN-WA024 MAR 25/2003

COORDINATE SYSTEM: INDIANA STATE PLANE COORDINATE (NAD 27)

ADAPTED FROM: GENERAL MOTORS POWERTRAIN
PLANT ENGINEERING DEPARTMENT
PLOT PLAN, 12/03/99

Nº	Revision	Date	Initial

LEGEND

- PROPERTY BOUNDARY
- BEDFORD CITY LIMIT
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- STREAM
- CONTOUR LINE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

CREEK AREA REMOVAL ACTION
BEDFORD, INDIANA

REMOVAL ACTION WORK PLAN

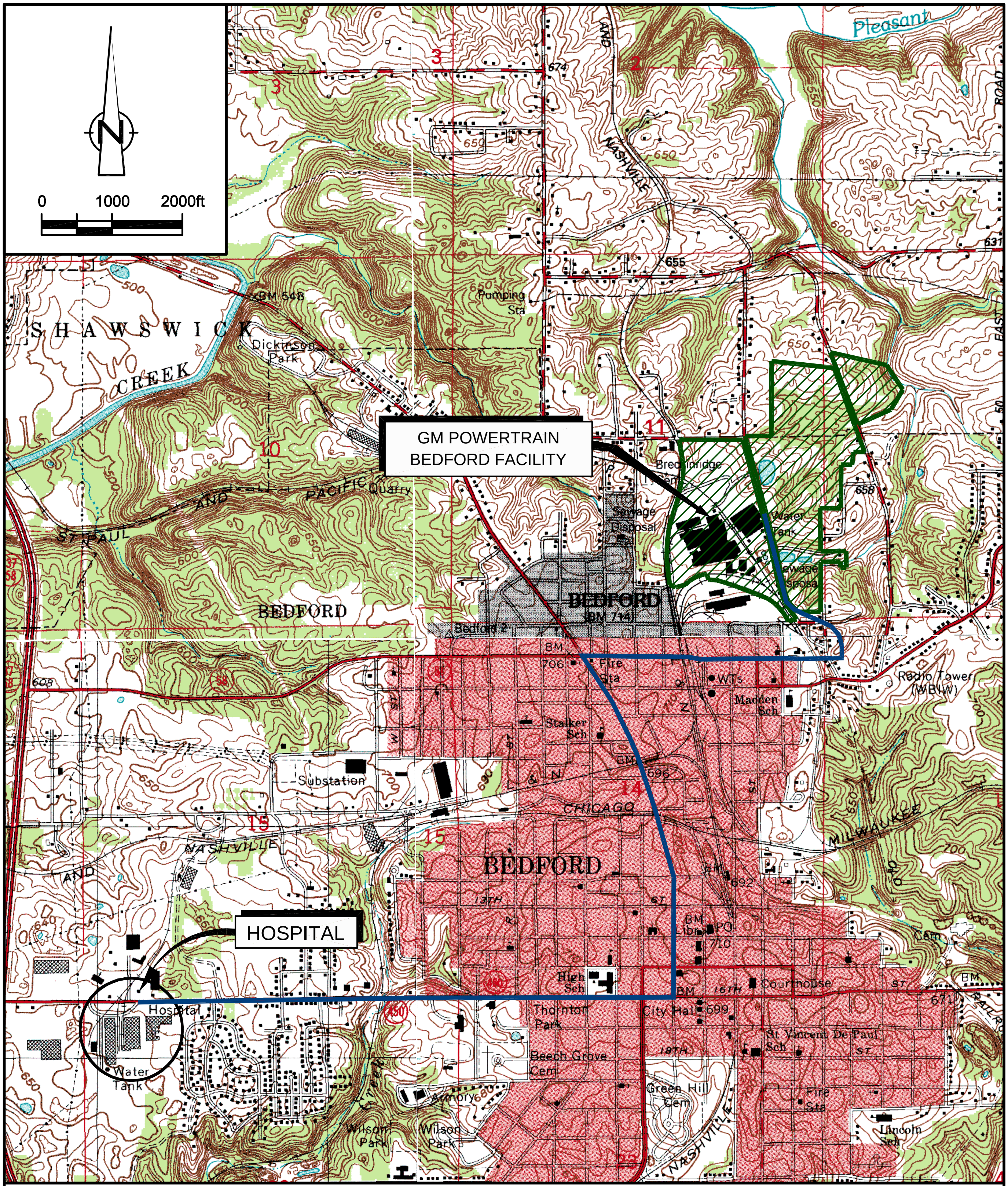
SITE PLAN - BEDFORD FACILITY

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager:	Reviewed By:	Date:	
J. McGUIGAN	J. DANIEL	MAY 2002	
Scale: 1"=200'	Project Nº: 13968-00	Report Nº: 018	Drawing Nº: figure B.2

13968-00(018)GN-WA026 MAR 25/2003



SOURCE: USGS QUADRANGLE MAPS;
BEDFORD EAST, BEDFORD WEST,
BARTLETTSVILLE, AND OOLITIC, INDIANA

figure B.3

ROUTE TO HOSPITAL
REMOVAL ACTION WORK PLAN
CREEK AREA INTERIM MEASURES
Bedford, Indiana

13968-00(018)GN-WA027 FEB 28/2003

TABLE B.1

POTENTIAL CONSTITUENTS OF CONCERN (Currently known)
PLEASANT RUN REMOVAL ACTION
BEDFORD, INDIANA

Contaminant	**REL**	**PEL**	**IDLH**	**IP (eV)**	**Flammability Range**	**Routes of Exposure**	**Symptoms of Exposure**	**Other**
Polychlorinated biphenyls	0.001 mg/m^3	0.5 mg/m^3	5 mg/m^3	NL	NA	Inhalation, Ingestion, Contact	Eye irritant; chloracne; liver damage; reproductive effects	Skin Absorptive

Notes: NA - Not Applicable
NL - Not Listed
REL - Recommended Exposure Limit (NIOSH)
PEL - Permissible Exposure Limit (OSHA)
IDLH - Immediate Danger to Life and Health (OSHA)
IP - Ionization Potential
ppm - parts per million
mg/m^3 - milligrams per cubic meter
eV - electron volts

TABLE B.2

HAZARD ANALYSIS
PLEASANT RUN REMOVAL ACTION
BEDFORD, INDIANA

Field Activities	*Hazards*	*Prevention*
Construction Oversight	Chemical hazards due to inhalation and dermal contact	Proper use of PPE
	Exposure to temperature extremes	Monitor for heat or cold stress
	Physical hazards associated with operation of excavation equipment	Maintain a safe distance from equipment
		Avoid overhead power lines (20 feet)
		Check for and mark underground utilities
	Biological Hazards	Proper PPE, exercising ordinary caution, use of "buddy system"
	High noise level	Use hearing protection
	Slip, trip, fall	Clean mud, snow or grease from shoes and equipment
Sampling Activities	Exposure to temperature extremes	Monitor for heat or cold stress
	Chemical hazards due to inhalation and dermal contact	Proper use of PPE
	Biological Hazards	Proper PPE, exercising ordinary caution, use of "buddy system"
Perimeter Air Monitoring	Exposure to temperature extremes	Monitor for heat or cold stress
	Chemical hazards due to	Proper use of PPE

TABLE B.3

EMERGENCY CONTACTS
PLEASANT RUN REMOVAL ACTION
BEDFORD, INDIANA

Agency/Firm	*Emergency Telephone Number*	*Business Telephone Number*
Local Emergency Services		
Fire Department	911	
Police Department	911	
Ambulance	911	
Hospital (Regional Medical Center) 2900 16th Street Bedford, IN 47421		(812) 275-1200
National Poison Center		(800) 942-5969
National Response Center		(800) 424-8802
CRA Industrial Hygienist - Matthew Lazaric		(773) 380-9933
CRA Project Manager - James McGuigan		(773) 380-9933 mobile (812) 277-8960
CRA Construction Manager - Ashley Valentine		(513) 942-4750 mobile (513) 604-3946
On-Site Contacts - Kimberly Dobosenski		(812) 279-7404
GM Emergency Contacts - Cheryl Hiatt		(248) 680-5219 mobile (313) 510-4328
- Ed Peterson		(248) 680-5726 mobile (313) 506-9465
- Laura Fitzpatrick		(313) 665-4881

Directions to the Hospital: **(REFER TO FIGURE B.4)**

Total Distance: 3.1 miles (from Bedford Faciltiy)
3.9 miles (from Parcel 22)

Travel Time: 7-9 minutes

ATTACHMENT B1

HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT FORM

ATTACHMENT B1

HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT FORM

The following employees have read and understood the attached Health and Safety Plan:

Name	***Employer***	***Date***

VISITOR REVIEW

Each visitor to the Facility pertaining to the specified SOW shall sign this form after the pre-entry briefing is completed and before being permitted access to the Facility. A copy of this signed form shall be kept at the Facility, and the original sent to the HSO.

VISITOR SIGNOFF

I have attended a pre-entry briefing outlining the specific health and safety provisions for the SOW.

I have received a copy of the Health and Safety Plan. I have read the Plan, and will comply with the provisions contained therein.

Name (printed)	Signature	Date

Witness:

Name (printed)	Signature	Date

ACTING SAFETY OFFICER:

This person has provided verification of current OSHA 40-Hour hazardous waste site worker training.

Name (printed)	Signature	Date

ATTACHMENT B2

RESPIRATORY PROTECTION PROGRAM

TABLE OF CONTENTS

1.0 RESPIRATORY PROTECTION

1.1 PRACTICE

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 Standard Operating Procedure (SOP). Any deviation from the requirements set forth must have approval from an Industrial Hygienist (IH).

1.1.1 AUTHORIZATION

CRA employees requiring respiratory protection must have authorization from an IH. Office management shall notify an IH of respirator needs. The work situation will then be assessed and a respirator will be issued based on the hazard(s) the individual is exposed to. Reassessment of the hazard and the individual's needs will be repeated periodically.

1.1.2 MEDICAL SURVEILLANCE

All personnel designated to use respirators must successfully complete a physical exam as part of the medical requirements placed on persons exposed to hazardous substances and for users of respiratory protection (29 CFR 1910.134 and 1910.120). The medical exam will be repeated annually. All medical data will be reviewed by a consulting occupational physician. The physician will generate a written opinion on the suitability of the employee to wear a respirator.

1.1.3 AIR QUALITY

When air supplied respirators are used, the breathing air shall meet the Compressed Gas Association (CGA-CG7.1) Standards for Grade D breathing air or better.

1.1.4 AIR CYLINDERS

Cylinders used to supply breathing air are tested and maintained as prescribed in Shipping Container Specifications (49 CFR 178). Self-Contained Breathing Apparatus

(SCBA) cylinders have approximately 2400-psi of pressure when full. Compressed air cylinders are visually inspected annually and hydrostatically tested once every five years for steel cylinders and once every three years for composite cylinders. These test dates are stamped on the cylinder for future reference.

1.2 FIT TESTING

1.2.1 QUALITATIVE OR QUANTITATIVE FIT TESTING

Fit testing of the respirator will be conducted by an IH or other designated, trained personnel following the medical evaluation. All users of respirators must be fit tested to ensure proper protection. Only the brand and size a person is fitted for is allowed to be used in the field. DO NOT SUBSTITUTE RESPIRATORS FOR A BRAND AND SIZE THAT YOU HAVE NOT BEEN PROPERLY FITTED FOR. The fit test will be accomplished quantitatively for full face APRs. Records will be maintained by the Corporate IH with copies available in CRA field offices for audit purposes. After fit testing, the employee will be issued an authorization card. This card serves as a reference for the proper type of respirator to use as well as prima facie proof of proper medical and training clearance for regulatory purposes. The user shall have the card available at any time when on CRA business where respiratory protection is used or hazardous waste cleanup sites are being entered.

1.2.2 POSITIVE & NEGATIVE FIT TESTING

All personnel will be instructed in the proper method of testing respirator fit by use of the **Positive & Negative** pressure test. This test is to be done by the user each and every 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.

1.2.2.1 POSITIVE PRESSURE

1) Block off the exhalation valve cover openings.

   MSA: Exhalation valve cover can be blocked with the palm of the hand.

Scott: Exhalation valve covers have front openings as well as four small side openings. These openings are difficult to block off with the hands. However, a small piece of flexible material such as Saran wrap or latex can be used.

North: Exhalation valve cover has long narrow openings around its perimeter. These can be blocked by encircling the fingers around the valve cover.

2) The person exhales gently, creating a slight positive pressure within the facepiece. The positive pressure should be maintained for at least 10 seconds.

3) If no outward leakage is detected, the person has passed the test.

4) If leakage is detected (usually felt as a cool sensation against the skin or a loss of pressure), the respirator is either malfunctioning or a gross leak between the face and facepiece is present. The following should be done when a failure occurs: Re-don or readjust the respirator.

If the facepiece continues to lose pressure, although previous positive or negative pressure tests performed with that respirator had passed, it is probably malfunctioning. Consult Industrial Hygiene. It is also possible that there are new scars or wrinkles, beard growth, missing teeth or dentures, significant weight gain or loss, etc. to cause gross leakage into the facepiece. When such new conditions exist, reevaluation of the respirator in a test atmosphere is necessary.

1.2.2.2 NEGATIVE PRESSURE

1) Block off the respirator cartridge inlet openings.

MSA: Cartridges can be blocked with the palms of the hands or with disposable latex gloves.

Scott: Cartridges can be blocked by using the palms of the hands or with gloves.

North: Cartridges can be blocked only with gloves.

2) Inhale gently, holding the negative pressure for at least 10 seconds.

3) If no inward leakage of air is detected, the person has passed the test.

4) If leakage is detected, see 4 above.

1.2.3 EXCEPTIONS

1.2.3.1 FACIAL HAIR

Any individual with facial hair which protrudes into the sealing surface of the masks will be refused fitting. Fitting, issuance, and use will be based on clean-shaven faces only. Employees with facial hair which interferes with respirator fit will not be permitted to work where respiratory protection must be worn.

1.2.3.2 GLASSES

Employees who wear prescription glasses and must wear a full-face respirator shall be fitted with special eyeglass adapters. Contact lenses will not be permitted when worn with any type of respiratory protection.

1.3 TRAINING

Proper training of respirator users is required to insure that all respirators will provide adequate protection against respiratory hazards and so that the user will understand the device's limitations. The training will include the following elements:

1) An explanation of the nature of respiratory hazards and what may happen if the respirator is not used properly.
2) A description of what engineering and administrative controls may be utilized to reduce the effects of the respiratory hazard and why respirators are required.
3) An explanation of the various types of respirators and why specific types have been selected.
4) A discussion of the function, capabilities, and limitations of respirator cartridges.
5) Instruction in the inspection, fit, and maintenance of the respirator.
6) Instructions in recognizing and handling emergency situations.

1.4 MAINTENANCE AND CARE OF RESPIRATORS

A program for the maintenance and care of respirators will include the following:

1) Inspection for defects;

2) Cleaning and disinfecting;
3) Repair/miscellaneous maintenance; and
4) Storage.

1.4.1 INSPECTION FOR DEFECTS

Employees shall inspect their respirators before each use. A respirator that is not routinely used but is kept ready for emergency use shall be inspected after each use and at least monthly to ensure that it is in satisfactory condition. SCBA shall be inspected monthly if kept for emergency response (i.e., long duration site remediation).

Inspection shall include a check of the tightness of the connections and the condition of the face piece, headbands, valves, breathing tubes and canisters. Rubber or elastic parts shall be inspected for pliability and signs of deterioration. Any respirator with worn or defective parts will be immediately taken out of service.

Before and after each use, respirators will be inspected for the following:

1) Tightness of connections and condition of the facepiece;
2) 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;
3) Valves and valve seats;
4) Connecting tube and canisters, air or oxygen cylinders;
5) Rubber or elastomer parts for pliability and deterioration; and
6) Regulators, fittings and gauges.

The following contains inspection information for various types of respirators.

<u>Air Purifying Respirators</u>

1) Check rubber facepiece for dirt, pliability of rubber, deterioration and cracks, tears, holes or distortion from improper storage.
2) Check straps for breaks, tears, loss of elasticity, broken snaps and proper tightness.

3) Check valves (exhalation and inhalation) for holes, warpage, cracks, etc. After removing its cover, the exhalation valve should be examined for: foreign material, distortion, defective or missing valve cover, or improper installation of valve into the valve seat.

4) Check filters or cartridges for dents, corrosion, etc. (loose or missing gaskets, improperly seated cartridges).

5) Check for cracked or badly scratched lenses in full facepieces; incorrectly mounted lens, broken or missing mounting clips.

Atmosphere-Supplying Respirators

1) Check appropriate items above.

2) Check air supply system for breaks or kinks in supply hoses and detachable coupling attachments.

3) Follow manufacturer's recommendations for the specific equipment.

4) Check air supply level and warning devices.

1.4.2 CLEANING AND DISINFECTING

The respirator must be washed after each day's use. If the respirator is shared it must be disinfected according to the manufacturer's instructions. Organic solvents of any kind must not be used for cleaning. Air purifying filters must not be wetted.

1.4.2.1 CLEANING

1) Remove any filters, cartridges or canisters and, if required by the manufacturer, straps and speaking diaphragms from the facepiece. Remove regulators on airline or SCBA.

2) Wash respirator parts excluding cartridges and canisters in warm (not to exceed 140°F), soapy water or in a product specifically designed by respirator manufacturers for this purpose. A plastic bristle hand brush may be helpful in removing dirt from respirator parts.

3) Rinse all parts thoroughly in warm water.

4) Air dry all parts.

5) Reassemble the respirator and insert new cartridges if needed.

6) Place the respirator in a plastic bag or container and seal it for storage. The respirator facepiece should be stored in its normal position so as not to distort the elastomer.

1.4.2.2 DISINFECTION

1) Disinfection should be done with a cleaner/disinfection agent purchased from the respirator vendor. If that material is not available the following NIOSH procedures can be followed:
   a) Immerse the respirator body for two minutes in a 50 ppm chlorine solution (about 2 ml bleach to 1 liter of water). Rinse thoroughly in clean water and air dry.
   b) Immerse the respirator body for two minutes in an aqueous solution of iodine (add 0.8 ml of iodine in 1 liter water). The iodine is about 7% ammonium and potassium iodide, 45% alcohol and 48% water. Rinse thoroughly in clean water and air dry.
2) Immersion times have to be limited to minimize damage to the respirator. The solutions can age rubber and rust metal parts.

   NOTE: The air-purifying elements must be removed from the respirator prior to cleaning and sanitizing the respirator. Never allow the air-purifying elements to come in contact with water or cleaning/sanitizing solution.

1.4.3 STORAGE

Respirators must be stored to protect them from contamination and mechanical damage at all times when not in use. New, cleaned or reconditioned respirators are to be kept in a clean, sealed plastic bag or container, stored in a normal position. The plastic bag should be labeled with the users name. A suitable cabinet or drawer should be used to protect respirators and supplies from dirt, extremes of temperature or bright sunlight. They are not to be left in vehicles or on perimeter fences, in change sheds, etc.

July 18, 2003

ATTACHMENT B3

HEAT STRESS AND COLD STRESS PROCEDURES

TABLE OF CONTENTS

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 degrees Fahrenheit (°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 resulting 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.
- 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. Follow the guidelines given below when the ambient air temperature is -5°F (-20°C) or lower:

- Contact the Project Manager (PM) or the industrial hygienest to determine if the project team should be working 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 on Table C.1. It is based on the cooling power of air that 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°C 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; and
- If more than 30 minutes from a medical facility, warm person with other bodies.

2.0 HEAT STRESS

2.1 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 or industrial hygienest 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.

2.2 PREDISPOSING

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.
- 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.

2.3 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 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 available 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 (21°C). 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.
- 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 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.

2.3.1 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; and
- 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; and
- Initiate heat stress monitoring and/or the use of cooling devices.

2.3.2 HEAT STRESS MONITORING

Heat stress monitoring may 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 one hour. If the next scheduled monitoring session shows a heart rate of >110 bpm once again, reduce the work time between breaks by one hour.

2.4 HEAT STRESS FIRST AID

2.4.1 HEAT CRAMPS

Cause: Excessive water loss/electrolyte imbalance.

Symptoms

Muscular pain in arms, legs, abdomen
Faintness, dizziness, exhaustion
Normal temp, cool moist skin

First-Aid Guidelines

Administer sips of Gatorade (1/2 glass every 15 minutes)
Do not massage cramping muscles
Relax person

2.4.2 HEAT EXHAUSTION

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

Symptoms

Moist, clammy, skin, usually pale
Dilated pupils
Weak, dizzy, nauseous, headache
Normal or low body temperature

First-Aid Guidelines

Move to a cool place
Apply cold, wet compresses to skin
Raise feet 8 to 12 inches
Administer sips of Gatorade (1/2 glass every 15 minutes)
Get medical attention

2.4.3 HEAT STROKE

Cause: Body overheats; temperature rises; no sweating occurs

Symptoms	First-Aid Guidelines
No sweating occurs	Get emergency medical assistance ASAP
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	

July 18, 2003

APPENDIX C

SAMPLING AND ANALYSIS PLAN (SAP)

July 18, 2003

SAMPLING AND ANALYSIS PLAN (SAP)

BAILEY'S BRANCH AND PLEASANT RUN REMOVAL ACTION

BEDFORD, INDIANA

JULY 2003
REF. NO. 13968 (18) APPC
This report is printed on recycled paper.

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(Following Text)

LIST OF ACRONYMS

Bedford Facility	General Motors Corporation Powertrain Bedford Facility
CRA	Conestoga-Rovers & Associates
Creek Areas	designated creek and adjacent floodplain areas of Pleasant Run and its tributaries
DOT	Department of Transportation
GM	General Motors Corporation
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan
U.S.EPA	United States Environmental Protection Agency
Work Plan	Interim Measures Work Plan

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) is submitted as an appendix to and forms part of the Removal Action Work Plan(s) (Work Plan) submitted by General Motors Corporation (GM) to the United States Environmental Protection Agency (U.S. EPA) for the designated creek and adjacent floodplain areas of Pleasant Run and its tributaries (Creek Areas) at the GM Powertrain Bedford Facility in Bedford, Indiana (Bedford Facility). This SAP covers investigation and removal action activities to be conducted at the Parcel where polychlorinated biphenyls (PCBs) have been identified in soil.

The SAP describes procedures for the collection of verification and stockpile soil samples, that will be collected during the implementation of the Work Plan. A detailed scope of work for the activities associated with this SAP can be found in Section 3.0 of the Work Plan.

2.0 GENERAL SAMPLING PROTOCOLS

2.1 SAMPLING

Samples will be collected at the locations and frequencies specified for each Parcel.

The following protocols will be employed during all sampling conducted during implementation of the Work Plan:

1. All sampling instruments and equipment will be cleaned in accordance with the protocols presented herein prior to collecting samples for chemical analyses at each location.

2. A new pair of disposable latex gloves will be used at each location to be sampled for chemical analyses. Additional glove changes will be made for conditions such as: if the gloves are observed to be torn, or the gloves are suspected of being soiled from a source other than the sample media itself.

3. Quality assurance/quality control samples will be collected as outlined in the approved project Quality Assurance Project Plan (QAPP) for the Site, and summarized in Table C.2.1.

4. All sampling generated wastes such as gloves, tyveks, etc. will be collected and containerized for proper disposal.

5. Samples will be identified using labels and a tag affixed to the neck of the container. Samples will also be labeled and tags noting the site, sample location, sample interval (if appropriate), analysis required, preservative added, date, time and sampler's initials. All sample preservation protocols will be followed in adherence with the QAPP. A hard cover bound field book will be maintained to record all samples and sampling events.

6. Containers for sample collection and preservation requirements will be determined as required by the analytical parameters. All sample bottles will be provided by the laboratory and will be prepared using a standard laboratory validated washing procedure. The sample bottles will be delivered to the site in sealed containers.

7. All collected sample shipments for chemical analysis will be immediately iced in laboratory supplied coolers after collection and labeling. Any remaining space will be filled with packing to cushion the containers within the shipment coolers.

Each cooler will be sealed with a transportation custody seal containing the sampler's initials. The cooler will then be sealed with packing tape.

All samples will be delivered to the laboratory by commercial courier or Conestoga-Rovers & Associates (CRA) personnel, the day following sample collection.

8. Samples will be shipped under chain-of-custody procedures as outlined in the QAPP.

2.2 EQUIPMENT CLEANING

Prior to the collection of any samples designated for chemical analyses, all sampling equipment and tools, except for dedicated equipment and pre-cleaned disposable tools, will be cleaned using the following cleaning protocols as follows:

i) wash with low phosphate detergent using a brush to remove particulate matter or surface film, if any;

ii) potable water rinse;

iii) rinse with pesticide-grade isopropanol;

iv) rinse with deionized water; and

v) air dry; and

vi) wrap in aluminum foil or polyethylene until required and during transport to the sampling site.

Fluids used for cleaning will not be recycled. All wash water and rinse water will be transferred to drums and/or a wastewater tank on Site pending final disposal. Isopropanol rinsings will be kept separate from wash/rinse waters and will be transferred to drums pending final disposal.

Following final rinse, sampling equipment will be visually inspected to verify that they are free of soil particulates and other solid material which may contribute to possible sample cross-contamination. Dedicated equipment which is used only once will not be subject to the above decontamination procedures.

2.3 WASTE HANDLING

All wash and rinse waters generated during excavation activities will be containerized in storage tanks or Department of Transportation (DOT) approved 55-gallon drums or equivalent, labeled, and sealed prior to characterization for disposal consistent with the Waste Management Plan.

3.0 SOIL SAMPLING PROTOCOL

3.1 VERIFICATION SOIL SAMPLING

Verification soil samples will be collected after excavation in accordance with Section 3.7.4 of the Work Plan and using the following protocols:

1. Discrete soil sample aliquots for composite samples will be collected using a pre-cleaned stainless steel trowel or other appropriate tool;
2. A new pair of disposable gloves will be used at each sample location;
3. Prior to use at each sample location, all sampling tools will be decontaminated in between each sample location, using the prescribed cleaning protocol presented in Section 2.2;
4. The collected discrete sample aliquots for each composite sample will be placed in a pre-cleaned stainless steel bowl and homogenized;
5. The homogenized soil will be placed directly in a clean, pre-labeled sample jar and sealed with a teflon-lined cap. Samples to be split for duplicate analyses will also be collected as necessary from the homogenized sample;
6. Samples will be labeled noting the location, date, time, and sampler's initials. Sample details will be recorded in a hard-cover bound field book; and
7. Samples will be placed in ice or cooler packs in laboratory supplied coolers after collection.

Characterization samples will be analyzed for PCBs by U.S. EPA method SW846 8081, in accordance with the approved project QAPP and all other parameters necessary for waste acceptance at the selected disposal facility(ies).

3.2 STOCKPILE SOIL SAMPLING

Sampling of stockpiled soils designated for disposal at commercial facilities, will be performed at the frequency specified by the disposal facility to characterize the soil for disposal purposes. The soil will have been already disturbed during excavation and mixed to a degree, therefore, the procedures used to obtain representative samples from in situ soils are not applicable in this situation. The stockpile will be divided into a sufficient number of quadrants to provide the required number of sample aliquots with one sample aliquot being collected from each quadrant to form a composite sample, according to the following protocols:

1. Prior to use at each stockpile to be sampled, the sampling equipment will be cleaned according to the protocol presented in Section 2.2;
2. A new pair of disposable gloves will be used at each sample location;
3. Stockpiled soil samples will be collected using a stainless steel trowel or other appropriate tool. Samples will be collected from approximately 1 foot below the surface of the stockpiled soil;
4. the discrete soil samples aliquots collected from each quadrant will be emptied into a clean stainless steel bowl and homogenized prior to collecting the composite analytical sample;
5. The collected soil will be placed directly in a clean, pre-labeled sample jar and sealed with a teflon-lined cap. Samples to be split for duplicate analyses will first be homogenized in a pre-cleaned stainless steel bowl;
6. A sufficient number of samples will be collected to satisfy disposal facility requirements.
7. Samples will be labeled noting the location, data, time, and sampler's initials. Sample details will be recorded in the hard-cover bound field book; and
8. Samples will be placed in ice or cooler packs in laboratory supplied coolers after collection.

Characterization samples will be analyzed for PCBs and all other parameters necessary for waste acceptance at the selected disposal facility(ies).

4.0 FIELD LOG

The field log book will be a bound document with consecutively numbered pages. The entries for each day commence on a new page which will be dated. All entries will be made only in indelible ink. Corrections will be made by marking through the error with a single line, so as to remain legible, and initialing this action followed by writing the correction. The field log books generated will be numbered consecutively and maintained by CRA.

The following information will be recorded in the field log book for each sample collected:

i) site location identification;
ii) unique sample identification number;
iii) date and time (in 2400 hour time format) of sample collection;
iv) weather conditions;
v) designation as to the type of sample (sediment, soil, or water);
vi) designation as to the means of collection;
vii) name of sampler;
viii) analyses to be performed on sample; and
ix) any other relevant comments such as odor, staining, texture, filtering, preservation, etc.

5.0 SAMPLE SHIPMENT AND CONTAINERS

5.1 CHAIN-OF-CUSTODY FORMS

Chain-of-custody records will be used to track all samples from time of sampling to the arrival of samples at the laboratory.

Each shipping container being sent to the laboratory will contain a chain-of-custody form. The chain-of-custody form consists of four copies which are distributed to the sampler, to the shipper, to the contract laboratory and to the office file of CRA. The sampler and shipper will maintain their copies while the other two copies are enclosed in a water proof enclosure within the sample container. The laboratory, upon receiving the samples, will complete the remaining copies. The laboratory will maintain one copy for its records. The executed original will be returned to CRA with the data deliverables package.

5.2 SAMPLE CONTAINERS AND HANDLING

Required sample containers, sample preservation methods, maximum holding times and filling instructions are provided in the QAPP.

All samples will be placed in appropriate sample containers, labeled, tagged and properly sealed. In addition, sample labels and sample tags (which will be affixed to the neck with a wire) will include sample number, place of collection, date and time of collection, and analyses to be performed. Samples will be cushioned within the shipping coolers by the use of vermiculite and/or bubble pack. Samples will be kept cool by the use of plastic bags of ice or cooler packs, as required and each sample will have an individual sample tag.

Samples will be shipped by commercial courier on a daily basis to the project laboratory.

Two seals comprised of CRA's chain-of-custody tape will be placed around each shipping cooler prior to shipment to secure the lid and provide evidence that the samples have not been tampered with en route to the laboratory. Clear tape will be placed over the seals to ensure that they are not accidentally broken during shipment.

Upon receipt of the cooler at the laboratory, the cooler will be inspected by the designated sample custodian. The condition of the cooler and seal will be noted on the chain-of-custody form by the sample custodian. The sample custodian will document the date and time of receipt of the cooler and sign the chain-of-custody forms.

The sample custodian then will check the contents of the cooler with those samples listed on the chain-of-custody form. If damage or discrepancies are noticed, they will be recorded in the remarks column of the chain-of-custody form, dated and signed. They will be reported to the laboratory supervisor who will inform the laboratory manager and QA officer.

Sample disposal will be the responsibility of the laboratory. Upon disposal, the laboratory shall sign the next open "Relinquished by" box, and the word "Disposed" shall be written in the "Received by" box.

TABLE C.2.1

SUMMARY OF SAMPLING AND ANALYSIS PROGRAM
PLEASANT RUN REMOVAL ACTION
BEDFORD, INDIANA

					Quality Control Samples			
Task/Event	*Sample Matrix*	*Field Parameters*	*Laboratory Parameters*	*Investigative Samples*	*Field Blanks*	*Field Duplicates*	*MS/MSD* [1]	*Total* [2]
Excavation Verification Sampling	Soil	--	PCBs [3,5]	TBD	0	1/10	1/20	--
Soil Characterization (if required)	Soil	--	PCBs [4]	TBD[5]	0	0	0	--

Notes:

1 Matrix spike/matrix spike duplicate (MS/MSD) and or a MS/duplicate (MS/DUP) analyses are required for each batch of 20 samples submitted.
2 The total quantity does not include MS/MSD and LSC/LCD samples.
3 Select samples may be processed for PCBs congener analysis.
4 Additional parameters may be required for waste disposal approval, these parameters will be defined upon selection of disposal facilities.
5 The actual quality of sample to be collected will depend on site activities.

TBD - To be determined
TCL - Target Compound List
PCB - Polychlorinated Biphenyls

July 18, 2003

APPENDIX D

WASTE MANAGEMENT PLAN (WMP)

REVISED DRAFT FOR REVIEW
July 18, 2003

WASTE MANAGEMENT PLAN (WMP)

BAILEY'S BRANCH AND PLEASANT RUN REMOVAL ACTION

BEDFORD, INDIANA

JULY 2003
REF. NO. 13968 (18) APPD
This report is printed on recycled paper.

TABLE OF CONTENTS

Page

LIST OF FIGURES
(Following Text)

LIST OF ATTACHMENTS

LIST OF ACRONYMS

AOC	Administrative Order by Consent
CA	Corrective Action
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Creek Areas	designated creek and adjacent floodplain areas of Pleasant Run and its tributaries
GM	General Motors Corporation
HASP	Health and Safety Plan
RA	Interim Measures
PCB	Polychorinated Biphenyls
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
ppm	parts per million
RA	Removal Action
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	Toxic Substances Control Act
U.S. DOT	U.S. Department of Transportation
U.S. EPA	U.S. Environmental Protection Agency
WMP	Waste Management Plan
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

The Waste Management Plan (WMP) presented herein, describes policies, procedures, and protocols for the handling of waste materials generated during the Removal Action (RA) being conducted for the designated creek and adjacent floodplain areas of Pleasant Run and its tributaries (Creek Areas) under an Administrative Order by Consent (AOC) by General Motors Corporation (GM) in Bedford, Indiana and Lawrence County, Indiana. Types of wastes that may be generated, potentially include but may not be limited to the following:

- Toxic Substances Control Act (TSCA) polychlorinated biphenyls (PCB) remediation waste (includes solids and liquids from drilling and excavating activities), as defined by 40 CFR Part 761; and
- solid waste (includes solids and liquids from excavating activities, personal protective equipment (PPE), debris, and soil).

Procedures for the proper management, handling, transportation, and staging of bulk soil excavated from the Creek Areas are presented in the Work Plan. This WMP presents details related to other waste materials which may be generated during the implementation of the RA.

The procedures and protocols outlined in the following subsections of this WMP include proper management, characterization testing/sampling, storage, transportation and/or disposal of wastes generated during project activities. These procedures will be performed in conjunction with those presented in the Site Health and Safety Plan (HASP). In addition, the WMP will be revised/expanded, as appropriate, while the RA work progresses to include information, methodologies and procedures associated with any changes in work scope and/or Site conditions.

2.0 WASTE MATERIALS

Waste materials generated as part of the RA activities, summarized in Section 1.0, may include:

- Drummed and/or containerized aqueous wastes consisting of decontamination water and dewatering of excavations;
- Drummed and/or containerized solid wastes from excavating (may include a mixture of soils, PPE, and cleared vegetation);
- Stockpiled solid wastes from drilling and excavation activities handled in accordance with 40 CFR Part 261.65 and consistent with the RA Work Plan; and
- Drummed and/or containerized mixed aqueous and solid waste consisting of river/stream sediments, or soils (may include PPE also).

None of the above wastes are considered to be explosive or shock-sensitive, therefore, provisions for these types of waste are not presented, herein. A detailed inventory by waste types/categories of all wastes produced during performance of the RA activities will be maintained by CRA's Site Representative using CRA's Waste Manager database program (see Attachment D-1).

2.1 RA GENERATED WASTES

Bulk soil excavated from Creek Areas as part of the RA will be staged in accordance with the RA Work Plan. Other RA generated wastes may include drummed or containerized waste which will be stored daily at the Parcel, while the drums/containers are still being filled. Once full, all drummed or containerized wastes will be transferred to the GM waste storage pad pending on-Site treatment and/or off-Site treatment/disposal.

Waste intended for off-Site disposal will be sent for disposal as soon as possible following proper waste characterization. The locations for waste storage are presented on Figure D.2.1.

Depending on the quantity of liquid waste produced, the water may be processed through GM's wastewater treatment plant (WWTP). The acceptability of utilizing the GM WWTP would be determined based on an evaluation of plant capacity and permit conditions.

3.0 DRUM AND CONTAINERIZED WASTE HANDLING PROTOCOLS

3.1 GENERAL

This section applies to all activities involved in the handling of the generated waste drums and containers that may potentially contain non-hazardous or TSCA waste materials in either solid or liquid state. All drum and container handling activities will be conducted in accordance with the HASP.

3.2 SAFETY EQUIPMENT/HANDLING EQUIPMENT

During the handling of drums or containers, PPE as specified in the HASP will be worn at all times. All handling, moving and transporting of drums or containers will be performed with mechanical equipment whenever possible.

Minimum equipment and materials will be maintained on Site at all times for control/cleanup in response to any spill, release, or discharge.

3.3 DRUM HANDLING

3.3.1 DRUM STAGING AND HANDLING

Drummed or containerized waste generated during RA activities will be stored daily at the Parcel, while the drums/containers are still being filled. Once full, all drummed or containerized wastes will be transferred to the GM waste storage pad (see Figure D.2.1) pending on-Site treatment and/or off-Site treatment/disposal.

All drums will be transferred to the Site's waste storage pad using mechanical equipment whenever possible. Drums will be moved by grappler, non-metallic slings, within a backhoe bucket or front end loader or by other means that will minimize damage to the drums and the potential release of contents therefrom. All drums will be placed on pallets and oriented to permit sampling of each individual drum, if necessary.

All drummed waste placed in the waste storage will be initially marked to include waste generation method, date produced (first date waste placed in drum), and unique drum number. All drums will be recorded by entering the container information in the CRA Waste Manager database program. Subsequent to completing waste sampling and characterization, as discussed in Sections 5.0 and 6.0, all drums containing hazardous/TSCA wastes designated for off-Site disposal/treatment will be labeled and manifested, as discussed in Section 4.0.

Containers/drums with TSCA waste will be stored on the GM hazardous waste storage pad for a period of up to 30 days from the initial waste generation date prior to shipment (generally shipped every two weeks). Drums which are more than 30 days old will be overpacked to provide secondary containment thereby allowing the storage time to be extended to ensure disposal in a period of less than 1 year. The TSCA containers more than 30 days old will be inspected for leaks pursuant to 40 CFR Part 761.

3.3.2 SPILL PREVENTION AND RESPONSE

The handling and transport of drummed and/or containerized waste will be, at all times, conducted in a controlled and safe manner which will minimize damage to the containers and prevent release of the contents.

In the event that a drum or container of liquid is spilled, the Site personnel 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, with the use of a portable hand pump, into a repack drum. 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 occurred on soil, outside of a previously identified contaminated area, CRA's Site Representative will immediately consult with CRA's Project Manager and the GM Project Manager to determine the appropriate response. If the spilled liquid consisted of decontamination water, the decision to excavate the visibly affected soils will be based on whether the water was generated from a source known to exhibit contamination. However, if a decontamination water spill occurred on soil within a previously identified contaminated area, the affected soil will not be excavated since the soils in these identified areas will be remediated, and verification sampling completed, as part of the RA.

All spills above reportable quantities will be reported according to local, state, and federal regulations, after consultation with GM personnel.

4.0 WASTE TRANSPORTATION AND DISPOSAL

4.1 MANIFESTING AND LABELING

All hazardous/TSCA wastes designated for off-Site disposal will be labeled and manifested prior to leaving the Site for off-Site treatment/disposal facilities. The manifest forms and records will be consistent with 40 CFR Part 262 "Environmental Protection Agency (EPA) Hazardous Waste Generator Standards", 40 CFR Part 263 "EPA Hazardous Waste Transporter Standards", 40 CFR Part 268, "Land Disposal Restriction Standards", 40 CFR Part 761, "EPA Polychlorinated Biphenyls Rules" and the State of Indiana. Attachment D-2 presents example waste labels. Attachment D-3 presents example manifests.

The Facility United States Environmental Protection Agency (U.S. EPA) ID number will be used on all manifests. A site-specific waste tracking form, as described in the RA Work Plan, will be utilized to track the shipment of bulk excavated soils from Creek Areas to the staging area at the GM Powertrain facility.

A customized version of CRA's Waste Manager database program will be installed at the CRA Site trailer in Bedford, Indiana (see Attachment D-1). CRA's Waste Manager program will track individual waste containers from generation through disposal. Specifically the program will track container start dates, container locations, container contents, regulatory storage/disposal timeframes, container labeling requirements, approved disposal locations, approved waste stream profiles and shipping documentation, including generating manifests and tracking receipt of returned manifests.

4.2 PREPARATION OF OFF-SITE TRANSPORT VEHICLES

All off-Site transport vehicles will be prepared as appropriate prior to receiving drummed or bulk waste. Drummed wastes will be loaded and secured in a manner which will prevent damage to the containerized materials.

A weatherproof tarp will be provided and secured over each shipment leaving Site. Exception will only be made for enclosed transport units.

Transport drivers will remain in their vehicle cabs while they are in an Exclusion Zone, temporary Exclusion Zone, or Contaminant Reduction Zone, as defined in the HASP.

Following tarping, each transport vehicle will enter the decontamination facility if leaving an Exclusion Zone, temporary Exclusion Zone, or Contaminant Reduction Zone. Each vehicle will be decontaminated to ensure that no loose soil, sludge or other material is tracked off Site. Particular attention will be paid to removing materials from the tires, under carriage and portions of vehicles which may have been in contact with waste material during loading operations. Decontamination activities will include sweeping, brushing and/or steam cleaning, as appropriate.

CRA's Site Representative will inspect and document that each vehicle leaving the decontamination area has been decontaminated properly, tarps are secured, proper placards are in place, manifest/documents are correct and there are no visible signs of leaks from the drums/containers that have been loaded onto the vehicles.

4.3 AUTHORIZED TRANSPORTERS

Only transporters which are licensed by U.S. EPA, U.S. Department of Transportation (U.S. DOT), and the State of Indiana will be used for the transport of hazardous waste. Transporters will be in compliance with applicable state and federal hazardous waste transportation requirements (i.e., 40 CFR Part 263). If shipments are scheduled for facilities outside of the State of Indiana, transporters will be required to be licensed in the appropriate State(s) as well as comply with other applicable Federal laws including DOT requirements.

If wastes are deemed to be non-hazardous, then transporters will be licensed for general transportation of sanitary wastes or as required by the State of Indiana for the transport of Special Waste. These wastes may be disposed of in an appropriate sanitary landfill or into an appropriately permitted wastewater treatment facility, as appropriate.

4.4 TRANSPORTATION ROUTES

Transportation routes to off-Site facilities will be pre-determined by the authorized transporter prior to commencing off-Site transport of waste materials. A primary and secondary route to each facility will be identified. The secondary route will be used only if the primary route becomes impassible due to weather and road conditions or blockage from traffic accidents. The appropriate State and interstate officials will be consulted as to whether any proposed routes are scheduled for construction or seasonal closures which will occur during implementation of this project.

Transportation route maps shall be provided for each phase of the RA prior to initiating material transport.

4.5 OFF-SITE TREATMENT/DISPOSAL

All off-Site treatment/disposal of waste materials will be conducted accordance with applicable state and federal regulations.

4.5.1 APPROVED TREATMENT/DISPOSAL FACILITIES

Off-Site facilities for the treatment, storage, or disposal of drummed/containerized or bulked wastes will be approved by GM prior to commencing transport to these facilities. All facilities identified for hazardous waste treatment/disposal will be Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) approved, RCRA compliant and/or TSCA compliant, as applicable.

Any wastes deemed to be non-hazardous may be transported to a sanitary landfill and/or Publicly Owned Treatment Works (POTW) system, as applicable, for disposal.

5.0 WASTE SAMPLING

5.1 GENERAL

Waste characterization and testing will be conducted as required on containerized liquid and solid wastes designated for off-Site disposal at permitted facilities, to determine the appropriate disposal mode and ensure compliance with 40 CFR 261, 40 CFR Part 268, 40 CFR Part 761, and/or the Indiana Regulations (Title 13). Soil/sediments may also be characterized and delineated in-situ then removed and shipped in bulk based on the in-situ characterization.

The following subsections describe the procedures which will be implemented for sampling bulk wastewater, drummed liquid wastes, drummed or containerized solid wastes, and drummed/containerized or bulk mixtures of solids and liquids for disposal characterization purposes.

5.2 SAMPLE COLLECTION PROTOCOLS

5.2.1 COLLECTED WASTEWATERS SAMPLING

Containerized wastewaters will be sampled and analyzed in accordance with requirements of the receiving off-Site treatment/disposal facility(ies). During the sampling of containerized wastes, personal protective equipment as specified in the HASP will be worn at all times. Collected wastewaters in wastewater tanks may include equipment decontamination washwaters, extraction test waters, and purging/development water. The frequency of sample collection will be determined in consultation with the disposal facility. Samples of containerized wastewaters will be collected as follows:

1. New disposable latex gloves will be used when collecting each liquid sample. Additional new glove changes will be made as conditions warrant.
2. Samples will be collected using a pre-cleaned glass sampling thief, a stainless steel bailer or a sampler capable of taking samples from discrete depths (i.e. bacon bomb sampler, kemmerer, etc.). Samples will be collected from the top, middle and bottom of the liquid volume, as appropriate, if multiple phases are present, or from the approximate mid-depth of liquid depending on the depth of liquid, if the liquid is a single phase. Samples will be collected in the appropriate precleaned bottles to be supplied by the laboratory. Bottle containers will be chosen, cleaned and quality controlled according to OSWER

Directive No. 9240.0-05*A* entitled "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers", December 1992.

3. All disposable gloves will be collected and contained for proper disposal with other PPE materials during the RFI, RA, and CA operations.
4. The chain-of-custody procedures will follow those specified in Section 5.2.3.

5.2.2 DRUMMED/CONTAINERIZED MATERIAL SAMPLING

This section describes the general procedures that will be followed when sampling drummed or bulk waste containers.

5.2.2.1 SAFETY EQUIPMENT

During the sampling of containerized materials, personal protective equipment as specified within the HASP will be worn at all times.

5.2.2.2 SAMPLING EQUIPMENT

Materials and equipment that may be required for sampling are as follows:

1. Chain-of-Custody data sheets.
2. Glass sampling thief for collection of liquid samples.
3. Stainless steel trowel, spoon or trier for collection of solid or sludge samples, if applicable.
4. Bung wrench.

All drums will be sampled on the storage pad to mitigate potential spillage onto ground surface.

5.2.2.3 SAMPLING PROCEDURES

The following procedures will be adhered to during sampling of drummed liquid waste.

1. Remove cover from sample container and remove lid/bung from the drum.
2. Insert sampling thief almost to the bottom of the drum or until a solid layer is encountered. If the liquid in the drum is a single phase, a representative sample of the liquid in the entire drum will be collected for compatibility testing, if necessary, and waste characterization. If more than a single phase of liquid is determined to be present in the drum, each phase of liquid will be sampled separately.
3. Allow the liquid waste in the drum to reach its natural level in the tube.
4. Cap the top of the sampling tube with a double-gloved thumb or stopper, ensuring liquids do not come into contact with the sampler's thumb or stopper.
5. Carefully remove the capped tube from the drum and insert the uncapped end in the sample container. Do not spill liquid on outside of bottle.
6. Slowly release the thumb or stopper and allow the glass thief to drain completely and fill the sample container. Repeat the above steps until sufficient volume has been collected for analysis.
7. Cap the sample container tightly and place pre-labeled sample container in a carrier.
8. Transport the sample to the laboratory for analysis.

Sampling of drummed and/or containerized solids or sludges will, in general, conform to the preceding procedures with the following exceptions:

1. Sample collection will be accomplished using a stainless steel trowel, spoon or trier. All sampling equipment will be cleaned prior to use. Reusable sampling equipment will be cleaned between subsequent drums using the protocol presented in Section 7.0.
2. A representative sample of drummed and/or containerized solids or sludges, will be collected, if practical.
3. The sample collected will be a composite of a minimum of four 25-gram samples collected from representative locations throughout the containerized material unless it is known that the containerized material is homogeneous in nature (e.g. soil cuttings, spent carbon). In this case, only one sample will be collected from the drum or container.

Samples collected from containerized waste containing the same material may be composited during sample collection into one sample for disposal characterization purposes.

5.2.3 SAMPLE SHIPMENT/CHAIN-OF-CUSTODY

All sample shipments will follow appropriate chain-of-custody procedures.

6.0 WASTE CHARACTERIZATION

The physical and chemical testing protocols which may be required to meet the general testing requirements of various treatment/disposal facilities vary. The waste characterization requirements will be confirmed following selection and identification of the treatment/disposal facility(ies).

In general, investigative soil samples will also be utilized for waste characterization purposes. Analytical laboratory results for total constituent concentrations (not leachable concentrations) will be compared to 20 times the RCRA Toxicity Characteristic Leaching Procedure (TCLP) limits and the TSCA polychlorinated biphenyl (PCB) limit of 50 parts per million (ppm). Should a total result for a RCRA parameter exceed 20 times the RCRA TCLP limit, a waste characterization sample will be collected from the container in question and the sample will be analyzed for TCLP for the parameter(s) in question.

Attachment D-4 presents copies of waste profiles and approvals for waste included under this WMP.

7.0 EQUIPMENT CLEANING

Since samples are being collected for waste characterization for disposal purposes, all sampling equipment and tools (other than pre-cleaned disposable tools) will be decontaminated prior to the collection of samples, at the Decon facility using the following rinse sequence:

i) wash with low phosphate detergent using a brush to remove particulate matter or surface film, if any;
ii) potable water rinse;
iii) rinse with pesticide-grade isopropanol;
iv) rinse with deionized water; and
v) air dry.

Fluids used for cleaning will not be recycled. All wash water and rinse water will be transferred to drums and/or a wastewater tank on Site pending final disposal. Isopropanol rinsings will be kept separate from wash/rinse waters and will be transferred to drums pending final disposal.

Following final rinse, sampling equipment will be visually inspected to verify that they are free of soil particulates and other solid material which may contribute to possible sample cross-contamination. Dedicated equipment which is used only once (e.g. glass thiefs) will not be subject to the above decontamination procedures.

8.0 PERSONNEL

Figure D.8.1 presents project personnel and their roles and responsibilities regarding this WMP.

Nº	Revision	Date	Initial

0 100 200ft

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- BEDFORD CITY LIMIT
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- STREAM
- 600 CONTOUR LINE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

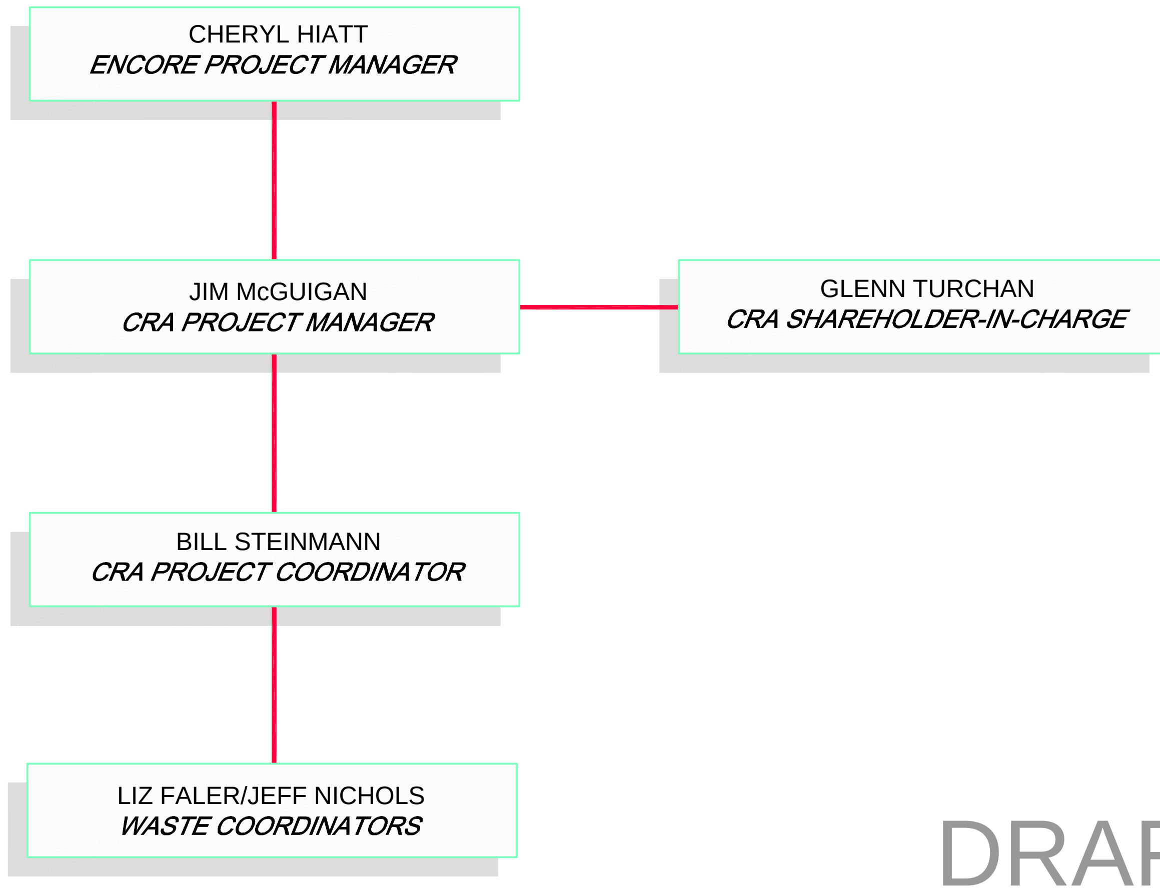
WASTE STORAGE LOCATIONS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager:	Reviewed By:	Date:	
JJM	PGR/LF	MAY 20, 2002	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
as shown	13968-00	018	figure D.2.1

13968-00(018)GN-DE001 FEB 24/2003



DRAFT

figure D.8.1

PROJECT PERSONNEL
GM POWERTRAIN BEDFORD FACILITY
Bedford, Indiana

13968-00(018)GN-DE002 FEB 24/2003

July 18, 2003

ATTACHMENT D-1

CRA WASTE MANAGER INFORMATION

CRA WASTE MANAGER

MPS/GM VERSION

USER GUIDE

JULY 2001
REF. NO. 15296 (2)
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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 GENERAL

The CRA Waste Manager is a data management system for tracking and reporting solid, hazardous, and other wastes. Among other features, the system:

- operates as a stand-alone database, in Microsoft ACCESS format;
- tracks and reports waste information, shipments, and disposition for multiple waste classifications;
- maintains detailed data on individual facility waste, shipments, transporters, shippers, disposers/waste management contractors, and container storage;
- allows data entry/tracking for multiple companies (or facilities) within the database, and waste tracking by generating unit or department within a facility;
- can export data, for possible future use with other data management systems;
- has drop-down menus for entry of recurring data items;
- provides disposal breakdowns by company, facility production unit/department, and waste stream;
- produces reports in various formats;
- produces date-sensitive tickler/exception reports for stored wastes and expiring waste profiles; and
- can maintain at least three-level user access security (User, Editor, and Administrator; others can be defined by the Administrator).

The enhanced Container Management version, included for most MPS installations, also includes the following:

- keeps detailed information about each container (generating facility, waste stream, profile, shipping label information, accumulation location, quantity, date of origination, changes of location, etc);
- allows selection of containers to be shipped in a particular shipment and creation of a shipment record from the selected drums, plus the selection of the transporter and disposal facility;
- produces various reports indicating location(s) and type(s) in holding areas, with emphasis on storage time and a report tracing history of container; and
- additional tracking of containers through various accumulation and holding locations (e.g., satellite storage, holding area) prior to disposal.

Additional options, included for most MPS installations, provide for manifest and bill of lading printing.

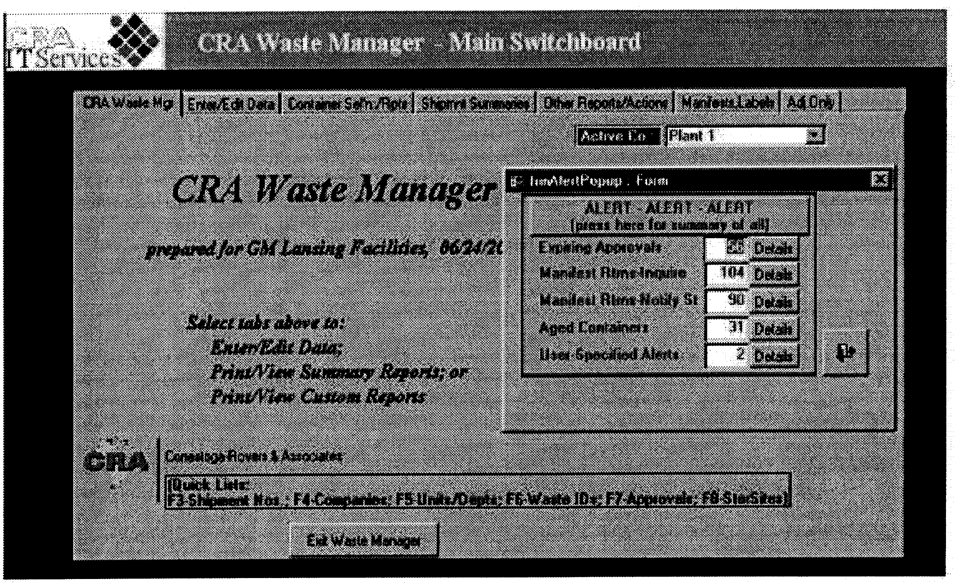
Many client- and facility-specific reports and charts, described below, have been included in the MPS versions as required. These include GM We Care reporting and charting based on disposition (landfill, recycle/reuse, etc.).

Chemical reporting, included in some versions of the CRA Waste Manager, is currently not included in MPS installations. When installed, it includes:

- definition of waste stream to include component percentages for SARA chemicals;
- computation of quantities of SARA chemicals based on percentages of waste stream quantities shipped; and
- lists and reports sorted/summed by SARA chemical for any selected period.

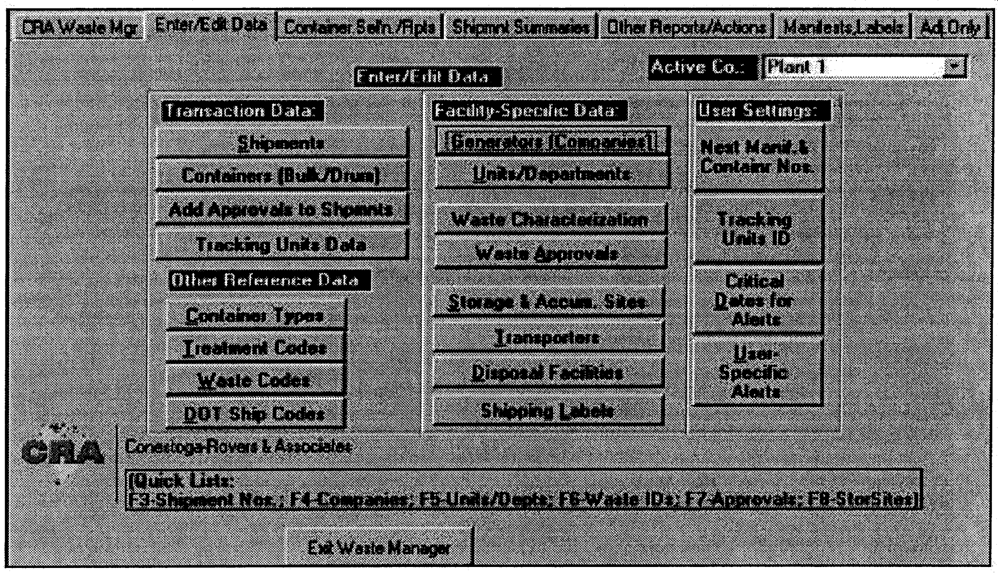
1.2 OVERVIEW - MAIN SWITCHBOARD SCREEN AND DATA FLOW

The Main Switchboard is composed of five distinct Waste Manager components under the following tab headings: Enter/Edit Data, Container Selection and Reports, Shipment Summaries, Other Reports and Actions, Manifest Printing, and Adjustments.



1.2.1 ENTER/EDIT DATA COMPONENTS

The Enter/Edit Data tab contains the forms and tables under four subheadings, including Facility-Specific Data, Transaction Data, Other Reference Data, and User Settings. Each of these subsections and their components are detailed in this section of the User Guide.



Facility-Specific Data

Prior to entering details related to waste shipments or container storage and disposal, Facility-Specific start-up data forms and tables should be filled out. This information will be used during data entry for Transactions to automatically fill in data or to provide drop-down lists. The Facility-Specific Data components are listed and described below.

Generators (Company Info)	Identification information for the companies (or generators) for which waste is being managed.
Units/Departments	Information on individual units or departments within the facility or company for which waste is being managed.
Transporters	Identification information for waste transporters.
Disposal Facilities	Identification information for the disposal and/or treatment facility (e.g., landfill to which waste is transported).

Waste Characterization (or Facility Wastes)	Information on individual waste streams being managed (includes waste codes, description, DOT shipping information, and profile/approval information).
Waste Approvals	Information on approvals/profiles for disposal and/or treatment facilities accepting waste from the generator.
Storage/Accumulation Sites	Information on waste storage and accumulation sites used by the waste generator. This information will be used in the Container transaction records to track the location of a particular container.
Shipping Labels	Identification for type of label required for waste shipments.

Transactions

Once the Facility-Specific Data information has been entered, specific information related to shipments and container storage may be entered. The Transaction subsection components are listed and described below.

Shipments	Details from shipment manifests and/or logs (manifest identification, transporter, disposal facility, etc.) may be entered here. Upon entry of the Waste ID code, waste identification data (EPA HW Codes, DOT shipping codes, etc.) are automatically entered from the Waste Characterization reference table. Shipment data may be broken down by unit or department.
Containers	Details about wastes in storage (drums, tanks, etc.). Upon entry of the Waste ID code, waste identification data (EPA HW Codes, etc.) are automatically entered from the Waste Characterization reference table. Dates of initial use and of disposal, as well as movement about the facility, are stored here.
Add Approvals to Shipments	A speedy entry form for adding Approvals to Shipments for which no approvals have yet been identified. Approval information can also be entered via the Shipments entry procedure, or through the pop-up "Auto Alerts" forms.

Tracking Units	Tracking Units can be anything for which the facility wants to track waste volumes per unit (of the Tracking Unit item). The identification of the Tracking Unit, such as number of widgets produced or manhours worked, is entered with the User Preferences. A form is provided for entering quantities of the Tracking Units produced by date.

Other Reference Data

Other Reference Data includes information from standard reference tables, such as EPA Waste and Treatment Codes, and DOT Shipping Codes.

Container Types	Identification for the type of containers used for storage and shipment of waste. Container weights entered here will be subtracted from the waste weight prior to computing SARA chemical quantities.
Treatment Codes	Identification for methods of waste disposal and treatment.
Waste Codes	Information regarding EPA and/or other waste codes and related information assigned to the waste stream.
DOT Ship Codes	Department of Transportation Shipping Names, UN Numbers, Packing Groups, etc.

User Settings

Next Manifest and	Shows the next available manifest and container ID numbers
Container No.	for each generator. These numbers are used as defaults for entering new shipments or containers, but can be overridden with specific IDs.
Tracking Units ID	Defines the unit to be tracked based on waste volumes per unit (e.g., manhours).
Critical Dates for Alerts	The number of days to be used to trigger Alerts is defined here for age of containers in storage, time that required manifests have not been returned, and time to waste approval expiration.

User-Specific Alerts	Any user-specified notes or to-do items can be entered here, along with an item-specific number of days prior to the target date that an Alert notification should be triggered.

Additional guidance concerning the components of the Enter/Edit Data portion of the CRA Waste Manager is provided in Section 2.

1.2.2 CONTAINER SELECTION AND REPORTS

There are two main subcategories under this tab, including Select and Update, and Reports and Lists. The components of each subcategory are listed and described below.

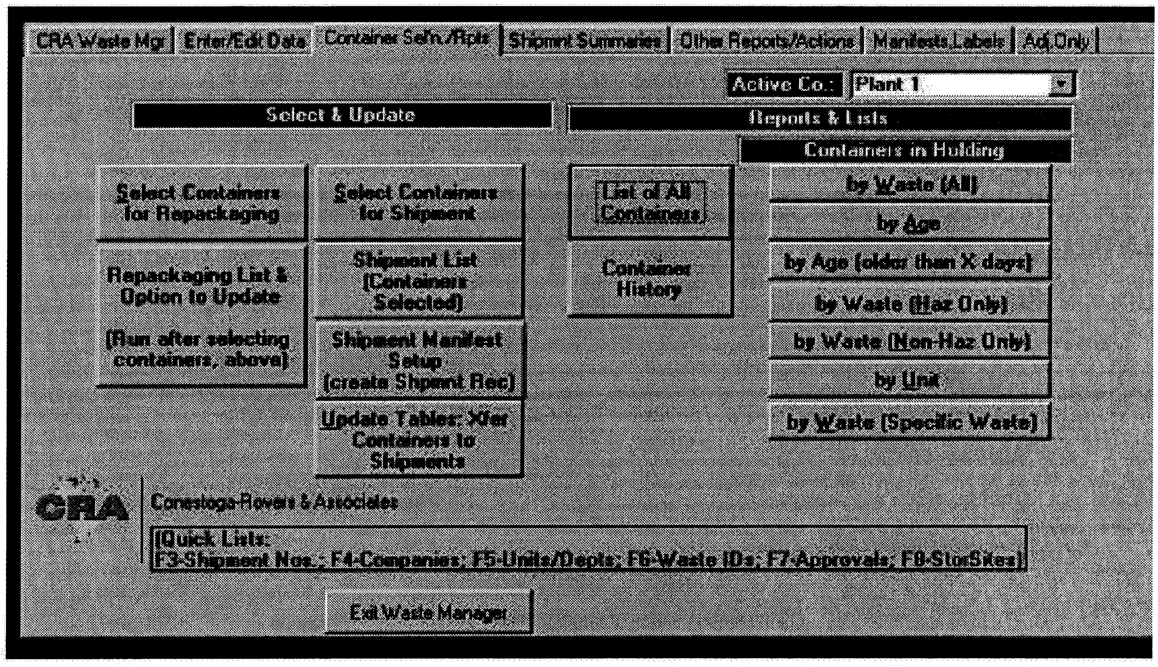
Select and Update

Select Containers for Repackaging	Table allowing user to select containers to be repackaged.
Repackaging List and Option to Update	Report presenting list of containers to be repackaged by group and receiving container. Allows option to update Container Table.
Select Containers for Shipment	Table allowing user to select containers for shipment.
Shipment List (Containers Selected)	Report presenting Shipment List by shipment number, scheduled date, transporter, disposer, etc. This is a proofing report only; no records are changed.
Shipment Manifest Setup (Create Shpmnt Rec)	Form allowing creation of shipment record (only manifest number and date required).
Update Tables: Xfer Containers to Shpmnts	Outgoing Shipments Report sorted by shipment number and date. Allows option to update Shipments Table. This routine actually performs the record updating to indicate on the container records that the waste has been shipped, and to summarize the container quantities and waste info on the shipment record.

Additional guidance concerning the components of the Container Select and Update features is provided in Section 3.

Container Reports and Lists

List of All Containers	Presents list of containers by company, unit, ID, type, initial use date, and waste information.
Container History	Presents history of containers (through storage/ accumulation areas and to ultimate repackaging or shipment) by company, unit, ID, type, initial use date, and waste information.



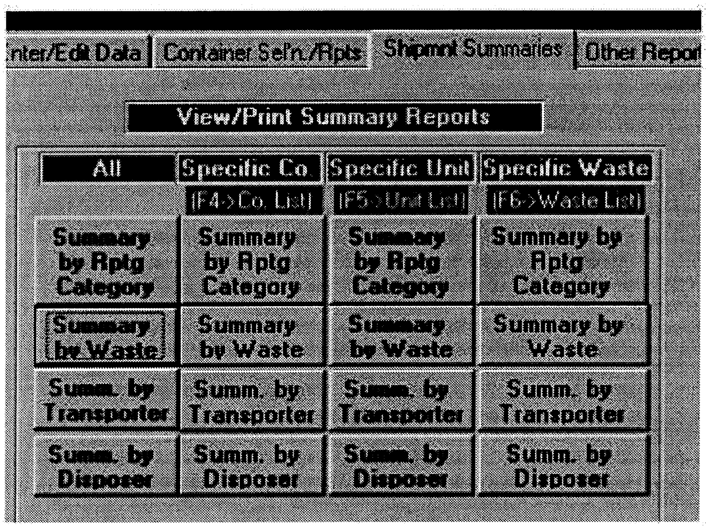
Containers in Holding:

By Waste (All)	Presents list of containers in holding with all wastes.
By Age	Presents list of all containers sorted by number of days since their initial use. Also lists information such as company, unit, ID, type, and waste information.
By Age (older than X days)	Presents list of containers older than x days since their initial use. Also lists information such as company, unit, ID, type, and waste information.
By Waste (Haz)	Presents list of containers in holding sorted by hazardous waste.

By Waste (Non-Haz)	Presents list of containers in holding sorted by non-hazardous waste.
By Unit	Presents list of containers in holding by all units.
By Waste (Specific Waste)	Presents list of containers in holding sorted by specific waste.

1.2.3 SHIPMENT SUMMARIES

Summary reports may be generated for the information entered into the database through the Enter/Edit Data portion of the Waste Manager. These reports may be sorted/summarized by four different categories: reporting categories (can include multiple related waste streams), waste, transporter, and disposal facility.

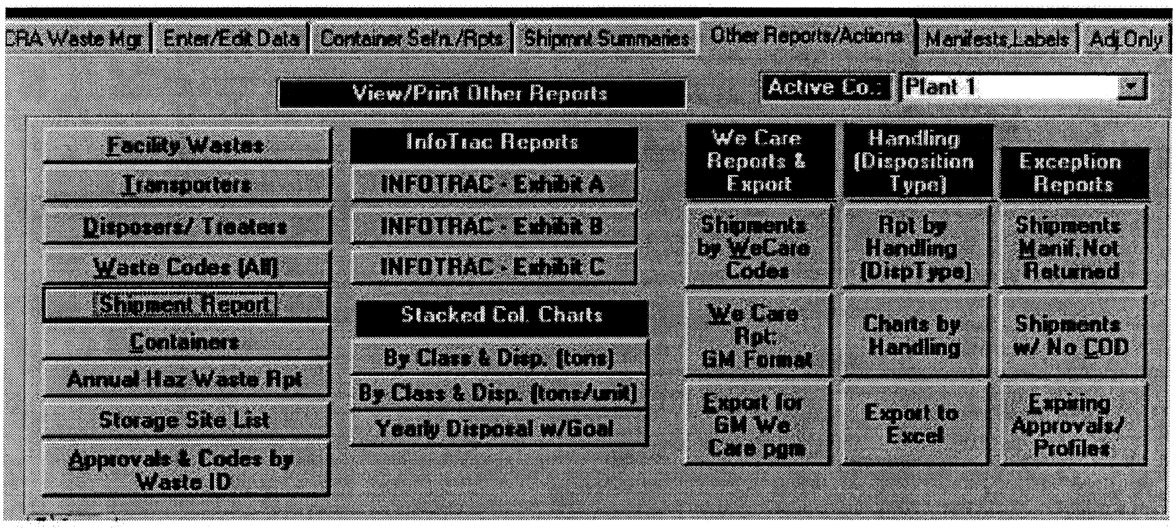


Within each category, data may be sorted by date for a specific company, a specific unit/department, a specific waste, or for all companies, units, and wastes in the database.

Additional guidance concerning the components of the Summary Reports portion of the CRA Waste Manager is provided in Section 4.

1.2.4 OTHER REPORTS AND ACTIONS (INCLUDES CHARTS AND EXPORTS)

There are other report categories including Reference, Transaction, and Site Data Reports; InfoTrac Reports; Charts; We Care Reports; Handling/Disposition Reports; and Exception Reports. Each of these categories is described below.



<u>Reference, Transaction, and Site Data Reports</u>

Facility Wastes	Presents waste IDs, names, classes, and descriptions by facility (data entered as Waste Characterization).
Transporter	Presents transporter IDs, names, and contact information.
Disposers	Presents disposal facility IDs, names, and contact information.
Waste Codes (All)	Presents waste codes, descriptions, and date reported.
Shipment Report	Presents shipment information by manifest within a selected date range.
Containers	Summary of container data and movement.
Annual Haz Waste Rpt	Presents information useful for the preparation of annual hazardous waste reports for selected company and date range.

Storage Site List	Lists all waste storage and accumulation area locations and associated waste type.
Approvals and Codes by Waste ID	List of all waste streams generated and the associated disposal facility, approval number and approval expiration date.

<u>InfoTrac Reports</u>

Exhibit A, B, and C	Used for obtaining and documenting waste stream authorizations and notifications.

<u>Charts</u>

By Class and Disp. (tons)	Illustrates in stacked column charts the quantity of waste disposed for each waste class according to disposal type for a defined time period. Also shows the annual monthly average for disposition type.
By Class and Disp (tons/unit)	Similar to the previous charts, but normalized by dividing waste quantity by Tracking Unit (e.g., manhours).
Yearly Disposal w/Goal	Charts showing annual disposal quantities as vertical bars, overlain by a line representing waste reduction goals.

<u>We Care Reports</u>

Shipments by We Care Codes	Summary of total waste disposed according to the GM We Care descriptions for each waste stream (not in GM format).
We Care Rpt: GM Format	A summary report in GM format for submission to GM may be generated as well as a detailed report showing the manifest and approval numbers associated with each shipment for each waste stream.
Export for GM We Care Pgm	A series of queries allows for the export of CRA Waste Manager We Care data to a file suitable for import into a GM database.

Handling/Disposition Reports

Rpt by Handling	Presents summary of the waste generated according to disposition type.
Charts by Handling	Generates pie charts showing summary of percent waste by disposition type.
Export to Excel	Allows handling/disposition data to be exported into an Excel file.

Exception Reports

Shipments: Manif. Outstanding	Presents list of shipments for which manifests are required but have not yet been returned by selected date range.
Shipments w/No COD	Presents list of shipments without a certificate of disposal (COD).
Expiring Approvals	Presents list of approvals/profiles expiring within a selected number of days. Provides waste ID, name, class, and disposal information.

1.2.5 MANIFEST PRINTING

Selecting a manifest number may generate and print a Manifest, Bill of Lading, and/or Weight Ticket.

1.2.6 ADJUSTMENTS ONLY

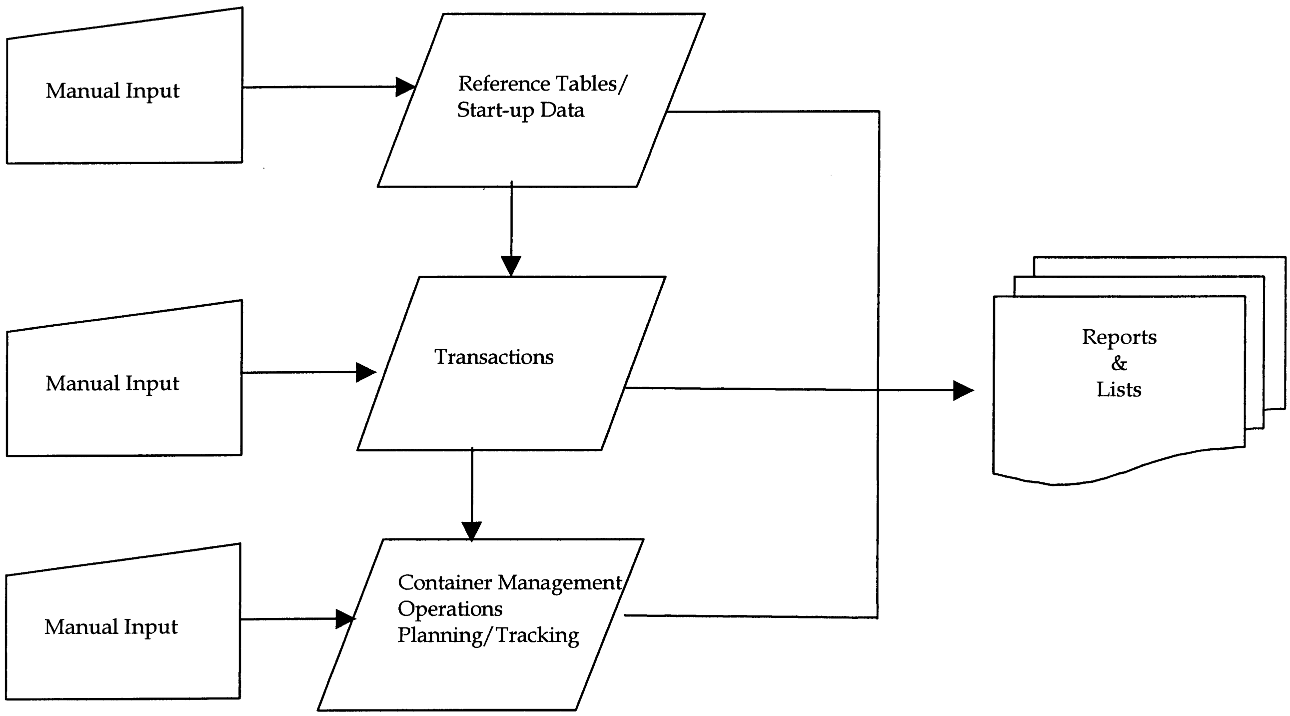
These selections will be rarely used; adjustments that can be made here can also be made in the Shipments Entry/Edit forms. These procedures allow access to information related to shipments, broken out into separate tables according to the overall manifest information, data concerning the waste stream, and unit/quantity details for the manifests. The components provided under this subheading are listed and described below.

Shipment Manifests	Form for making adjustments to summary manifest data. See Shipments (under Transactions) for detail manifest data.
Shipment Sequence	Table for making adjustments to the individual waste stream identification and approval/profile number.
Shipment Details	Form for making adjustments to manifest details, including department, quantity, measurement type, units, weight, container type, cost, etc.

Options also allow for global changes of Waste IDs, Approval Numbers, and Manifest Numbers. **Note: global changes will be performed on data for ALL companies in the system, and should be used with caution.**

1.2.7 GENERAL DATA FLOW

The following flow chart illustrates the general flow of data in the database from manual data entry to the generation of reports and lists.



2.0 DATA ENTRY/EDIT

2.1 GENERAL

Most data related to specific waste shipments and/or storage is entered in the Shipments entry/edit screen. Here are entered items normally found on the manifest, such as the waste identification, transporter(s), disposal facilities (listed in the database and below as disposers), quantities, and allocation to facility units or departments. In order to facilitate routine entry, tables of reference data are used to provide immediate data pull-in from the reference files and/or drop-down lists of available selections. Start-up data, such as the waste stream definitions and waste approval (or profile) information is also critical to the entry of shipment transactions.

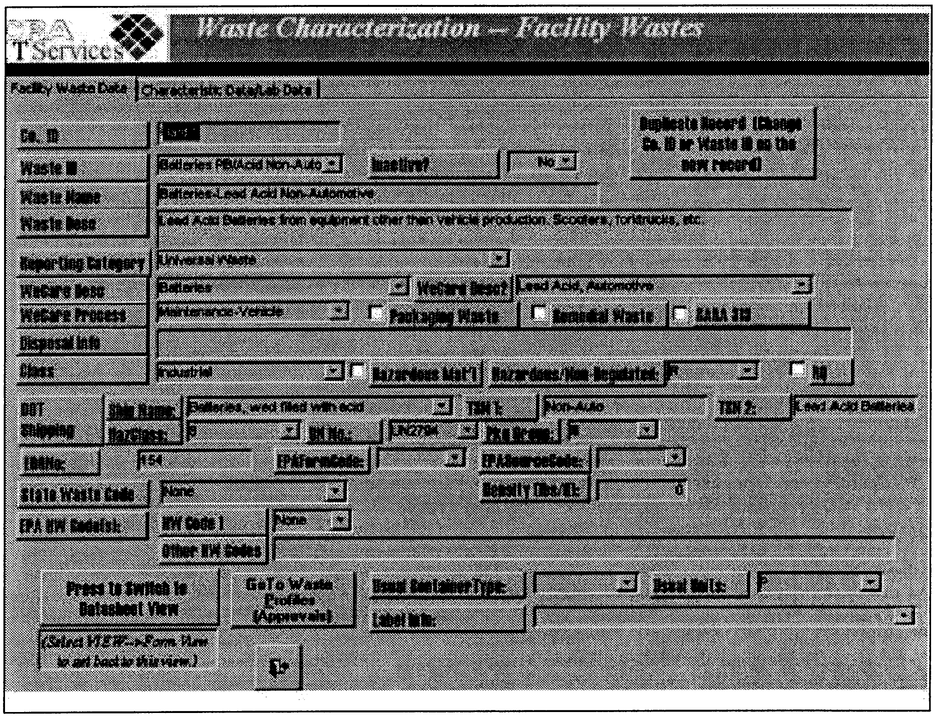
Note: The user's MS Access "Options" settings affect the number and type of Caution or Warning messages the user receives, as well as behavior of the "Find" utility. See Section 5.0 for suggested settings.

2.2 FACILITY-SPECIFIC DATA

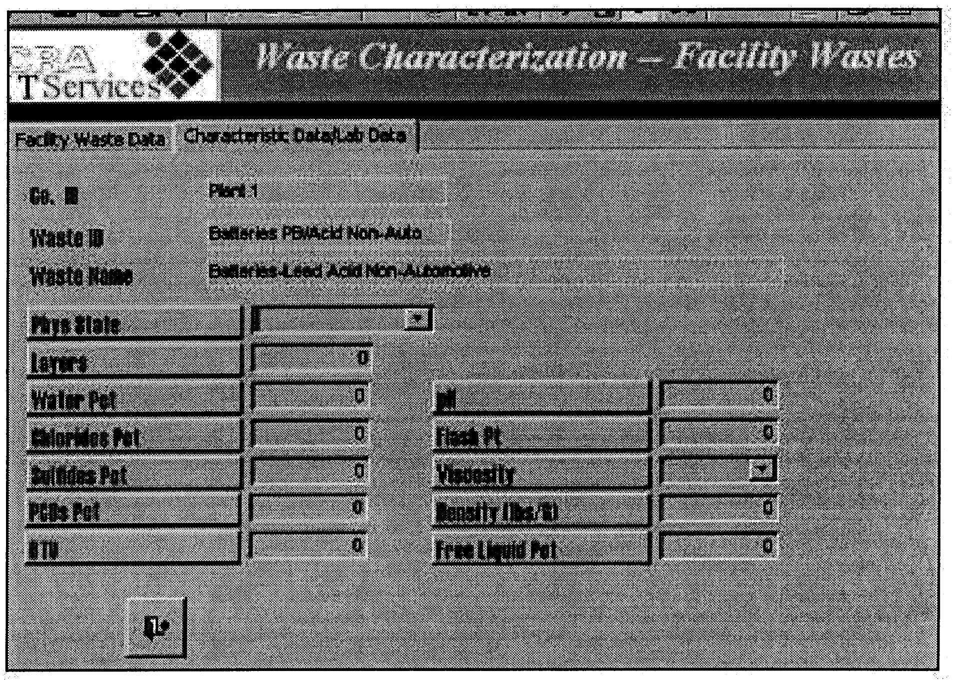
The Facility-Specific Data, which should be entered prior to entering specific shipment data, includes:

- Generators (Companies) – If multiple companies' waste are being managed at the same site, assign (create) a brief company ID code and enter EPA ID numbers, contact information, etc. The only required information is the Company ID and the Company Name.
- Units/Departments – For tracking wastes within the facility by units or departments. Includes Unit ID (which you assign) and contact information. For each unit or department to be tracked, enter at least the facility-assigned Unit ID and description. Note: tracking by unit/department is not required, and no records are required in this table.
- Waste Characterization – This is a two-part form; select by using the tabs.

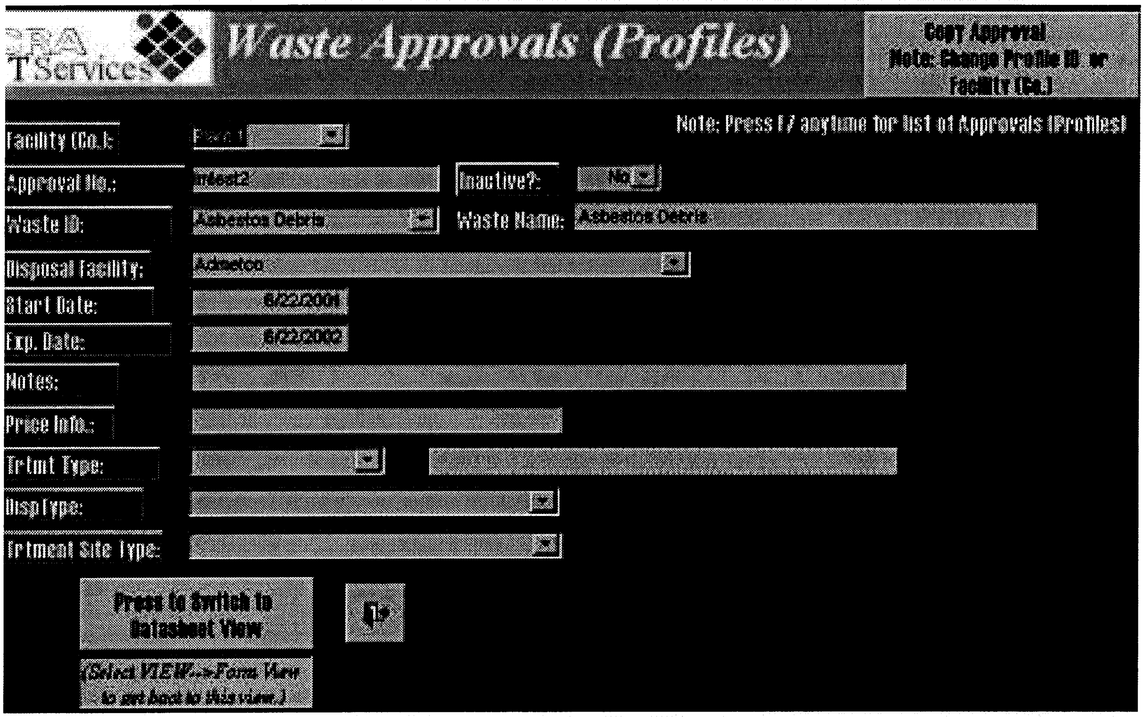
  Under the Facility Waste Data tab, enter a waste ID, name, description, disposal information, material class, and shipping information. Much of this information is printed on manifests, and items from this form are used for selection of records to be included in reports.



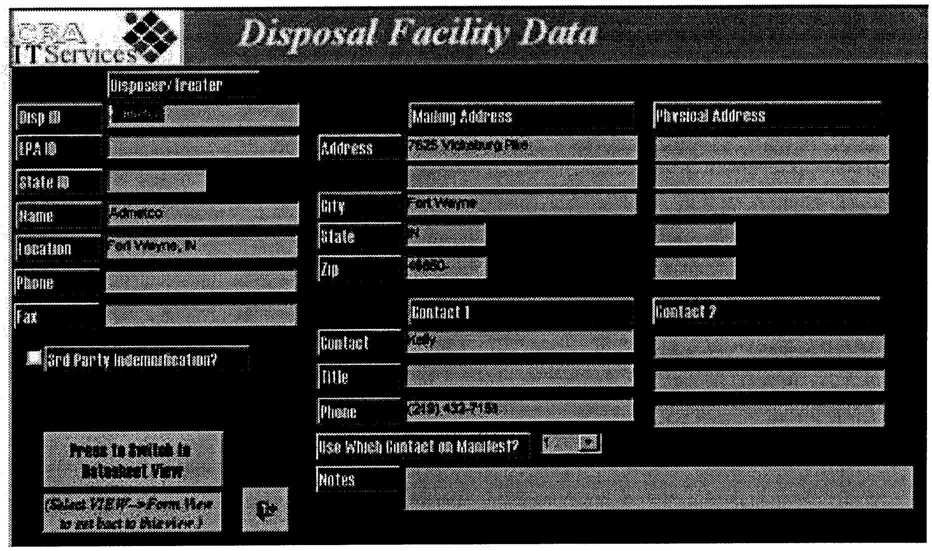
Under the Waste Data tab, enter primary and secondary characteristics, lab data, as well as the physical state and properties. All information on this tab is optional.



- Waste Approvals (or Waste Profiles) – Enter approval (or profile) number assigned by the receiving facility, waste ID, and name, receiving (disposal) facility, start date, expiration date, known price information, treatment type, disposal type, and treatment site type. Note: It is the Waste Approval record that provides the ultimate disposition type (e.g., recycle or landfill) information for the waste stream. If not entered, reports/charts based on disposition type will be incorrect.



- Storage/Accum. Sites – For each storage or accumulation site, enter a storage site ID, location, description, department, storage type, and driver information. This information is used for tracking container movement.
- Transporters – Enter ID numbers, contact information, etc. This information is used for drop-down menus in the Shipments entry screen.
- Disposal Facilities - ID numbers, contact information, etc. for disposal or treatment facilities. This information is used for drop-down menus in the Shipments entry screen, and is printed on reports and manifests.

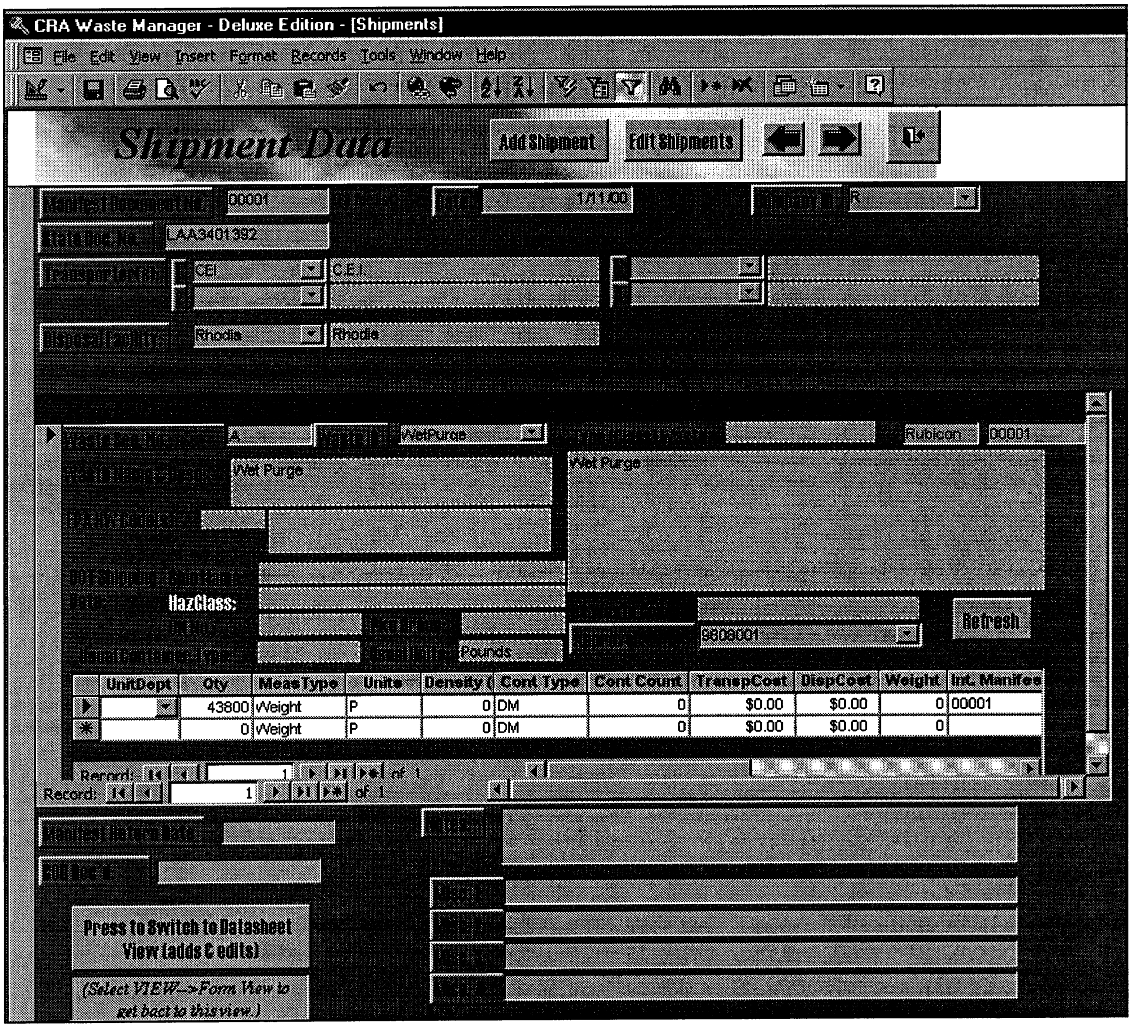


- Shipment Labels - For each waste shipment type, add a label type to the table. This information is optional.

2.3 TRANSACTIONS

The Transactions, which include most data related to specific shipments, include:

- Shipments - For each shipment, enter manifest number, date, transporter, disposal facility, and waste data. Each record has a unique Manifest Number (alpha or numeric), which can be assigned by the facility. A separate field is provided for state or other manifest document number. As the Facility Waste ID is entered, relevant fields are automatically filled in from the pre-defined Waste Characterization table. These include Waste Description, EPA (and other) Waste Codes, and DOT shipping data. Drop-down menus (using data from relevant master tables) are provided to facilitate entry of Transporter and Disposal Facility IDs, etc. A sub-form in the entry screen allows multi-line entry of Shipment Details for various Units/Departments. Details include quantity of waste, weight/volume units, density (for conversion to weight if volume is entered), number and type of containers, and cost for transport and disposal. Fields are also available in the Shipments record for waste profile information, additional notes, and manifest return date. Records can be deleted by highlighting the gray bar to their left and pressing the Delete key.



Notes:

(1) When you first enter the Shipments form, you will be in ADD-ONLY mode. A default manifest number will be provided, based on the "Next Manifest No." entry for this company; the default can be overridden with a specific entry.

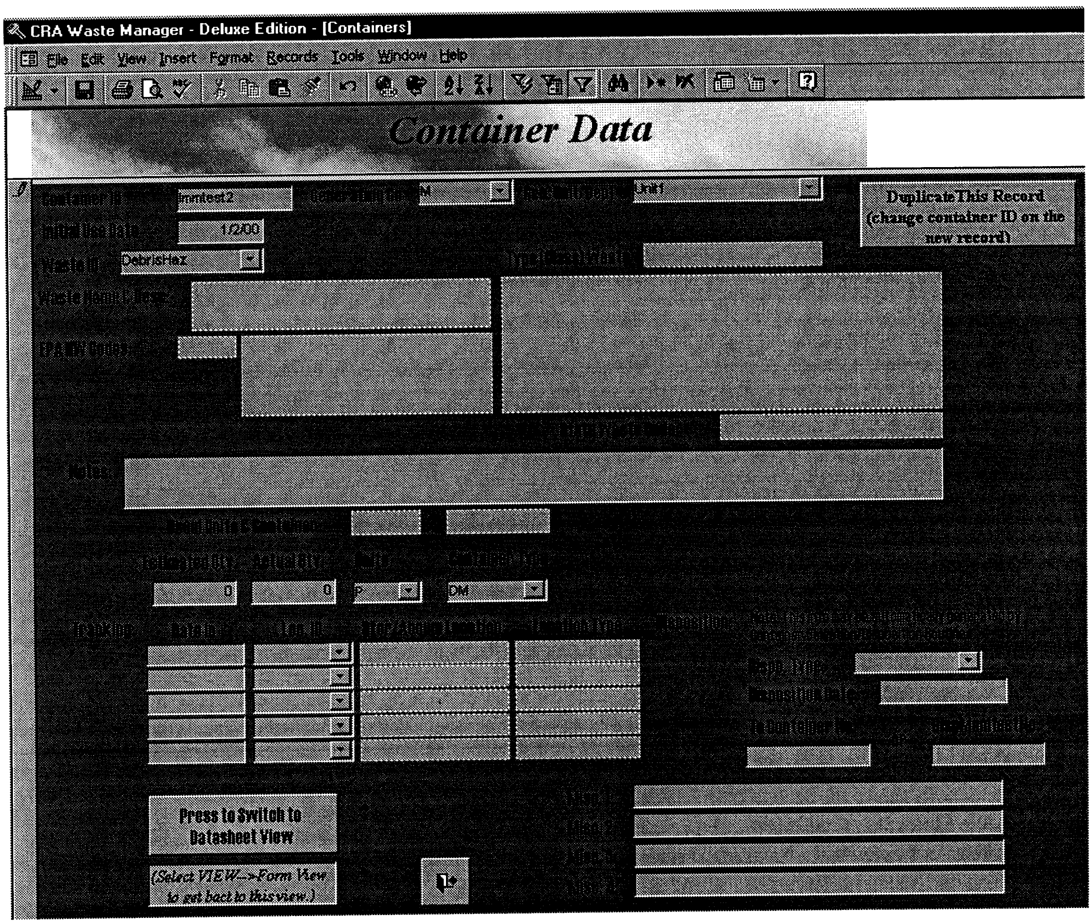
(2) To review or EDIT existing Shipment records, press the "Edit Shipments" button on the form title bar. You will then have available all records for the active company. Navigate (a) via the arrow buttons for Previous/Next Record in the title bar; (b) using the record toolbar at the bottom of the screen; or (c) using FIND (binoculars button) or SORT (AZ/ZA button).

(3) Waste data for this shipment is entered in the middle of the form. Be sure to select an Approval. To add a new waste line item, use the "New Line" button or the -->* button at the bottom of the Waste Data box.

(4) The grid subform in the Waste Data box allows entry of waste quantities and container information. Density will default from the Waste Characterization record, and is required to compute weight if the Quantity is entered as a volume (e.g., gallons). The "Weight" column should ONLY be used if you want to plug an override quantity in pounds for report calculations; otherwise, leave it blank/0.

- Container Storage – Enter container ID, unit/department, initial use date, waste name and description, EPA codes, units, and tracking information. Each record should have a unique container ID. Waste descriptions are pulled from the reference data tables. Container history can be tracked by entering Storage/Accumulation Location movement tracking information.

  Note: As with Shipments, you first enter in ADD-ONLY mode. Navigation is similar to that described above for Shipments.



When the Container Update routines are run (either the Update for Repackaging or the Update for Shipping), the Disposition information is automatically filled in by the Update routine.

To reverse a container shipment Update, delete the Disposition Date (GenDate) and the Manifest Number from each container record affected, and delete and re-setup the pertinent Shipment record (at least delete all waste records from the shipment).

- Add Approvals to Shipments - Provides a streamlined method of adding Approvals to Shipment records lacking them. Only records with no Approvals are shown.
- Tracking Units Data - Enter the company ID, unit/department, date, and tracking unit quantity.

2.4 OTHER REFERENCE DATA

The Other Reference Data, which is comprised of basic waste-related information, includes:

- Container types - For each distinct container type, enter a type code, description, weight, and EPA description and storage code. Standard EPA container types are already entered.
- Treatment Codes - Enter each on- or off-site treatment type.
- Waste Codes - Information can be entered into this file (1) to provide drop-downs for EPA HW Codes (e.g., F001) and other codes (e.g., state-assigned); and (2) to provide a location for recording, where required, that the first use of a new waste code has been reported to the regulatory agency. It is not required that information be entered into this table.
- DOT Ship Codes - Enter DOT information for each waste stream including shipping name, hazard class, UN/NA number, packaging group, label information, and ERG number. The shipping codes are available in a dropdown menu under the Waste Characterization form.

2.5 USER SETTINGS

The User Settings are available to define and set-up user-specific functions and automated actions and include:

- Next Manifest and Container No. - Shows the next available manifest and container ID numbers for each generator. These numbers are used as defaults for entering new shipments or containers, but can be overridden with specific IDs.
- Tracking Units ID - Defines the unit to be tracked based on waste volumes per unit (e.g., manhours).
- Critical Dates for Alerts - The number of days to be used to trigger is defined here.
- Alerts - For age of containers in storage, time that required manifests have not been returned, and time to waste approval expiration.
- User-Specific Alerts - Any user-specified notes or to-do items can be entered here, along with an item-specific number of days prior to the target date that an Alert notification should be triggered.

3.0 CONTAINER MANAGEMENT

3.1 GENERAL

A Container Management module has been included in the CRA Waste Manager MPS/GM version. This function allows for containers to be tracked from initial use through to shipment off site for treatment or disposal. It also provides an alternate method for preparing shipment records for containers being shipped off site. In addition, container history and current status reports may be generated. The container reports were previously described in Section 1.2.2. The following section describes the steps involved in selecting and tracking container movement.

3.2 SELECT AND UPDATE

This function allows for the selection and modification of records in data tables, including:

- Select Containers for Repackaging – This will bring up, in datasheet view (i.e., one record per line), all the records of containers that have not yet been shipped or repackaged. To select for repackaging, enter a number (which you assign to the selection set) in the Selection Number field. You may select for multiple repackaging at the same time, by using separate Selection Numbers.
- Repackaging List and Option to Update – Print list of From and To containers, and Update the container records.
- Select Containers for Shipment – This will bring up, in datasheet view, all the records of containers that have not yet been shipped or repackaged. To select for shipment, enter a number (which you assign to the selection set) in the Selection Number field. You may select for multiple shipments at the same time, by using separate Selection Numbers.
- Shipment List (Containers Selected) - List containers to be shipped (the only required data is the Selection Set and the date). This is a proofing report only. No records are changed.
- Shipment Manifest Setup (Create Shipment records) – A Shipment (manifest) record must be created before the container data can be summarized to it. You may create the Shipment record via the Shipments form or the one provided here. If you use one already created elsewhere, be sure it does not contain any waste (sequence) records.

- Update Tables: Xfer Containers to Shipments – Update the Shipment and Container records per the designated operation.
- Notes:

  (1) During the update process, temporary tables are created and updated. Answer "Yes" or "OK" to any caution here about overwriting the temporary tables.

  (2) To reverse a container shipment Update, delete the Disposition Date (GenDate) and the Manifest Number from each container record affected, and delete and re-setup the pertinent Shipment record (at least delete all waste records from the shipment).

4.0 REPORTS

4.1 GENERAL

The CRA Waste Manager contains two main categories of reports, Summary Reports and Other Reports. Each report within these categories is detailed below.

Note: For most reports, a pop-up dialog box will prompt for report dates and other criteria as appropriate. Pressing the "OK" or "Print Preview" button on that dialog box produces a report image on screen. To review the report, the dialog box may be moved about, but should not be closed until after printing as the report generation uses the criteria from the dialog box in headings to be printed. If closed, dates and other criteria will not be printed correctly.

4.2 SUMMARY REPORTS

Several options for Summary Reports are provided, each including concise lists of Shipment data for a specified date range. Reports can be created by Waste, Transporter, or by Disposal Facility. These reports can simultaneously display information for all Companies, Units/Departments, and Wastes, or may be selected to display information regarding a specific Company, Unit, or Waste.

Summary by Transporter

Dates: 1/1/00 to 12/31/00

Transp:	Waste	Co ID	Unit	Date	Int.Manifest	P.O.	Cost	Type	Wt (lbs)	Wt (tons)	Profile No.	Disposer(s)	P.O.(s)
123	ASBESTOS INSULATION	M	LAB	1/1/00	LMM4444		44.00	Non-Hazardous	9,960	4.980			
20	HW-OIL	V	A1	1/2/00	LMMManifest		0.00	Hazardous	0	0.000	12		
999	999 Waste	R		12/18/00	lmm1218		0.00		1,000	0.500	23456		
Total							$44		10,960	5.480			
Transp: ALLIED & BFI	Waste	Co ID	Unit	Date	Int.Manifest	P.O.	Cost	Type	Wt (lbs)	Wt (tons)	Profile No.	Disposer(s)	P.O.(s)
13	PAINT WASTE	R	A1	1/1/00	lmm555		0.00	Hazardous	0	0.000	sk1234	ONYX	
15	N-H SOLIDS WITH ORGANICS	R	B1	6/14/00	lmmtest777		0.00	Non-Hazardous	12	0.006	267837	lmmdis	
ALLIED & BFI Total							$0		12	0.006			
Transp: BRANDT & GSS	Waste	Co ID	Unit	Date	Int.Manifest	P.O.	Cost	Type	Wt (lbs)	Wt (tons)	Profile No.	Disposer(s)	P.O.(s)
1	ASBESTOS INSULATION	R	A1	6/6/00	lmm666		0.00	Hazardous	10	0.005	sk1234	WMCARL	
BRANDT & GSS Total							$0		10	0.005			

4.3 OTHER REPORTS

Several Custom Reports have been included in the Deluxe Edition of the CRA Waste Manager, which are detailed below. Others can be added as the need is identified.

Reference, Transaction, and Site Data Reports produce reports of basic reference data, including:

- Facility Wastes – Presents waste ID, name, characteristic, description, and disposal information.
- Transporters – Presents transporter ID and name, as well as contact information.
- Disposers – Presents disposal facility ID and name, as well as contact information.
- Waste Codes (All) – Presents waste code, description, date reported (if reported.)
- Shipment Report – Presents manifest details for shipments selected by date.
- Containers – Presents container ID, type, date of initial use, disposition, and waste information.
- Annual Hazardous Waste Report – Presents summary of annual hazardous waste disposed including waste ID, waste codes, disposal facility, and quantity disposed.

Annual Hazardous Waste Report

Company: Respected Company, I
Dates: 1/1/99 to 12/31/99

WasteName ASBESTOS INSULATION	Disposer	Weight (Tons)	
Waste = ASBESTOS INSULAT			
LAB ASBESTOS INSULATION 1234-011 U170 D002, D001, F001, H002, U123	SKDPLAIDLAW/SAFETY-KLEEN (DEE 2/2/99	4.98	
Total ASBESTOS INSULATION			4.98
Waste = HW-DIRT			
A2 HW-DIRT	SKLP SAFETY-KLEEN (LAPORTE), IN 5/31/99	4.8	
Total HW-DIRT			4.8
Waste = HW-OIL			
A2 HW-OIL 1234-011 D001 D002, D003	SKDPLAIDLAW/SAFETY-KLEEN (DEE 7/7/99	0.005	
Total HW-OIL			0.005

- Storage Site List – Present the building, column location, waste type, site number and signage available for each waste storage and accumulation location.
- Approvals and Codes by Waste ID – Presents the company ID, waste type, disposal facility, approval number and approval expiration date.

InfoTrac Reports produce documentation to be used for obtaining and documenting authorizations for shipping hazardous materials, including facility profile information (company, address, emergency contacts), a hazardous materials list identifying material being shipped, and waste stream-specific details (waste description, codes, etc.).

Charts may be generated to show summary reports in columnar format and include a summary by class and disposition type in tons, in tons/unit, and by yearly disposal with goal identified.

We Care Reports are a GM reporting requirement and include:

- Shipments by We Care Codes – Presents waste information according to We Care description and identifies waste type, unit, We Care process, and shipment details. This report is not in GM format.
- We Care Rpt: GM Format – Presents the summary report in the GM We Care Report format; the detailed report is similar and identifies the manifest and approval numbers associated with each shipment for each waste stream.

Handling/Disposition Reports generates reports according to method of waste handling/disposal and include:

- Rpt by Handling – Presents disposition types and sum of weight in tons for each disposition type.
- Charts by Handling – Presents summary of disposition type by percent waste in pie chart format.

Exception Reports produce reports regarding outstanding manifests, certificates of destruction, and approvals, including:

- Shipments: Manifests Outstanding - Presents manifest number, date, transporter ID, and disposal facility ID for a selected period of time for shipments (requiring manifest return) for which the manifest has not been returned.
- Shipments w/No COD – Presents company ID, manifest number, date, state document number, transporter ID, and disposal facility ID for shipments without a COD date.
- Expiring Approvals – Presents waste ID, name, class, description, and disposal information for approvals/profiles expiring within a selected number of days.

Similar information is presented via the pop-up Auto-Alerts which run at program start-up or at will.

Expiring Approvals (Waste Profiles) **Profiles expiring within 90 days of 19-Jan-01**

Waste ID	*Waste Name*	*Class*	*Description Disposal Info.*
1	ASBESTOS INSULATION SW Code: TestSWC HW Codes: U170 D002	Non-Hazardous	FRIABLE AND NON-FRIABLE ASBESTOS. Profile: WASTE MANAGEMENT (WOODSIDE) - WM1234 Exp. 6/6/00
1	ASBESTOS INSULATION SW Code: 1234-011 HW Codes: U170 D002, D001, F001, H002, U123	Hazardous	FRIABLE AND NON-FRIABLE ASBESTOS. Profile: WASTE MANAGEMENT (WOODSIDE) - WM1234 Exp. 6/6/00
1	ASBESTOS INSULATION SW Code: 1234-011 HW Codes: U170 D002	Non-Hazardous	FRIABLE AND NON-FRIABLE ASBESTOS. Profile: WASTE MANAGEMENT (WOODSIDE) - WM1234 Exp. 6/6/00

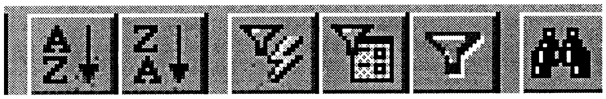
Manifests and Label Printing produce manifests and shipment labels, including:

- Print Manifest, Bill of Lading and/or Weight Ticket – Produces typical manifest, Bill of Lading or Weight Ticket.

5.0 RECORD VIEWING AND EDITING FEATURES

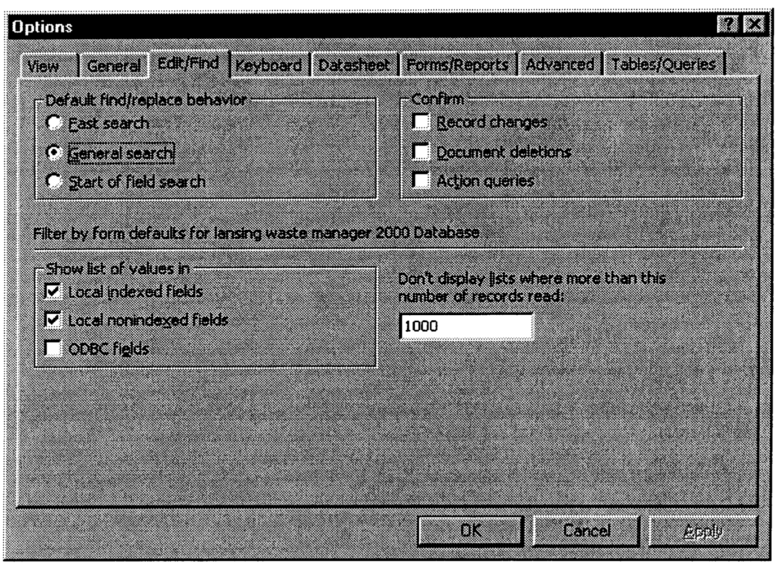
For each table, in each Form View or Datasheet View, Standard MS Access Searching and Sorting Features are available.

Sort	Filter	Find



- To sort on a field - Place cursor in field and press "A-Z" or "Z-A" button.
- Use "binoculars" button to search for specific text. Search criteria can be general (all fields) or limited to the specific field by adjusting responses in "Find" dialog box.
- To limit a view to the records meeting a "Find" criterion, press the "Filter by Example" (lightning bolt) button. Press the "Filter Button" (funnel) to return to the all records (no filter) view.
- To delete a record, highlight the gray bar to the left of the record and press the Delete key.

Note: The user's MS Access "Options" settings affect the number and type of Caution or Warning messages the user receives, as well as behavior of the "Find" utility. For CRA Waste Manager, the following settings for "Default find/replace behavior" and "Confirm" are suggested (under drop-down menu item Tools -> Options -> Edit/Find Tab).



6.0 SECURITY

Multi-level security by user and password can be implemented. A typical multi-level set-up might include levels such as the following:

User

- Default set-up.
- Can view records in all form and datasheet views, search and sort.
- Cannot add or change data, cannot save searches or sorts.
- Can view and print reports.

Editor

- Has All User Rights.
- Additionally, can add or change data format and report format.

Administrator

- Has all editor rights.
- Additionally, can add or change system users and rights.

7.0 EXAMPLE

A new waste stream has been identified and is being disposed by Company A1. The initial shipment is transported by transporter T1 to the Landfill L1.

Before entering initial shipment information, be sure the following master file information has been entered:

- Generator (Company) Table - Company information for Company A1. (At a minimum, a Company ID, created and assigned for this system, and a company name.)
- Unit/Department Table - Unit information for the Unit(s)/Department(s) that will be generating this waste stream. (At a minimum, the Unit ID, created and assigned for this system, and a Unit description.)
- Waste Code Table (Optional) – All applicable waste codes for this waste (e.g., D001, F005, or state-assigned). If entered, these codes will be available as drop-downs for subsequent entry screens for Facility Wastes.
- Waste Characterization (Facility Waste) Table – A facility-assigned waste stream ID, description of the waste stream, waste profile information, DOT shipping information, and associated waste codes. (This information will subsequently be automatically entered for you in the Shipment entry screen as soon as you identify the Facility Waste ID.)
- Waste Approval (Profile) Information – The specific approval number provided by the disposal facility (or other), along with the method of disposition, treatment, etc. Information in this table is vital to reporting waste disposition by handling method.
- Transporter Table (Optional) – The ID number and name of the transporter. If entered, this will be available in drop-downs during Shipment data entry.
- Disposer Table (Optional) – The ID number and name of the disposal facility. If entered, this will be available in drop-downs during Shipment data entry.

At this point, Shipment data may be entered using the "Shipments" button from the Data Entry/Edit switchboard.

ATTACHMENT D-2

EXAMPLE WASTE LABELS

CAUTION

CONTAINS

PCBs

PCB Out of Service Date = x/x/xx

(Polychlorinated Biphenyls)

A toxic environmental contaminant requiring special handling and disposal in accordance with U.S. Environmental Protection Agency Regulations 40 CFR 761 – For Disposal Information contact the nearest U.S. E.P.A. Office.

In case of accident or spill, call toll free the U.S. Coast Guard National Response Center:
800-424-8802

Also Contact: ______________________________

Tel No.: ______________________________

NON-RCRA REGULATED WASTE

THIS WASTE NOT REGULATED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY 40CFR(RCRA) BUT MAY BE SUBJECT TO DEPT. OF TRANSPORTATION REGULATIONS, (49CFR) OR STATE OR LOCAL REGULATIONS.

GENERATOR INFORMATION:

SHIPPER General Motors Powertrain Div.

ADDRESS 105 GM Drive

CITY, STATE, ZIP Bedford, IN 47421

PROPER D.O.T. SHIPPING NAME RQ, Polychlorinated Biphenyls solid, mixture, 9, UN2315, II

UN OR NA NO.: UN2315

PHONE: ____________

NON-RCRA REGULATED WASTE

BWMV REV.11-1-92 Printed by Labelmaster, An American Labelmark Co., Chicago, IL 60646 (800) 621-5808

OPTIONAL INFORMATION

SHIPPER ______________________________

ADDRESS ______________________________

CITY, STATE, ZIP ______________________________

CONTENTS ______________________________

____

Printed By: Lab Safety Supply Inc., Janesville WI 53547-1368

Reorder No. 478

ATTACHMENT D-3

EXAMPLE MANIFESTS

~~NY~~B9567198

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS

HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Please type or print. Do not staple.

(Hazardous Waste Manifest 5/00)

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator's US EPA No. IND006036099	Manifest Doc. No.	2. Page 1 of 2	Information within heavy bold line is not required by Federal Law.

3. Generator's Name and Mailing Address
General Motors Corp
105 GM Drive
Bedford, IN 47421

4. Generator's Telephone Number (812) 279-7360

A. NYB9567198

B. Generator's ID: Same

5. Transporter 1 (Company Name): Wills Trucking

6. US EPA ID Number: OHD068913409

C. State Transporter's ID

D. Transporter's Telephone (800) 362-3570

7. Transporter 2 (Company Name)

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Telephone ( )

9. Designated Facility Name and Site Address
CWM Chemical Services, LLC
1550 Balmer Rd.
Model City, NY 14107

10. US EPA ID Number: NYD049836679

G. State Facility ID

H. Facility Telephone (716) 754-8231

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	12. Containers Number	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Polychlorinated Biphenyls, Solid Mixture, 9, UN 2315, PG II	001	DM		K	EPA STATE B007
b. Non-Hazardous, Non-Regulated Material per 40 CFR & 49 CFR (drilling mud)	004	DM		K	EPA STATE None
c. Non-Hazardous, Non-Regulated Material per 49 CFR & 40 CFR (soil cuttings)	004	DM		K	EPA STATE None
d.					EPA STATE

J. Additional Descriptions for Materials listed Above

a. GMM050
b. GMM048
c. GMM049
d.

K. Handling Codes for Wastes Listed Above

a. L
b. L
c. L
d.

15. Special Handling Instructions and Additional Information
PCB out of service date = 2/11/02
Chemtrec Emergency Response Number = (800) 424-9300

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations.

If I am large quantity generator. I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a smaller generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Mo. Day Year
Jeff Nichols, CRA for GM		03 12 02

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Mo. Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Mo. Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Mo. Day Year

GENERATOR
TRANSPORTER
FAC.

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the NYS Department of Environmental Conservation

COPY 1-DISPOSER STATE - MAILED BY TSD FACILITY

PCB MANIFEST CONTINUATION FORM

ase include on the manifest or on an attachment to the manifest:

nique ID # or Serial # of container	Profile of waste	Type of PCB Waste	Date of Removal From Service	Weight in Kg.
H	GMM 050	soil w/ PCB >50ppm	2/11/02	

(Make additional copies if needed)

DISPOSAL STANDARDS FOR NEW YORK STATE REGULATED HAZARDOUS PCB WASTES

GENERATOR NAME: General Motors

MANIFEST #: ______ CWM PROFILE #: GmM050

UNIQUE DRUM#: H OUT OF SERVICE DATE: 02/11/02

The following New York State regulated and land restricted wastes are subject to 6 NYCRR Part 376. Refer to 6 NYCRR 376.4(f) for New York land disposal requirements. Check all that apply:

[ ] B001 [ ] B002 [ ] B003 [ ] B004 [ ] B005 [ ] B006 [X] B007

Certification - Waste Meets Treatment Standards

[X] I am the generator of the waste as identified above, that is restricted under 6 NYCRR Part 376. I have determined that this waste meets all applicable treatment standards set forth in 6 NYCRR 376 and, therefore, it can be land disposed without further treatment. Waste does not include solidified B002 material (liquid with PCBs 50-500 ppm).

I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that waste complies with the treatment standards specified in Part 376, Section 376.4 and all applicable prohibitions set forth in subdivision 376.3(b) of Part 376 or RCRA Section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification including the possibility of a fine or imprisonment.

Notification - Waste Does Not Meet Treatment Standards

[ ] I am the generator of a waste restricted under 6 NYCRR Part 376 as identified above. I notify that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this notification that the waste does not comply with the treatment standards specified in 6 NYCRR Part 376.4(f). This waste must be treated to the applicable standard set forth in 6 NYCRR 376.4(f) prior to land disposal.

GENERATOR'S SIGNATURE: ______

TITLE: ______ DATE: ______

Updated 05/19/98

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. IND006036099

Manifest Document No.

2. Page 1 of 1

A. Non-hazardous Manifest Document Number Z 0048233

3. Generator's Name and Mailing Address
GENERAL MOTORS CORP
105 GM DRIVE
BEDFORD, IN 47421

4. Generator's Phone (812) 279-7360

B. State Generator's ID SAME

5. Transporter 1 Company Name

6. US EPA ID Number

C. State Trans. ID

D. Transporter's Phone ( )

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Trans. ID

F. Transporter's Phone ( )

9. Designated Facility Name and Site Address
Metalworking Lubricants Company
1509 S. Senate Ave
Indianapolis, IN 46225

10. US EPA ID Number IND000646950

G. State Facility's ID

H. Facility's Phone (317) 269-2444

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	L Waste No.
a.	Non-regulated, non-hazardous material per 40 & 49 CFR (wastewater)		TT		G	
b.						
c.						
d.						

GENERATOR

J. Additional Descriptions for Materials Listed Above

a. CW #7867

b.

c.

d.

K. Handling Codes for Wastes Listed Above

a.

b.

c.

d.

15. Special Handling Instructions and Additional Information

CHEMTREL EMERGENCY RESPONSE NUMBER => (800) 424-9300

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261 or any applicable state law.

Printed/Typed Name | Signature | Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name | Signature | Month Day Year

July 18, 2003

ATTACHMENT D-4

WASTE PROFILES AND APPROVALS

Date 3/08/02

Time 9:00:31

WASTE MANAGEMENT DECISION

Page . . : 1

Location of Original MIDWEST REGIONAL LAB

Tracking #: 4567451 Priority : MC
Profile # : GMM050 Date Received: 03/07/02
Effective Date: 03/07/02
Generator : GENERAL MOTORS CORP
Waste Category Code:
Description : SOIL/DEBRIS (>50 PPM PCBS)

I. ›nerator and Facility Information

Decision Site CWM MODEL CITY FACILIT
Proposed Management Facility CWM MODEL CITY FACILIT

*** This Decision is APPROVED

II. Decision to Deny Approval for Management of Waste

Reason for Denying Approval

Final Approval ______________ Name (print) ______________ Date ________

III. Decision to Approve
Approved

a) Approved Management Methods
TSCA Landfill.

b) Precaution Conditions or Limitations on Approval

(1) Site Conditions
RMU 1(ANY)

(2) Contracting Conditions

(3) Site and Contracting Conditions
- Waste must not contain any free liquid,
source >500 ppm.
manifests and drums.
Serv.,Inc. for delays at Model City for on-site
arranges their own transportation.
should place the phrase "Certificate of
manifest.
Certification Form must be properly executed
- Drummed waste must be properly marked with the
labeling under RCRA and/or DOT provisions.
qualifying for landfill to be full and have no
upon the generator waste being contained in
- Shipment of PCB material must meet the manifest
761.207.
void space or to absorb free liquids must be
- Sorbents present in bulk shipments must be
a solidification agent to remove free standing
solidified B002 liquids or liquids with PCB
- Waste profile sheet numbers must appear on
- No demurrage will be paid by CWM Chemical
acceptance procedures when generator/customer
- Customers who require Certificates of Disposal
Disposal Required" in Section 15 of the
- Special Land Disposal Notification and
and accompany first shipment of this waste.
profile number and bear only the appropriate
- SLF restrictions require all drummed solids
void space. Price and disposal is contingent
open top drums.
requirements outlined by the USEPA in 40 CFR
- Any sorbents used in drum loads to eliminate
nonbiodegradable.
non biodegradable and must not have been used as
liquid in the load.

c) Analytical Requirements for Each Load

)ate 3/08/02 WASTE MANAGEMENT DECISION Page . . : 2
:ime 9:00:31

Location of Original MIDWEST REGIONAL LAB

Tracking #: 4567451 Priority : MC
Profile # : GMM050 Date Received: 03/07/02
Effective Date: 03/07/02
Generator : GENERAL MOTORS CORP
Waste Category Code:
Description : SOIL/DEBRIS (>50 PPM PCBS)

:. **nerator and Facility Information**

Decision Site CWM MODEL CITY FACILIT
Proposed Management Facility CWM MODEL CITY FACILIT

*** This Decision is APPROVED

II. Continuation.....

Wap tests: Miscellaneous.
Suitable to smash if drums contain void space.
.

Soil ID required on first load after 3/7/02.
LDR form with first shipment.

Per Waste Analysis Plan

d) Decision Expiration Date 03/07/04

V. Final Decision

State any Additional Precautions, Conditions, or Limitations

inal Approval ______________________ Name (print) JILL KNICKERBOCKER Date 03/07/02

WASTE MANAGEMENT, INC.

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

Service Agreement on File? ☒ YES ☐ NO

Profile Number: GMM050

Renewal Date

☐ Hazardous ☐ Non-Hazardous ☒ TSCA

A. Waste Generator Information

1. Generator Name: General Motors Corporation – Bedford Facility
2. SIC Code: 3365 and 3363
3. Facility Street Address: 105 GM Drive
4. Phone: (812) 279-7404
5. Facility City: Bedford
6. State/Province: Indiana
7. Zip/Postal Code: 47421
8. Generator USEPA/FED ID #: IND006036099
9. County: Lawrence
10. State/Province ID#:
11. Customer Name: Waste Management National Accounts
12. Customer Phone:: (866) 469-2783
13. Customer Contact: Kelly Morrissey
14. Customer Fax: (586) 573-3636
15. Billing Address: Waste Management - National Accounts, 12200 E. 13 Mile Rd., Warren, MI 48088 ☐ Same as above

B. Waste Stream Information

1. DESCRIPTION

a. Name of Waste: Soil/Debris (>50 ppm PCBs)

b. Processing Generating Waste: Site investigation and remediation activities. (Use analytical from Profile #GMF068)

c. Color	d. Strong odor	e. Physical state @ 70°F	f. Layers	g. Free liquid range
Grey/brown	(describe)	☒ Solid ☐ Liquid ☐ Gas ☐ Sludge ☐ Other	☒ Single Layer ☐ Multi-Layer	0 % to
				h. PH: Range to 10

i. Liquid Flash Point: ☐ <73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☒ Not Applicable

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis):.

Constituents	Concentration Range	Constituents	Concentration Range
Inerts (soil/concrete debris)	25-100%		
Other Debris (Plastic liners/PPE)	0-75%		
Polychlorinated biphenyls	≥50 ppm		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k. ☐ Oxidizer ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐ Carcinogen ☐ Infectious ☐ Shock Sensitive ☐ Water Reactive

l. Does the waste represented by this profile contain any of the carcinogens which require OSHA Notification? (list in Section B.1.)........ ☐ YES ☒ NO

m. Does the waste represented by this profile contain dioxins? (list in B.1.j)........ ☐ YES ☒ NO

n. Does the waste represented by this profile contain asbestos?........ ☐ YES ☒ NO
If yes........ ☐ friable ☐ non-friable

o. Does the waste represented by this profile contain benzene........ ☐ YES ☒ NO
If yes, concentration ppm
Is the waste subject to benzene waste operations NESHAP?........ ☐ YES ☒ NO

p. Is the waste subject to RCRA Subpart CC controls........ ☐ YES ☒ NO
If yes, volatile organic concentration

q. Does the waste contain any Class I or Class II ozone-depleting substance?........ ☐ YES ☒ NO

r. Does the waste contain debris? (list in Section B.1.j)........ ☒ YES ☐ NO

2. Quantity of Waste
Estimated Annual Volume 35,000 ☐ Tons ☐ Yards ☐ Drums ☒ Other (specify) Kg

Shipping Information

a. Packaging:
☒ Bulk Solid; Type/Size: Roll-off box (23-yard box) ☐ Bulk Liquid, Type/Size
☒ Drum; Type/Size: 55 gal or overpacked drums ☐ Other:

b. Shipping Frequency: Units Varies ~ 0-5 Per: ☒ Month ☐ Quarter ☐ Year ☐ One Time ☐ Other

c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip d, e and f)........ ☒ YES ☐ NO

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

d. Reportable Quantity (lbs.; kgs.): 1 pound PCBs e. Hazard Class/ID#: UN2315

f. USDOT Shipping Name: Polychlorinated biphenyls, Solid Mixture, 9, UN2315, PG II

g. Personal Protective Equipment Requirements: ERG #171

h. Transporter/Transfer Station:

C. Generator's Certification (Please check appropriate responses, sign, and date below.)

1. Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to 2.................... ☐ YES ☒ NO
   a. If yes, identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U)
   b. If a characteristic hazardous waste, do underlying hazardous constituents B.1.j) (UHCs) apply? (if yes, list in Section.. ☐ YES ☒ NO
   c. Does this waste contain debris? (if yes, list size and type in Chemical Composition- B.1.).. ☐ YES ☒ NO
2. Is this a state hazardous waste?.. ☒ YES ☐ NO
   Identify ALL state hazardous waste codes B007 – New York State
3. Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated clean-up?.. ☐ YES ☒ NO
   If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site clean-up for activity. For state mandated clean-up, provide relevant documentation.
4. Does the waste represented by this waste profile sheet contain radioactive material, or is disposal regulated by the Nuclear Regulatory Commission?.. ☐ YES ☒ NO
5. Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? (if yes, list in Chemical Composition - B.1.j).. ☒ YES ☐ NO
   a. If yes, were the PCBs imported into the U.S.?.. ☐ YES ☒ NO

Do the waste profile sheet and all the attachments contain true and accurate descriptions of the waste material, and has all relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor?.. ☒ YES ☐ NO

7. Will all changes which occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor?... ☒ YES NO

☒ Check here if a Certificate of Destruction or Disposal is required.

Any sample submitted is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. I authorize WMI to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. If approved for management, Contractor has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile.

Certification Signature: Kimberly Dobosenski Title: Environmental Engineer

Name (Type or Print) Kimberly Dobosenski Company Name General Motors Corporation Date: 3/6/02

☐ Check if additional information is attached. Indicate the number of attached pages.

D. WMI Management's Decision FOR WMI USE ONLY

1. Management Method ☐ Landfill ☐ Non-hazardous Solidification ☐ Bioremediation ☐ Incineration ☐ Hazardous Stabilization ☐ Other (Specify)
2. Proposed Ultimate Management Facility:
3. Precautions, Special Handling Procedures, or Limitation on Approval
4. Waste Form: 5. Source 6. System Type

cial Waste Decision.. ☐ Approved ☐ Disapproved

esperson's Signature: Date:

Division Approval Signature (Optional): Date:

Special Waste Approvals Person Signature Date:

WASTE MANAGEMENT, INC.

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

Service Agreement on File? ☒ YES ☐ NO

Profile Number: GMM049

Renewal Date

☐ Hazardous ☒ Non-Hazardous ☐ TSCA

A. Waste Generator Information

1. Generator Name:	General Motors Corporation – Bedford Facility	2. SIC Code	3365 and 3363
3. Facility Street Address:	105 GM Drive	4. Phone	(812) 279-7404
5. Facility City:	Bedford	6. State/Province:	Indiana
7. Zip/Postal Code:	47421	8. Generator USEPA/FED ID #:	IND006036099
9. County:	Lawrence	10. State/Province ID#:	
11 Customer Name:	Waste Management National Accounts	12. Customer Phone::	(866) 469-2783
13. Customer Contact:	Kelly Morrissey	14. Customer Fax:	(586) 573-3636

15. Billing Address: Waste Management - National Accounts, 12200 E. 13 Mile Rd., Warren, MI 48088 ☐ Same as above

B. Waste Stream Information

1. DESCRIPTION

a. Name of Waste: Soil/Debris (<50 ppm PCBs)

b. Processing Generating Waste: Site investigation and remediation activities. (Use analytical from profile #GMF067)

c. Color	d. Strong odor	e. Physical state @ 70°F	f. Layers	g. Free liquid range
Grey/brown	(describe)	☒ Solid ☐ Liquid ☐ Gas ☐ Sludge ☐ Other	☒ Single Layer ☐ Multi-Layer	0 % to
				h. PH: Range to 10

i. Liquid Flash Point: ☐ <73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☒ Not Applicable

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis):.

Constituents	Concentration Range	Constituents	Concentration Range
Inerts (soil/concrete debris)	25-100%		
Other Debris (Plastic liners/PPE)	0-75%		
Polychlorinated biphenyls	<50 ppm		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k. ☐ Oxidizer ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐ Carcinogen ☐ Infectious ☐ Shock Sensitive ☐ Water Reactive

l. Does the waste represented by this profile contain any of the carcinogens which require OSHA Notification? (list in Section B.1.)........ ☐ YES ☒ NO

m. Does the waste represented by this profile contain dioxins? (list in B.1.j)........ ☐ YES ☒ NO

n. Does the waste represented by this profile contain asbestos?........ ☐ YES ☒ NO
If yes........ ☐ friable ☐ non-friable

o. Does the waste represented by this profile contain benzene........ ☐ YES ☒ NO
If yes, concentration ppm
Is the waste subject to benzene waste operations NESHAP?........ ☐ YES ☒ NO

p. Is the waste subject to RCRA Subpart CC controls........ ☐ YES ☒ NO
If yes, volatile organic concentration

q. Does the waste contain any Class I or Class II ozone-depleting substance?........ ☐ YES ☒ NO

r. Does the waste contain debris? (list in Section B.1.j)........ ☒ YES ☐ NO

2. Quantity of Waste
Estimated Annual Volume 35,000 ☐ Tons ☐ Yards ☐ Drums ☒ Other (specify) Kg

Shipping Information

a. Packaging:
☒ Bulk Solid; Type/Size: Roll-off box (23-yard box) ☐ Bulk Liquid, Type/Size
☒ Drum; Type/Size: 55 gal drums ☐ Other:

b. Shipping Frequency: Units Varies ~ 0-5 Per: ☒ Month ☐ Quarter ☐ Year ☐ One Time ☐ Other

c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip d, e and f)........ ☐ YES ☒ NO

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

d. Reportable Quantity (lbs.; kgs.): ______ e. Hazard Class/ID#: ______
f. USDOT Shipping Name: ______
g. Personal Protective Equipment Requirements: ______
h. Transporter/Transfer Station: ______

C. Generator's Certification (Please check appropriate responses, sign, and date below.)

1. Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to 2.................... ☐ YES ☒ NO
   a. If yes, identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U) ______
   b. If a characteristic hazardous waste, do underlying hazardous constituents B.1.j) (UHCs) apply? (if yes, list in Section.................................... ☐ YES ☒ NO
   c. Does this waste contain debris? (if yes, list size and type in Chemical Composition- B.1.).. ☐ YES ☒ NO
2. Is this a state hazardous waste?.. ☐ YES ☒ NO
   Identify ALL state hazardous waste codes ______
3. Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated clean-up?.. ☐ YES ☒ NO
   If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site clean-up for activity. For state mandated clean-up, provide relevant documentation.
4. Does the waste represented by this waste profile sheet contain radioactive material, or is disposal regulated by the Nuclear Regulatory Commission?.. ☐ YES ☒ NO
5. Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? (If yes, list in Chemical Composition - B.1.j)...................................... ☐ YES ☒ NO
   a. If yes, were the PCBs imported into the U.S.?.. ☐ YES ☐ NO

Do the waste profile sheet and all the attachments contain true and accurate descriptions of the waste material, and has all relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor?.. ☒ YES ☐ NO

7. Will all changes which occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor?.. ☒ YES NO

☒ Check here if a Certificate of Destruction or Disposal is required.

Any sample submitted is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. I authorize WMI to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. If approved for management, Contractor has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile.

Certification Signature: Kimberly Dobosenski Title: Environmental Engineer
Name (Type or Print): Kimberly Dobosenski Company Name: General Motors Corporation Date: 3/6/02

☐ Check if additional information is attached. Indicate the number of attached pages.

D. WMI Management's Decision FOR WMI USE ONLY

1. Management Method ☐ Landfill ☐ Non-hazardous Solidification ☐ Bioremediation ☐ Incineration ☐ Hazardous Stabilization ☐ Other (Specify) ______
2. Proposed Ultimate Management Facility: ______
3. Precautions, Special Handling Procedures, or Limitation on Approval ______
4. Waste Form: ______ 5. Source ______ 6. System Type ______

ecial Waste Decision.................................... ☐ Approved ☐ Disapproved
alesperson's Signature: ______ Date: ______
Division Approval Signature (Optional): ______ Date: ______
Special Waste Approvals Person Signature ______ Date: ______

ate 3/19/02
ime 9:45:35

WASTE MANAGEMENT DECISION

Location of Original MIDWEST REGIONAL LAB

Tracking #: 4567739 Priority : MC
Profile # : GMM051 Date Received: 03/18/02
Effective Date: 03/18/02
Generator : GENERAL MOTORS CORP
Waste Category Code:
Description : DRILLING MUD/SOIL >50 PPM PCBS

I. enerator and Facility Information

Decision Site CWM MODEL CITY FACILIT
Proposed Management Facility CWM MODEL CITY FACILIT

*** This Decision is APPROVED

II. Decision to Deny Approval for Management of Waste

Reason for Denying Approval

Final Approval ____________ Name (print) ____________ Date ____________

III. Decision to Approve
Approved

a) Approved Management Methods
TSCA Landfill.

b) Precaution Conditions or Limitations on Approval

(1) Site Conditions
RMU 1(ANY) MC:X Stabilize any free liquid with sufficient CKD.

(2) Contracting Conditions

(3) Site and Contracting Conditions
- Waste profile sheet numbers must appear on
- No demurrage will be paid by CWM Chemical
acceptance procedures when generator/customer
- Customers who require Certificates of Disposal
Disposal Required" in Section 15 of the
- Special Land Disposal Notification and
and accompany first shipment of this waste.
profile number and bear only the appropriate
- SLF restrictions require all drummed solids
void space. Price and disposal is contingent
open top drums.
requirements outlined by the USEPA in 40 CFR
- Any sorbents used in drum loads to eliminate
nonbiodegradable.

manifests and drums.
Serv.,Inc. for delays at Model City for on-site
arranges their own transportation.
should place the phrase "Certificate of
manifest.
Certification Form must be properly executed
- Drummed waste must be properly marked with the
labeling under RCRA and/or DOT provisions.
qualifying for landfill to be full and have no
upon the generator waste being contained in
- Shipment of PCB material must meet the manifest
761.207.
void space or to absorb free liquids must be

c) Analytical Requirements for Each Load
Wap tests: Miscellaneous.
Suitable to smash.

LDR form with first shipment.

WASTE MANAGEMENT DECISION

ate 3/19/02
ime 9:45:35

Location of Original MIDWEST REGIONAL LAB

Tracking #: 4567739 Priority : MC
Profile # : GMM051 Date Received: 03/18/02
Effective Date: 03/18/02
Generator : GENERAL MOTORS CORP
Waste Category Code:
Description : DRILLING MUD/SOIL >50 PPM PCBS

:. enerator and Facility Information

Decision Site CWM MODEL CITY FACILIT
Proposed Management Facility CWM MODEL CITY FACILIT

*** This Decision is APPROVED

III. Continuation.....
Per Waste Analysis Plan

d) Decision Expiration Date 03/18/03

Initial Approval __________ Name (print) ANTHONY OSWALD Date 03/18/02

IV. Final Decision

State any Additional Precautions, Conditions, or Limitations

Final Approval __________ Name (print) JILL KNICKERBOCKER Date 03/18/02

Chemical Waste Management. Inc.

Date Printed 03/19/02

GENERATOR'S WASTE PROFILE SHEET

Profile # MDC GMM051

(_) Check here if this is a Recertification LOCATION OF ORIGINAL CWM MODEL CITY FACILITY

G' AL INFORMATION

1 .nerator Name: GENERAL MOTORS CORP

Generator USEPA ID: IND006036099

2. Generator Address: 105 GM DR
PO BOX 271
BEDFORD IN 47421

Billing Address: (_) Same
WASTE MANAGEMENT NATL ACCTS
720 BUTTERFIELD RD
LOMBARD IL 60148

3. Technical Contact/Phone:

4. Alternate Contact/Phone:

Billing Contact/Phone: KELLY MORRISSEY 866/469-2783

PROPERTIES AND COMPOSITION

5. Process Generating Waste: SITE INVESTIGATION AND REMEDIATION ACTIVITIES

6. Waste Name: DRILLING MUD/SOIL >50 PPM PCBS

7A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes (_) No (X)
B. Identify ALL USEPA listed and characteristic waste code numbers (D.F.K.P.U):
State Waste Codes: B007

8. Physical State @ 70F: A. Solid(_) Liquid(_) Both(X) Gas(_) B. Single Layer (_) Multilayer (X) C. Free liq. range 0 to 75%

9A. pH: Range ____ to 10.0 or Not applicable (_) B. Strong Odor (_);describe

10. Liquid Flash Point: < 73F (_) 73-99F (_) 100-139F (_) 140-199F (_) >= 200F (_) N.A. (X) Closed Cup (X) Open Cup (_)

11. CHEMICAL COMPOSITION: List ALL constituents (incl. halogenated organics) present in any concentration and forward analysis

Constituents	Range	Unit Description
	to	
INERTS		
DRILLING MUD/SOIL/CONCRETE DEBRIS	25 to 100	%
WATER	0 to 75	%
COMMENTS	to	
PCB CONCENTRATION ON LIQUID-0.35 UG/L	to	
	to	
TOTAL COMPOSITION (MUST EQUAL OR EXCEED 100%):	175.000000	

12. OTHER: PCBs if yes, concentration 54 ppm. PCBs regulated by 40 CFR 761 (X). Pyrophoric (_) Explosive (_)
Radioactive (_) Benzene if yes, concentration ____ ppm. NESHAP (_) Shock Sensitive (_) Oxidizer (_)
Carcinogen (_) Infectious (_) Other

13. If waste subject to the land ban & meets treatment standards. check here: _ & supply analytical results where applicable.

SHIPPING INFORMATION

14. PACKAGING: Bulk Solid (_) Bulk Liquid (_) Drum (X) Type/Size: 55 GALLON DRUM Other

15. ANTICIPATED ANNUAL VOLUME: 6 Units: 55 GALLON DRUM Shipping Frequency: MONTH

Sample Tracking Number: 4567521

SAMPLING INFORMATION

16a. Sample source (drum. lagoon. pond. tank. vat. etc.):

Date Sampled: Sampler's Name/Company:

16b. Generator's Agent Supervising Sampling:

17. (_) No sample required (See instructions.)

GENERATOR'S CERTIFICATION

reby certify that all information submitted in this and all attached documents contains true and accurate descriptions of , waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

Signature on original profile GMM051 KIMBERLY DOBOSENSKI ENVIRONMENTAL ENGINEER 3/07/02

Signature Name and Title Date

WM
WASTE MANAGEMENT, INC.

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

Profile Number: GMM051
Renewal Date

Service Agreement on File? ☒ YES ☐ NO

☐ Hazardous ☐ Non-Hazardous ☒ TSCA

A. Waste Generator Information

1. Generator Name:	General Motors Corporation – Bedford Facility	2. SIC Code	3365 and 3363
3. Facility Street Address:	105 GM Drive	4. Phone	(812) 279-7404
5. Facility City:	Bedford	6. State/Province:	Indiana
7. Zip/Postal Code:	47421	8. Generator USEPA/FED ID #:	IND006036099
9. County:	Lawrence	10. State/Province ID#:	
11. Customer Name:	Waste Management National Accounts	12. Customer Phone::	(866) 469-2783
13. Customer Contact	Kelly Morrissey	14. Customer Fax:	(586) 573-3636
15. Billing Address	Waste Management - National Accounts, 12200 E. 13 Mile Rd., Warren, MI 48088		☐ Same as above

B. Waste Stream Information

1. DESCRIPTION
   a. Name of Waste: Drilling Mud/Soil (≥50 ppm PCBs)
   b. Processing Generating Waste: Site investigation and remediation activities.

c. Color	d. Strong odor	e. Physical state @ 70°F	f. Layers	g. Free liquid range
Grey/brown	(describe)	☐ Solid ☐ Liquid ☐ Gas ☒ Sludge ☐ Other	☐ Single Layer ☒ Multi-Layer	0 % to 75
				h. PH: Range to 10

i. Liquid Flash Point: ☐ <73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥200°F ☒ Not Applicable

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis):.

Constituents	Concentration Range	Constituents	Concentration Range
Inerts (drilling mud/soil/concrete debris)	25-100%		
Other Debris (Plastic liners/PPE)	0-75%		
Polychlorinated biphenyls in solid	≥50 ppm		
Polychlorinated biphenyls in liquid	<50 ppm		
Water from drilling	0-75%		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k. ☐ Oxidizer ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐ Carcinogen ☐ Infectious ☐ Shock Sensitive ☐ Water Reactive

l. Does the waste represented by this profile contain any of the carcinogens which require OSHA Notification? (list in Section B.1.)........ ☐ YES ☒ NO

m. Does the waste represented by this profile contain dioxins? (list in B.1.j)........ ☐ YES ☒ NO

n. Does the waste represented by this profile contain asbestos?........ ☐ YES ☒ NO
   If yes........ ☐ friable ☐ non-friable

o. Does the waste represented by this profile contain benzene........ ☐ YES ☒ NO
   If yes, concentration ppm
   Is the waste subject to benzene waste operations NESHAP?........ ☐ YES ☒ NO

p. Is the waste subject to RCRA Subpart CC controls........ ☐ YES ☒ NO
   If yes, volatile organic concentration

q. Does the waste contain any Class I or Class II ozone-depleting substance?........ ☐ YES ☒ NO

r. Does the waste contain debris? (list in Section B.1.j)........ ☒ YES ☐ NO

2. Quantity of Waste
   Estimated Annual Volume 8,750 ☐ Tons ☐ Yards ☐ Drums ☒ Other (specify) Kg

3. Shipping Information
   a. Packaging:
      ☒ Bulk Solid; Type/Size: Roll-off box (23-yard box) ☐ Bulk Liquid, Type/Size
      ☒ Drum; Type/Size: 55 gal or overpack drums ☐ Other:
   b. Shipping Frequency: Units Varies – 0-5 Per: ☒ Month ☐ Quarter ☐ Year ☐ One Time ☐ Other
   c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip d, e and f)........ ☒ YES ☐ NO

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

d. Reportable Quantity (lbs.; kgs.): 1 pound PCBs e. Hazard Class/ID#: UN2315
f. USDOT Shipping Name: Polychlorinated biphenyls, Solid Mixture, 9, UN2315, PG II
g. Personal Protective Equipment Requirements: ERG #171
h. Transporter/Transfer Station:

C. Generator's Certification (Please check appropriate responses, sign, and date below.)

1. Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to 2 .... ☐ YES ☒ NO
   a. If yes, identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U)
   b. If a characteristic hazardous waste, do underlying hazardous constituents B.1.j) (UHCs) apply? (if yes, list in Section .... ☐ YES ☒ NO
   c. Does this waste contain debris? (if yes, list size and type in Chemical Composition- B.1.) .... ☐ YES ☒ NO
2. Is this a state hazardous waste? .... ☒ YES ☐ NO
   Identify ALL state hazardous waste codes B007 – New York State
3. Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated clean-up? .... ☐ YES ☒ NO
   If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site clean-up for activity. For state mandated clean-up, provide relevant documentation.
4. Does the waste represented by this waste profile sheet contain radioactive material, or is disposal regulated by the Nuclear Regulatory Commission? .... ☐ YES ☒ NO
5. Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? (if yes, list in Chemical Composition - B.1.j) .... ☒ YES ☐ NO
   a. If yes, were the PCBs imported into the U.S.? .... ☐ YES ☒ NO
6. Do the waste profile sheet and all the attachments contain true and accurate descriptions of the waste material, and has all relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor? .... ☒ YES ☐ NO
7. Will all changes which occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor? .... ☒ YES NO

☒ Check here if a Certificate of Destruction or Disposal is required.

Any sample submitted is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. I authorize WMI to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. If approved for management, Contractor has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile.

Certification Signature: Kimberly Dobosenski
Title: Environmental Engineer
Name (Type or Print): Kimberly Dobosenski
Company Name: General Motors Corporation
Date: 3/7/02

☐ Check if additional information is attached. Indicate the number of attached pages.

D. WMI Management's Decision FOR WMI USE ONLY

1. Management Method ☐ Landfill ☐ Non-hazardous Solidification ☐ Bioremediation ☐ Incineration ☐ Hazardous Stabilization ☐ Other (Specify)
2. Proposed Ultimate Management Facility:
3. Precautions, Special Handling Procedures, or Limitation on Approval
4. Waste Form: 5. Source 6. System Type

Special Waste Decision .... ☐ Approved ☐ Disapproved
Salesperson's Signature: Date:
Division Approval Signature (Optional): Date:
Special Waste Approvals Person Signature Date:

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2C130104

Date Reported: 3/15/02

Client Sample ID: MW-X045Y258
Sample #: 001 Date Sampled: 03/12/02 10:00 Date Received: 03/13/02 Matrix: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
PCBs by SW-846 8082					In Review
Aroclor 1016	ND	0.20	ug/L	SW846 8082	
Aroclor 1221	ND	0.20	ug/L	SW846 8082	
Aroclor 1232	ND	0.40	ug/L	SW846 8082	
Aroclor 1242	ND	0.20	ug/L	SW846 8082	
Aroclor 1248	**0.35**	**0.20**	**ug/L**	**SW846 8082**	
Aroclor 1254	ND	0.20	ug/L	SW846 8082	
Aroclor 1260	ND	0.20	ug/L	SW846 8082	

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GMPT BEDFORD
Project Number: 13968

Lot #: A2A310106

Date Reported: 2/14/02

Client Sample ID: S-013002-KMV-518
Sample #: 002 Date Sampled: 01/30/02 09:05 Date Received: 01/31/02 Matrix: SOLID

Reviewed ✓

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
PCBs by SW-846 8082				
Aroclor 1016	ND	3900	ug/kg	SW846 8082
Aroclor 1221	ND	3900	ug/kg	SW846 8082
Aroclor 1232	ND	3900	ug/kg	SW846 8082
Aroclor 1242	ND	3900	ug/kg	SW846 8082
Aroclor 1248	**51000**	**3900**	**ug/kg**	**SW846 8082**
Aroclor 1254	ND	3900	ug/kg	SW846 8082
Aroclor 1260	**3100 J**	**3900**	**ug/kg**	**SW846 8082**

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Reviewed ✓

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Volatile Organics by GC/MS				
Acetone	ND	22	ug/kg	SW846 8260B
Benzene	ND	5.5	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.5	ug/kg	SW846 8260B
Bromoform	ND	5.5	ug/kg	SW846 8260B
Bromomethane	ND	5.5	ug/kg	SW846 8260B
2-Butanone	ND	22	ug/kg	SW846 8260B
Carbon disulfide	ND	5.5	ug/kg	SW846 8260B
Carbon tetrachloride	ND	5.5	ug/kg	SW846 8260B
Chlorobenzene	ND	5.5	ug/kg	SW846 8260B
Chloroethane	ND	5.5	ug/kg	SW846 8260B
Chloroform	ND	5.5	ug/kg	SW846 8260B
Chloromethane	ND	5.5	ug/kg	SW846 8260B
Cyclohexane	ND	11	ug/kg	SW846 8260B
Dibromochloromethane	ND	5.5	ug/kg	SW846 8260B
1,2-Dibromo-3-chloropropane	ND	11	ug/kg	SW846 8260B
1,2-Dibromoethane	ND	5.5	ug/kg	SW846 8260B
1,2-Dichlorobenzene	ND	5.5	ug/kg	SW846 8260B
1,3-Dichlorobenzene	ND	5.5	ug/kg	SW846 8260B
1,4-Dichlorobenzene	ND	5.5	ug/kg	SW846 8260B
Dichlorodifluoromethane	ND	5.5	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	5.5	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	5.5	ug/kg	SW846 8260B

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SEVERN TRENT LABORATORIES, INC.
PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GMPT BEDFORD
Project Number: 13968

Lot #: A2A310106

Date Reported: 2/14/02

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD

Client Sample ID: S-013002-KMV-518
Sample #: 002 Date Sampled: 01/30/02 09:05 Date Received: 01/31/02 Matrix: SOLID

Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Volatile Organics by GC/MS				
1,1-Dichloroethene	ND	5.5	ug/kg	SW846 8260B
cis-1,2-Dichloroethene	ND	2.7	ug/kg	SW846 8260B
trans-1,2-Dichloroethene	ND	2.7	ug/kg	SW846 8260B
1,2-Dichloropropane	ND	5.5	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	5.5	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	5.5	ug/kg	SW846 8260B
Ethylbenzene	ND	5.5	ug/kg	SW846 8260B
2-Hexanone	ND	22	ug/kg	SW846 8260B
Isopropylbenzene	ND	5.5	ug/kg	SW846 8260B
Methyl acetate	ND	11	ug/kg	SW846 8260B
Methylene chloride	ND	5.5	ug/kg	SW846 8260B
Methylcyclohexane	ND	11	ug/kg	SW846 8260B
4-Methyl-2-pentanone	ND	22	ug/kg	SW846 8260B
Methyl tert-butyl ether	ND	22	ug/kg	SW846 8260B
Styrene	ND	5.5	ug/kg	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	5.5	ug/kg	SW846 8260B
Tetrachloroethene	ND	5.5	ug/kg	SW846 8260B
Toluene	ND	5.5	ug/kg	SW846 8260B
1,2,4-Trichloro-benzene	ND	5.5	ug/kg	SW846 8260B
1,1,1-Trichloroethane	ND	5.5	ug/kg	SW846 8260B
1,1,2-Trichloroethane	ND	5.5	ug/kg	SW846 8260B
Trichloroethene	ND	5.5	ug/kg	SW846 8260B
Trichlorofluoromethane	ND	5.5	ug/kg	SW846 8260B
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.5	ug/kg	SW846 8260B
Vinyl chloride	ND	5.5	ug/kg	SW846 8260B
Xylenes (total)	ND	5.5	ug/kg	SW846 8260B

Results and reporting limits have been adjusted for dry weight.

Reviewed ✓

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Semivolatile Organic Compounds by GC/MS				
Acenaphthene	ND	390	ug/kg	SW846 8270C
Acenaphthylene	ND	390	ug/kg	SW846 8270C
Acetophenone	ND	390	ug/kg	SW846 8270C
Anthracene	ND	390	ug/kg	SW846 8270C

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GMPT BEDFORD
Project Number: 13968

Lot #: A2A310106

Date Reported: 2/14/02

Client Sample ID: S-013002-KMV-518
Sample #: 002 Date Sampled: 01/30/02 09:05 Date Received: 01/31/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
					Reviewed
Semivolatile Organic Compounds by GC/MS					
Atrazine	ND	390	ug/kg	SW846 8270C	
Benzo(a)anthracene	ND	390	ug/kg	SW846 8270C	
Benzo(a)pyrene	ND	390	ug/kg	SW846 8270C	
Benzo(b)fluoranthene	ND	390	ug/kg	SW846 8270C	
Benzo(ghi)perylene	ND	390	ug/kg	SW846 8270C	
Benzo(k)fluoranthene	ND	390	ug/kg	SW846 8270C	
Benzaldehyde	ND	390	ug/kg	SW846 8270C	
1,1'-Biphenyl	ND	390	ug/kg	SW846 8270C	
bis(2-Chloroethoxy) methane	ND	390	ug/kg	SW846 8270C	
bis(2-Chloroethyl)-ether	ND	390	ug/kg	SW846 8270C	
bis(2-Ethylhexyl) phthalate	**72 J**	**390**	**ug/kg**	**SW846 8270C**	
4-Bromophenyl phenyl ether	ND	390	ug/kg	SW846 8270C	
Butyl benzyl phthalate	ND	390	ug/kg	SW846 8270C	
Caprolactam	ND	390	ug/kg	SW846 8270C	
Carbazole	ND	390	ug/kg	SW846 8270C	
4-Chloroaniline	ND	390	ug/kg	SW846 8270C	
4-Chloro-3-methylphenol	ND	390	ug/kg	SW846 8270C	
2-Chloronaphthalene	ND	390	ug/kg	SW846 8270C	
2-Chlorophenol	ND	390	ug/kg	SW846 8270C	
4-Chlorophenyl phenyl ether	ND	390	ug/kg	SW846 8270C	
Chrysene	ND	390	ug/kg	SW846 8270C	
Dibenz(a,h)anthracene	ND	390	ug/kg	SW846 8270C	
Dibenzofuran	ND	390	ug/kg	SW846 8270C	
3,3'-Dichlorobenzidine	ND	1900	ug/kg	SW846 8270C	
2,4-Dichlorophenol	ND	390	ug/kg	SW846 8270C	
Diethyl phthalate	ND	390	ug/kg	SW846 8270C	
2,4-Dimethylphenol	ND	390	ug/kg	SW846 8270C	
Dimethyl phthalate	ND	390	ug/kg	SW846 8270C	
Di-n-butyl phthalate	ND	390	ug/kg	SW846 8270C	
4,6-Dinitro-2-methylphenol	ND	1900	ug/kg	SW846 8270C	
2,4-Dinitrophenol	ND	1900	ug/kg	SW846 8270C	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GMPT BEDFORD
Project Number: 13968

Lot #: A2A310106

Date Reported: 2/14/02

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD

Client Sample ID: S-013002-KMV-518
Sample #: 002 Date Sampled: 01/30/02 09:05 Date Received: 01/31/02 Matrix: SOLID

Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Semivolatile Organic Compounds by GC/MS				
2,4-Dinitrotoluene	ND	390	ug/kg	SW846 8270C
2,6-Dinitrotoluene	ND	390	ug/kg	SW846 8270C
Di-n-octyl phthalate	ND	390	ug/kg	SW846 8270C
Fluoranthene	ND	390	ug/kg	SW846 8270C
Fluorene	ND	390	ug/kg	SW846 8270C
Hexachlorobenzene	ND	390	ug/kg	SW846 8270C
Hexachlorobutadiene	ND	390	ug/kg	SW846 8270C
Hexachlorocyclopenta-diene	ND	1900	ug/kg	SW846 8270C
Hexachloroethane	ND	390	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	390	ug/kg	SW846 8270C
Isophorone	ND	390	ug/kg	SW846 8270C
2-Methylnaphthalene	ND	390	ug/kg	SW846 8270C
2-Methylphenol	ND	390	ug/kg	SW846 8270C
4-Methylphenol	ND	390	ug/kg	SW846 8270C
Naphthalene	ND	390	ug/kg	SW846 8270C
2-Nitroaniline	ND	1900	ug/kg	SW846 8270C
3-Nitroaniline	ND	1900	ug/kg	SW846 8270C
4-Nitroaniline	ND	1900	ug/kg	SW846 8270C
Nitrobenzene	ND	390	ug/kg	SW846 8270C
2-Nitrophenol	ND	390	ug/kg	SW846 8270C
4-Nitrophenol	ND	1900	ug/kg	SW846 8270C
N-Nitrosodi-n-propyl-amine	ND	390	ug/kg	SW846 8270C
N-Nitrosodiphenylamine	ND	390	ug/kg	SW846 8270C
2,2'-oxybis(1-Chloropropane)	ND	390	ug/kg	SW846 8270C
Pentachlorophenol	ND	390	ug/kg	SW846 8270C
Phenanthrene	ND	390	ug/kg	SW846 8270C
Phenol	ND	390	ug/kg	SW846 8270C
Pyrene	ND	390	ug/kg	SW846 8270C
2,4,5-Trichloro-phenol	ND	390	ug/kg	SW846 8270C
2,4,6-Trichloro-phenol	ND	390	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GMPT BEDFORD
Project Number: 13968

Date Reported: 2/14/02

Lot #: A2A310106

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD

Client Sample ID: S-013002-KMV-518
Sample #: 002 Date Sampled: 01/30/02 09:05 Date Received: 01/31/02 Matrix: SOLID

Reviewed ✓

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Inorganic Analysis				
Amenable Cyanide	ND	0.60	mg/kg	SW846 9012
Cyanide, Total	ND	0.60	mg/kg	SW846 9012A
Total Organic Carbon	**4000**	**120**	**mg/kg**	**MSA WALKLEY-BLACK**
Total Residue as Percent Solids	**83.7**	**10.0**	**%**	**MCAWW 160.3 MOD**

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: EB-013002-KMV-001 ✓
Sample #: 003 Date Sampled: 01/30/02 14:00 Date Received: 01/31/02 Matrix: WATER

Reviewed ✓

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Trace Inductively Coupled Plasma (ICP) Metals				
Arsenic	ND	0.010	mg/L	SW846 6010B
Lead	ND	0.0030	mg/L	SW846 6010B
Selenium	ND	0.0050	mg/L	SW846 6010B
Thallium	**0.0063 B**	**0.010**	**mg/L**	**SW846 6010B**

Reviewed ✓

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Inductively Coupled Plasma (ICP) Metals				
Silver	ND	0.010	mg/L	SW846 6010B
Aluminum	**0.084 B**	**0.20**	**mg/L**	**SW846 6010B**
Barium	ND	0.20	mg/L	SW846 6010B
Beryllium	ND	0.0050	mg/L	SW846 6010B
Cadmium	ND	0.0050	mg/L	SW846 6010B
Cobalt	ND	0.050	mg/L	SW846 6010B
Chromium	ND	0.010	mg/L	SW846 6010B
Copper	ND	0.025	mg/L	SW846 6010B
Iron	ND	0.10	mg/L	SW846 6010B
Manganese	**0.0011 B**	**0.015**	**mg/L**	**SW846 6010B**
Nickel	ND	0.040	mg/L	SW846 6010B
Antimony	ND	0.060	mg/L	SW846 6010B
Vanadium	ND	0.050	mg/L	SW846 6010B
Zinc	**0.019 B**	**0.020**	**mg/L**	**SW846 6010B**

Reviewed ✓

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Mercury in Liquid Waste (Manual Cold-Vapor)				
Mercury	ND	0.00020	mg/L	SW846 7470A

(Continued on next page)

Date 3/08/02 WASTE MANAGEMENT DECISION Page . . : 1
Time 9:01:03

Location of Original MIDWEST REGIONAL LAB

Tracking #: 4567449 Priority : MC
Profile # : GMM048 Date Received: 03/07/02
Effective Date: 03/07/02
Generator : GENERAL MOTORS CORP
Waste Category Code:
Description : DRILLING MUD WITH PCBS

I 'enerator and Facility Information

Decision Site CWM MODEL CITY FACILIT
Proposed Management Facility CWM MODEL CITY FACILIT

*** This Decision is APPROVED

II. Decision to Deny Approval for Management of Waste

Reason for Denying Approval

Final Approval ______________ Name (print) ______________ Date ______________

III. Decision to Approve
Approved

a) Approved Management Methods
Subtitle C Landfill.

b) Precaution Conditions or Limitations on Approval

(1) Site Conditions
RMU 1(ANY) MC:N,X If free liquid present, stabilize non-reg, then
landfill.

(2) Contracting Conditions

(3) Site and Contracting Conditions
- Waste profile sheet numbers must appear on manifests/shipping papers and drums.
- No demurrage will be paid by CWM Chem. Services Inc. for delays at Model City for on-site
acceptance procedures when generator/customer arranges their own transportation. Customers who
require Certificates of Disposal should place the phrase "Certificate of Disposal Required" in
Section 15 of the manifest.
- Drummed waste must be properly marked with the
profile number and bear only the appropriate labeling under RCRA and/or DOT provisions.
- SLF restrictions require all drummed solids for landfill to be full and have no void space.
Price and disposal is contingent upon the generator's waste being contained in open top
drums.
- Any sorbents used to absorb free liquids or
eliminate void space in drums must be non-biodegradable.
- Sorbents present in bulk shipments must be non-biodegradable and must not have been used as
a solidification agent to remove free-standing liquid in the load.
- If material is shipped as non-hazardous, appropriate non-hazardous labels must be on
drums, per Model City permit requirements.

c) Analytical Requirements for Each Load
Wap tests: Misc. (non-haz soil with analysis provided)
generator will be running analysis on each

Location of Original MIDWEST REGIONAL LAB

Tracking #: 4567449 Priority : MC
Profile # : GMM048 Date Received: 03/07/02
Effective Date: 03/07/02
Generator : GENERAL MOTORS CORP
Waste Category Code:
Description : DRILLING MUD WITH PCBS

I. Generator and Facility Information

Decision Site CWM MODEL CITY FACILIT
Proposed Management Facility CWM MODEL CITY FACILIT

*** This Decision is APPROVED

III. Continuation.....

container to insure PCBs <50 ppm. A spreadsheet of the results will be provided prior to shipment

Per Waste Analysis Plan

d) Decision Expiration Date 03/06/04

IV. Final Decision

State any Additional Precautions, Conditions, or Limitations

Final Approval ______________________ Name (print) JILL KNICKERBOCKER Date 03/07/02

WM
WASTE MANAGEMENT, INC.

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

Service Agreement on File? ☒ YES ☐ NO

Profile Number: GMM 048

Renewal Date

☐ Hazardous ☒ Non-Hazardous ☐ TSCA

A. Waste Generator Information

1. Generator Name:	General Motors Corporation – Bedford Facility	2.	SIC Code	3365 and 3363
3. Facility Street Address:	105 GM Drive	4.	Phone	(812) 279-7404
5. Facility City:	Bedford	6.	State/Province:	Indiana
7. Zip/Postal Code:	47421	8.	Generator USEPA/FED ID #:	IND006036099
9. County:	Lawrence	10.	State/Province ID#:	
11 Customer Name:	Waste Management National Accounts	12.	Customer Phone::	(866) 469-2783
13. Customer Contact:	Kelly Morrissey	14.	Customer Fax:	(586) 573-3636
15. Billing Address	Waste Management - National Accounts, 12200 E. 13 Mile Rd., Warren, MI 48088		☐ Same as above	

B. Waste Stream Information

1. DESCRIPTION
   a. Name of Waste: Drilling Mud/Soil (<50 ppm PCBs)
   b. Processing Generating Waste: Site investigation and remediation activities.

c. Color	d. Strong odor (describe)	e. Physical state @ 70°F	f. Layers	g. Free liquid range / h. PH: Range
Grey/brown		☐ Solid ☐ Liquid ☐ Gas ☒ Sludge ☐ Other	☐ Single Layer ☒ Multi-Layer	0 % to 75 / to 10 ☒ Not Applicable

i. Liquid Flash Point: ☐ <73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis):.

Constituents	Concentration Range	Constituents	Concentration Range
Inerts (drilling mud/soil/concrete debris)	25-100%		
Other Debris (Plastic liners/PPE)	0-75%		
Polychlorinated biphenyls in solid	<50 ppm		
Polychlorinated biphenyls in liquid	<50 ppm		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k. ☐ Oxidizer ☐ Pyrophoric ☐ Explosive ☐ Radioactive
☐ Carcinogen ☐ Infectious ☐ Shock Sensitive ☐ Water Reactive

l. Does the waste represented by this profile contain any of the carcinogens which require OSHA Notification? (list in Section B.1.)........ ☐ YES ☒ NO

m. Does the waste represented by this profile contain dioxins? (list in B.1.j)........ ☐ YES ☒ NO

n. Does the waste represented by this profile contain asbestos?........ ☐ YES ☒ NO
If yes........ ☐ friable ☐ non-friable

o. Does the waste represented by this profile contain benzene........ ☐ YES ☒ NO
If yes, concentration ppm
Is the waste subject to benzene waste operations NESHAP?........ ☐ YES ☒ NO

p. Is the waste subject to RCRA Subpart CC controls........ ☐ YES ☒ NO
If yes, volatile organic concentration

q. Does the waste contain any Class I or Class II ozone-depleting substance?........ ☐ YES ☒ NO

r. Does the waste contain debris? (list in Section B.1.j)........ ☒ YES ☐ NO

2. Quantity of Waste
Estimated Annual Volume 8,750 ☐ Tons ☐ Yards ☐ Drums ☒ Other (specify) Kg

3. Shipping Information
   a. Packaging:
   ☒ Bulk Solid; Type/Size: Roll-off box (23-yard box) ☐ Bulk Liquid, Type/Size
   ☒ Drum; Type/Size: 55 gal drums ☐ Other:
   b. Shipping Frequency: Units Varies – 0-5 Per: ☒ Month ☐ Quarter ☐ Year ☐ One Time ☐ Other
   c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip d, e and f)........ ☐ YES ☒ NO

WM
WASTE MANAGEMENT, INC.

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

Service Agreement on File? ☒ YES ☐ NO

Profile Number: GMM 048

Renewal Date

☐ Hazardous ☒ Non-Hazardous ☐ TSCA

A. Waste Generator Information

1. Generator Name:	General Motors Corporation – Bedford Facility	2. SIC Code	3365 and 3363
3. Facility Street Address:	105 GM Drive	4. Phone	(812) 279-7404
5. Facility City:	Bedford	6. State/Province:	Indiana
7. Zip/Postal Code:	47421	8. Generator USEPA/FED ID #:	IND006036099
9. County:	Lawrence	10. State/Province ID#:	
11 Customer Name:	Waste Management National Accounts	12. Customer Phone::	(866) 469-2783
13. Customer Contact:	Kelly Morrissey	14. Customer Fax:	(586) 573-3636

15. Billing Address: Waste Management - National Accounts, 12200 E. 13 Mile Rd., Warren, MI 48088 ☐ Same as above

B. Waste Stream Information

1. DESCRIPTION
   a. Name of Waste: Drilling Mud/Soil (<50 ppm PCBs)
   b. Processing Generating Waste: Site investigation and remediation activities.

c. Color	d. Strong odor	e. Physical state @ 70°F	f. Layers	g. Free liquid range
Grey/brown	(describe)	☐ Solid ☐ Liquid ☐ Gas ☒ Sludge ☐ Other	☐ Single Layer ☒ Multi-Layer	0 % to 75
				h. PH: Range to 10

i. Liquid Flash Point: ☐ <73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☒ Not Applicable

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis):

Constituents	Concentration Range	Constituents	Concentration Range
Inerts (drilling mud/soil/concrete debris)	25-100%		
Other Debris (Plastic liners/PPE)	0-75%		
Polychlorinated biphenyls in solid	<50 ppm		
Polychlorinated biphenyls in liquid	<50 ppm		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k. ☐ Oxidizer ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐ Carcinogen ☐ Infectious ☐ Shock Sensitive ☐ Water Reactive

l. Does the waste represented by this profile contain any of the carcinogens which require OSHA Notification? (list in Section B.1.) ☐ YES ☒ NO

m. Does the waste represented by this profile contain dioxins? (list in B.1.j) ☐ YES ☒ NO

n. Does the waste represented by this profile contain asbestos? ☐ YES ☒ NO
   If yes ☐ friable ☐ non-friable

o. Does the waste represented by this profile contain benzene ☐ YES ☒ NO
   If yes, concentration ppm
   Is the waste subject to benzene waste operations NESHAP? ☐ YES ☒ NO

p. Is the waste subject to RCRA Subpart CC controls ☐ YES ☒ NO
   If yes, volatile organic concentration

q. Does the waste contain any Class I or Class II ozone-depleting substance? ☐ YES ☒ NO

r. Does the waste contain debris? (list in Section B.1.j) ☒ YES ☐ NO

2. Quantity of Waste
   Estimated Annual Volume 8,750 ☐ Tons ☐ Yards ☐ Drums ☒ Other (specify) Kg

3. Shipping Information
   a. Packaging:
      ☒ Bulk Solid; Type/Size: Roll-off box (23-yard box) ☐ Bulk Liquid, Type/Size
      ☒ Drum; Type/Size: 55 gal drums ☐ Other:
   b. Shipping Frequency: Units Varies – 0-5 Per ☒ Month ☐ Quarter ☐ Year ☐ One Time ☐ Other
   c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip d, e and f) ☐ YES ☒ NO

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105

Date Reported: 2/08/02

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD

Client Sample ID: S-012502-KMV-514
Sample #: 001 Date Sampled: 01/25/02 10:15 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Arsenic	7.3	1.2	mg/kg	SW846 6010B
Lead	28.2	0.37	mg/kg	SW846 6010B
Selenium	0.66	0.62	mg/kg	SW846 6010B
Thallium	0.77 B	1.2	mg/kg	SW846 6010B
Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	ND	1.2	mg/kg	SW846 6010B
Aluminum	9280	24.9	mg/kg	SW846 6010B
Barium	77.7	24.9	mg/kg	SW846 6010B
Beryllium	0.64	0.62	mg/kg	SW846 6010B
Cadmium	0.10 B	0.62	mg/kg	SW846 6010B
Cobalt	17.2	6.2	mg/kg	SW846 6010B
Chromium	21.9	1.2	mg/kg	SW846 6010B
Copper	27.5	3.1	mg/kg	SW846 6010B
Iron	16100	12.5	mg/kg	SW846 6010B
Manganese	457	1.9	mg/kg	SW846 6010B
Nickel	43.4	5.0	mg/kg	SW846 6010B
Antimony	ND	7.5	mg/kg	SW846 6010B
Vanadium	24.9	6.2	mg/kg	SW846 6010B
Zinc	45.7	2.5	mg/kg	SW846 6010B
Mercury in Solid Waste (Manual Cold-Vapor)				Reviewed
Mercury	0.059 B	0.12	mg/kg	SW846 7471A

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
PCBs by SW-846 8082				Reviewed
Aroclor 1016	ND	4100	ug/kg	SW846 8082
Aroclor 1221	ND	4100	ug/kg	SW846 8082
Aroclor 1232	ND	4100	ug/kg	SW846 8082
Aroclor 1242	ND	4100	ug/kg	SW846 8082
Aroclor 1248	14000	4100	ug/kg	SW846 8082
Aroclor 1254	ND	4100	ug/kg	SW846 8082
Aroclor 1260	1100 J	4100	ug/kg	SW846 8082

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Date Reported: 2/08/02

Lot #: A2A260105

Client Sample ID: S-012502-KMV-514
Sample #: 001 Date Sampled: 01/25/02 10:15 Date Received: 01/26/02 Matrix: SOLID

Reviewed

PCBs by SW-846 8082

Results and reporting limits have been adjusted for dry weight.
J Estimated result. Result is less than RL.

Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Volatile Organics by GC/MS				
Acetone	ND	22	ug/kg	SW846 8260B
Benzene	ND	5.5	ug/kg	SW846 8260B
Bromodichloromethane	ND	5.5	ug/kg	SW846 8260B
Bromoform	ND	5.5	ug/kg	SW846 8260B
Bromomethane	ND	5.5	ug/kg	SW846 8260B
2-Butanone	ND	22	ug/kg	SW846 8260B
Carbon disulfide	ND	5.5	ug/kg	SW846 8260B
Carbon tetrachloride	ND	5.5	ug/kg	SW846 8260B
Chlorobenzene	ND	5.5	ug/kg	SW846 8260B
Chloroethane	ND	5.5	ug/kg	SW846 8260B
Chloroform	ND	5.5	ug/kg	SW846 8260B
Chloromethane	ND	5.5	ug/kg	SW846 8260B
Cyclohexane	ND	11	ug/kg	SW846 8260B
Dibromochloromethane	ND	5.5	ug/kg	SW846 8260B
1,2-Dibromo-3-chloro- propane	ND	11	ug/kg	SW846 8260B
1,2-Dibromoethane	ND	5.5	ug/kg	SW846 8260B
1,2-Dichlorobenzene	ND	5.5	ug/kg	SW846 8260B
1,3-Dichlorobenzene	ND	5.5	ug/kg	SW846 8260B
1,4-Dichlorobenzene	ND	5.5	ug/kg	SW846 8260B
Dichlorodifluoromethane	ND	5.5	ug/kg	SW846 8260B
1,1-Dichloroethane	ND	5.5	ug/kg	SW846 8260B
1,2-Dichloroethane	ND	5.5	ug/kg	SW846 8260B
1,1-Dichloroethene	ND	5.5	ug/kg	SW846 8260B
cis-1,2-Dichloroethene	ND	2.8	ug/kg	SW846 8260B
trans-1,2-Dichloroethene	ND	2.8	ug/kg	SW846 8260B
1,2-Dichloropropane	ND	5.5	ug/kg	SW846 8260B
cis-1,3-Dichloropropene	ND	5.5	ug/kg	SW846 8260B
trans-1,3-Dichloropropene	ND	5.5	ug/kg	SW846 8260B
Ethylbenzene	ND	5.5	ug/kg	SW846 8260B
2-Hexanone	ND	22	ug/kg	SW846 8260B

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc

Lot #: A2A260105 GM-BEDFORD **Date Reported:** 2/08/02

Project Number: 13968

Client Sample ID: S-012502-KMV-514

Sample #: 001 Date Sampled: 01/25/02 10:15 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
Isopropylbenzene	ND	5.5	ug/kg	SW846 8260B	
Methyl acetate	**3.3 J**	**11**	**ug/kg**	**SW846 8260B**	
Methylene chloride	**4.3 J**	**5.5**	**ug/kg**	**SW846 8260B**	
Methylcyclohexane	ND	11	ug/kg	SW846 8260B	
4-Methyl-2-pentanone	ND	22	ug/kg	SW846 8260B	
Methyl tert-butyl ether	ND	22	ug/kg	SW846 8260B	
Styrene	ND	5.5	ug/kg	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	5.5	ug/kg	SW846 8260B	
Tetrachloroethene	ND	5.5	ug/kg	SW846 8260B	
Toluene	ND	5.5	ug/kg	SW846 8260B	
1,2,4-Trichloro-benzene	ND	5.5	ug/kg	SW846 8260B	
1,1,1-Trichloroethane	ND	5.5	ug/kg	SW846 8260B	
1,1,2-Trichloroethane	ND	5.5	ug/kg	SW846 8260B	
Trichloroethene	ND	5.5	ug/kg	SW846 8260B	
Trichlorofluoromethane	ND	5.5	ug/kg	SW846 8260B	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.5	ug/kg	SW846 8260B	
Vinyl chloride	ND	5.5	ug/kg	SW846 8260B	
Xylenes (total)	ND	5.5	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Acenaphthene	ND	410	ug/kg	SW846 8270C	
Acenaphthylene	ND	410	ug/kg	SW846 8270C	
Acetophenone	ND	410	ug/kg	SW846 8270C	
Anthracene	ND	410	ug/kg	SW846 8270C	
Atrazine	ND	410	ug/kg	SW846 8270C	
Benzo(a)anthracene	ND	410	ug/kg	SW846 8270C	
Benzo(a)pyrene	ND	410	ug/kg	SW846 8270C	
Benzo(b)fluoranthene	**74 J**	**410**	**ug/kg**	**SW846 8270C**	
Benzo(ghi)perylene	ND	410	ug/kg	SW846 8270C	
Benzo(k)fluoranthene	ND	410	ug/kg	SW846 8270C	
Benzaldehyde	ND	410	ug/kg	SW846 8270C	

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Lot #: A2A260105

Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Date Reported: 2/08/02

Client Sample ID: S-012502-KMV-514
Sample #: 001 **Date Sampled:** 01/25/02 10:15 **Date Received:** 01/26/02 **Matrix:** SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					**Reviewed**
1,1'-Biphenyl	ND	410	ug/kg	SW846 8270C	
bis(2-Chloroethoxy) methane	ND	410	ug/kg	SW846 8270C	
bis(2-Chloroethyl)- ether	ND	410	ug/kg	SW846 8270C	
bis(2-Ethylhexyl) phthalate	ND	410	ug/kg	SW846 8270C	
4-Bromophenyl phenyl ether	ND	410	ug/kg	SW846 8270C	
Butyl benzyl phthalate	ND	410	ug/kg	SW846 8270C	
Caprolactam	ND	410	ug/kg	SW846 8270C	
Carbazole	ND	410	ug/kg	SW846 8270C	
4-Chloroaniline	ND	410	ug/kg	SW846 8270C	
4-Chloro-3-methylphenol	ND	410	ug/kg	SW846 8270C	
2-Chloronaphthalene	ND	410	ug/kg	SW846 8270C	
2-Chlorophenol	ND	410	ug/kg	SW846 8270C	
4-Chlorophenyl phenyl ether	ND	410	ug/kg	SW846 8270C	
Chrysene	**65 J**	**410**	**ug/kg**	**SW846 8270C**	
Dibenz(a,h)anthracene	ND	410	ug/kg	SW846 8270C	
Dibenzofuran	ND	410	ug/kg	SW846 8270C	
3,3'-Dichlorobenzidine	ND	2000	ug/kg	SW846 8270C	
2,4-Dichlorophenol	ND	410	ug/kg	SW846 8270C	
Diethyl phthalate	ND	410	ug/kg	SW846 8270C	
2,4-Dimethylphenol	ND	410	ug/kg	SW846 8270C	
Dimethyl phthalate	ND	410	ug/kg	SW846 8270C	
Di-n-butyl phthalate	ND	410	ug/kg	SW846 8270C	
4,6-Dinitro- 2-methylphenol	ND	2000	ug/kg	SW846 8270C	
2,4-Dinitrophenol	ND	2000	ug/kg	SW846 8270C	
2,4-Dinitrotoluene	ND	410	ug/kg	SW846 8270C	
2,6-Dinitrotoluene	ND	410	ug/kg	SW846 8270C	
Di-n-octyl phthalate	ND	410	ug/kg	SW846 8270C	
Fluoranthene	**140 J**	**410**	**ug/kg**	**SW846 8270C**	
Fluorene	ND	410	ug/kg	SW846 8270C	
Hexachlorobenzene	ND	410	ug/kg	SW846 8270C	
Hexachlorobutadiene	ND	410	ug/kg	SW846 8270C	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105

Date Reported: 2/08/02

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD

Client Sample ID: S-012502-KMV-514
Sample #: 001 **Date Sampled:** 01/25/02 10:15 **Date Received:** 01/26/02 **Matrix:** SOLID

Semivolatile Organic Compounds by GC/MS — Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Hexachlorocyclopenta-diene	ND	2000	ug/kg	SW846 8270C
Hexachloroethane	ND	410	ug/kg	SW846 8270C
Indeno(1,2,3-cd)pyrene	ND	410	ug/kg	SW846 8270C
Isophorone	ND	410	ug/kg	SW846 8270C
2-Methylnaphthalene	ND	410	ug/kg	SW846 8270C
2-Methylphenol	ND	410	ug/kg	SW846 8270C
4-Methylphenol	ND	410	ug/kg	SW846 8270C
Naphthalene	ND	410	ug/kg	SW846 8270C
2-Nitroaniline	ND	2000	ug/kg	SW846 8270C
3-Nitroaniline	ND	2000	ug/kg	SW846 8270C
4-Nitroaniline	ND	2000	ug/kg	SW846 8270C
Nitrobenzene	ND	410	ug/kg	SW846 8270C
2-Nitrophenol	ND	410	ug/kg	SW846 8270C
4-Nitrophenol	ND	2000	ug/kg	SW846 8270C
N-Nitrosodi-n-propyl-amine	ND	410	ug/kg	SW846 8270C
N-Nitrosodiphenylamine	ND	410	ug/kg	SW846 8270C
2,2'-oxybis(1-Chloropropane)	ND	410	ug/kg	SW846 8270C
Pentachlorophenol	ND	410	ug/kg	SW846 8270C
Phenanthrene	**110 J**	**410**	**ug/kg**	**SW846 8270C**
Phenol	ND	410	ug/kg	SW846 8270C
Pyrene	**100 J**	**410**	**ug/kg**	**SW846 8270C**
2,4,5-Trichloro-phenol	ND	410	ug/kg	SW846 8270C
2,4,6-Trichloro-phenol	ND	410	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Inorganic Analysis — Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Amenable Cyanide	ND	0.62	mg/kg	SW846 9012
Cyanide, Total	ND	0.62	mg/kg	SW846 9012A
Total Organic Carbon	**8000**	**620**	**mg/kg**	**MSA WALKLEY-BLACK**
Total Residue as Percent Solids	**80.2**	**10.0**	**%**	**MCAWW 160.3 MOD**

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105

Date Reported: 2/08/02

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Client Sample ID: S-012502-KMV-514					
Sample #: 001 Date Sampled: 01/25/02 10:15 Date Received: 01/26/02 Matrix: SOLID					
Total Residue as Percent Solids					Reviewed
Results and reporting limits have been adjusted for dry weight.					
Client Sample ID: S-012502-KMV-515					
Sample #: 002 Date Sampled: 01/25/02 10:20 Date Received: 01/26/02 Matrix: SOLID					
Trace Inductively Coupled Plasma (ICP) Metals					Reviewed
Arsenic	10.4	1.3	mg/kg	SW846 6010B	
Lead	22.4	0.38	mg/kg	SW846 6010B	
Selenium	1.3	0.64	mg/kg	SW846 6010B	
Thallium	ND	1.3	mg/kg	SW846 6010B	
Inductively Coupled Plasma (ICP) Metals					Reviewed
Silver	ND	1.3	mg/kg	SW846 6010B	
Aluminum	13000	25.5	mg/kg	SW846 6010B	
Barium	77.6	25.5	mg/kg	SW846 6010B	
Beryllium	0.64	0.64	mg/kg	SW846 6010B	
Cadmium	0.084 B	0.64	mg/kg	SW846 6010B	
Cobalt	11.6	6.4	mg/kg	SW846 6010B	
Chromium	21.6	1.3	mg/kg	SW846 6010B	
Copper	42.1	3.2	mg/kg	SW846 6010B	
Iron	24200	12.7	mg/kg	SW846 6010B	
Manganese	325	1.9	mg/kg	SW846 6010B	
Nickel	23.2	5.1	mg/kg	SW846 6010B	
Antimony	ND	7.6	mg/kg	SW846 6010B	
Vanadium	33.0	6.4	mg/kg	SW846 6010B	
Zinc	66.6	2.5	mg/kg	SW846 6010B	
Mercury in Solid Waste (Manual Cold-Vapor)					Reviewed
Mercury	0.076 B	0.13	mg/kg	SW846 7471A	

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105

Date Reported: 2/08/02

Client Sample ID: S-012502-KMV-515
Sample #: 002 Date Sampled: 01/25/02 10:20 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
PCBs by SW-846 8082					Reviewed
Aroclor 1016	ND	4200	ug/kg	SW846 8082	
Aroclor 1221	ND	4200	ug/kg	SW846 8082	
Aroclor 1232	ND	4200	ug/kg	SW846 8082	
Aroclor 1242	ND	4200	ug/kg	SW846 8082	
Aroclor 1248	**12000**	**4200**	**ug/kg**	**SW846 8082**	
Aroclor 1254	ND	4200	ug/kg	SW846 8082	
Aroclor 1260	ND	4200	ug/kg	SW846 8082	

Results and reporting limits have been adjusted for dry weight.

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
Acetone	ND	22	ug/kg	SW846 8260B	
Benzene	ND	5.4	ug/kg	SW846 8260B	
Bromodichloromethane	ND	5.4	ug/kg	SW846 8260B	
Bromoform	ND	5.4	ug/kg	SW846 8260B	
Bromomethane	ND	5.4	ug/kg	SW846 8260B	
2-Butanone	ND	22	ug/kg	SW846 8260B	
Carbon disulfide	ND	5.4	ug/kg	SW846 8260B	
Carbon tetrachloride	ND	5.4	ug/kg	SW846 8260B	
Chlorobenzene	ND	5.4	ug/kg	SW846 8260B	
Chloroethane	ND	5.4	ug/kg	SW846 8260B	
Chloroform	ND	5.4	ug/kg	SW846 8260B	
Chloromethane	ND	5.4	ug/kg	SW846 8260B	
Cyclohexane	ND	11	ug/kg	SW846 8260B	
Dibromochloromethane	ND	5.4	ug/kg	SW846 8260B	
1,2-Dibromo-3-chloro-propane	ND	11	ug/kg	SW846 8260B	
1,2-Dibromoethane	ND	5.4	ug/kg	SW846 8260B	
1,2-Dichlorobenzene	ND	5.4	ug/kg	SW846 8260B	
1,3-Dichlorobenzene	ND	5.4	ug/kg	SW846 8260B	
1,4-Dichlorobenzene	ND	5.4	ug/kg	SW846 8260B	
Dichlorodifluoromethane	ND	5.4	ug/kg	SW846 8260B	
1,1-Dichloroethane	ND	5.4	ug/kg	SW846 8260B	
1,2-Dichloroethane	ND	5.4	ug/kg	SW846 8260B	
1,1-Dichloroethene	ND	5.4	ug/kg	SW846 8260B	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105 **Date Reported:** 2/08/02

Client Sample ID: S-012502-KMV-515
Sample #: 002 Date Sampled: 01/25/02 10:20 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
cis-1,2-Dichloroethene	ND	2.7	ug/kg	SW846 8260B	
trans-1,2-Dichloroethene	ND	2.7	ug/kg	SW846 8260B	
1,2-Dichloropropane	ND	5.4	ug/kg	SW846 8260B	
cis-1,3-Dichloropropene	ND	5.4	ug/kg	SW846 8260B	
trans-1,3-Dichloropropene	ND	5.4	ug/kg	SW846 8260B	
Ethylbenzene	ND	5.4	ug/kg	SW846 8260B	
2-Hexanone	ND	22	ug/kg	SW846 8260B	
Isopropylbenzene	ND	5.4	ug/kg	SW846 8260B	
Methyl acetate	**5.0 J**	**11**	**ug/kg**	**SW846 8260B**	
Methylene chloride	**3.2 J**	**5.4**	**ug/kg**	**SW846 8260B**	
Methylcyclohexane	ND	11	ug/kg	SW846 8260B	
4-Methyl-2-pentanone	ND	22	ug/kg	SW846 8260B	
Methyl tert-butyl ether	ND	22	ug/kg	SW846 8260B	
Styrene	ND	5.4	ug/kg	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	5.4	ug/kg	SW846 8260B	
Tetrachloroethene	ND	5.4	ug/kg	SW846 8260B	
Toluene	ND	5.4	ug/kg	SW846 8260B	
1,2,4-Trichloro-benzene	ND	5.4	ug/kg	SW846 8260B	
1,1,1-Trichloroethane	ND	5.4	ug/kg	SW846 8260B	
1,1,2-Trichloroethane	ND	5.4	ug/kg	SW846 8260B	
Trichloroethene	ND	5.4	ug/kg	SW846 8260B	
Trichlorofluoromethane	ND	5.4	ug/kg	SW846 8260B	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.4	ug/kg	SW846 8260B	
Vinyl chloride	ND	5.4	ug/kg	SW846 8260B	
Xylenes (total)	ND	5.4	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Acenaphthene	ND	420	ug/kg	SW846 8270C	
Acenaphthylene	ND	420	ug/kg	SW846 8270C	
Acetophenone	ND	420	ug/kg	SW846 8270C	
Anthracene	ND	420	ug/kg	SW846 8270C	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105 **Date Reported:** 2/08/02

Client Sample ID: S-012502-KMV-515
Sample #: 002 Date Sampled: 01/25/02 10:20 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Atrazine	ND	420	ug/kg	SW846 8270C	
Benzo(a)anthracene	ND	420	ug/kg	SW846 8270C	
Benzo(a)pyrene	ND	420	ug/kg	SW846 8270C	
Benzo(b)fluoranthene	ND	420	ug/kg	SW846 8270C	
Benzo(ghi)perylene	ND	420	ug/kg	SW846 8270C	
Benzo(k)fluoranthene	ND	420	ug/kg	SW846 8270C	
Benzaldehyde	ND	420	ug/kg	SW846 8270C	
1,1'-Biphenyl	ND	420	ug/kg	SW846 8270C	
bis(2-Chloroethoxy) methane	ND	420	ug/kg	SW846 8270C	
bis(2-Chloroethyl)- ether	ND	420	ug/kg	SW846 8270C	
bis(2-Ethylhexyl) phthalate	ND	420	ug/kg	SW846 8270C	
4-Bromophenyl phenyl ether	ND	420	ug/kg	SW846 8270C	
Butyl benzyl phthalate	ND	420	ug/kg	SW846 8270C	
Caprolactam	ND	420	ug/kg	SW846 8270C	
Carbazole	ND	420	ug/kg	SW846 8270C	
4-Chloroaniline	ND	420	ug/kg	SW846 8270C	
4-Chloro-3-methylphenol	ND	420	ug/kg	SW846 8270C	
2-Chloronaphthalene	ND	420	ug/kg	SW846 8270C	
2-Chlorophenol	ND	420	ug/kg	SW846 8270C	
4-Chlorophenyl phenyl ether	ND	420	ug/kg	SW846 8270C	
Chrysene	ND	420	ug/kg	SW846 8270C	
Dibenz(a,h)anthracene	ND	420	ug/kg	SW846 8270C	
Dibenzofuran	ND	420	ug/kg	SW846 8270C	
3,3'-Dichlorobenzidine	ND	2000	ug/kg	SW846 8270C	
2,4-Dichlorophenol	ND	420	ug/kg	SW846 8270C	
Diethyl phthalate	ND	420	ug/kg	SW846 8270C	
2,4-Dimethylphenol	ND	420	ug/kg	SW846 8270C	
Dimethyl phthalate	ND	420	ug/kg	SW846 8270C	
Di-n-butyl phthalate	ND	420	ug/kg	SW846 8270C	
4,6-Dinitro- 2-methylphenol	ND	2000	ug/kg	SW846 8270C	
2,4-Dinitrophenol	ND	2000	ug/kg	SW846 8270C	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105 Date Reported: 2/08/02

Client Sample ID: S-012502-KMV-515
Sample #: 002 Date Sampled: 01/25/02 10:20 Date Received: 01/26/02 Matrix: **SOLID**

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
2,4-Dinitrotoluene	ND	420	ug/kg	SW846 8270C	
2,6-Dinitrotoluene	ND	420	ug/kg	SW846 8270C	
Di-n-octyl phthalate	ND	420	ug/kg	SW846 8270C	
Fluoranthene	ND	420	ug/kg	SW846 8270C	
Fluorene	ND	420	ug/kg	SW846 8270C	
Hexachlorobenzene	ND	420	ug/kg	SW846 8270C	
Hexachlorobutadiene	ND	420	ug/kg	SW846 8270C	
Hexachlorocyclopenta-diene	ND	2000	ug/kg	SW846 8270C	
Hexachloroethane	ND	420	ug/kg	SW846 8270C	
Indeno(1,2,3-cd)pyrene	ND	420	ug/kg	SW846 8270C	
Isophorone	ND	420	ug/kg	SW846 8270C	
2-Methylnaphthalene	ND	420	ug/kg	SW846 8270C	
2-Methylphenol	ND	420	ug/kg	SW846 8270C	
4-Methylphenol	ND	420	ug/kg	SW846 8270C	
Naphthalene	ND	420	ug/kg	SW846 8270C	
2-Nitroaniline	ND	2000	ug/kg	SW846 8270C	
3-Nitroaniline	ND	2000	ug/kg	SW846 8270C	
4-Nitroaniline	ND	2000	ug/kg	SW846 8270C	
Nitrobenzene	ND	420	ug/kg	SW846 8270C	
2-Nitrophenol	ND	420	ug/kg	SW846 8270C	
4-Nitrophenol	ND	2000	ug/kg	SW846 8270C	
N-Nitrosodi-n-propyl-amine	ND	420	ug/kg	SW846 8270C	
N-Nitrosodiphenylamine	ND	420	ug/kg	SW846 8270C	
2,2'-oxybis(1-Chloropropane)	ND	420	ug/kg	SW846 8270C	
Pentachlorophenol	ND	420	ug/kg	SW846 8270C	
Phenanthrene	ND	420	ug/kg	SW846 8270C	
Phenol	ND	420	ug/kg	SW846 8270C	
Pyrene	ND	420	ug/kg	SW846 8270C	
2,4,5-Trichloro-phenol	ND	420	ug/kg	SW846 8270C	
2,4,6-Trichloro-phenol	ND	420	ug/kg	SW846 8270C	

Results and reporting limits have been adjusted for dry weight.

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Lot #: A2A260105 GM-BEDFORD Date Reported: 2/08/02

Project Number: 13968

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD

Client Sample ID: S-012502-KMV-515
Sample #: 002 Date Sampled: 01/25/02 10:20 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Inorganic Analysis				Reviewed
Amenable Cyanide	ND	0.64	mg/kg	SW846 9012
Cyanide, Total	ND	0.64	mg/kg	SW846 9012A
Total Organic Carbon	**5700**	**640**	**mg/kg**	**MSA WALKLEY-BLACK**
Total Residue as Percent Solids	**78.4**	**10.0**	**%**	**MCAWW 160.3 MOD**

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: S-012502-KMV-516
Sample #: 003 Date Sampled: 01/25/02 10:35 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Trace Inductively Coupled Plasma (ICP) Metals				Reviewed
Arsenic	**13.6**	**1.3**	**mg/kg**	**SW846 6010B**
Lead	**21.1**	**0.40**	**mg/kg**	**SW846 6010B**
Selenium	**1.2**	**0.67**	**mg/kg**	**SW846 6010B**
Thallium	**1.1 B**	**1.3**	**mg/kg**	**SW846 6010B**
Inductively Coupled Plasma (ICP) Metals				Reviewed
Silver	ND	1.3	mg/kg	SW846 6010B
Aluminum	**12200**	**26.7**	**mg/kg**	**SW846 6010B**
Barium	**137**	**26.7**	**mg/kg**	**SW846 6010B**
Beryllium	**0.96**	**0.67**	**mg/kg**	**SW846 6010B**
Cadmium	**0.12 B**	**0.67**	**mg/kg**	**SW846 6010B**
Cobalt	**12.5**	**6.7**	**mg/kg**	**SW846 6010B**
Chromium	**18.8**	**1.3**	**mg/kg**	**SW846 6010B**
Copper	**11.8**	**3.3**	**mg/kg**	**SW846 6010B**
Iron	**28200**	**13.3**	**mg/kg**	**SW846 6010B**
Manganese	**1260**	**2.0**	**mg/kg**	**SW846 6010B**
Nickel	**24.5**	**5.3**	**mg/kg**	**SW846 6010B**
Antimony	ND	8.0	mg/kg	SW846 6010B
Vanadium	**31.8**	**6.7**	**mg/kg**	**SW846 6010B**
Zinc	**68.3**	**2.7**	**mg/kg**	**SW846 6010B**
Mercury in Solid Waste (Manual Cold-Vapor)				Reviewed
Mercury	**0.057 B**	**0.13**	**mg/kg**	**SW846 7471A**

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc

Lot #: A2A260105

GM-BEDFORD

Date Reported: 2/08/02

Project Number: 13968

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD

Client Sample ID: S-012502-KMV-516

Sample #: 003 Date Sampled: 01/25/02 10:35 Date Received: 01/26/02 Matrix: SOLID

Mercury in Solid Waste (Manual Cold-Vapor) — Reviewed

Results and reporting limits have been adjusted for dry weight.

B Estimated result. Result is less than RL.

PCBs by SW-846 8082 — Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Aroclor 1016	ND	44	ug/kg	SW846 8082
Aroclor 1221	ND	44	ug/kg	SW846 8082
Aroclor 1232	ND	44	ug/kg	SW846 8082
Aroclor 1242	ND	44	ug/kg	SW846 8082
Aroclor 1248	**30 J**	**44**	**ug/kg**	**SW846 8082**
Aroclor 1254	ND	44	ug/kg	SW846 8082
Aroclor 1260	ND	44	ug/kg	SW846 8082

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

Volatile Organics by GC/MS — Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Acetone	**10 J**	**27**	**ug/kg**	**SW846 8260B**
Benzene	ND	6.7	ug/kg	SW846 8260B
Bromodichloromethane	ND	6.7	ug/kg	SW846 8260B
Bromoform	ND	6.7	ug/kg	SW846 8260B
Bromomethane	ND	6.7	ug/kg	SW846 8260B
2-Butanone	ND	27	ug/kg	SW846 8260B
Carbon disulfide	ND	6.7	ug/kg	SW846 8260B
Carbon tetrachloride	ND	6.7	ug/kg	SW846 8260B
Chlorobenzene	ND	6.7	ug/kg	SW846 8260B
Chloroethane	ND	6.7	ug/kg	SW846 8260B
Chloroform	ND	6.7	ug/kg	SW846 8260B
Chloromethane	ND	6.7	ug/kg	SW846 8260B
Cyclohexane	ND	13	ug/kg	SW846 8260B
Dibromochloromethane	ND	6.7	ug/kg	SW846 8260B
1,2-Dibromo-3-chloro-propane	ND	13	ug/kg	SW846 8260B
1,2-Dibromoethane	ND	6.7	ug/kg	SW846 8260B
1,2-Dichlorobenzene	ND	6.7	ug/kg	SW846 8260B

(Continued on next page)

SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105

Date Reported: 2/08/02

Client Sample ID: S-012502-KMV-516
Sample #: 003 Date Sampled: 01/25/02 10:35 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Volatile Organics by GC/MS					Reviewed
1,3-Dichlorobenzene	ND	6.7	ug/kg	SW846 8260B	
1,4-Dichlorobenzene	ND	6.7	ug/kg	SW846 8260B	
Dichlorodifluoromethane	ND	6.7	ug/kg	SW846 8260B	
1,1-Dichloroethane	ND	6.7	ug/kg	SW846 8260B	
1,2-Dichloroethane	ND	6.7	ug/kg	SW846 8260B	
1,1-Dichloroethene	ND	6.7	ug/kg	SW846 8260B	
cis-1,2-Dichloroethene	ND	3.3	ug/kg	SW846 8260B	
trans-1,2-Dichloroethene	ND	3.3	ug/kg	SW846 8260B	
1,2-Dichloropropane	ND	6.7	ug/kg	SW846 8260B	
cis-1,3-Dichloropropene	ND	6.7	ug/kg	SW846 8260B	
trans-1,3-Dichloropropene	ND	6.7	ug/kg	SW846 8260B	
Ethylbenzene	ND	6.7	ug/kg	SW846 8260B	
2-Hexanone	ND	27	ug/kg	SW846 8260B	
Isopropylbenzene	ND	6.7	ug/kg	SW846 8260B	
Methyl acetate	ND	13	ug/kg	SW846 8260B	
Methylene chloride	**3.9 J**	**6.7**	**ug/kg**	**SW846 8260B**	
Methylcyclohexane	ND	13	ug/kg	SW846 8260B	
4-Methyl-2-pentanone	ND	27	ug/kg	SW846 8260B	
Methyl tert-butyl ether	ND	27	ug/kg	SW846 8260B	
Styrene	ND	6.7	ug/kg	SW846 8260B	
1,1,2,2-Tetrachloroethane	ND	6.7	ug/kg	SW846 8260B	
Tetrachloroethene	ND	6.7	ug/kg	SW846 8260B	
Toluene	ND	6.7	ug/kg	SW846 8260B	
1,2,4-Trichloro-benzene	ND	6.7	ug/kg	SW846 8260B	
1,1,1-Trichloroethane	ND	6.7	ug/kg	SW846 8260B	
1,1,2-Trichloroethane	ND	6.7	ug/kg	SW846 8260B	
Trichloroethene	ND	6.7	ug/kg	SW846 8260B	
Trichlorofluoromethane	ND	6.7	ug/kg	SW846 8260B	
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	6.7	ug/kg	SW846 8260B	
Vinyl chloride	ND	6.7	ug/kg	SW846 8260B	
Xylenes (total)	ND	6.7	ug/kg	SW846 8260B	

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Lot #: A2A260105

Date Reported: 2/08/02

Client Sample ID: S-012502-KMV-516
Sample #: 003 Date Sampled: 01/25/02 10:35 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	
Semivolatile Organic Compounds by GC/MS					Reviewed
Acenaphthene	ND	440	ug/kg	SW846 8270C	
Acenaphthylene	ND	440	ug/kg	SW846 8270C	
Acetophenone	ND	440	ug/kg	SW846 8270C	
Anthracene	ND	440	ug/kg	SW846 8270C	
Atrazine	ND	440	ug/kg	SW846 8270C	
Benzo(a)anthracene	ND	440	ug/kg	SW846 8270C	
Benzo(a)pyrene	ND	440	ug/kg	SW846 8270C	
Benzo(b)fluoranthene	ND	440	ug/kg	SW846 8270C	
Benzo(ghi)perylene	ND	440	ug/kg	SW846 8270C	
Benzo(k)fluoranthene	ND	440	ug/kg	SW846 8270C	
Benzaldehyde	ND	440	ug/kg	SW846 8270C	
1,1'-Biphenyl	ND	440	ug/kg	SW846 8270C	
bis(2-Chloroethoxy) methane	ND	440	ug/kg	SW846 8270C	
bis(2-Chloroethyl)-ether	ND	440	ug/kg	SW846 8270C	
bis(2-Ethylhexyl) phthalate	ND	440	ug/kg	SW846 8270C	
4-Bromophenyl phenyl ether	ND	440	ug/kg	SW846 8270C	
Butyl benzyl phthalate	ND	440	ug/kg	SW846 8270C	
Caprolactam	ND	440	ug/kg	SW846 8270C	
Carbazole	ND	440	ug/kg	SW846 8270C	
4-Chloroaniline	ND	440	ug/kg	SW846 8270C	
4-Chloro-3-methylphenol	ND	440	ug/kg	SW846 8270C	
2-Chloronaphthalene	ND	440	ug/kg	SW846 8270C	
2-Chlorophenol	ND	440	ug/kg	SW846 8270C	
4-Chlorophenyl phenyl ether	ND	440	ug/kg	SW846 8270C	
Chrysene	ND	440	ug/kg	SW846 8270C	
Dibenz(a,h)anthracene	ND	440	ug/kg	SW846 8270C	
Dibenzofuran	ND	440	ug/kg	SW846 8270C	
3,3'-Dichlorobenzidine	ND	2100	ug/kg	SW846 8270C	
2,4-Dichlorophenol	ND	440	ug/kg	SW846 8270C	
Diethyl phthalate	ND	440	ug/kg	SW846 8270C	
2,4-Dimethylphenol	ND	440	ug/kg	SW846 8270C	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

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Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Date Reported: 2/08/02

Lot #: A2A260105

Client Sample ID: S-012502-KMV-516
Sample #: 003 Date Sampled: 01/25/02 10:35 Date Received: 01/26/02 Matrix: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD	Reviewed
Semivolatile Organic Compounds by GC/MS					
Dimethyl phthalate	ND	440	ug/kg	SW846 8270C	
Di-n-butyl phthalate	ND	440	ug/kg	SW846 8270C	
4,6-Dinitro-2-methylphenol	ND	2100	ug/kg	SW846 8270C	
2,4-Dinitrophenol	ND	2100	ug/kg	SW846 8270C	
2,4-Dinitrotoluene	ND	440	ug/kg	SW846 8270C	
2,6-Dinitrotoluene	ND	440	ug/kg	SW846 8270C	
Di-n-octyl phthalate	ND	440	ug/kg	SW846 8270C	
Fluoranthene	ND	440	ug/kg	SW846 8270C	
Fluorene	ND	440	ug/kg	SW846 8270C	
Hexachlorobenzene	ND	440	ug/kg	SW846 8270C	
Hexachlorobutadiene	ND	440	ug/kg	SW846 8270C	
Hexachlorocyclopentadiene	ND	2100	ug/kg	SW846 8270C	
Hexachloroethane	ND	440	ug/kg	SW846 8270C	
Indeno(1,2,3-cd)pyrene	ND	440	ug/kg	SW846 8270C	
Isophorone	ND	440	ug/kg	SW846 8270C	
2-Methylnaphthalene	ND	440	ug/kg	SW846 8270C	
2-Methylphenol	ND	440	ug/kg	SW846 8270C	
4-Methylphenol	ND	440	ug/kg	SW846 8270C	
Naphthalene	ND	440	ug/kg	SW846 8270C	
2-Nitroaniline	ND	2100	ug/kg	SW846 8270C	
3-Nitroaniline	ND	2100	ug/kg	SW846 8270C	
4-Nitroaniline	ND	2100	ug/kg	SW846 8270C	
Nitrobenzene	ND	440	ug/kg	SW846 8270C	
2-Nitrophenol	ND	440	ug/kg	SW846 8270C	
4-Nitrophenol	ND	2100	ug/kg	SW846 8270C	
N-Nitrosodi-n-propylamine	ND	440	ug/kg	SW846 8270C	
N-Nitrosodiphenylamine	ND	440	ug/kg	SW846 8270C	
2,2'-oxybis(1-Chloropropane)	ND	440	ug/kg	SW846 8270C	
Pentachlorophenol	ND	440	ug/kg	SW846 8270C	
Phenanthrene	ND	440	ug/kg	SW846 8270C	
Phenol	ND	440	ug/kg	SW846 8270C	
Pyrene	ND	440	ug/kg	SW846 8270C	
2,4,5-Trichlorophenol	ND	440	ug/kg	SW846 8270C	

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SEVERN TRENT LABORATORIES, INC.

PRELIMINARY DATA SUMMARY

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

Conestoga Rovers & Assoc., Inc
GM-BEDFORD
Project Number: 13968

Date Reported: 2/08/02

Lot #: A2A260105

Client Sample ID: S-012502-KMV-516 Date Received: 01/26/02 Matrix: SOLID
Sample #: 003 Date Sampled: 01/25/02 10:35

Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Semivolatile Organic Compounds by GC/MS				
2,4,6-Trichloro-phenol	ND	440	ug/kg	SW846 8270C

Results and reporting limits have been adjusted for dry weight.

Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Inorganic Analysis				
Amenable Cyanide	ND	0.67	mg/kg	SW846 9012
Cyanide, Total	ND	0.67	mg/kg	SW846 9012A
Total Organic Carbon	**4000**	**270**	**mg/kg**	**MSA WALKLEY-BLACK**
Total Residue as Percent Solids	**74.9**	**10.0**	**%**	**MCAWW 160.3 MOD**

Results and reporting limits have been adjusted for dry weight.

Client Sample ID: TB-012502-KMV-001 Date Received: 01/26/02 Matrix: WATER
Sample #: 004 Date Sampled: 01/25/02 08:00

Reviewed

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
Volatile Organics by GC/MS				
Acetone	ND	10	ug/L	SW846 8260B
Benzene	ND	1.0	ug/L	SW846 8260B
Bromodichloromethane	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
Bromomethane	ND	1.0	ug/L	SW846 8260B
2-Butanone	ND	10	ug/L	SW846 8260B
Carbon disulfide	ND	1.0	ug/L	SW846 8260B
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Chloroethane	ND	1.0	ug/L	SW846 8260B
Chloroform	ND	1.0	ug/L	SW846 8260B
Chloromethane	ND	1.0	ug/L	SW846 8260B
Cyclohexane	ND	1.0	ug/L	SW846 8260B
Dibromochloromethane	ND	1.0	ug/L	SW846 8260B
1,2-Dibromo-3-chloro-propane	ND	2.0	ug/L	SW846 8260B
1,2-Dibromoethane	ND	1.0	ug/L	SW846 8260B

(Continued on next page)

METALWORKING
LUBRICANTS
COMPANY

Since 1952

25 Silverdome Industrial Park
Pontiac, Michigan 48342
Telephone 248-332-3500
Telecopy 248-332-4959

March 19, 2002

Mr. Jeffrey M. Nichols
Conestoga-Rovers & Associates
8615 West Bryn Mawr Avenue
Chicago, IL 60631-3501

Dear Mr. Nichols:

Metalworking Lubricants is pleased to offer the following quotation for the disposal of your non-hazardous waste stream:

CW7867 (NH Waste Water/Solids)	\$.06/Gross Gallon
Freight (Bedford, IN)	\$235.00/Load
Min. Disposal Charge'	\$250.00

See "Fuel Surcharge Letter" attached.

Seven (7) percent solids as recorded under ASTM D-96 will be allowed. There will be a charge of \$.015 per gallon per each one (1) percentage point for all solids above 7%. For example, 9% solids will be an additional \$.03 per gallon charge; 16% solids will be an additional \$.135 per gallon charge.

Seller will be charged \$50.00 per tankwagon lot for PCB analysis. For purposes of this agreement, seller's representations and warranties concerning PCB levels shall be determined in the extractable phase as per EPA test methods SW 846 Method 3510 procedure. Seller warrants and represents material contains no more than 5 PPM of PCB. Should the 5 PPM level be exceeded, MWL shall make all decisions regarding the proper handling, transportation, response and/or remedial action and seller will be held responsible for all costs incurred.

Seller is asked to supply M.S.D. sheets on oils which produce this waste or written representation on your confirming purchase order the composition of such producing oils are "unlabeled" as classified under OSHA 29 CFR 1910.1200. Seller warrants material is non-hazardous, non EPA toxic, and contains no crankcase. All B.S.&W. run by ASTM D-96; all results by MWL final. All shipments will be loaded in full 5500 gallon tankwagon lots. Loading the vehicle is seller's responsibility. One hour free loading; subsequent demurrage at $48/hour for regular tankwagon; $85/hour for vac truck. Shipping schedule to be managed and determined by MWL. Pricing may change on written notice. All transportation costs to be paid by Conestoga-Rovers. Should labeled materials be used after November 25, 1985, under 29 CFR 1910.1200, it will be seller's responsibility to notify MWL with particular hazardous M.S.D. sheets within ten (10) days. Contract may be cancelled by MWL on written notice. Drum pumping is $.06 per gross gallon additional charge. A one-time charge of $200.00 will be invoiced to cover a TCLP analysis upon commencement of the first shipment.

"TRADE-IN"

All material removed can be returned as hydrocarbon product generally for 30% less. Additionally, it may be recycled 5 times before it is lost. We welcome the opportunity to discuss this with you.

Sincerely,

METALWORKING LUBRICANTS COMPANY

Karl Stamman

Karl Stamman
Assistant Division Manager

KS:jf

Cc: Liz Faler

METALWORKING LUBRICANTS COMPANY

Since 1952

1509 S. Senate Ave.
Indianapolis, IN 46225
Telephone 317-269-2444
Telecopy 269-2443

CW # 7867 Salesperson Stamman

Date Received 3-14-02

Generator B.M. Customer CRA

BEDFORD, IN

EPA ID# EPA ID#

Contact Jeff Nichols Fax 812 277 8980 Contact

Description DECON TANKS

Expected Volume Lab Analyst

Analysis:

Odor	ok			Color	Brown	pH	11
Oil	0	Water	88	Floating Solids	0	Bottom Solids	12
Flashpoint	>200	Halides	0	Cyanide	0	Ammonia	
Sulfate	0	Sulfite	0	Nitrate	10	Nitrite	10
Phenol		Normality		Neutralization Number			
Sulfur		Chlorine		Viscosity	ok		
Reactivity @ pH 2	ok			Reactivity @ pH 10			
Metals Login	13-7	PCB Login	T30-210-1	PCB Results	ND @ 1 Ppm		

Analytical Comments metals ok

Initial Processing Cost high

Detrimental Effects on Plant Solids

Oil Destination B310 B320 B310-F

Stream Acceptance YES By [signature] Date 3/15/02

July 18, 2003

APPENDIX E

AMBIENT AIR QUALITY MONITORING PLAN (AAQMP)

July 18, 2003

AMBIENT AIR QUALITY MONITORING PLAN (AAQMP)

BAILEY'S BRANCH AND PLEASANT RUN REMOVAL ACTION

BEDFORD, INDIANA

JULY 2003
REF. NO. 13968 (18) APPE
This report is printed on recycled paper.

TABLE OF CONTENTS

LIST OF TABLES
(Following Text)

LIST OF ACRONYMS

AAQMP	Ambient Air Quality Monitoring Plan
AOC	Administrative Order by Consent
CRA	Conestoga-Rovers & Associates
Creek Areas	designated creek and adjacent floodplain areas of Pleasant Run and its tributaries
GM	General Motors Corporation
HASP	Site Health and Safety Plan
IDEM	Indiana Department of Environmental Management
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
PEL	permissible exposure limit
PPE	Personal Protection Equipment
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RA	Removal Action
TSP	Total Suspended Particulate
TWA	time weighted average
U.S. EPA	United State Environmental Protection Agency
Work Plan	Interim Measures Work Plan

1.0 INTRODUCTION

This Ambient Air Quality Monitoring Plan (AAQMP) was prepared by Conestoga-Rovers & Associates, Inc. (CRA) for Removal Action (RA) activities to be completed for designated portions of the creek and associated floodplain of Pleasant Run and its tributaries located in Bedford, Indiana and Lawrence County, Indiana (Creek Areas or Site). The purpose of the AAQMP is to present the scope of work for ambient air monitoring activities which will be conducted as part of the Interim Measures Work Plan (Work Plan). The Work Plan activities are being implemented to remove (excavate) soils impacted with polychlorinated biphenyls (PCBs) at levels above the cleanup criteria. The objective of this air monitoring program is to quantify the airborne concentrations of contaminants, if any, at the locations of the nearest potential receptors that may be associated with the Work Plan activities.

Specifically, this AAQMP describes the protocols and procedures for assessing potential airborne concentrations of PCBs and dust using the following methods:

- total suspended particulates (TSPs) in air utilizing a real time dust monitor (i.e., SKC Haz-Dust III); and
- compound specific PCBs and TSPs air sample analysis by an off-Site laboratory utilizing United States Environmental Protection Agency (U.S. EPA) analytical methods.

The AAQMP has been developed based on project and Site-specific conditions. The monitoring activities will be implemented in support of the RA activities.

The procedures and protocols identified in this AAQMP are applicable to air monitoring activities conducted around the work area perimeter during the Work Plan excavation activities involving PCBs. This air monitoring program is separate from, and supplemental to, the health and safety air monitoring program to be implemented during soil excavation and handling activities (as detailed in the Health and Safety Plan). The daily supervision of the AAQMP (and the associated air monitoring activities) will be completed by CRA.

1.1 GENERAL STRATEGY

During the soil excavation and material handling activities at the Site, the potential may exist for the emission of PCBs and TSPs. In order to verify that no unacceptable emissions occur, air monitoring will be conducted around the Site perimeter during excavation activities at locations representative of the closest potential receptors. Air monitoring activities will also be conducted at the soil staging area during waste placement activities.

The Site air monitoring activities, including the staging area, will be conducted to verify that IM activities do not adversely affect the health of off-site personnel (i.e., members of the general public); off-Site Residents; or the environment. The following two levels of air monitoring will be implemented at the Site and staging area:

i) real time monitoring instruments for TSPs (i.e., short-term monitoring consisting of field measurements with immediate results); and

ii) compound-specific air-monitoring for PCBs and TSPs (i.e., long-term monitoring consisting of collection of air samples over a 24-hour period and subsequent analyses in a certified/ approved laboratory).

The air monitoring activities will be conducted by approved CRA personnel in accordance with the AAQMP and Site Health and Safety Plan (HASP).

1.2 SUMMARY OF PLANNED SITE ACTIVITIES

This section presents a summary of tasks for the RA. CRA, as Engineer, will provide overall project coordination at the direction of General Motors Corporation (GM), provide oversight services during the implementation of the RA, collect and manage related data, and develop and prepare the Final Construction Report. CRA will coordinate and manage the procurement of subcontractors (e.g., surveyor and analytical laboratory).

The U.S. EPA will be notified of the name and qualifications of each subcontractor who will conduct activities related to the RA a minimum of 5 days prior to each subcontractor's mobilization to the Site.

Following approval of the Work Plan by the U.S. EPA and procurement of the necessary access agreements, contractors, and subcontractors, the initiation of the RA activities will occur and will include the following:

- implementation of a Site-specific HASP;

- mobilization of construction facilities, material, equipment, and personnel necessary to perform the work;
- provision and maintenance of construction facilities and temporary controls;
- site preparation including:
  - work zone identification,
  - the provision of temporary utilities,
  - construction of decontamination facilities,
  - construction of staging facilities,
  - clearing and grubbing of existing vegetation (as required);
- provision of site security;
- implementation of environmental controls;
- survey and layout of soil excavations areas;
- excavation of soil;
- staging/characterization of soil, as necessary;
- review of soil cleanup levels;
- backfilling/grading of excavated areas with appropriate material;
- transportation and staging/disposal of waste material at appropriate facilities in accordance with State and Federal regulations (as required);
- removal of miscellaneous debris and disposal at appropriate facilities (as required);
- RA closeout activities including:
  - cleanup of tracked areas,
  - restoration,
  - decontamination of site equipment and facilities,
  - management/disposal of wastewaters; and
- demobilization of construction facilities and equipment from the Parcel.

1.3 AAQMP ORGANIZATION

This AAQMP consists of the following sections:

- Section 2.0 - describes the procedures for the determination of TSPs at the Creek Areas and staging area perimeters on a real-time basis (short-term).

- Section 3.0 - describes the procedures for the determination of compound-specific PCBs and TSPs at the Creek Areas and staging area perimeters (24-hour average) (long-term).
- Section 4.0 - describes the corrective actions required should the short-term (real-time) or long-term (24-hour) concentrations exceed the ambient air criteria.
- Section 5.0 - describes the required corrective actions should the quality assurance/quality control (QA/QC) requirements not be met.

2.0 REAL TIME AIR MONITORING (SHORT-TERM)

Real-time air monitoring at the perimeters of the Creek Areas and staging area will be conducted to measure TSPs during the remedial activities. Short-term concentrations for PCBs will be screened using the short-term TSPs data. Short-term PCB concentrations will be determined by multiplying the highest soil concentrations of PCBs by the TSPs concentration. The determination of the PCB concentrations is used for screening purposes only, since it addresses only PCBs on particulates. Actual collected samples analyzed in the laboratory will be relied upon as representative data. The site perimeter air monitoring will be conducted by CRA air monitoring technicians. A summary of the real-time air monitoring activities is presented in Table E.2.1.

2.1 REAL TIME SAMPLING LOCATIONS

Readings for TSPs will be obtained from four sampling locations at the work area and four sampling locations at the staging area selected daily prior to the initiation of the remedial activities based on the area of active work. The locations will be positioned at approximately 90 degree intervals (approximately north, south, east, and west) around the active work area. One of the four air sampling locations will represent the upwind (i.e., background) sample based on the prevailing wind direction over the working day as measured by the on-Site meteorological station. The meteorological station will be located at the Site trailer and will record temperature, wind speed and direction, barometric pressure, and precipitation. The meteorological station will be calibrated at the frequency and by the methods recommended by the manufacturer. The results of the background sample will be compared to the downwind sample results to determine the extent of any potential emissions migrating off-site due to on-Site activities.

2.2 REAL TIME SAMPLING METHODS

Real-time air monitoring will be performed utilizing the following instrumentation:

1. SKC Haz-Dust III dust monitor for TSPs.

All instrumentation will be utilized and calibrated in accordance with the manufacturers' specification. The SKC Haz-Dust III has an operating range of 0.01 to 200 mg/m^3 with ±0.02 mg/m^3 precision, and ±10 percent accuracy.

Short-term PCB concentrations will be determined by multiplying the highest soil concentrations of PCBs by the TSPs concentration.

Also, odors will be monitored qualitatively by the Engineer at these sampling locations to determine potential odor impacts from Site activities. Odors observed cannot be assessed against regulated criteria since odors are subjective with varying thresholds.

2.3 REAL-TIME SAMPLING FREQUENCY

The Site and staging area perimeter real-time air monitoring frequencies are summarized in Table E.2.1.

During the first week of excavation activities, readings of TSPs will be collected once every hour in the creek and once every two hours in the staging area from each real-time sampling location around the active work area. Short-term PCB concentrations will be determined by multiplying the highest soil concentrations of PCBs by the TSPs concentration. Odors will also be monitored at the same locations and frequency of real-time monitoring. Qualitative assessments of odors will be recorded by the on-Site Engineer.

If "stop work" action levels for TSPs and PCBs are not exceeded during the first week of real-time air monitoring activities (see Table E.2.2), the frequency of monitoring will be reduced to every two hours (creek area) and twice per day (staging area).

Whenever a new phase of the Work Plan is initiated, or an exceedance of perimeter air monitoring "stop work" action levels occurs, the frequency of real-time perimeter air monitoring will be increased to once every hour (creek area) or once every two hours (staging area) during each day of activities for a period of one week. Again, if real-time air monitoring "stop work" action levels are not exceeded during the first week of operation, the monitoring frequency will be decreased consistent with Table E.2.1 for the remainder of that phase of work.

2.4 ACTION LEVELS, NOTIFICATION AND REPORTING

The real-time TSPs and PCBs air monitoring action levels for the active work area are presented in Table E.2.2. The percentage action level for TSPs are based on Indiana Department of Environmental Management (IDEM), Title 326, Article 6, Rule 4 of the Indiana Administrative Code. There are no National Institute for Occupational Safety and Health (NIOSH)or Occupational Safety and Health Administration (OSHA) short-term criteria for PCBs thus, the selected criteria was based on a conversion from the OSHA 8-hour permissible exposure limit (PEL) for an 8-hour time-weighted average (TWA) worker exposure to an 8-hour TWA for sensitive population (TWA/10) and conservatively using this TWA as the short-term criteria.

Corrective actions (should real-time readings exceed these criteria) are outlined in Section 4.0 of the AAQMP.

There are no quantitative criteria for odors; however, the Engineer will monitor odors and record their qualitative assessment. If odors become problematic (i.e., in the judgement of the Engineer or due to odor complaints by nearby property owners), the Engineer will initiate corrective actions (see Section 4.0).

GM and U.S. EPA will be given immediate verbal notification of any operational problems or detected concentrations of airborne contaminants in excess of the action levels. Daily results of the monitoring activities will be transmitted to GM and U.S. EPA.

3.0 24-HOUR AMBIENT AIR MONITORING (LONG-TERM)

Compound-specific air sampling for PCBs and TSPs will be performed around the active work areas during the excavation activities. In addition to ensuring that emissions migrating off-Site will be identified and mitigated to protect the public and the environment, the compound-specific air monitoring around the active work area will allow the real-time monitoring action levels to be supported (i.e., the compound-specific monitoring will be used to verify the appropriateness of the real-time air monitoring action levels). The compound-specific active work area air monitoring at the Site will be conducted by CRA's air monitoring technician(s).

The compound-specific PCBs and TSPs active work area air monitoring at the Site and staging area will be based on 24-hour air samples. The air-monitoring program will yield average concentrations in the ambient air for the selected compounds over each 24-hour period. Concentrations for PCBs as well as TSPs will be determined by:

- measuring the amount of contaminant collected onto absorbent media or filters over a 24-hour period; and
- measuring the volume of air collected over a 24-hour period, corrected for flow rates, temperature, humidity, and pressure.

Meteorological readings will be recorded daily from nearby weather stations or a Site-specific station in order to correct the measured data to standard ambient conditions and to determine the quality of the measured data.

A summary of the compound-specific PCBs and TSPs air monitoring to be conducted around the active work area is presented in Table E.3.1.

3.1 24-HOUR SAMPLING LOCATIONS

Sampling for compound specific PCBs and TSPs monitoring will be obtained from at least two of the four sampling locations around each of the active work areas (i.e., upwind and downwind). The locations will be chosen daily prior to the initiation of the remedial activities. The locations will be positioned at approximately 90 degree intervals (e.g., north, south, east, and west) around the active work area. At least one of the four air sampling locations at each work area will represent the upwind (i.e., background) sample. The results of the background sample will be compared to the downwind sample results to determine the concentration of emissions that may be migrating off site due to on-Site activities. The same locations will be used for both PCBs and TSPs air monitoring stations and real-time air monitoring stations (see Section 2.1).

3.2 BACKGROUND AIR SAMPLING

Prior to initiating intrusive or dust generating activities, two days of monitoring will be completed for PCBs and TSPs at all four monitoring stations at each work area to establish background conditions.

3.3 24-HOUR SAMPLING AND ANALYSIS METHODS

The sampling and analyses methods are provided in Site Quality Assurance Project Plan (QAPP). The QAPP also includes additional sampling details such as sample volumes.

Perimeter sampling will be conducted in accordance with U.S. EPA Method T-04A. This U.S. EPA method uses a polyurethane foam (PUF) sampler to collect ambient air at a flow rate of approximately 200-280 liters per minute for a duration of 24 hours. Airborne PCBs are collected on a polyurethane cartridge preceded by a quartz fiber filter. Both the cartridge and filter are analyzed. PCB concentrations are then determined per unit volume of air, i.e., micrograms per cubic meter of air. Air monitoring equipment will be maintained and calibrated in accordance with the manufacturer's instructions.

3.4 24-HOUR AMBIENT AIR SAMPLING FREQUENCY

The Site perimeter compound-specific PCBs and TSPs air monitoring frequencies are summarized in Table E.3.1.

Compound-specific PCBs and TSPs air monitoring will be conducted during excavation activities at the Site. Samples for PCBs and TSPs will be submitted for analysis, on a 24-hour turnaround time basis, regardless of real-time results for that day.

One of the four monitoring stations will be sampled once in the first week of monitoring for each new work area. The monitoring station to be selected will be the upwind location and will be used to establish background concentrations. Three stations will be selected as the downwind locations and will be monitored daily for the first week of the commencement of activities in each new work area (see Table E.3.1). If ambient air criteria are not exceeded in the Staging Area during the first week of work, then the frequency of monitoring will be reduced to once per week, subject to approval from U.S. EPA and GM. Monitoring frequency in the creek areas will not be reduced.

3.5 AMBIENT AIR QUALITY CRITERIA, NOTIFICATION AND REPORTING

The selected criteria for PCBs are based on the NIOSH level of 1 $\mu g/m^3$ PEL

The ambient air criteria for a 24-hour sampling period is provided in Table E.3.2.

Corrective actions (should ambient air criteria exceed the criteria outlined in Table E.3.2) are outlined in Section 4.0 of the AAQMP.

GM and U.S. EPA will immediately be given verbal notification of any operational problems, or detected concentrations of airborne contaminants in excess of the ambient air criteria. The full set of results will be distributed in a bi-weekly report.

4.0 CORRECTIVE ACTION

Workers within the active work areas will be protected in accordance with the Site-specific Health and Safety Plan. Provisions in the health and safety plan will require that workers use personal protective equipment (PPE) if specific health and safety air monitoring results indicate that this is necessary.

Should elevated off-Site short-term monitoring results indicate that activities at one of the work areas (the Parcel or staging area) are causing potential exceedances of the ambient air criteria, activities at that work area will be immediately evaluated and discussed with U.S. EPA and changes will be made to the work to reduce the measured concentrations to below the ambient air criteria. These changes might include slowdown of the work, or application of dust suppressant materials, including water, foam, sawdust, or other appropriate materials. The concentrations of the specific parameters at these locations will be monitored during this period until the concentrations fall below the ambient air criteria. Should elevated off-Site long-term monitoring results exceed ½ the stop work level at one of the work areas (the Parcel or staging area), activities at that work area will be immediately evaluated and changes will be made to the work to reduce the measured concentrations to below the ambient air criteria. These changes could include a work slowdown, additional engineering controls, or changes to work procedures. Should the concentrations exceed the stop work criteria for PCBs, then the work activities will be halted at that work area. A decision will then be made to recommence activities only after winds have subsided or to implement the use of emission suppressant materials or other controls. Emissions suppressant materials may include water, foam, sawdust or other material to minimize the migration of dust, odors, or organic compounds.

5.0 QA/QC CORRECTIVE ACTION

Field QA/QC requirements are as outlined in the QAPP. The need for corrective action may be identified by system or performance audits or by standard QC procedures. The essential steps in the corrective action system will be:

i) checking the predetermined limits for data acceptability beyond which corrective action is required;

ii) identifying and defining problems;

iii) assigning responsibility for investigating the problem;

iv) investigating and determining the cause of the problem;

v) determination of a corrective action to eliminate the problem (this may include reanalyses or resampling and analyses);

vi) assigning and accepting responsibility for implementing the corrective action;

vii) implementing the corrective action and evaluating the effectiveness;

viii) verifying that the corrective action has eliminated the problem; and

ix) document the corrective action taken.

The Engineer's QA/QC Officer will conduct and co-ordinate the QA/QC evaluation. For each measurement system, the QA/QC Officer will be responsible for initiating the corrective action and the laboratory supervisor will be responsible for implementing the corrective action. The corrective action taken will depend upon the QA/QC results that did not meet the necessary criteria, and may range from qualifying data to resampling on the Site.

TABLE E.2.1

AIR MONITORING SUMMARY - REAL TIME (SHORT TERM)
PERIMETER AIR MONITORING PROGRAM
BEDFORD, INDIANA

Remediation Areas	*Parameters*	*Duration of Monitoring*	*Air Monitoring Locations*	*Air Monitoring Frequency*
Creek Areas	1) TSP & PCB screening 2) Odor (Qualitative Assessment only)	Duration of IM	Four locations around Perimeter	Every 2 hours
Staging Area	1) TSP & PCB screening 2) Odor (Qualitative Assessment only)	First week	Four locations around Perimeter	Every 2 hours
		Duration of IM (after first week)	Four locations around Perimeter	- Twice per day (if stop work ac level in first week is not excee - see Note 1

Notes:
1. Upon the initiation of a new phase of remedial activities, or if a stop work action level is exceeded, the frequency of the real-time air monitoring for that parameter will be increased to hourly for two weeks after which the frequency may be decreased if stop work action levels are not exceeded.

PCBs - Polychlorinated Biphenyls
TSP - Total Suspended Particulates

TABLE E.2.2

REAL-TIME AIR MONITORING ACTION LEVELS AT SITE PERIMETER
PERIMETER AIR MONITORING PROGRAM
BEDFORD, INDIANA

Action Levels	Response
TSP 67% above ambient upwind concentration [(1)]	Contact HSO, attempt to determine source of emissions, and take corrective actions.
PCB - 0.05 mg/m^3 (measured based on TSP concentration x highest concentration of PCBs in soil)	Contact HSO, attempt to determine source of emissions, and take corrective actions
Odors, determined by Engineer or based on neighbor complaints to be an unacceptable nuisance	Contact HSO, attempt to determine source of odors, and take corrective actions.

Notes:

[(1)] TSP Action Level percentage adopted from Indiana Department of Environmental Management, Title 326, Article 6, Rule 4 of the Indiana Administrative Code

HSO - Health and Safety Officer
TSP - Total Suspended Particulates

TABLE E.3.1

AIR MONITORING SUMMARY - 24-HOUR (LONG TERM)
PERIMETER AIR MONITORING PROGRAM
BEDFORD, INDIANA

Excavation Areas	*Parameters*	*Duration of Monitoring*	*Air Monitoring Locations*	*Air Monitoring Frequency*
Creek Areas	Compound Specific PCBs, TSPs	Duration of IM	Four locations around Perimeter	Daily from 3 down wind locations Once per week from 1 upwind location
Staging Area	Compound Specific PCBs, TSPs	First week	Four locations around Perimeter	Daily from 3 down wind locations Once per week from 1 upwind location
		Duration of IM (after first week)	Four locations around Perimeter	Once per week from all 4 locations (if ambient air criteria in first week is not exceeded)

Notes:
Upon the initiation of a new phase of remedial activities, or if an ambient air criteria is exceeded, the frequency of the 24-hour ambient air monitoring for that parameter will be increased to daily for two weeks after which the frequency may be decreased if ambient air criteria are not exceeded.
PCBs - Polychlorinated Biphenyls
TSPs - Total Suspended Particulates

TABLE E.3.2

AMBIENT AIR CRITERIA
PERIMETER AIR MONITORING PROGRAM
GMPT BEDFORD
BEDFORD, INDIANA

		Assessment of Long-Term (24-Hour) Monitoring Criteria		For Short-Term (Real Time) Monitoring Criteria (see Table E.2.2)
Compound	CAS	Evaluate Engineering Controls/Work Practices (µg/m3)	Stop Work Action Level (µg/m3)	Short-Term Criteria (mg/m3)
PCBs (total - 54% Cl)	11097-69-1	0.5	1.0	0.05 (1)
TSP		(2)	(2)	(2)

Notes:

(1) Criteria is based on dividing TWA by 10 for sensitive receptors and assuming this criteria applies to short-term exposure (conservative).
(2) Action level for TSP is 67% in excess of upwind ambient air concentration, based on Indiana Department of Environmental Management, Title 326, Article 6, Rule 4 of the Indiana Administrative Code
N/A - not applicable

July 18, 2003

APPENDIX F

HYDROLOGIC MODELING TABLES

TABLE F-1

HEC-HMS OUTPUT
100-YEAR/24-HOUR EVENT

Sub-catchment	*100-Year Instantaneous Peak Discharge From Sub-catchment (cfs)*
1	240
2a	58
2b	81
2c	30
3a	100
3b	52
3c	65
4	160
5	26
6	220
7	590
8a	26
8b	30
8c	32
9a	290
9b	28
9c	80
10a	31
10b	110
10c	150
11a	110
11b	220
12	3180
13a	130
13b	140
14	190
15	670
16	450
17	23
18	110
19	180
20	1090
21	690

Notes:

1) Peak flows from subcatchments cannot be added arithmetically.
2) Peak flow for a location is determined at a junction point in hydrologic routing model.

Table F.2
HEC-HMS Output at HEC-RAS Junctions
100-year Peak Discharge

HEC-HMS Junction No.	Peak Discharge (*cfs*)
J-1	1582
J-2a	1984
J-2b	2578
J-3	2578
J-4	5434
J-5	5940
J-6	4374
J-7	6529
J-8	324
J-8a	389
J-8b	563
J-9	3181
J-10	4938
J-11	946
J-12	392
J-13	385
J-14	170
J-15	1494
J-16	5316