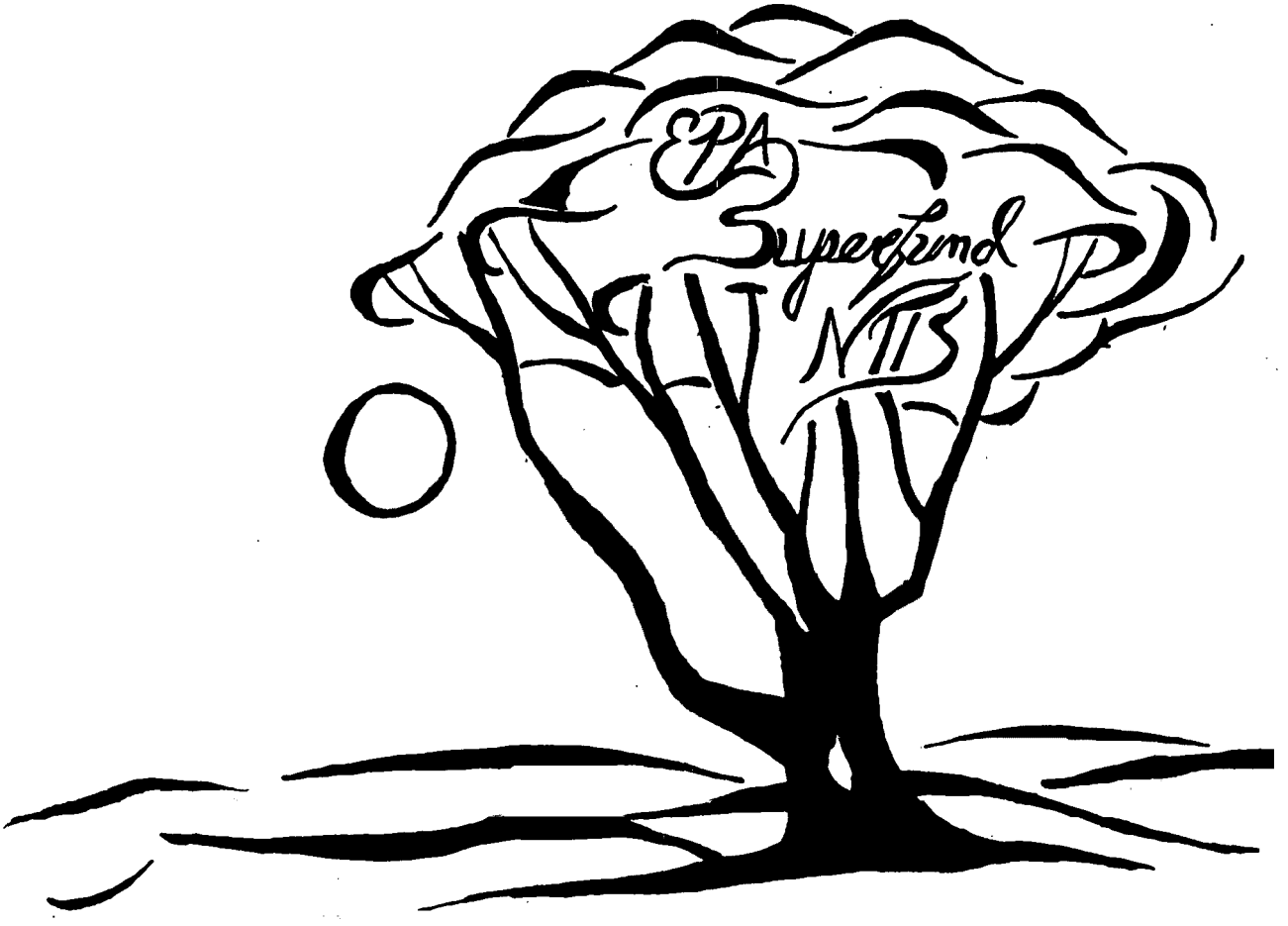
PB94-964102
EPA/ROD/R05-94/248
July 1994

EPA Superfund Record of Decision:

J and L Landfill Site, Rochester Hills, MI



DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

J&L Landfill, Rochester Hills, Michigan

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the J&L Landfill, in Rochester Hills, Michigan, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This ROD is for the landfill operable unit (OU1) remedial action. Groundwater will be addressed as OU2 in a separate document. This decision is based on the administrative record for the site.

The State of Michigan concurs with the selected remedy because it is expected to attain a standard of performance that is equivalent to that required under Michigan Act 64. However, the State of Michigan disagrees with the U.S. EPA's determination that Michigan Act 64 is not an Applicable or Relevant and Appropriate Requirement (ARAR). The State of Michigan believes that Act 64 is an ARAR.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The purpose of this remedy is to reduce the risks associated with exposure to the contaminated materials and to reduce the potential for migration of contaminants to the groundwater. The selected remedy for OU1 consists of a 1-foot compacted clay layer overlain with a Geosynthetic Clay Liner (GCL)/60 mil Flexible Membrane Liner (FML) barrier layer, a drainage layer consisting of geonet with geotextile filter fabric, a 36-inch clean fill layer, and a 6-inch topsoil layer; consolidation of the contaminated soil and sediments from the east ditch; and monitoring of the contaminated groundwater beneath the site. In addition, a proper slope will be constructed and maintained so that all surface water runoff properly drains off the cap into a collection system, or drainage ditches around the perimeter of the site.

Other components of the selected remedy include:

- Abandoning (plugging) the sediment pond culverts, consolidating any contaminated soils/sediments beneath the existing landfill cap and backfilling the sedimentation pond to grade with clean fill.

- Consolidating any contaminated surface soils and sediments, including landfill waste, from the east ditch to beneath the existing landfill cap.

- Regrading the south ditch to retain existing stormwater capacity.

- Preparing the existing landfill surface in order to provide a foundation for the new cap, as well as removing existing vegetation from the landfill surface.

- Regrading the site to promote runoff.

- Retrofitting existing monitoring wells.

- Installing a passive gas management system.

- Implementation of long-term groundwater monitoring program to ensure the effectiveness of the remedial action.

- Vegetative cover placement.

- Fence installation.

- Use of institutional controls, including deed restrictions, to limit land and groundwater use.

- Monitoring plan for cap integrity and fence inspection, and landfill gas migration.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for this site. However, because treatment of the large volume of waste was not found to be practicable, this remedy does not satisfy the statutory preference for remedies that reduce the toxicity, mobility, or volume as a principal element.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after commencement of the remedial action to ensure

that the remedy continues to provide adequate protection of human health and the environment.

STATE CONCURRENCE

The State of Michigan concurs with the selected remedy because it is expected to attain a standard of performance that is equivalent to that required under Act 64. However, the State of Michigan does not agree with the U.S. EPA's determination that Michigan Hazardous Waste Management Act 64 of 1979, as amended, and administrative rules is not ARAR. The State's position regarding their belief that Michigan Act 64 is an ARAR with respect to the J&L Landfill is attached to this ROD as part of the Responsiveness Summary.

Valdas V. Adamkus
Regional Administrator

6/30/94
Date

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DECISION SUMMARY
J&L Landfill

A. SITE LOCATION AND DESCRIPTION

The J&L Landfill Superfund site is located on Hamlin Road in Rochester Hills, Michigan (Figure 1). The area surrounding and including J&L Landfill is generally level, with the exception of a drainage ditch along the eastern boundary, Ladd Drain near the northern boundary, the south ditch along Hamlin Road, and a sediment pond in the northwestern corner of the site (Figure 2). The sediment pond contains continuously flowing water fed by groundwater and an inlet culvert originating off-site. There is also a concrete outlet culvert which is believed to be oriented to the northeast, passing under the landfill, the east ditch, and the adjacent property and terminating in Ladd Drain. Vegetation covers most of the site except in scattered patches and roadways. Access to the site is unrestricted.

Land use in the vicinity of the J&L site includes residential, industrial, recreational, other landfills, and mining (Figure 2). The J&L site is bordered on the east and north by Sandfill Landfill No.2, and on the west by Sandfill Landfill No. 1. There are at least six other landfills within one-half mile of the site. Residential areas exist within 500 feet of the southern property boundary, approximately 1,000 feet northwest of the site, and approximately 600 feet east of the site along Hamlin Road. The J&L site and adjacent properties are zoned light industrial.

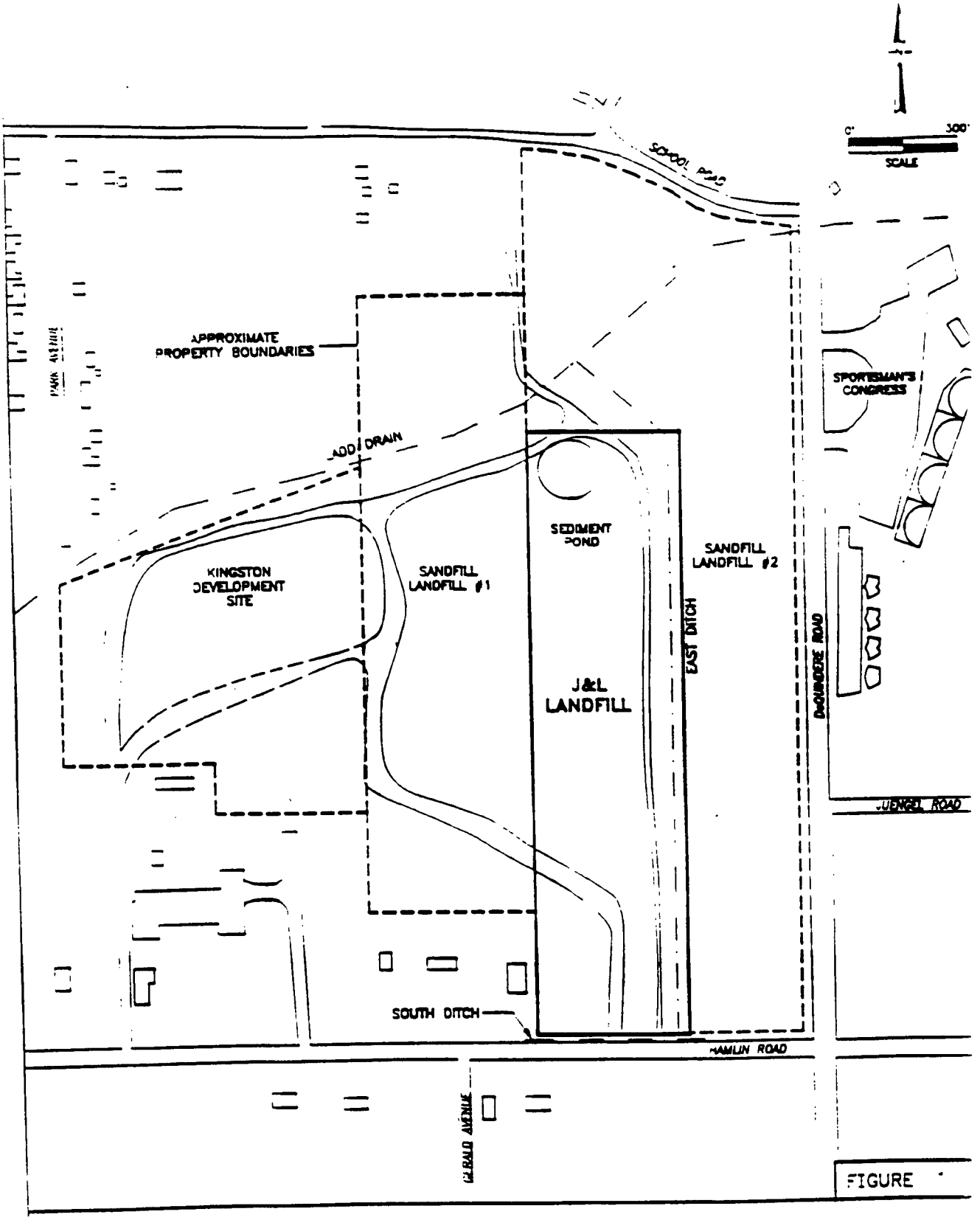
The J&L site is located less than 1 mile west of the Clinton River which flows from northwest to southeast through the Rochester-Utica State Recreation Area. Ladd Drain, which is located on the northern boundary of the site, drains into the Clinton River. Surface water drainage from the area also flows primarily to the north and east toward the Clinton River. Groundwater flow direction similarly, is towards the north and east.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

1. Site History

Steel slag and steel manufacturing wastes were the primary wastes disposed at the site, which was a former sand and gravel borrow area. During 1967 or 1968, baghouse dust filters were installed on the electric arc furnaces at the J&L Steel Warren, Michigan facility. The dust collected by these filters, referred to as electric arc furnace (EAF) dust, was thereafter codisposed of with slag at the J&L site. This EAF dust, if classified today, would be considered a listed hazardous waste under the Resource Conservation and Recovery Act (RCRA). Disposal operations at J&L may have started as early as 1951 and were terminated in 1980 when the site was closed and the current cap was installed.

By November of 1980, J&L landfill had been brought up to grade, as specified by Avon


SCHOOL ROAD
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SCALE
APPROXIMATE
PROPERTY BOUNDARIES
PARK AVENUE
ADD DRAIN
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POND
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LANDFILL #2
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LANDFILL
DOUBDORE ROAD
JUENGEL ROAD
SOUTH DITCH
HAMLIN ROAD
GERALD AVENUE
FIGURE

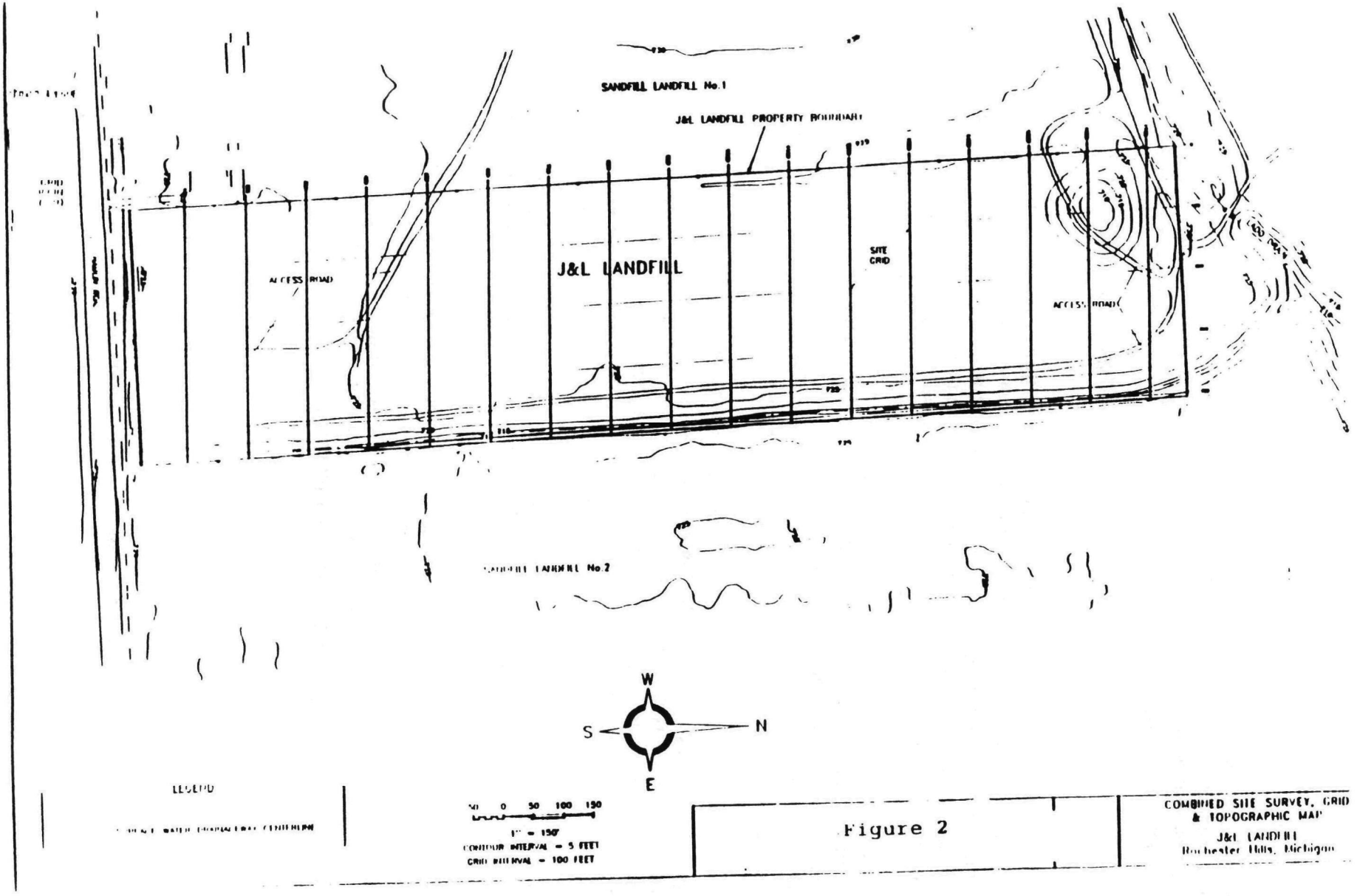

Figure 2

COMBINED SITE SURVEY, GRID & TOPOGRAPHIC MAP

J&L LANDFILL

Rochester Hills, Michigan

Township Rochester Hills, and covered with a landfill cap. The current cap appears to have been mixed with slag materials. Additionally, there are areas void of vegetation and scattered areas of debris across the surface. This indicates that the current cap is not adequate and requires improvement.

2. Past Studies

In 1976, the Michigan Department of Natural Resources (MDNR) conducted an area-wide groundwater study and identified an area of groundwater contamination primarily attributed to a landfill west of the J&L Landfill. As a result, local residents were provided with an alternative drinking water supply. This study also determined that although the area-wide groundwater contamination problem was attributable to many possible sources, the J&L site was probably contributing as well.

U.S. EPA Region V files indicate that the J&L Steel Company submitted a Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) notification in June 1981, claiming ownership of the subject property for which it reported disposal of 55,555 cubic yards of steel slag from 1966 to 1980. Ecology and Environment, Inc. (E&E), completed a Preliminary Site Assessment in July, 1983, followed by a Site Inspection in June, 1984 to verify the site location and ownership. The Hazard Ranking System (HRS) scoring was completed by an E&E Field Investigation Team (FIT) in July 1985, with an HRS score of 31.65 based on the site's potential for groundwater contamination. The site was proposed for addition to the NPL in the June 10, 1986 Federal Register (Vol. 51, No. 111, pp. 21099-21108).

A comprehensive field investigation was conducted during the Remedial Investigation (RI) in order to determine the nature and extent of contamination at J&L. This investigation included geophysical study, waste characterization borings followed by waste sampling and analysis, surface soil sampling, surface water sampling, sediment sampling, groundwater monitoring well installation and sampling, and residential well sampling. Results of the RI are detailed in the RI report (December 1991). Based on the results of the RI and previous investigations, the U.S. EPA divided the site into two sections called **Operable Units** (OU). Operable Unit 1 (OU1) consists of the landfill and its contents. Operable Unit 2 (OU2) consists of the groundwater and will be addressed in a separate document in the future. The Site Focused Feasibility Study (FFS) for OU1 was completed in January of 1994. The FFS documents in detail the development and evaluation of several remedial action alternatives for the landfill operable unit at J&L.

C. HIGHLIGHTS OF COMMUNITY PARTICIPATION

A RI fact sheet was released by the U.S. EPA in July of 1990, followed by a public meeting on August 6, 1990, for the RI to inform the local residents of the Superfund process and the work to be conducted during the RI. In February, 1992, the U.S. EPA issued a second letter to the public to inform them of the upcoming RI public meeting on March 12, 1992, where the results of the RI

were discussed.

Information repositories have been established at the Rochester Hills Public Library, 500 Olde Towne Road, Rochester, Michigan and Rochester Hills City Hall, 1000 Rochester Hills Drive, Rochester Hills, Michigan. In accordance with Section (113)(k)(1) of CERCLA, the Administrative Record is available to the public at these locations, as well as the U.S. EPA Region 5 office in Chicago, Illinois.

The Proposed Plan was available for public comment from January 25, 1994 to March 26, 1994 through the release of a fact sheet. A public meeting was held on February 9, 1994 to present the proposed plan and U.S. EPA's recommended alternative for OU1 at J&L Landfill. At the public meeting, U.S. EPA and the MDNR answered questions about the site and the remedial alternatives under consideration. Formal oral comments on the Proposed Plan were documented by a court reporter. A verbatim transcript of this public meeting has been placed in the information repositories and Administrative Record. Written comments were also accepted at this meeting.

Advertisements announcing the availability of the Proposed Plan and the start of the comment period were published in the Oakland Press on January 17, 1994. At the close of the public comment period, February 29, 1994, a second release to the Oakland Press was issued to announce the extension of the comment period until March 26, 1994. Post cards were also sent out to parties on U.S. EPA's mailing list to announce the extension. Oral and written comments received during the above mentioned Public Comment period and the U.S. EPA's responses are included in the Responsiveness Summary of this ROD for OU1.

The public participation requirements of CERCLA sections 113 (k) (2) (i-v) and 117 of CERCLA have been met in the remedy selection process for the operable unit at J&L. This decision document presents the selected remedial action for the J&L site chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the National Contingency Plan (NCP). The decision for this Site is based on the Administrative Record.

D. SCOPE OF THE SELECTED REMEDY

The J&L Landfill is divided into two areas of concern or "operable units" (OUs): OU1 consists of the landfill contents, and OU2 comprises the groundwater. U.S. EPA anticipates that groundwater will be addressed in a future proposed plan, upon completion of a focused feasibility study report for groundwater.

This ROD addresses the remedy for OU1 at the J&L Landfill Site. The threats posed by this Site to human health and the environment result from source material in the landfill and from contaminated surface and subsurface soil in the landfill. This response action will contain the source material and eliminate risks associated with direct contact with contaminated soil/sediments. This response action will be conducted in accordance with applicable or relevant and appropriate requirements of Federal and State law. U.S. EPA considers containment of the landfill material, which is also a potential source of groundwater contamination, to be the most practicable remedy. Containment of the

landfill also follows U.S. EPA's Presumptive Remedy approach for landfills, which supports capping alternatives for sites where there is a large volume of low level waste materials.

This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for the site. However, because treatment of the large volume of low level waste materials at the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy.

Because this remedy will result in hazardous substances remaining on site above health based levels, a five year review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment.

E. SUMMARY OF CURRENT SITE CONDITIONS

The RI performed at the J&L Landfill Site was designed to characterize the nature and extent of contamination posed by the landfilled materials at the site, and to conduct a human health risk assessment and environmental assessment. The RI included sampling and an analysis of groundwater, surface water, sediments of the surrounding ditches and pond, surface soil, subsurface soil (waste borings), and residential wells. In addition to chemical analysis, waste boring samples were collected and tested for their leaching potential (also known as EP toxicity).

Based on the results of the RI, U.S. EPA has determined that current risks posed at J&L include direct contact with sediments contaminated with PAH's and inhalation of surface soils containing chromium and other heavy metals. Surface samples along the side slopes of the east ditch, sediment pond, and Ladd Drain also contain low levels of Volatile Organic Compounds (VOCs) and Semivolatile Organic Compounds (SVOCs), in addition to the heavy metals previously mentioned. In addition, waste boring samples analyzed for leaching characteristics showed that selenium in one sample and lead in another, had the potential to leach into the groundwater. Other heavy metals, including nickel and zinc, were found to have leaching potentials, but do not have established EP toxicity maximum allowable concentrations. U.S. EPA also determined through the RI results, that a threat to human health and the environment is posed through future residential exposure upon ingestion of groundwater contaminated with arsenic, and through direct contact with sediments contaminated with heavy metals and polyaromatic hydrocarbons (PAH's).

In addition, arsenic was also found in a saturated area of general refuse currently below the water table, however, data indicates that the arsenic is not currently mobile and has not migrated off-site.

1. Topography

The J&L Site is on the surface of a glacio-lacustrine delta which slopes to the southeast at a relatively shallow gradient. The delta is comprised of approximately 35 to 40 feet of sand and gravel deposits which have been extensively mined throughout the area. Underlying the sand and gravel deposits are thick lacustrine and morainal silty clay deposits, followed by bedrock composed primarily of shales.

2. Geology

Three stratigraphic units consisting of landfill materials, deltaic sand and gravel, and clay materials were encountered during drilling at the site. Landfill materials are further divided into clay materials and waste fill material. Clay and other materials comprise the landfill cap and solid fill in areas that are devoid of waste, presumably to bring the landfill up to surrounding surface grade. The thickness of clay in the current landfill cap ranges from zero to 2.75 feet; the thickness of the solid clay fill ranges from 4.75 to 19.5 feet. Waste material encountered consists of slag from 2 to 18.5 feet thick and general refuse from 3.25 to 22.5 feet thick. In some areas, the two waste materials are mixed. EAF dust was not directly observed in discrete quantities, but may have been encountered as very fine-grained material mixed within general slag material. Sand and gravel deposits ranging from 7.5 to 25 feet thick and silty clay directly underlie the landfill materials.

3. Hydrology

An unconfined water table aquifer extends into the J&L Site waste materials. Monitoring wells installed at on- and off-site locations indicate that groundwater flow in the upper and lower portions of the aquifer is eastward, and that the water table elevations fluctuate seasonally. Slug tests performed on all on-site monitoring wells indicate that the mean hydraulic conductivities for the upper and lower portions of the aquifer are 8.14×10^{-3} cm/sec, and 1.43×10^{-3} cm/sec, respectively. These data indicate that the upper portion of the aquifer is more permeable and more conducive to contaminant transport than the lower porion of the aquifer. This is also reflected in the finer material grain size and the decrease in moisture content observed with depth. The mean groundwater flow velocity for the upper portion of the aquifer is approximately 175 ft/year, and is approximately 15 ft/year for the lower portion. Laboratory permeability test performed on silty clay and clayey silt materials at the base of the shallow aquifer ranged from 5.5×10^{-7} to 6.6×10^{-7} cm/sec, indicating that the materials are capable of retarding, but not preventing, vertical migration of groundwater.

Surface water flow rates were measured during both dry and wet weather conditions at various locations upstream, adjacent, and downstream of the J&L Site in Ladd Drain and the east ditch, and in the on-site sediment pond. Based on the depth of the pond, surface water elevation, and groundwater elevations in nearby wells, it is probable that the sediment pond acts as a localized groundwater discharge zone. The sediment pond contains water that flows actively through the pond in a west-to-east direction via inlet and outlet culverts.

4. Contamination Source

The source of contamination at J&L site is the landfilled waste, which is comprised of steel slag, steel manufacturing wastes intermixed with EAF dust, and general refuse. The estimated volume of waste contained within the landfill is approximately 455,000 cubic yards, of which approximately 65% (295,750 cubic yards) consists of steel manufacturing waste (slag intermixed with EAF dust), and approximately 35% (159,250 cubic yards) consists of general refuse. Although J&L was properly closed and capped in accordance with existing requirements in 1980, current site conditions

indicate that the existing cap no longer meets current Federal and State requirements. For example, although a continuous grass cover is present over most of the site, there are also several areas void of vegetation where the soil is darker in color or where roadways are present. Slag material is also found at the surface of the landfill and debris is scattered over the surface of the landfill and along the east ditch. Additionally, access to the property is also unrestricted.

F. SUMMARY OF REMEDIAL INVESTIGATION RESULTS

The Remedial Investigation was conducted during the summer of 1990, with additional sampling conducted in January 1991. The scope of work for the investigation included: sampling and analysis of waste material, natural soil and surface soil, surface water and sediment, residential water wells, and groundwater. A geophysical survey was also performed.

Results of the sampling indicate that the landfill contents are composed of clay materials consisting of silty clay, clayey silt, sand, and waste fill material. Clay materials comprise the existing landfill cap and solid fill in areas that are devoid of waste, presumably to bring the landfill up to surrounding surface grade. Waste material encountered consists of slag from 2 to 18.5 feet thick, and general refuse from 3.25 to 22.5 feet thick. In some areas the two waste materials are mixed. There is also the possibility that EAF dust is mixed with some of the waste, although the data collected to date does not confirm this.

The hydrogeological investigation indicates that the groundwater flow is from west to east. The water table surface was found at approximately 13 to 16 feet below ground surface in the central portions of the landfill. These elevations correspond to levels within the landfill waste.

Results of the waste boring samples indicates that VOCs and SVOCs are predominantly associated with general refuse, while inorganics (metals) are the principal component of the slag material. However, in an analysis performed by J&L Steel in 1980 of EAF dust collected from the J&L Plant in Warrenville, Michigan, 2.1 weight percent of the EAF dust sample was found to be composed of volatile solids/soils. Also, two waste boring samples collected from the area of general refuse showed that Extraction Procedure (EP) toxicity values for selenium in one sample, and lead in the other sample, exceeded the maximum concentrations of contaminants characteristic of EP toxicity, as cited in U.S. Code of Regulations (40 CFR 261.24). For this reason, the general refuse material, at least at the two locations, can be considered hazardous based on the leachability of lead and selenium. Eight waste boring samples were also collected and analyzed from the slag and steel waste materials. Although these results indicate that EP toxicity metal concentrations were very low and not above standards, there is the potential for low levels of selenium, lead, chromium, nickel and zinc to leach into the groundwater from the slag and steel wastes under the right conditions.

In other analyses, the slag material exhibited elevated concentrations of antimony, arsenic, calcium, chromium, cobalt, iron, magnesium, manganese, nickel, silver, thallium, and zinc. Of these 12 inorganics, calcium, chromium, magnesium, manganese, nickel, and zinc were also reported as components in the EAF dust analysis conducted by J&L in 1980. This indicates the probable

presence of EAF dust in the samples, although discrete quantities of the material were not specifically observed during RI sampling.

Surface soil sampling results also indicate that low levels of organic compounds including toluene, acetone, benzo(b)fluoranthene, benzo(a)pyrene and fluoranthene are present on the sideslopes of the east ditch, on-site sediment pond, and Ladd Drain; and high levels of inorganic chemicals were detected in the southwest and northeast areas of the site devoid of vegetation. Inorganics were also detected in the existing landfill cap, but this may be due to mixing of materials when the cap was installed, and/or the occurrence of weathering and erosion. The presence of these contaminants, in addition to groundwater sampling results, indicate that the landfill may be a source of groundwater contamination.

Groundwater sampling results indicate that VOCs, SVOCs, pesticides, and inorganic chemicals are present in the groundwater. The VOC contaminants found included acetone, 2-butanone, benzene, toluene, ehtylbenzene, and total xylenes. The Maximum Contaminant Levels (MCLs) for total xylenes, ethylbenzene and benzene were exceeded. The MCL for arsenic was also exceeded in groundwater underlying an area of saturated general refuse. Although the detected VOCs assisted in driving the future risk to human health and the environment up to the calculated levels, groundwater in both the upper and lower portions of the aquifer was also found to contain some VOCs as it entered the J&L site. Thus, the J&L site appears to be contributing to the area groundwater contamination, most likely through the areas of general refuse where the majority of VOCs and the highest concentrations were detected. The residential wells that were sampled downgradient of the site were found to be free of contamination originating from the site.

G. SUMMARY OF SITE HEALTH RISKS AND ENVIRONMENTAL IMPACTS

As part of the J&L Landfill site investigation, U.S. EPA conducted a Human Health Risk Assessment to determine if contamination from the landfill could pose a present or future risk to human health. The assessment compared contaminant levels detected at the landfill with Michigan and federal standards, considered the manners in which people could be exposed to these contaminants, and estimated whether these contaminants could pose a threat to human health. The potential risks to human health were calculated based on the assumption that no future remedial actions would be taken at the site. The human populations potentially exposed to the contamination at the site include persons living on the site and dirtbike riders trespassing on the site.

When considering potential health risks, U.S. EPA examines two factors: the risk of contaminants causing cancer, and the risk of contaminants causing other ailments, such as respiratory, heart, or nervous system disorders. According to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), U.S. EPA's general cleanup policy under Superfund indicates that when the calculated cancer risk from lifetime exposure to site-related contaminants is more than one additional cancer case in 10,000 people, some type of remedial action is generally required. When the cancer risk falls between one additional cancer case in every 10,000 people and one additional cancer case in 1 million people, action may be necessary depending on site-specific factors such as

location and environmental impact. If the risk is less than one additional cancer case in 1 million, action is generally not required unless there is an unacceptable "non-carcinogenic" or environmental risk.

When calculating non-cancer risk, U.S. EPA uses a "hazard index" for both short-term (subchronic) exposures and long-term (chronic) exposures. A hazard index of greater than 1.0 indicates a potential for adverse health effects due to exposure to toxic compounds and is also considered an unacceptable risk level which requires action.

The selected exposure pathways considered to be most relevant at the J&L Landfill site are those associated with current dirt-bike riding and potential future residential uses of the site. Cancer risks associated with the dirt-bike rider scenario exceed the 1 in one million "point of departure" with respect to dermal absorption of sediments and soil, inhalation of dust, and ingestion of sediments and soil. In this case, for current on-site dirt bike riders the risk is 8 out of one million;[1] EPA seeks to manage sites such that the carcinogenic risk from any medium generally falls within a range of 10^{-4} to 10^{-6}. EPA's preference is to be at the more protective end of the risk range (10^{-6}). The noncancer risks associated with the dirt-bike rider scenario were found to be insignificant for the evaluated pathways (hazard index less than 1).

Cancer risks associated with the future potential residential scenario also exceed the 1 in one million "point of departure" for ingestion, inhalation, and dermal absorption of groundwater, and for ingestion and dermal absorption of soil. Noncancer risks associated with the future residential use of groundwater as a potable water supply also exceed acceptable levels (hazard index is more than 1), and are primarily due to arsenic.

The selected remedy for OU1 will not directly address the groundwater contamination, which may be attributed to several potential sources in the area, including the J&L Landfill site. As several potential source areas may be involved, an area-wide groundwater study may be necessary to define the plume of contamination and identify each potential source.

In addition to the Human Health Risk Assessment, an environmental assessment was also conducted to evaluate the potential impacts on the flora and fauna from the contaminants at the J&L Landfill site. The site is primarily a flat, open field, with scattered areas of scrub brush. There are no wetlands on the property. Surface water features are a man-made sediment pond, eastern boundary ditch, a south ditch and Ladd Drain on the northern border. The flows in the drainage ditches are ephemeral. The ecological receptors at the J&L Landfill site include both on-site vegetation and local animal populations that may come into contact with site contaminants. It was determined that some risks may be associated with exposure for terrestrial, avian, and aquatic wildlife species; however, these risks are expected to be low because no species is expected to receive large exposures to the on-site contaminants.

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[1]. See RI for method of risk calculation.

II. RATIONALE FOR FURTHER ACTION

U.S. EPA has two goals related to OU1. One is to protect people from breathing and ingesting contaminated dust particles and from coming into contact with contaminated soils and sediments on the surface of the landfill. The second is to minimize the potential for contaminants (primarily metals) in the general refuse waste, and in the slag intermixed with EAF dust, from affecting the environment through runoff into ditches and drains, and from leaching into the groundwater. This will reduce the potential for further groundwater contamination from infiltration of water through the unsaturated materials into the aquifer beneath the landfill materials. Additionally, these two goals would also prevent contaminants from impacting terrestrial, avian, and aquatic receptors. Cancer risks to sensitive populations are within the U.S. EPA's point of departure risk range. In order to protect human health and the environment from these risks, U.S. EPA has evaluated solutions for OU1 that involve minimizing the potential for human and environmental exposure to contamination through containment. Containment is more practicable than treatment in this case, because of the large volume of low level waste materials. The FFS report for OU1 documents the evaluation of the magnitude of site risks, site-specific applicable or relevant and appropriate requirements (ARARs), and the requirements of CERCLA and the NCP in the derivation of remedial alternatives for OU1 at the J&L Landfill Site.

I. DESCRIPTION OF ALTERNATIVES

Although the NCP reaffirms U.S. EPA's preference for permanent solutions to Superfund site problems through the implementation of treatment technologies, the preamble to the NCP contemplates that many remedial alternatives may be impractical for certain sites due to severe implementability problems or prohibitive costs (e.g., treatment of the entire contents of a large landfill).

For the landfill contents, U.S. EPA considered the following alternatives. The costs presented for each alternative include capital costs (equipment, labor, and other construction expenses to implement the remedy), and maintenance costs (irrigating, fertilizing, and mulching soil cover or making fence repairs). These costs are then combined and presented as a "present net worth," a method of economic calculation that estimates the amount of money that would need to be invested today at 6 percent interest in order to cover initial construction costs, as well as future maintenance costs.

Of the four alternatives considered, the first is the No Action alternative, which is required by Superfund regulations to be considered at every Superfund site. The No Action alternative is used as a baseline against which all the other alternatives are measured. The remaining three alternatives are capping alternatives which would prevent people from coming in contact with contaminants and would minimize the potential for erosion as well as percolation of water through the waste. Capping the landfill will eliminate the risks associated with exposure to surface contaminants as well as reduce the potential for leaching. In addition, these alternatives, alternatives two through four, would also require institutional controls, including deed restrictions to prevent the installation of

drinking water wells within the landfilled portion of the site and future disturbance of the cap and the landfilled materials, fence installation; a landfill gas management system, backfilling the sediment pond; and abandonment of the drainage culvert system that currently underlies the landfill.

Alternative 1 - No Action. Under this alternative, the potential human health and environmental risks associated with exposure to landfill contaminants would not be mitigated and would most likely increase as site conditions deteriorate in the future.

Capital Costs:	$0
Maintenance:	$0
Present Net Worth:	$0
Timeframe:	Not Applicable

Alternatives 2a and 2b:

2a: 2-Foot Clay Barrier Layer/6-Inch Topsoil/Vegetative Layer

Under this alternative, the landfill and the east ditch would be capped with a 2-foot clay barrier layer overlain by a 6-inch topsoil layer. The impermeable clay layer beneath the topsoil would be designed to minimize percolation of water through the waste material, and the vegetative layer would serve to control infiltration of precipitation by evapotranspiration and the removal of water by runoff.

Capital Costs:	$2,366,500
Maintenance:	$249,400
Present Net Worth:	$2,615,900
Timeframe:	9 months

2b: 2-Foot Clay Barrier Layer/42-Inch Protective Layer

This alternative is similar to Alternative 2a, but with a 42-inch protective layer instead of a 6-inch topsoil layer. The 42-inch protective layer would consist of a 12-inch sand drainage layer, a 24-inch fill layer and a 6-inch topsoil layer placed over the clay barrier layer. Additionally, this alternative would involve modifying the cap for the east ditch in order to retain its invert elevation and existing stormwater capacity. The primary purpose of the 42-inch layer is to protect the clay barrier layer from frost damage. The 12-inch drainage layer would also promote lateral movement of water to minimize infiltration into the clay barrier layer, and would also increase the water-storage capacity of the protective layer. The cover system for the east ditch would consist of 3.5 foot protective layer underlain by a 60 mil Flexible Membrane Liner (FML). The purpose of the FML in the east ditch is to replace the 2 feet of clay as the impermeable component of the barrier layer.

Capital Costs:	$3,937,600
Maintenance:	$187,500
Present Net Worth:	$4,125,100
Timeframe:	12 months

Alternatives 3a and 3b:

3a: 3-Foot Clay Barrier Layer with Flexible Membrane Liner (FML)/42-Inch Protective Layer.

This alternative includes the same components as the previous alternatives, but differs in the cover construction. This cover system would consist of a 3-foot compacted clay layer with FML, a 12-inch sand drainage layer, a 24-inch clean fill layer, and a 6-topsoil layer. Similar to alternative 2b, the east ditch would also require a modified cap construction, and would consist of a FML instead of a 3 foot clay layer as the impermeable layer overlain with 42 inches of frost protection.

Capital Costs:	$5,350,300
Maintenance:	$247,000
Present Net Worth:	$5,597,300
Timeframe:	13 months

3b: 3-Foot Clay Barrier Layer with FML/12-Inch Drainage Layer/42-Inch Protective Layer.

This alternative contains the same components as the other alternatives, except that its cover system consists of a 3-foot compacted clay/FML barrier layer, a 12-inch sand drainage layer, a 36-inch clean fill layer, and a 6-inch topsoil layer. Under this alternative, the 12-inch clean fill layer in alternative 3a would be increased by 12 inches for a total of 36 inches of clean fill. The additional six inches of fill protects the drainage layer from frost and would prevent clogging of the drainage layer. The east ditch would receive the modified cap construction described under Alternative 3a.

Capital Costs:	$5,830,000
Maintenance:	$265,600
Present Net Worth:	$6,095,600
Timeframe:	13-15 months

Alternatives 4a and 4b:

4a: 1-foot clay barrier layer under a geosynthetic clay liner (GCL), overlain with a FML and topped by a 42-inch protective layer.

Alternative 4a consists of a 1-foot compacted clay layer overlain with a geosynthetic clay liner (GCL), a 60 mil flexible membrane liner (FML) barrier layer, a 12-inch sand drainage layer with geotextile filter fabric, a 24-inch clean fill layer, and a 6-inch topsoil layer. The GCL cover system replaces replaces 2 of the 3 feet of compacted clay layer considered for Alternatives 3a and 3b. The excavation of the east ditch would receive the modified cap construction described under Alternatives 3a and 3b.

Capital Costs:	$4,480,400
Maintenance:	$211,000
Present Net Worth:	$4,691,400
Timeframe:	12 months

4b: 1-foot clay barrier layer under a GCL/geonet with geotextile fabric, FML/42-inch protective layer.

Alternative 4b consists of a 1-foot compacted clay overlain by a GCL/60 mil FML barrier layer, a drainage layer consisting of geonet with geotextile filter fabric (replacing the 12-inch sand drainage layer), a 36-inch clean fill layer, and a 6-inch topsoil layer. The GCL cover system replaces 2 of the 3 feet of compacted clay considered for Alternatives 3a and 3b. The construction of cover would be the same as Alternative 4a. Alternative 4b was developed to evaluate the effectiveness of a geonet drainage layer and the placement of the drainage layer below the frost line. The geonet drainage layer would have a higher permeability than a sand drainage layer. Protection from frost would prevent clogging of the drainage layer. The design and construction for the east ditch would be the same as for alternative 3a, 3b and 4a.

Capital Costs:	$4,653,150
Maintenance:	$220,800
Present Net Worth:	$4,873,950
Timeframe:	12 months

J. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the relative performance of each alternative is evaluated using the nine criteria, as specified in Title 40 of the Code of Federal Regulations (40 CFR) Section 300.430(e) (9) (iii), as a basis for comparison. An alternative providing the best balance of considerations with respect to the nine

criteria is determined from this evaluation. The following discussion evaluates the remedial alternatives separately using each of these nine criteria.

Threshold Criteria

The following two criteria, overall protection of human health and the environment, and compliance with Applicable or Relevant and Appropriate Requirements (ARARs) are criteria that must be met in order for an alternative to be selected.

1) Overall Protection of Human Health and Environment addresses whether a remedy would provide adequate protection to human health and the environment from exposure to contaminated soils and sediments, and describes how risks posed through each pathway would be eliminated, reduced, or controlled under each alternative. At the J&L landfill, the major exposure pathways of concern are from ingestion, inhalation, and direct contact with the groundwater and contaminated sediments and soils.

The No Action alternative does not satisfy the requirement for overall protection to human health or the environment. Alternative 2a would only provide an intermediate level of protection because of the effects of freezing and thawing on the clay barrier layer in the absence of a protective layer. This would result in a higher than predicted value for percolation through the clay barrier layer using the Hydrologic Evaluation of Landfill Performance (HELP) model, Version 2, 1989 (See Table 1 of this ROD). Alternatives 2b, 3a, 3b, 4a and 4b provide a much greater and more complete degree of overall protection because these alternatives reduce cross-media contamination. Since the quantity of percolation through the barrier layer is minimal for Alternatives 3a, 3b, 4a, and 4b, the groundwater would be most protected against contaminant migration as compared to other alternatives.

2) Compliance with ARARs (laws and regulations) addresses whether a remedy would meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes and/or provide grounds for invoking a waiver.

As alternative 1, the No Action alternative, does not involve conducting any remedial action at the site, no ARARs analysis is necessary for Alternative 1. Alternatives 2a, 2b, 3a, 3b, 4a, and 4b are expected to be in compliance with ARARs.

Primary Balancing Criteria

3) Long-term Effectiveness and Permanence refers to magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Alternative 1 provides no long-term effectiveness and would result in continuation of the elevated risk levels that currently exist at the J&L site.

TABLE 1

Summary of HELP Model Results
JLLF Site
Rochester Hills, Michigan

	Existing Condition inch/year (%)	Alternative 2a inch/year (%)	Alternative 2b inch/year (%)	Alternative 3a inch/year (%)	Alternative 3b inch/year (%)	Alternative 4a inch/year (%)	Alternative 4b inch/year (%)
Precipitation	29.76 (100)	29.76 (100)	29.76 (100)	29.76 (100)	29.76 (100)	29.76 (100)	29.76 (100)
Runoff	1.08 (3.63)	4.73 (15.90)	0.49 (1.65)	1.52 (5.09)	1.36 (4.58)	1.50 (5.04)	0.10 (0.35)
Evapotranspiration	23.63 (79.38)	24.00 (80.65)	26.07 (87.61)	27.29 (91.68)	27.16 (91.26)	27.28 (91.66)	25.04 (84.14)
Lateral Drainage	NA	NA	0.55 (1.86)	0.73 (0.14)	0.90 (3.01)	0.73 (2.45)	4.59 (15.43)
Percolation through barrier layer	NA	0.952 (3.20)*	2.434 (8.18)	0.022 (0.08)	0.026 (0.09)	0.046 (0.15)	0.000 (0.00)
Volume of percolation through barrier layer (cu. ft./year)	NA	58,000*	147,800	1,500	1,600	2,800	0
Percolation through existing clay layer	4.986 (16.75)	0.947 (3.18)*	2.428 (8.16)	0.017 (0.06)	0.020 (0.07)	0.015 (0.05)	0.001 (0.002)
Volume of percolation through existing clay layer (cu. ft./year)	302,800	57,000*	147,500	1,100	1,200	900	50

* The HELP model does not take into account the increase in the clay barrier's permeability due to the effects of freezing and thawing in the absence of a protective layer. Thus, Alternative 2a could expect a much higher percolation through the barrier and existing clay layer as compared to the model predicted value.

NA - Not applicable.

All of the containment alternatives reduce risks to exposure from contaminated soils and sediments by restricting access as well as by reducing infiltration of precipitation into the waste. Good maintenance, however, would be required for long-term reliability, especially in the east ditch area. A water balance study was conducted for the J&L site to evaluate the degree to which the potential for contaminant migration would be reduced under each of the alternatives. The water balance study estimated the average surface water runoff, evapotranspiration, lateral drainage, and percolation through the cover systems of each alternative, and compared these alternatives with existing site conditions. The results of this study are shown in Table 1.

The model that was used for the water balance study was the HELP model, Version 2, 1989. This model, however, does not accurately model the percolation over time in cover systems having little or no protective layer over the barrier layer, and instead assumes that the clay barrier layer's permeability would remain constant through the post-closure period. In actuality, however, the effects of freezing and thawing could increase the permeability of the clay barrier layer, resulting in a much larger volume of percolation through the cap than the model would predict. As a result, Alternative 2a could expect a much higher volume of percolation through the clay barrier layer compared to what the model predicted. The other alternatives evaluated all include a frost protection layer; therefore, the model's predictions for those alternatives is more reliable.
As illustrated in Table 1, Alternative 4b would result in the least amount of percolation through the barrier layer as compared to other alternatives.

4) Reduction of Toxicity, Mobility, or Volume through Treatment evaluates treatment technology performance in the reduction of chemical toxicity, mobility, or volume. This criterion addresses the statutory preference for selecting remedial actions which include, as a principal element, treatment that permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants.

U.S. EPA recognizes that for large landfills such as the J&L site, source control alternatives that emphasize treatment to reduce the principal threat posed by the landfill contents may not be applicable or appropriate. As only containment alternatives were evaluated for the landfill operable unit at J&L, this remedy does not meet the criterion for reduction of toxicity, mobility, or volume through treatment, and therefore this criterion is not evaluated as part of the detailed analysis of alternatives.

5) Short-Term Effectiveness refers to the speed with which the remedy would achieve protection, as well as the remedy's potential to create adverse impacts on human health and the environment during the construction and implementation period. This includes protection of the community from any risk that would result from implementation of the proposed remedial action, protection of workers from any threats that may be posed during remedial action and the effectiveness and reliability of protective measures that would be taken, environmental impacts that could result from the implementation of an alternative and a corresponding evaluation of available mitigation measures, and the time required to achieve remedial action objectives.

All containment alternatives may pose some short-term risks due to site-related activities that could create noise and dust, increase local traffic, or disturb wastes. In general, the containment alternatives involve minimal disturbance of contaminants; however, the east ditch would require excavation and grading activities involving potentially contaminated soils/sediments. The sediment pond and, if appropriate, the south ditch, will also require some excavation and grading activities. In addition, the on-site drums containing RI waste will be consolidated on-site and therefore, will also create a temporary disturbance while being consolidated beneath the existing clay cap. Conscientious construction and operating practices, and appropriate health and safety measures would significantly reduce any potential risks to human health, as well as the off-site migration of contaminants via the air or surface water pathways during remedial action. For all of the alternatives except Alternative 1, measures would be taken to monitor and minimize any fugitive dust emissions, and minimize erosion and potential impact to Ladd Drain. The time required to complete cap installation was determined by assuming an average placement rate of 2,000 cubic yards/day for capping material and 1 acre/day for placement of GCL and FML. For all of the alternatives except Alternative 1, maintenance of the operable unit would cease only at the discretion of the Regional Administrator. However, a 30-year time frame was used for cost estimation purposes.

6) Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services required to implement the remedy. There are no serious barriers to the implementation of any of the containment alternatives, however, the following off-site components of each containment alternative may require permission for access from adjacent landowners: 1) The excavation material from the East Ditch which is on Sandfill No. 2 property, and 2) the installation of landfill gas monitoring probes south of the J&L site property and across Hamlin Road.

7) Cost addresses the estimated capital and operation and maintenance costs, as well as present net worth. See Cost Summary Table (Table 2, page 27 of this ROD).

8) State Acceptance indicates whether, based on its review of the RI/FS and Proposed Plan, the state of Michigan concurs with, opposes, or has no comment on the preferred alternative.

The state of Michigan concurs with the selected remedy because it is expected to attain a standard of performance that is technically equivalent to that required under Michigan Act 64. However, the State of Michigan disagrees with the U.S. EPA's determination that Michigan Act 64 is not an ARAR. The State of Michigan believes that Michigan Act 64 is an ARAR (see the attached Responsiveness Summary and letter of concurrence for further comments issued by MDNR).

9) Community Acceptance

Comments have been submitted by the Community, local officials, and PRPs. Comments and responses to those comments are described in the attached Responsiveness Summary.

IX. THE SELECTED REMEDY

Based upon considerations of the requirements of CERCLA, the NCP and balancing of the nine criteria, the U.S. EPA has determined that Alternative 4b is the most appropriate remedy for the I&L site. The components of the selected remedy are described below.

Alternative 4b consists of a 1-foot compacted clay layer overlain by a GCL/60 mil FML barrier layer, a drainage layer consisting of geonet with geotextile filter fabric, a 36-inch clean fill layer to provide frost protection, and a 6-inch topsoil layer. The GCL cover system replaces 2 of the 3 feet of compacted clay considered for Alternative 3b. The clay must be compacted to a maximum permeability of 1×10^{-7} cm/s with a minimum of 25% clay sized (0.005mm) particles. Alternative 4b was developed to evaluate the effectiveness of a geonet drainage layer and the placement of the drainage layer below the frost line. The geonet drainage layer would have a higher permeability than a sand drainage layer, and protection from frost would prevent clogging of the drainage layer. The east ditch would also require a modified cap construction, including a FML impermeable layer. The on-site drums containing RI waste will be consolidated on-site. In addition, a proper slope will be constructed and maintained so that all surface water runoff properly drains off the cap into a collection system, or drainage ditches around the perimeter of the site.

Other components of the selected remedy include:

- Removing existing vegetation from the landfill surface.
- Abandoning (plugging) the culverts, consolidating any contaminated soils/sediments beneath the existing landfill cap and backfilling the sedimentation pond to grade with clean fill.
- Consolidating any contaminated surface soils and sediments, including landfill waste, from the east ditch to beneath the existing landfill cap.
- Cleaning and regrading the south ditch to retain existing stormwater capacity.
- Regrading the surface of the site to promote runoff.
- Preparing the existing surface in order to provide a foundation for the new cap.
- Retrofitting existing monitoring wells.
- Installing a passive gas management system.
- Vegetative cover placement.
- Fence installation.

- Implementation of institutional controls to limit land and groundwater use.

- Monitoring plan for cap integrity and fence inspection, and landfill gas migration.

- Implement long-term groundwater program to ensure effectiveness of the remedial action.

L. STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent technologies to the maximum extent practicable. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for remedies that reduce the toxicity, mobility, or volume through treatment as a principal element. The size of the landfill, as well as the nature and location of wastes, precludes a remedy in which contaminants could be excavated and treated cost-effectively.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

1. Protection of Human Health and the Environment

Implementation of the selected remedy will protect human health and the environment by reducing the risk of exposure to hazardous substances present in surface soils and reduce the potential for contamination to migrate to groundwater at the site. Groundwater monitoring will be required to provide early warning against the risk that the hazardous substances present in the leachate may migrate and further contaminate the aquifer. Institutional controls will be imposed to restrict uses of the site to prevent exposure to hazardous substances and contaminants in the soil and the leachate at the site. No unacceptable short-term risks will be caused by implementation of the remedy. The community and site workers may be exposed to dust and noise nuisances during construction of the final cover, however mitigative measures will be taken during remedy construction activities to minimize the impacts of construction upon the surrounding community and environments. Ambient air monitoring will be conducted and appropriate safety measures will be taken if contaminants are emitted.

2. **Compliance with ARARs**

The selected remedy for the J&L Landfill Superfund Site will comply with all identified, applicable, or relevant and appropriate, Federal and more stringent State requirements (ARARs) unless waived pursuant to Section 121(d)(4)(B). The ARARs for the selected remedy are listed below:

Chemical-Specific Requirements

Chemical-specific ARARs regulate the release to the environment of specific substances having certain chemical characteristics. Chemical-specific ARARs typically determine clean-up levels at a site when the remedy requires treatment or removal of contaminated media, or involves a discharge of contaminated or treated media. The selected remedy does not require contaminant treatment, removal or destruction, but rather relies on containment of wastes left in place. No chemical-specific requirements are applicable, or relevant and appropriate, at the J&L Landfill Superfund Site for this operable unit.

Location-Specific Requirements

Location-specific ARARs are those requirements that relate to natural site features, such as wetlands and floodplains. The State of Michigan has identified the following as a location-specific requirement for the remedial action at this site:

Michigan Inland Lakes and Streams Act 346 of 1972

Michigan has identified Act 346 as an ARAR. The Act addresses filling or partial filling of streams. The Ladd drain, adjacent to the site, drains into the Clinton river. Because Act 346 is ARAR, the remedial action must be implemented with care to avoid the filling or partial filling of Ladd Drain.

Action-Specific Requirements

Action-specific requirements are those requirements related to the specific remedial action selected for the site. The remedial action selected for the J&L Landfill Site is the installation of a final cover for the landfill. This action will involve the movement of waste within the boundaries of the site, grading and placement of the final cover, closure of the sediment pond on-site with abandonment of the inlet and outlet culverts in the pond, and long term maintenance and post-closure care, including installation of gas venting and ground water monitoring systems. The following laws and regulations are ARAR for this action:

FEDERAL ARARs

Clean Air Act

40 CFR Part 50: Air quality standards must be achieved to address emissions that may occur during installation of a final cover and gas venting from the landfill.

Resource Conservation and Recovery Act (RCRA)

Subtitle D Part 241

Subtitle D of RCRA governs the disposal of solid waste. The Subtitle D regulations, promulgated in October, 1993, are not applicable to the site; but the U.S. EPA has determined that these regulations may be relevant and appropriate. These include the following regulations:

40 CFR Part 257: Requirements for classification of solid waste disposal facilities and practices

40 CFR Part 258: Criteria for municipal solid waste landfills

Although this site is not a municipal solid waste landfill it does appear that some portion of the landfilled waste at the J&L Landfill Site was similar to municipal solid waste; therefore, the criteria established by this requirement may be relevant and appropriate.

The requirements of 40 CFR Part 258 and associated guidance (guidance documents are not ARAR but do constitute a factor to be considered) recommend the use of a barrier layer to prevent infiltration consisting of two feet of clay or a technical equivalent which will provide equal or greater protection against infiltration of the cover by precipitation.

Subtitle C

Subtitle C of RCRA is not applicable at the J&L Landfill Superfund Site. The effective date of the regulations regarding the disposal of listed hazardous waste was November 19, 1980. Waste disposed prior to that date is not considered as RCRA listed hazardous waste even if the waste in question is similar to RCRA listed hazardous waste. Since the final disposal of waste at the J&L Landfill Site took place before the effective date of the regulations, these requirements are not applicable; however, a number of the requirements set forth in Part 264 regarding landfill closure are relevant because they deal with landfill closure and are also appropriate to the specific conditions at this particular site. These requirements include the regulations set out below:

40 CFR Part 261 Identification of hazardous waste

40 CFR 264.117 These requirements regulate post-closure care, including groundwater monitoring, and future use of the property.

40 CFR 264.228 These requirements regulate closure and post-closure care. These requirements are relevant for closure and post-closure care of the landfill and the sediment pond.

40 CFR 264.310 These regulations set forth requirements for closure and post-closure care at landfills. The landfill closure requirements set forth in this regulation include requirements that the final cover must be designed and constructed to minimize the migration of liquids through the landfill. In order to satisfy this requirement, the Office of RCRA has established a policy of

SUMMARY OF QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC MEETING AND U.S. EPA RESPONSES TO THESE COMMENTS.

Written comments received during the public comment period for the J&L landfill site have been summarized below together with U.S. EPA's response to these comments. Copies of the original letters are available for review in the information repositories and Administrative Record.

Comments by the Michigan Department of Natural Resources (MDNR)

COMMENT: The first comment is a reiteration of MDNR's view that Michigan Act 64 is an Applicable or Relevant and Appropriate Requirement (ARAR).

RESPONSE: The respective positions of MDNR and U.S. EPA on this question have already been established in correspondence between the Agencies, particularly in letters to and from Mr. William Bradford (MDNR) and Mr. James Mayka (U.S. EPA). U.S. EPA has determined that Act 64 is not an ARAR for this site. U.S. EPA has determined that Act 64 is not applicable as the wastes at the site were disposed prior to the effective date of the Act's implementing regulations. The Act may be relevant as the remedial action will require closure of a landfill at which wastes similar to listed RCRA wastes were disposed; however, U.S. EPA has determined that the specific requirement that three feet of clay be used for the cover is not appropriate as the selected remedy will achieve equal or better performance in preventing infiltration of precipitation by using a one foot layer of Geosynthetic Clay Liner (GCL). The resulting decrease in overall thickness of the cover is a significant advantage as the topography of the area presents engineering problems related to the height of the cover system relative to the surrounding area. While U.S. EPA has determined that Act 64 is not ARAR, the Agency does believe that the Act's requirements and, in particular, the standard of performance it sets forth for reduction of infiltration of precipitation through the waste mass are to be considered (TBC).

COMMENT: Michigan believes that only Alternative 3b meets the technical requirements of Act 64; however, MDNR will not object to the selection of Alternative 4b, provided that it attains the performance standard for reduction of infiltration required by Act 64.

RESPONSE: The selected alternative 4b does attain a standard of performance equivalent to that required under Act 64. Therefore, the MDNR has concurred with the selected remedy.

COMMENT: MDNR states that the proposed alternative must also address issues related to the sediment pond, the east ditch, the current drums on-site, and surface water runoff.

RESPONSE: In order to address these concerns, the following activities will be included as part of the remedy;

- Contaminated sediments from the sediment pond in the northwest corner of the site will be removed before the sediment pond is filled to grade with clean fill. These sediments will then be consolidated underneath the current landfill cap.

- Contaminated surface soils in the east ditch will be removed before capping and consolidated underneath the current landfill cap.

- The drums currently on site that are filled with personal protective equipment (PPE) and drilling cuttings from on-site activities will be shredded and consolidated in a contiguous part of the landfill.

- Any drums on site filled with site-related liquid waste (i.e., decontamination water, etc.) will be tested for analytical parameters and removed for proper off-site disposal unless the substantive components of applicable groundwater discharge permit exemptions are met.

- The proposed landfill cap will be designed such that surface runoff, as well as the water that filters through the cap to the drainage layer above the GCL, is directed to one of the on-site drainage ditches or other appropriate outlet.

COMMENT: The proposed plan description of U.S. EPA's preferred alternative did not clearly state the order of placement of the GCL and flexible membrane liner (FML).

RESPONSE: The order is clarified in the Record of Decision (ROD), which states that the clay will be overlaid by the GCL followed by the FML.

COMMENT: Page 5 of the proposed plan did not include the one foot of clay over the waste before the GCL and FML are laid down.

RESPONSE: This item is appropriately addressed in the ROD where the one foot of clay is clearly included as part of the remedy.

COMMENT: MDNR believes that the ARARs listed in the Focussed Feasibility Study (FFS) are actual, not potential state ARARs for OU1.

RESPONSE: Until a Record of Decision is issued in which U.S. EPA selects a remedy, it is appropriate to qualify all references to ARARs as "potential". This is because an ARAR is triggered by on-site remedial action. As long as remedial actions are only considered as possible alternatives or proposed alternatives, it is appropriate to refer to "potential" ARARs which might be triggered if a particular remedial action alternative is selected. When the Record of Decision is issued, U.S. EPA makes a final determination regarding all ARARs for the remedial action selected.

COMMENT: MDNR states that the final cover design needs to address waste dewatering and groundwater remediation options because such future actions would cause substantial settlement of the landfill cap. In addition, they recommend the use of a very low density polyethylene as the material for the FML.

RESPONSE: These comments assume that a future operable unit (OU2) will dewater the waste mass as part of the remedy. This cannot be determined at this time; however, potential future actions will be considered during the remedial design phase. At that time,

potential future actions to remedy groundwater will be considered as part of the design process for selecting appropriate materials for the FML.

COMMENT: MDNR states that Act 64 requires a groundwater monitoring program.

RESPONSE: Although Act 64 is not an ARAR for this site, a groundwater monitoring program is included as part of the selected remedy.

Comments from Officials of the City of Rochester Hills.

1. Letter from the Mayor, Billie Ireland (with enclosure prepared by the City Engineer)

COMMENT: The Mayor would like to see the State and U.S. EPA work cooperatively and address the area-wide contamination problem, not just J&L Landfill as an isolated issue. The Mayor's letter also expressed the City's desire to work in close cooperation with U.S. EPA on site remedy issues. The City expressed concerns regarding drainage and run-off from the landfill and the potential for adverse impacts on the surrounding area. The future use of the area, along with both physical and aesthetic impacts of remediation at J&L Landfill to the area are also concerns expressed by the Mayor.

RESPONSE: a. In response to the expressed hope that U.S. EPA will work closely with the City, U.S. EPA will be working cooperatively and closely with local government entities throughout the remedial process.

b. Concerns that remediation work will detrimentally affect adjacent properties or public facilities in the area, particularly with respect to storm water runoff from the site, will be addressed in accordance with 40 CFR 264.228, and 40 CFR 264.310 (b). Both of these laws address landfill cover drainage, run-off and run-on in the context of preventing erosion to the cover, and any such detrimental effects to the maximum extent practicable. One of the technical criteria considered in the selection of the remedy was the height of the various cover alternatives and the consequent impact on the surrounding area. This concern will also be further considered during the Remedial Design (RD) phase of implementation. U.S. EPA will work to prevent adverse impacts on the surrounding area to the maximum extent practicable, consistent with the primary goals of protecting human health and the environment.

c. To the extent practicable, the appearance of the site will be considered; however, site security will have to be assured; therefore, a security fence is one component of the selected remedy.

d. The Mayor's concern that the J&L Landfill site is one of many landfills in this area and should be addressed as part of an area-wide problem by both the U.S. EPA and MDNR, is a concern shared by many. The U.S. EPA has consistently urged this idea with the State; however, until agreements can be reached regarding an area-wide approach to contamination, the Agency's mandate to respond to releases from identified facilities requires that the J&L landfill be addressed as a separate site.

2. Letter from the Director of the Planning Department

COMMENT: The Planning Commission shares the MDNR's support of Alternative 3b. The cap in 3b includes a thicker clay barrier and a 12-inch drainage layer.

RESPONSE: The U.S. EPA believes that the selected remedy offers equal or greater protection against infiltration as compared to Alternative 3b, and agrees with other comments which support a reduction in the amount of clay required as a barrier layer.

COMMENT: The Planning Commission feels that sealing the landfill before the evaluation and remediation of the groundwater contamination is premature and that the OU2 process may show that groundwater contamination is running off into the Ladd Drain and the Clinton River.

RESPONSE: As part of the selected remedy, U.S. EPA has included a groundwater monitoring program which will serve as an indicator of the effectiveness of the cap and the potential for any contaminants detected in groundwater to migrate off-site. Consistent with Agency policy, U.S. EPA is trying to address the most immediate and greatest potential risks first at the J&L site. The Remedial Investigation (RI) shows that present risks could result from direct contact with contaminated material, while potential risk from groundwater is a future risk based on a future residential scenario, where residents would be living on the landfill and drinking well water from the contaminated shallow aquifer. Capping the landfill will reduce present risks by reducing the potential for direct contact with contaminants, as well as reduce the potential for infiltration and groundwater contamination and off-site migration of contaminants while OU2 is being addressed. The selected remedy includes the imposition of deed restrictions to prevent future use of the property that might adversely affect the remedy. These restrictions will also act to prevent future risk by banning future residential development or groundwater consumption at the site.

3. Comments from Manager of Inspection Services

COMMENT: Jerome Eby, the Building Department's Manager of Inspection Services, expresses concern about the impact of the proposed remedy on drainage patterns in the area.

RESPONSE: As mentioned earlier, such concerns will be addressed during the Remedial Design in accordance with ARARs and are expected to maintain current drainage patterns.

As far as the aquifer is concerned, OU2 will specifically address these concerns. U.S. EPA has consistently expressed support for the idea of an area-wide groundwater study.

4. Comments from the City Engineer

COMMENT: Jim Dietrick, City Engineer, was primarily concerned with run-off and drainage issues, specifically regarding the surface run-off that sheet-flows west to east across the landfill and the building west of the site.

RESPONSE: The remedy will be designed to ensure that, to the maximum extent practicable, the surface run-off is not significantly altered by the remedial action and that adjacent property is not adversely affected.

COMMENT: Mr. Dietrick also questioned the number of trucks that will be hauling materials and what their route will be.

RESPONSE: This issue will be determined during the remedial design phase, once the exact volume of materials required for remediation can be more accurately estimated. At that time, the public will be notified of such actions.

As far as the legal concerns raised regarding compliance with local ordinances, CERCLA and the NCP do not require U.S. EPA to obtain permits for any actions conducted entirely on-site; however, the remedial action will comply with the substantive portions of any applicable or relevant and appropriate requirements.

Comments by Private Citizens

COMMENT: Mr. Robert Green of Waterford, Michigan recommends that additional measures for implementation be considered;

First of all, he recommends a plan that does not depend entirely upon containment as the only means of addressing the contamination at the site, but may also include some non-containment activities in conjunction with capping.

RESPONSE: In response, U.S. EPA is in the process of addressing OU2, which will consider alternatives for groundwater. Also, alternatives considered for this site follow U.S. EPA's presumptive remedy approach for landfills, which supports capping alternatives for sites where there is a large volume of waste materials, contaminated at low levels. The selected remedy is protective of human health and the environment. Attempting to excavate and remove even portions of the J&L landfill would not be practicable or cost effective, and no more effective in reducing the risk.

COMMENT: Mr. Green expresses the concern for wildlife and the protection of dwindling habitat.

RESPONSE: The concern for wildlife is very important, and was considered during the remedy selection process. The selected remedy is designed to prevent the migration of site contaminants by eliminating the potential for direct contact with contaminated materials and substantially reducing the potential for infiltration, and the potential for contaminants to migrate to the aquifer, and potentially to the river. In addition, it should also be pointed out that while the selected remedy will have positive impacts for wildlife, the RI has not indicated any adverse effects on wildlife or the Clinton River, and none are to be expected as a result of the remedial action.

COMMENT: Mr. Green recommends the installation and monitoring of permanent downgradient wells.

RESPONSE: Installation of additional permanent down gradient monitoring wells is not necessary at this time; however, the groundwater monitoring program listed in the selected remedy will address such concerns.

COMMENT: Mr. Green recommended that a subsurface drainage collection system be installed using both vertical and horizontal drilling techniques.

RESPONSE: A drainage collection system, as such, is not determined to be appropriate at this site because the remedy includes a drainage layer to deal with water which infiltrates through the cap layer. This water would be uncontaminated water which had infiltrated through the clean materials of the upper layers of the landfill cover. As already indicated above, drainage and runoff will be directed to the existing drainage system.

COMMENT: Mr. Green would like to see both groundwater and gas monitoring programs as part of the remedy.

RESPONSE: Groundwater monitoring, as well as gas venting and appropriate air monitoring are included as part of the selected remedy.

COMMENT: A continuing effort for future reimbursement of any clean-up costs from any and all PRPs associated with the site is recommended in light of recent U.S. Court of Appeals decisions which allow for institutional liability of contaminated sites.

RESPONSE: U.S. EPA has a policy of "Enforcement First" and will pursue reimbursement of all response costs from potentially responsible parties (PRPs), in addition to seeking performance of both the remedial design and remedial actions by the PRPs.

COMMENT: Specific Deed Restrictions for the site have not been detailed and fully disclosed for this remedy.

RESPONSE: In regard to deed restrictions, U.S. EPA will seek the imposition of institutional controls which will be defined and specified in the Consent Decree (CD) or Order for implementation of the selected remedy. The CD will be a public document, and will be available for public comment prior to being entered by the court. The deed restrictions will be recorded in the official chain of title and will be public documents. U.S. EPA will seek deed restrictions that will protect the integrity of the remedial action and prevent future land use that would endanger human health through ingestion or direct contact with hazardous substances.

COMMENT: Ms. Ruth Haselhuhn, a local resident, has described unpleasant odors from the area, as well as the groundwater being a possible drinking water source.

RESPONSE: The intention of addressing J&L landfill with the selected remedy for OU1, and then OU2, is to alleviate some of these concerns. Gas venting and groundwater

monitoring programs incorporated into the selected remedy will address these specific issues related to J&L Landfill. It is also important to note that arsenic found in the groundwater beneath J&L Landfill was not found to have migrated off-site or downgradient of the site.

COMMENT: Mr. David Van Maele suggests planting trees on the site and making it a public park, or at least taking into account other measures to beautify the site.

RESPONSE: Neither the vegetative cover nor the future uses permitted at the site can be allowed to interfere with the effectiveness of the cover as a barrier to prevent contaminant migration. For example, tree roots could interfere with the integrity of the remedy by damaging the cover. However, the aesthetic concern expressed about the appearance of the site will be discussed with the PRP during negotiations. If U.S. EPA performs the remedy, aesthetic concerns will be addressed by the Agency.

Comments by the Clinton River Watershed Council

COMMENT: The Council is concerned, as others mentioned above are, with diverting the water around the landfill, as well as addressing OU2 as soon as possible.

RESPONSE: These concerns about the area-wide problem and groundwater, are being considered partially in the selected remedy and as part of OU2. As mentioned in the Council's letter, "no one is using groundwater wells in this vicinity for drinking water supply purposes and there are not detectable impacts on Clinton River water quality from groundwater inflow or surface water conveyed via the Ladd Drain".

Comments by LTV Steel, the Potentially Responsible Party (PRP)

General Comments

COMMENT: LTV Steel asserts that the remedial action objectives (RAOs) were improperly developed because risk from groundwater ingestion was considered in developing RAOs for this operable unit. LTV asserts that this operable unit is specific to the soil medium; therefore, that U.S. EPA acted erroneously in considering any risks other than direct contact with soils in developing RAOs for this operable unit.

RESPONSE: The U.S. EPA does not consider operable units for individual media apart from the context of the site as a whole. The U.S. EPA looks at how the action selected for one unit will affect other media at the same site, with the objective of achieving a consistent, coordinated series of remedial actions. Developing RAOs for individual operable units without considering the effect on other media could result in a significant increase in cost, without sufficient gains in protectiveness to justify the additional cost. U.S. EPA's Risk Assessment Guidance calls for preparation of a baseline risk assessment which considers all risks presented at a site.

COMMENT: LTV states that the landfill does not have a bottom liner and that some waste is below the groundwater table, therefore they do not believe it necessary to eliminate surface water infiltration as part of the remedy. LTV Steel also believes that groundwater

contamination contribution through infiltration is not as significant as groundwater flow, and thus would like to address groundwater flow and contribution to groundwater contamination separately.

RESPONSE: Groundwater contamination contribution through groundwater flow will be addressed separately during development of the proposed plan for OU2; however, there is still contribution and potential for further contribution of groundwater contamination through infiltration. Thus, infiltration is a consideration of the selected remedy. Also, EP toxicity tests performed as part of the RI indicate that selenium, lead, and possibly some other heavy metals have the potential to leach from unsaturated materials into the groundwater.

U.S. EPA will consider groundwater flow through the waste as part of the focused feasibility study which will develop alternatives for the second operable unit.

COMMENT: LTV Steel believes that the risk assessment developed for the site overestimates the total cancer risk and inappropriately uses groundwater as a media of concern, and therefore does not agree with the RAOs established.

RESPONSE: U.S. EPA's risk assessment process is based on specific guidance developed for this purpose, and it is a conservative process. J&L Landfill's Risk Assessment complies with approved U.S. EPA Risk Assessment guidance.

COMMENT: LTV Steel describes what they believe to be inaccuracies in the RI characterization of site contaminants.

RESPONSE: Some of these inaccuracies described are not pertinent to OU1, and are more specific towards groundwater issues, which will be addressed in OU2. One specific comment which, if accurate, would possibly affect the risk assessment in regard to PAHs is the current slope factor for Benzo(a)pyrene (BaP). In July 1992 the slope factor of 5.8 $(mg/kg\text{-}day)^{-1}$ as described by LTV, was revised to 7.3+0 $(mg/kg\text{-}day)^{-1}$. The original slope factor of 1.15+1 $(mg/kg\text{-}day)^{-1}$ applied in the RI is no longer valid; however, use of the revised lower slope factor for BaP would not lower the calculated risks to a point at which the conclusions of the risk assessment would be changed. The change would only decrease the cancer risks estimated to result from exposure to carcinogenic PAHs by approximately one third (37%). Therefore, the total reasonable maximum exposure (RME) cancer risk for the on-site dirt bike rider decreased from 1.4×10^{-5} to 1.2×10^{-5} and the total RME cancer risk for the off-site dirt bike rider decreased from 2.4×10^{-5} to 1.7×10^{-5}. Also, the total RME cancer risk for the future resident was unchanged. Thus, the risk levels still fall within U.S. EPA's point of departure of 1×10^{-6}.

COMMENT: LTV Steel disagrees with the type of cap recommended by the Agency because they believe it represents a misapplication of ARARs. The recommended alternative, 4b (4a in the FFS) is based on a technical equivalent of RCRA Subtitle C (hazardous waste) cover system. As RCRA Subtitle C is not an ARAR for the J&L Landfill, an FML is not required to meet RAOs and ARARs.

RESPONSE: The Agency selected alternative 4b, based on the evaluation of the nine evaluation criteria and the technical merit of 4b as opposed to a "misapplication of an ARAR." Although the selected remedy meets a higher performance level than is legally required, alternative 4b was also found to be more cost effective proportionate to the degree of protectiveness it affords, compared to all the other alternatives evaluated. For instance, according to the HELP model, 4b allows 0.001 inch/year, or 453 gallons/year of percolation through the barrier layer for the cost of an additional capital cost of $ 535,500. LTV's recommended cap allows 1.7 inches/year, or 770,908 gallons/year of percolation through the barrier layer.

COMMENT: Related to the above comment, LTV Steel does not agree with the inclusion of a FML as part of the selected remedy.

RESPONSE: The U.S. EPA has determined that the FML provides a very cost effective engineering component which greatly improves the design and protectiveness of the cover system as a whole for this site.

COMMENT: LTV Steel disagrees with the thickness of frost protection for this cover system, based on their knowledge of frost protection applications at other landfills in the area. LTV specifically compares 30 inch frost protection layers allegedly approved for G&H Landfill and Rasmussen Landfill.

RESPONSE: The Record of Decision for G&H Landfill specifies 42 inches of frost protection. Although the PRPs contested this during negotiations, the Agency required that 42 inches of frost protection be used at the G&H Landfill. At Rasmussen Landfill, 30 inches of frost protection is sufficient because the site is in Livingston County where local frost protection codes are at 30 inches. In Livingston County there are lower average frost depths than for Oakland County, where the J&L site is located; therefore, any frost protection layer less than 42-inches would not meet local codes and requirements for frost protection required in Oakland County.

Proposed Plan and FFS Comments

COMMENT: LTV recognizes that the rules for Michigan Act 307 include a cleanup criterion for soils that considers leaching of chemicals from soils into groundwater (R299.5711)(2). However they do not believe that there is a comparison presented in the RI or FFS of concentrations in groundwater expected from leaching of soil contamination to assess whether the estimated infiltration of the proposed remedy will exceed a Type B groundwater cleanup level. Regardless, LTV does not believe that the recommended remedy includes groundwater remedial action objectives (RAOs), and that it is not appropriate nor necessary to propose a remedy that addresses any groundwater exposure.

RESPONSE: Since Act 307 is an ARAR, the requirements of Act 307 should be met; however, R299.5711(2) is Type B criteria, and J&L Landfill site is a Type C cleanup. The aforementioned rule states that "to ensure that soils do not pose a threat of aquifer contamination, the concentration of the hazardous substance in soil shall be below that which

produces a concentration in leachate that is equal" to Type B Cleanup Criteria for ingestion of groundwater. As indicated by LTV, no comparison between leachable concentrations in groundwater and Type B Cleanup Criteria was made: this is due to the fact that this site is a Type C cleanup under the Act 307 rules. Therefore, this comment is not applicable to the selected remedy. Also, the cover design that prevents water infiltration to the greatest extent would be the preferred remedy.

COMMENT: LTV states that the results of the HELP model evaluation indicates that the highest contribution of chemical migration to the groundwater is from the saturated waste (below the watertable) and not the unsaturated waste. LTV also states that the remedial measures which reduce contaminant migration from the unsaturated waste to the groundwater will have only a small effect in reducing the overall contaminant migration to the groundwater. Implementing LTV's alternative cover (see Table 3 of this document) would reduce the unsaturated waste contribution to only 5 percent.

RESPONSE: The contaminant Migration Model presented as an Attachment to LTV's comments provides an acceptable equation and methodology for determining the ratio of the contaminant migration from the unsaturated waste to the total contaminant migration from the unsaturated and saturated waste. However, LTV makes an unvalidated assumption that chemical concentrations within the infiltrating water from the unsaturated zone and the saturated zone would be the same. This assumption would only be true after the system (landfill) has reached an "equilibrium" with respect to contribution of contaminants from unsaturated and saturated waste. Typically as time progresses, the concentrations of chemical constituents within the groundwater would decrease during a shorter time period than the concentrations of constituents within the pore water of the unsaturated zone. This is primarily due to the higher water volume flowing through the saturated waste material. Therefore, field measurements (i.e., lysimeter) should be taken to validate the above assumption before simplifying the equation to ratio of flows. Additionally, U.S. EPA's selected remedy will reduce the unsaturated waste contribution to 0.042 percent, compared to the 5 percent offered by LTV's alternative cap.

COMMENT: LTV describes a comparison against the evaluation criteria, and in general of the U.S. EPA Proposed Plan Cap and Alternative Cap. LTV states that both the proposed plan recommended cap and the LTV alternative cap would be protective in the long term for human health and the environment.

RESPONSE: The proposed plan recommended cap would provide a greater degree of environmental protection than the LTV alternative cap due to the reduction in infiltration through the landfill.

The statement under the bullet for Reduction of Toxicity, Mobility or Volume through Treatment that it (the proposed plan cap) would only have a small effect in reducing the overall migration of contaminants is not substantiated as discussed in the previous response.

Remedial Investigation Comments

COMMENT: LTV comments that the site was improperly characterized during the RI and lists three specific comments summarized as follows:

- The RI did not define site-specific contaminant fate and transport mechanisms and the extent of contamination.
- The RI did not differentiate between chemicals that can be solely attributed to the site, as opposed to potential off-site sources.
- Background sampling criteria were not met.

RESPONSE: The above specific comments were apparently summarized from a comment letter dated 9 April 1992 where specific issues are brought up. As such, specific responses are contained in the following sections. However, no details regarding the first comment (site-specific contaminant fate and transport) are given in either letter. There is reference to a LTV comment letter dated 23 March 1994, but it is unknown whether this is the letter contained in Attachment A with a different date.

9 April 1992 Letter

General RI Comments

COMMENT: LTV states that the overall approach followed in conducting the RI is the state of the practice and generally conforms to the current regulations and guidance documents.

RESPONSE: U.S. EPA agrees with this comment.

COMMENT: LTV states that laboratory data sheets were not provided for samples from the waste material, groundwater, surface water, surface soil and sediment. Also, that detection limits for all the chemicals reported were not present in the summary tables.

RESPONSE: Due to the volume of data sheets generated during the RI, copies were not incorporated into the RI Report. Copies were sent to U.S. EPA as they were received from the Contract Laboratory Program (CLP) laboratory or the U.S. EPA Central Regional Laboratory (CRL). All analytical raw data was validated by WESTON (U.S. EPA's consultant) personnel in accordance with U.S. EPA validation guidelines. Generally, the detection limits for all analytes were achieved as specified in the QAPP (January 1990). In some cases, laboratory QA objectives were not met due to matrix interference or non-linear instrument response. In these cases, the detection limit is reported on the data summary tables and qualified with "UJ." For the purposes of the RI, these were considered non-detections.

COMMENT: LTV believes that several background samples were selected for this investigation that do not meet background sample criteria. It is stated that background media sampling should meet one or more of the following summarized criteria:

Table 3
Comparison of Various Cap Components for the J&L Landfill Cap

Component	US EPA Recommended Cap (FFS Alternative 4b)	LTV Alternative Cap
Topsoil	6 in.	6 in.
Fill Thickness	36 in.	12 in.
Filter Fabric	(Composed with the Geonet)	Non-woven Geotextile
Drainage Layer	Geonet	12 in. sand
Flexible Membrane Liner (FML)	60 mil	none
Geosynthetic Clay Liner (GCL)	Bentomat or equivalent	Bentomat or equivalent
Compacted Clay	12 in.	12 in.
Cap Construction Cost	$1,893,700	$1,104,800
Total Cost	$4,730,400	$3,233,700

- Locations should be selected such that there is no potential impact from site contaminants.
- A minimum of three background samples should be collected.
- Background samples should be of the same material type and depth range as the investigative samples collected from each media.

RESPONSE: A specific reference to these guidelines is not provided. The above summarized criteria are not found or referenced in OSWER Directive 9355.3-01 "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," which was the document primarily used to develop the RI planning documents at the time. Investigative sample results were compared to available site-specific background samples which were limited due to the presence of other landfill sites surrounding the J&L Landfill site; as well as typical concentrations in soils as published by the U.S. EPA and MDNR. The combination of these three sources yields an adequate database for comparison purposes. Also, draft MDNR guidance such as "Verification of Soil Remediation" was not available at the time of the RI for J&L Landfill. Therefore, this guidance would not have been used at the time of the RI and is not applicable.

However, considering the above mentioned criteria, the fact that monitoring wells GW-02S and GW-02D are located on the J&L Landfill property in the southwest corner does not constitute deletion as suitable background evaluation points. Historical aerial photographs do not indicate that filling activities occurred in this area and the boring logs for these wells do not indicate that any waste materials were encountered. These facts, combined with the eastward groundwater flow direction, indicate they are suitable background evaluation points.

COMMENT: LTV also indicates that only two upgradient surface water samples were collected (SW-05 and SW-09).

RESPONSE: Additional upgradient surface water sample locations were identified in the immediate vicinity of the study area; however, the locations were dry even after significant precipitation and could not be sampled.

Also, surface soil sample results were compared to soil samples collected from a background soil boring located southwest of the site. It is acknowledged that the depth intervals and geologic materials (sandy) of the background soil boring are different than the landfill cap materials (predominantly clayey). However, it should be noted that the clayey landfill cap materials are anomalous to the area. The natural surficial soils of the area are sandy loam (see Subsection 3.5.2 of the RI report). The only other clayey surface soils within the study area are cap materials for surrounding landfills which would not represent natural background surficial soil conditions either. This being the case, a comparison of the chemical composition of cap materials to natural background sandy soils is valid. It should also be noted that a surface soil sample was also collected on the property south of J&L across Hamlin Road as a background sample during the additional off-site characterization work described in Appendix H. Comparing the analytical results from this sample indicates the chemical composition is very similar to that of the background soil boring soil sample results and that the on-site surface soils results are still high (especially inorganics) in comparison.

COMMENT: LTV believes that the RI report does not evaluate the data to identify which chemicals are site related and that the waste characteristics of the surrounding landfills are similar to those at J&L Landfill. Additionally, the RI does not discuss potential contributions of chemicals from other surrounding landfills.

RESPONSE: In response to the comment that the waste characteristics of the surrounding landfills is similar to that of the J&L Landfill, the U.S. EPA does not believe this to be the case. The J&L Landfill is composed of 65% slag materials, as stated in the RI Report. The surrounding landfills are filled with general refuse with the exception of a small area within Sandfill Landfill No. 2 and some slag spread over the surface as described in Appendix H. The chemical characteristics of the general refuse and slag materials are quite different. In general volatiles and semivolatiles were found associated with general refuse and inorganics were found associated with slag materials.

Specific RI Comments

COMMENT: Pg 3, Groundwater. Eight chemicals were evaluated by LTV: Benzene, trichloroethane, phenol, bis(2-ethylhexyl)phthalate, arsenic, cyanide, lead and iron. LTV's evaluation indicates only arsenic to be directly attributable to J&L Landfill. The other chemicals were found at higher concentrations in upgradient wells. Also, although monitoring well GW-05S is screened in the waste material and showed higher concentrations of phenol and iron than in upgradient wells, LTV considers this monitoring well to be a leachate well. LTV also believes that phenol and iron most likely have migrated to the site from upgradient sources and are not site related.

RESPONSE: LTV has selected eight chemicals (benzene, trichloroethane, phenol, bis(2-ethylhexyl)phthalate, arsenic, cyanide, lead, and iron) for an evaluation of whether they are site-related or not in groundwater. The selection criteria for these eight compounds in relation to the point that LTV is trying to make is unclear. It is stated in the RI report that benzene and lead were detected in both upgradient and downgradient wells and the placement of the wells indicates that the potential sources of these contaminants may be an upgradient source and/or general refuse within J&L. It is also acknowledged that lead was detected in quality control flush water samples at concentrations up to 7 μg/L. Because of this, there is uncertainty as to whether low concentrations of lead detected in groundwater can be attributed to the site. However, it must also be realized that lead is present within the landfill waste materials and may have migrated to the water table. This conclusion is based on the results of EP toxicity data for which lead was found to exceed maximum allowable concentrations indicating the refuse materials in the landfill contain lead and can be considered hazardous due to leachability.

There is apparently some confusion regarding trichloroethane. U.S. EPA takes this to mean 1,1,1-trichloroethane; however, this compound was not detected in either Round 1 or Round 2 groundwater sampling. If it is a typographical error and LTV meant trichloroethene, this compound was only detected once in an upgradient well at a low concentration.

Phenol was detected in two downgradient well locations at concentrations ranging from 30 to 410 μg/L compared to a single upgradient detection (during second round sampling) at 150

ug L. The premise for deleting phenol as a site contaminant seems to be its detection in MW-05S as LTV considers MW-05S to be a leachate well rather than a groundwater well. Given the fact that landfill waste is present below the natural water table in direct contact with underlying aquifer materials (sand) without benefit of a low-permeability liner, a case can be made to consider this a water table well. However, if we delete the phenol results of MW-05S we are still left with the fact that phenol was detected in downgradient deep well MW-05D during both rounds at comparable concentrations, whereas phenol was detected in an upgradient well only during the second round of sampling.

The compound bis(2-ethylhexyl)phthalate was detected in upgradient monitoring wells at similar or greater concentrations than downgradient wells. This compound is also a common laboratory contaminant. However, this compound can be considered site-related and is a chemical contaminant of potential concern (Risk Assessment) due to its presence at high concentrations in waste materials and the potential for it to migrate to groundwater. Similarly, cyanide was only detected in upgradient wells but can still be considered a site contaminant due to its presence in other media.

Although iron is not a chemical of potential concern, the groundwater analytical results clearly indicate that iron concentrations in groundwater are greater in downgradient wells compared to upgradient wells. This is not surprising given slag materials and EAF dust (not found in upgradient landfills) are composed of iron oxide at greater than 27% by weight (Table 2-1 of the RI).

The upcoming additional groundwater monitoring at the site may help to resolve some of the groundwater issues highlighted in this section. It should also be noted that LTV split groundwater samples in the field with U.S. EPA during the RI. The results of these samples have not been made available to U.S. EPA by the PRPs for review and comparison.

COMMENT: It is stated in the RI Report (Subsection 6.2.2) that the results of surface water sampling indicate that, in general, volatiles, semivolatiles, and pesticides were only detected at very low levels in investigative samples. It is also stated that while inorganics were detected at high levels, the highest levels were detected in upgradient sample SW-09.

RESPONSE: As discussed in response to groundwater issues above, a determination as to whether a specific chemical is site related or not, cannot be made solely on the basis of its detection in a specific media; but rather, the determination should take into account all media in which the chemical was detected on-site.

COMMENT: It is stated that the concentrations of semivolatiles detected in background samples were higher than in site sediment samples; therefore, contributions from off-site sources are likely.

RESPONSE: The RI Report states that volatiles, semivolatiles, pesticides, and inorganics were only detected at low levels in investigative sediment samples or at comparable levels to that of upgradient samples.

Risk Assessment Comments

1 April 1994 Letter

Validity of Risk Assessment

COMMENT: LTV believes that the data indicates there is a strong likelihood that many chemicals found at the site are from other sources or are a background condition. Furthermore, the risk assessment must include a discussion of the contribution of "additional" risk from the site above the background conditions, which include the artificial background levels contributed by non-site related sources.

RESPONSE: The data presented in the RI and site history indicate that the inorganics associated with the slag materials pose potential environmental problems and health risks that are not equivalent to those posed by surrounding landfills. Therefore, evaluation of "additional" risk from the site above surrounding conditions is not necessary.

COMMENT: LTV states that there is a 2 to 20 fold overestimation of the total cancer risk due to the uncertainty associated with the use of inappropriate slope factors or incorrect quantification of the dermal absorption of a few of the chemicals considered in the calculation. In addition, calculation mistakes for averaging time, exposure duration, and average exposure frequency were also identified by LTV.

RESPONSE: There were no inappropriate cancer slope factors used or incorrect quantification of dermal absorption. Typographical errors in tables of Section 7 regarding averaging time, exposure durations, and average exposure frequency did not affect the calculation of risks.

COMMENTS: LTV states that the groundwater pathway is a hypothetical pathway, and it is not likely that groundwater would be used directly as a source of residential drinking water. In addition, the use of the concentrations of contaminants in the on-site monitoring wells leads to an unrealistic over-estimation of the levels of contaminants in downgradient residential wells.

RESPONSE: U.S. EPA agrees that the groundwater exposure pathway is a hypothetical scenario. However, it was conservatively evaluated in accordance with regional U.S. EPA guidance.

COMMENT: The risk was calculated by summing the risks across all pathways. To assume that one person will be exposed to maximum concentrations through all pathways is inappropriate and not consistent with agency guidance.

RESPONSE: It is not unreasonable, and is consistent with U.S. EPA guidance, to assume that one receptor may be exposed to the reasonable maximum concentration of chemicals in each environmental medium. It is important to recognize that the reasonable maximum concentration represents the high end of what is expected to be the average concentration for the site. General practice for risk assessments examined cumulative risk, and therefore the

risk was calculated by summing the risks across all pathways in accordance with Agency guidance at that time.

9 APRIL 1992 LETTER
Comments on Section 7 (Risk Assessment)

These comments were addressed in the responses to comments contained in the 1 April 1992 letter regarding the validity of the risk assessment.

COMMENT: LTV believes that data presentation was poor, that tables were unclear and difficult to interpret. Specifically, the tables did not indicate which slope factor was used for nickel, or which forms of chromium was analyzed.

RESPONSE: As stated on pg 7-109, paragraph 2, though total chromium was determined at the site, 10 percent was assumed to be Cr^{+6} and 90 percent assumed to be Cr^{+3}. Also, Table 7-24 indicates that the cancer slope factor for nickel refinery dust was used. The assumed distribution of Cr^{+3} and Cr^{+6} is stated on pg 7-109, paragraph 2.

COMMENT: LTV would like to see an explanation for the statistical methodology applied to derive the exposure concentrations for average and the reasonable maximum scenario cases. Also, they would like described how the "non-detect" results were treated in the process of calculation to estimate the exposure concentrations. Additionally, LTV requests a copy of Sample Quantitation Limits (SQLs) in order to complete their review.

RESPONSE: As described on pg 7-49, Subsection 7.1.3, and in accordance with U.S. EPA guidance, nondetects were included in the calculations at one-half of the sample quantitation limit (SQL) except for cases of unusually high SQL which resulted in elimination of the value from the analysis. SQLs can be obtained from the laboratory data packages.

Specific Risk Assessment Comments

COMMENT: In section 7-1: paragraph 3: sentence 3 of the RI, the future contaminant concentrations were based on current contaminant levels assuming that present concentrations will persist in the future. The assumption ignores the rates of chemical and physiological degradations and this may result in an over-estimation of exposure point concentrations for all media exposures. The risk estimations obtained in the risk assessment are not appropriate to be presented as future risks.

RESPONSE: An assumption was made in the risk assessment that current contaminant concentrations will persist in the future. This is a conservative simplifying assumption that may arguably lead to overestimation of future contaminant concentrations for those contaminants that are subject to degradation (i.e., organic contaminants). This assumption does not lead to any significant overestimation of the future concentration of inorganic contaminants. Since inorganic contaminants in soils and sediments appear to be driving the remedy selection, modeling of future organic contaminant concentrations appear to be unnecessary.

COMMENT: pg 7, 7-14: Table 7-2, the ranges of detected concentrations for benzofluoranthene were shown as 69-69. Is it coincidental that both samples had the identical concentrations?

RESPONSE: Surface soil samples SS10 and SS14 both had detections of benzo(k)fluoranthene of 69 μg/kg.

COMMENT: pg 7, 7-18: Table 7-3, LTV requests an explanation of how the calculation method was not consistent in each table.

RESPONSE: The average exposure concentration was the geometric mean of the data. The maximum exposure concentration was the minimum of the following two quantities: the maximum detected concentration and the upper 95 percent confidence limit on the arithmetic mean of the data. Nondetects were included at one-half of the sample quantitation limit. The calculation method was consistent in all tables.

COMMENT: pg 7, 7-18: Table 7-3, LTV asks how the average and maximum exposure concentrations for beryllium was calculated.

RESPONSE: The average and maximum exposure concentrations for beryllium are incorrectly listed as 0.58 and 0.57, respectively. The correct values should be 0.49 and 0.57, respectively. The corrected value for the average exposure concentrations will not affect the conclusions of the risk assessment.

COMMENT: pg 8, 7-18: Table 7-3, chromium was not defined in this table or others, as trivalent, hexavalent or as total chromium.

RESPONSE: Total chromium levels were determined during RI investigations.

COMMENT: pg 8, 7-19: Table 7-3, for mercury the frequency of detection was reported as 1/12 in the table and average and maximum exposure concentrations of 0.1 and 0.09 were listed, therefore LTV requests an explanation of this.

RESPONSE: The average and maximum exposure concentrations for mercury are listed as 0.1 and 0.09, respectively. The correct values should be 0.07 and 0.09, respectively. The corrected value for the average exposure concentration will not affect the conclusions of the risk assessment.

COMMENT: pg 8, 7-31:1:2, LTV states that the elimination criteria used to exclude some chemicals are not appropriate, as it should be based on the concentration-toxicity screening applied to specific media at the site.

RESPONSE: Screening of chemicals in the risk assessment was performed in accordance with U.S. EPA's Risk Assessment Guidance for Superfund (1989).

COMMENT: pg 8, 7-57:3:1, LTV believes that the evaluation of lead is outdated.

RESPONSE: In the absence of U.S. EPA health criteria for lead, a qualitative risk evaluation was presented. No current or future on-site residential exposure scenarios were evaluated in the risk assessment, and therefore, use of U.S. EPA's lead uptake biokinetic model (LUBK) was inappropriate. The LUBK model might have been appropriate for the future hypothetical off-site residential exposure scenario. However, the concentrations of lead in sediments that may move off site and be deposited in a background were low and not of concern.

COMMENT: pg 8, 7-58:4:1. LTV believes that bioconcentration factor (BCF) or log BCF information would be useful to characterize chemicals in the environment. Also, there is no fate and transport information included in section 7.2.1.2 in relation to the rate of biodegradation, various half lives in air, water and soil for each chemical of concern. This missing information, LTV states, contributes significantly to assess the fate of chemicals in the environment.

RESPONSE: Since environmental modeling was not within the scope of the RI, future risks presented in the risk assessment were based on measured contaminant levels. Estimated rates of biodegradation and chemical degradation for the organic contaminants are not needed since inorganic contaminants appear to be driving the remedy selection.

COMMENT: pg 8, 7-60: Table 7-11, LTV notes some minor corrections of molecular weights for benzene at 78.11, methylene chloride at 84.93, and trichloroethene at 131.40. Also, when octanol/water partition coefficient and vapor pressure are provided, temperatures measured must be specified.

RESPONSE: The minor corrections of molecular weights are noted. Temperature-dependent physical properties, such as vapor pressure and octanol/water partition coefficient, were obtained from the literature for a temperature of 20°C, or as close to 20°C as possible.

COMMENT: pg 9, 7-70:1:1. LTV does not believe that the conceptual model contains a description of the rationale for assessing exposure pathways for J&L and partitioning the site-related risks, especially considering it is located adjacent to other landfills.

RESPONSE: An evaluation of the conceptual exposure model and the rationale used in selecting exposure pathways for further analysis is presented on pg 7-70 to 7-77.

COMMENT: pg 9, 7-72:4 (Subsection 7.2.2.2), LTV does not believe that the scenario for exposure to drinking water from the upper 25 ft is appropriate for the site, because it is unlikely that the groundwater at the site would be used directly as a source of residential drinking water.

RESPONSE: While the State of Michigan may impose restrictions on the use of aquifers within 25 feet of ground surface, assumptions regarding the use of this aquifer are justified since the well survey conducted in the vicinity of the site identified several wells 25 feet or less in depth.

COMMENT: pg 9, 7-73:2:1. LTV would like an explanation for the rationale for the omission of groundwater modeling.

RESPONSE: The risk assessment states that the groundwater exposure pathway is a hypothetical future exposure scenario and that groundwater modeling of contaminant migration might provide more realistic estimates of future groundwater concentrations. However, groundwater modeling was not a part of the scope of the RI. In addition, guidance from U.S. EPA Region V indicates that the "... the contaminant concentration used to calculate the ground water reasonable maximum exposure should be the concentration of the contaminant at the center of the contaminant plume" (Memorandum from: John Kelly, To: Remedial and Enforcement Response Branch RPMs and Supervisors, Subject: Future Residential Land Use Ground Water Exposure Point Concentrations for the Baseline Risk Assessment, 10 May 1991).

COMMENT: pg 9, 7-78:2:1, Define the "off-site" locations in the text.

RESPONSE: The off-site locations refer to soils from adjacent landfills that were sampled, analyzed, and presented in Table 7-3.

COMMENT: pg 9, 7-79; Table 7-16, LTV makes several comments on the calculations used for soil ingestion, dermal contact and dust inhalation.

RESPONSE: The fraction ingested for the average scenario, in the absence of U.S. EPA guidance, is based upon professional judgment. The averaging times listed in Table 7-16 are incorrect. The averaging times should be 3,650 days (365 days/year x 10 years) for noncarcinogenic risk calculations. The correct averaging times were used for the risk calculations (Appendix G) so the typographical errors in this table had no effect on risks calculated for the site. The average exposure frequency, in the absence of U.S. EPA guidance, is based on professional judgment.

Adjustment of chemical intake for the soil matrix effect is not specified in U.S. EPA's Risk Assessment Guidance for Superfund (1989), (RAGS).

Adjustment of chemical intake via inhalation of particulates for a deposition factor is not specified in RAGS.

COMMENT: pg 10, 7-80; Table 7-17, LTV does not believe that the sediment dermal contact adherence factor for average and maximum scenario are realistic.

RESPONSE: The adherence factors used are based on conservative values recommended in RAGS. The fraction of dermal exposure to contaminated soils was conservatively assumed to be 1.0 as recommended in RAGS.

COMMENT: pg 11, 7-82:4:1, LTV states that the estimation of fugitive dust release is not accurate.

RESPONSE: It is recognized that the equation used to estimate the air concentration of fugitive dust releases associated with vehicular traffic may contain a significant degree of uncertainty, as described in Subsection 7.4.4 (Uncertainty Analysis). An equation developed by U.S. EPA for vehicles with at least four wheels was used in the absence of a similar equation for two-wheeled vehicles.

COMMENT: pg 11, 7-87; Table 7-18. LTV comments on several of the exposure frequencies used for ingestion of drinking water, dermal contact by bathing, and inhalation by showering.

RESPONSE: U.S. EPA guidance does not indicate that the average exposure frequency for a residential scenario is 275 days/year. Guidance from U.S. EPA, Region VI indicates 350 days/year for the average residential exposure frequency (Memorandum From: John Rauscher, Ph.D., Toxicologist, To: Donald Williams, Section Chief, Subject: Central Tendency and RME Exposure Parameters, 18 August 1992). This value was used in the risk assessment.

Evaluating residential exposure to groundwater via bathing and showering is a conservative approach that is not unrealistic. Bathing evaluated only the dermal contact exposure route, and was chosen to be representative of all dermal contact with groundwater (resulting from activities such as hand washing, household chores, car washing, gardening, and showering). Showering evaluated only the inhalation exposure route, and was chosen to be representative of all inhalation exposure to groundwater (resulting from activities such as cooking, dishwashing, laundering, and bathing).

COMMENT: pg 11, 7-90; Table 7-19. LTV believes that the parameters used for the surface water pathway require clarification and that the exposure frequency of 365 (days/year) is not valid for surface water/sediment exposure pathway for adults.

RESPONSE: The exposure frequencies listed in Table 7-19 are incorrect. The correct values are 245 days/year for the average and maximum exposure scenarios. The correct exposure frequencies were used for the risk calculations (Appendix G) so the typographical errors in this table had no effect on the risks calculated for the site.

The exposure duration of 10 years is correct. The averaging time should be 3,650 days. The correct averaging times were used in the risk calculations (Appendix G) so the typographic errors in this table had no effect on the risks calculated for the site.

Based on site surveillance, the dirt-bike rider was assumed to be a pre-teen to young adult with hands, arms, and legs exposed to surface water. The adult resident was assumed to have hands and forearms exposed to surface water.

COMMENT: pg 12, 7:102; Table 7-24. LTV states that the slope factors used for BaP by inhalation and ingestion routes are not correct.

RESPONSE: The current oral cancer slope factor for benzo(a)pyrene is 7.3E+0 $(mg/kg\text{-}day)^{-1}$, as opposed to the value of 1.15E+1 $(mg/kg\text{-}day)^{-1}$ used in the risk assessment. This

change would decrease the cancer risks estimated to result from exposure to carcinogenic polycyclic aromatic hydrocarbons (PAHs) by approximately one-third (37 percent). The decrease would be most notable in the estimated risks resulting from dermal exposure to soil and sediment, where carcinogenic PAHs contributed virtually all of the risk. However, use of the new lower slope factor for benzo(a)pyrene would not lower the calculated risks from other media and would not change the conclusions of the risk assessment.

COMMENT: pg 12, 7-105: Table 7-25. The RfD for thallium (in soluble salts) of 2E-2 (mg/kg/d) is available on the Integrated Risk Information System (IRIS) and should be used instead of 7E-5 from Health Effects Assessment Tables (HEAST).

RESPONSE: The current oral RfD for thallium (sulfate) is 8E-05 mg/kg-day, as opposed to the value of 7E-05 mg/kg-day used in the risk assessment. This change would lower the noncancer Health Quotient (HQ) for thallium. However, since this metal did not contribute significantly to site risks in the risk assessment, a decrease in this HQ would also be insignificant with respect to overall site risks.

COMMENT: pg 12, 7-118:1:2. LTV believes that the use of the slope factor derived from the dermal absorption of drinking water leads to an overestimation of risk as stated in the text. Without the lifetime cancer risk of arsenic in drinking water, the total future cancer risk by all other organics is 4.3E-6.

RESPONSE: The oral cancer slope factor for arsenic is based on the study of Tseng et al. (1977) which reported an increased incidence of skin cancers in humans that were exposed to arsenic in drinking water via ingestion.

COMMENT: pg 12, 7-118:3:1, LTV states that the risk associated with dermal contact and ingestion of soil will be reduced when the slope factor for BaP is corrected to 5.8 $(mg/kg/d)^{-1}$, and the ingestion of arsenic through groundwater is adjusted or eliminated.

RESPONSE: The revised risk estimates associated with the revised cancer slope factor for benzo(a)pyrene were discussed above for comment 7:102:Table 7-24. No adjustment in the risk posed by arsenic in groundwater is appropriate.

COMMENT: pg 13, 7-118:6:2, LTV asks U.S. EPA to describe why the total adult hazard indices for all pathways combined were 6.7E-1 for the RME and 1.6E+0 for RAE.

RESPONSE: This comment identifies a typographical error. The corrected sentence is: "The total adult hazard indices for all pathways combined range from 6.7E-1 to 1.6E+0 for the RAE and RME, respectively, and the total child hazard indices range from 1.7E+0 to 4.2E+0 for the RAE and RME, respectively."

COMMENT: pg 13, 7-119:1:1, LTV states that the Hazard Index values for RME exceeded 1.0 for both the adult and child because drinking water ingestion included manganese and barium, which should have been excluded from the chemicals of concern list. These two metals are insoluble in water and have low intrinsic toxicities.

RESPONSE: Insolubility and low intrinsic toxicity are not an acceptable basis to exclude manganese and barium from the list of chemicals of potential concern.

COMMENTS: pg 13. 7-125:4:1. LTV would like to see the assumptions applied for the estimates of ingestion of fugitive dust for dirt-bike riders should be re-examined based on a two-wheel vehicle-specific equation.

RESPONSE: U.S. EPA is not aware of a two-wheel vehicle-specific equation for estimation of particulate emission. The estimate was based on EPA guidance for air emission, where an equation is not available for two wheel vehicles. This is conservative, however at the time there was a considerable amount of dirt-bike riding observed at the site and U.S. EPA has confidence in the use of this available equation.

COMMENT: pg 13. 7-138:2:1. Again, LTV states that recalculation of total cancer risk is required since the slope factor of BaP must be corrected. In addition, the use of trivalent chromium and reduction of slope factors and the risk from arsenic will decrease the total carcinogenic effect at the site.

RESPONSE: The use of the current slope factor for benzo(a)pyrene will reduce cancer risks associated with PAH exposure by 37 percent. No correction is required for trivalent chromium or arsenic. For the purpose of initial screening of chemicals of potential concern, chromium was assumed to be present entirely in its most toxic oxidation state (Cr^{+6}). However, based on analysis of EAF dust and U.S. EPA's experience at other sites, it was conservatively assumed for the risk assessment that the total chromium values measured consisted of 90 percent Cr^{+3} and 10 percent Cr^{+6}.

Appendix G

COMMENT: pg 13. Table G-1. LTV would like to see CAS numbers for identified compounds.

RESPONSE: CAS numbers, while informative and potentially useful, are not required.

COMMENT: pg 13, Table G-2, LTV would like blanks in columns to be clarified.

RESPONSE: Blank table entries indicate that health criteria are not available.

COMMENT: The barium RfD is 5E-2 not 7E-2 (mg/kg/day).

RESPONSE: The correct barium reference dose is 7E-2 mg/kg-day.

COMMENT: pg 13. Table G-2. LTV states that there are no RfD or slope factor values which exist for cobalt.

Lead: the text page 7-57 (7.1.5) states ".... there are no U.S. EPA-verified toxicological values for lead.", although Table G-2 lists the RfD for lead as 1.4E-3 (mg/kg.d).

Nickel: The U.S. EPA has not evaluated soluble salts of nickel as a class of compounds for potential human carcinogenicity. Which form of nickel compound was used for the SF value listed in the Table G-2?

Thallium: Describe the form of thallium for the listed RfD.

The tables G-2 and G-3 list the RfDs without identifying the exposure routes. Not all the RfDs are identical for both oral and inhalation exposures.

RESPONSE: No RfDs or cancer slope factors are presented for cobalt as none has been established by U.S. EPA.

Lead: the concentration-toxicity screening included a semiquantitative evaluation of lead by using U.S. EPA's previously withdrawn RfD for lead. This resulted in lead being included as a chemical of potential concern for the site. However, the withdrawn RfD was not used in the calculation of site risks; exposure to lead was evaluated in a qualitative fashion.

Nickel: For the purpose of a conservative initial concentration-toxicity screening, it was assumed that nickel was present in a carcinogenic form. The cancer slope factor for nickel refinery dust was used.

Thallium: The RfD for thallium sulfate was used.

For the purposes of a conservative concentration-toxicity screening, health criteria for the oral exposure route were used as a default. However, for chemicals that are known to be of particular concern via inhalation exposure (e.g., Cr^{+6}), inhalation health criteria were included in the concentration-toxicity screening.

following, whenever possible, the design standards in Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA 530-SW89-047, July, 1989, a RCRA technical guidance document for the design of landfill covers. This guidance requires the use of a flexible membrane liner (FML); however, guidance documents are not promulgated standards; therefore, such guidance is not ARAR under the standards of Section 121 of CERCLA. Such guidance is, however, a factor which is "to be considered" in the selection of a remedy. The selected remedy will not follow the requirements for a RCRA Subtitle C cover given in the guidance document cited; however, the selected remedy will employ a FML, as well as geosynthetic and natural clay layers, and a drainage layer of geonet and geotextile fabric. The reason for this is explained below.

Occupational Safety and Health Act

Regulations promulgated under the Occupational Safety and Health Act, codified at 29 CFR 1910, regulate the safety and health of workers. These requirements are applicable and will protect the health and safety of workers at the site implementing the selected response action.

STATE ARARs

Michigan Environmental Protection Act 127 of 1970

This Act prohibits any action at the site which pollutes, impairs, or destroys the State's natural resources. This Act is applicable or relevant and appropriate to the remedial action at this site. The remedial action must be carried out in such a fashion as to avoid any pollution, impairment or destruction of the State's natural resources.

Michigan Occupational Safety and Health Act 154 of 1974

This act provides for regulation to protect the safety and health of workers. This requirement is applicable or relevant and appropriate for the response action at this site.

Michigan Environmental Response Act 307 of 1982, as amended and Parts 6 and 7 of the associated rules

The Michigan Environmental Response Act 307 (Act 307) provides for the identification, risk assessment, and evaluation of contaminated sites within the State; therefore, Act 307 is applicable, or relevant and appropriate, to the J&L Landfill Superfund Site. The U.S. EPA considers the substantive portions of Parts 6 and 7 of the Act 307 rules to be ARARs for the remedial action at this site. The requirements of the act provide that remedial actions shall be protective of human health, safety, the environment, and the natural resources of the State. To achieve the standard of protectiveness, Act 307 requires that a remedial action shall achieve a degree of cleanup identified by the Act as either Type A (cleanup to background levels), Type B (cleanup to risk-based levels), or Type C (cleanup to risk-based levels under site-specific conditions). At the J&L Landfill Site,

U.S. EPA has determined that Type C criteria are appropriate. The selected remedy requires containment of the landfilled waste. Type A or Type B criteria could not be met without excavating and removing the landfilled waste at a great cost which would yield little or no additional protection or environmental benefit. The use of Type C criteria will ensure a suitably protective, appropriate, and cost-effective remedy.

Michigan Soil Erosion and Sedimentation Control Act 347 of 1972

The Michigan Soil Erosion and Sedimentation Control Act (Act 347) regulates earth changes, including cut and fill activities, which may contribute to soil erosion and sedimentation of the surface waters of the State. The Ladd Drain, adjacent to the site, flows into the Clinton River, a surface water of the State. Act 347 will be applicable or relevant and appropriate to the earthmoving activities at the site to the extent that those activities might result in soil erosion and sedimentation of the waters of the State.

Michigan Air Pollution Act 348 of 1965, as amended and associated rules. To the extent that Act 348 may be more stringent than the Federal program, Act 348 is considered ARAR. The remedial action will be conducted in a manner that shall comply with all applicable air pollution requirements, particularly regarding fugitive dust emissions and any venting that may be necessary as a component of the remedial action.

Michigan Hazardous Waste Management Act 64 of 1979, as amended and administrative rules

Michigan is authorized to administer its own hazardous waste program within the State, in lieu of the Federal program. This Act regulates the generation, transport, treatment and disposal of hazardous waste in Michigan. As with RCRA, Act 64 is not applicable to closure of the landfill as the disposal ceased prior to the effective date of the regulations implementing the Act. The specific requirements of the Act regarding cover component specifications may be relevant for the same reasons given, above, regarding the Federal regulations promulgated under Subtitle C of RCRA; however, U.S. EPA does not consider those requirements appropriate for this site when the hydrogeological characteristics of this site and the relation of the remedy for this site to the surrounding landfills and the topography thereof, as well as the special constraints imposed by climate are considered. While U.S. EPA does not believe that Act 64 is ARAR for this remedial action, U.S. EPA has determined that Act 64 is "to be considered", and U.S. EPA has considered the goals of the Act regarding the closure of landfills containing hazardous waste as this site contains substances similar to "hazardous waste" as that term is defined by RCRA. Additional discussion of site-specific factors relevant to the remedy selection is provided below.

The waste at this site is in contact with a shallow aquifer which is already contaminated up-gradient from the site. The location of the site and its relation to the surrounding landfills impose practical constraints on the thickness of any cap which can be engineered on the site and effectively maintained as a barrier layer. A clay cap must, if it is to retain any effectiveness as a barrier layer given the climate of these latitudes, be protected by an additional soil layer (42 inches of frost

protection), or the cover will be subject to degradation through cracking and erosion as a result of seasonal freezing and thawing.

The site covers only 17 acres in areal extent. It is long and narrow. The cover must have a suitable slope to permit the drainage of precipitation if it is to function properly in reducing infiltration. The engineering problems associated with these factors are exacerbated by each additional requirement to thicken the barrier layer. Therefore, U.S. EPA has determined that the most appropriate cover will be one which achieves the maximum reduction in infiltration rate consistent with a suitable slope to permit drainage. To achieve this, U.S. EPA has selected a remedy which employs a one-foot clay layer followed by a geosynthetic clay layer, a flexible membrane liner, and a geonet with geotextile filter fabric for drainage, as well as the necessary 42 inches of frost protection. By using geosynthetics rather than clay and sand, it is possible to achieve the desired minimization of infiltration and the requisite drainage layer while avoiding the erection of a barrier layer so tall that it would be difficult to design it to slope properly in relation to the surrounding landfills. This barrier should provide the most appropriate level of protection against infiltration possible at this site.

Michigan Solid Waste Management Act 641 of 1978

The State is authorized to administer its own solid waste management program, in lieu of the Federal program. The Michigan Act was revised in October of 1993, and the implementing regulations regarding landfill closure were rewritten and promulgated then; therefore, these regulations are not applicable at this site; however, they may be considered relevant. The regulations at R299.4425(3) have been identified by Michigan as those that would "apply" (sic) to this landfill for purposes of closure. R299.4425(3) requires two feet of clay and six inches of top soil. U.S. EPA has determined that this requirement would not be appropriate for this site, and U.S. EPA has selected a cover design which, while it uses only one foot of clay, nevertheless provides greater protection against infiltration of liquids than what could be achieved using two feet of clay while being more suitable for this site in regard to the engineering difficulties discussed above.

Michigan Compiled Laws Annotated Section 257.722 ("frost laws").

Michigan has identified these requirements pertaining to maximum axle loads permitted over certain Michigan highways during certain months of the year. These laws are designed to prevent damage to Michigan highways that might otherwise be caused by excessively heavy loads during the period when the weather alternates between freeze and thaw.

A requirement must be triggered by a component of the remedial action which occurs on-site to be ARAR. Actions which take place off-site must comply with all applicable laws, but only actions which occur on-site as a component of the remedial action selected in the Record of Decision are ARAR. The requirements of MCLA § 257.722 are not ARAR; however, they do constitute applicable off-site requirements.

3. Cost Effectiveness

Cost effectiveness compares the effectiveness of an alternative in proportion to its cost of providing environmental benefits. Table 2 lists the costs associated with the implementation of the selected remedy.

TABLE 2

Total estimated costs for the selected remedy at the J&L Landfill Site:

Alternative	Total Capital Cost	Total O&M, 30 yr.	Total Present Worth
4b	$4,653,200	$220,800	$4,874,000

The selected remedy for this site is cost effective because it provides the greatest overall effectiveness proportionate to its costs when compared to the other alternatives evaluated; the net present worth being $4,874,000. Although slightly higher than 4a and a bit higher than 2b, the estimated cost of the selected remedy is fully justified because the level of effectiveness increases greatly. The effectiveness of 4b is actually greater than 3a and 3b, yet the cost is significantly less compared to the cost of $5,397,300 and $6,095,600 for 3a and 3b, respectively. The effectiveness of 4b assures a high degree of certainty that the remedy will be effective in the long-term due to the significant reduction of the potential mobility of the contaminants achieved through containment of the source material and the decrease in potential leachate generation. In addition, 4b is also more effective from an engineering perspective. That is, due to the flatness of the surrounding areas, construction of a cap which meets the technical requirements set forth and which is effective in reducing infiltration to the greatest extent possible, would be more difficult to implement using the components and design in alternatives 3a and 3b.

4. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner for OU1 at this site. Of those alternatives that are protective of human health and the environment and that comply with ARARs, U.S. EPA has determined that the selected remedy provides the best balance in terms of long-term effectiveness and permanence, reduction of toxicity, mobility, or volume of contaminants, short term effectiveness, implementability, and cost, taking into consideration State and community acceptance.

The installation and maintenance of a final cover for the landfill, ground water monitoring, and restriction of site access through installation of a fence and institutional controls, will provide the most permanent solution practicable, proportionate to the cost.

5 Preference for Treatment as a Principal Element

Based on current information, U.S. EPA believes that the selected remedy is protective of human health and the environment and utilizes permanent solutions and alternative treatment technologies to the maximum extent possible. The remedy, however, does not satisfy the statutory preference for treatment of the hazardous substances present at the site as principle element, as such treatment was not found to be practicable or cost effective.

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

Stevens T. Mason Building, P.O. Box 30028 Lansing, MI 48909

ROLAND HARMES, Director

June 30, 1994

Mr. Valdas V. Adamkus, R-19J
Administrator, Region 5
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Mr. Adamkus:

The Michigan Department of Natural Resources (MDNR), on behalf of the State of Michigan, has reviewed the Record of Decision (ROD) for the J&L Landfill Superfund site operable unit 1 (OU1) remedial action (landfill cap) and the proposed remedy contained in that ROD. Michigan concurs with the OU1 remedy proposed in the ROD consisting of: 1) a Michigan Hazardous Waste Management Act, 1979 PA 64, as amended, and associated rules technical equivalent landfill cap (one-foot compacted clay overlain by a geosynthetic clay liner (GCL), a 60-mil flexible membrane liner (FML) barrier layer, a geonet/geotextile filter fabric drainage layer, a 36-inch clean fill layer, and a 6-inch topsoil layer) and 2) the remedy components listed on Page 22 of the attached ROD. The State concurs with the understanding that the U.S. Environmental Protection Agency (EPA) will further evaluate and address the contaminated groundwater at the site in a second operable unit for the J&L Landfill Superfund site.

The State does not concur with EPA's omission from the ROD and from other references of the following State of Michigan regulations which the State considers as applicable or relevant and appropriate requirements (ARARs): 1) the Michigan Hazardous Waste Management Act, 1979 PA 64, as amended, and associated rules, 2) the Michigan Water Resources Commission Act, 1929 PA 245, as amended, MCL 323.6(1), MCL 323.1 et seq, and the associated Part 22 Administrative Rules MAC R.323.2201 et seq, 3) the Mineral Well Act, 1969 PA 315, as amended, 4) the Liquid Industrial Waste Removal Act, 1969 PA 136, 5) the substantive portions of Part 5 of the Michigan Environmental Response Act, 1982 PA 307, as amended, cleanup rules, and 6) the Michigan Compiled Laws Annotated--Section 257.722 (frost laws). The State has previously identified these requirements as ARARs for the OU1 remedial action being selected for this site. The State still considers these as ARARs.

The EPA previously identified 40 CFR parts 262 and 263 regulations for removal, transport and off-site disposal of hazardous waste as ARARs yet did not include them in the final ROD. Please include these regulations in the final ROD because the drummed well development and decontamination water may be classified as hazardous and will likely be taken off site for treatment/disposal.

The State of Michigan believes that the EPA should determine what actions will be taken to address the contaminated groundwater at the site before the OU1 landfill cap is installed. If this determination is not made prior to cap installation, it is possible that groundwater remediation or waste dewatering, if deemed necessary, will adversely affect the integrity of the cap due to excessive settling. Moving ahead with the cap prior to making a final decision on the need for a groundwater remedy could also have the tendency to bias that evaluation, particularly if implementing a groundwater remedy would or could result in high cost damage to the landfill cap. If the cap is constructed prior to completing the groundwater evaluation and a groundwater remedy is subsequently implemented which adversely affects the cap, the State will not guarantee its 10% match (if OU1 is a fund response) for any costs associated with repairing the cap.

There were a number of components of the OU1 remedy which were not clearly defined in the text of the ROD but were better defined in the responsiveness summary. The State of Michigan concurs with the remedy selected with the following understanding of the points in question:

- The proposed landfill cap will be designed such that the water that filters through the cap to the drainage layer above the GCL is directed to one of the on-site drainage ditches or other appropriate collection system;

- Contaminated sediments from the sediment pond in the northwest corner of the site will be removed before the sediment pond is filled to grade with clean fill. These sediments will then be consolidated underneath the current landfill cap. Similarly, the contaminated surface soils/sediments from the east ditch will be excavated from the ditch and consolidated underneath the existing landfill cap; and

- The cap for the east ditch will consist of an FML (60 mil) overlain with 42 inches of clean fill/topsoil/vegetation for frost protection.

The State of Michigan also recommends that the following be included as part of OU1 remedy implementation: 1) the water from surface runoff and the drainage layer of the cap be sampled to ensure that the water leaving the site and entering a surface water body is uncontaminated, 2) any contaminated soils/sediments from the south ditch be excavated and placed beneath the existing clay cap with the rest of the landfill contents, and 3) all of the on-site drums containing soil cuttings, personal protective equipment, and well development and purge water be addressed now or, at a minimum, be properly secured; currently, they are not adequately secured to prevent human exposure.

The State of Michigan also requests that the June 20, 1994, letter from Ms. Beth O'Brien, MDNR, to Ms. Laura Evans, EPA, transmitting comments on the second draft of the OU1 ROD be included as a part of the administrative record for this site.

We are pleased to be partners with you in selecting this remedy and look forward to working together to accomplish the final remedy at this site.

Sincerely,

Russell J. Harding
Deputy Director
517-373-7917

Attachment

cc: Mr. James Mayka, EPA
Ms. Wendy Carney, EPA
Ms. Laura Evans, EPA
Mr. Paul Novak, MDAG
Mr. Tarik Namour, MDNR
Mr. William Bradford, MDNR
Dr. George Carpenter, MDNR
Ms. Beth O'Brien, MDNR

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL RESPONSE DIVISION

SUPERFUND SECTION

FAX TRANSMITTAL

PLEASE DELIVER TO:

NAME: Wendy Carney

COMPANY: U.S. EPA, Region 5

TELEPHONE NUMBER: (312) 353-6553

FAX NUMBER: (312) 353 5541

SENT BY:

NAME: Beth O'Brien

TITLE/UNIT: Project Manager, SMU 1

PHONE NUMBER: (517) 335-3098

FAX NUMBER: (517) 335-4887

TODAY'S DATE: June 30, 1994

NOTE:

Here is the signed copy of the J&L OU1 ROD concurrence letter. The original will be mailed by regular mail. Call if you have any questions.

5 pages total

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: JUN 30 1994

SUBJECT: Request for Concurrence on the Record of Decision for Remedial Action at the J&L Landfill Site, Rochester Hills, Michigan

FROM: William E. Muno
Director
Waste Management Division

Gail C. Ginsberg
Regional Counsel

TO: Valdas V. Adamkus
Regional Administrator

The purpose of this memorandum is to recommend that you sign the attached Record of Decision (ROD) for the J&L Landfill site located in Rochester Hills, Michigan.

The ROD was prepared in accordance with the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499, and, to the extent practicable the National Contingency Plan, 40 CFR Part 300, and Agency policy. We have reviewed the attached documents and have concluded that the ROD is both legally and technically sufficient. As such, we believe that implementation of this remedial measure is a proper exercise of your delegated authority.

Please feel free to contact either of us should you have any questions.

Attachment

6/28/94

YELLOW 6/28/94