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Illinois, Indiana,
Michigan, Minnesota,
Ohio, Wisconsin

EPA

Himco Dump Cleanup Plan Revised

Himco Dump Superfund Site
Elkhart, Ind. **April 2003**

What Can You Do?

Comments provided by residents and other interested people are valuable in helping EPA decide the best course of action. The Agency encourages you to share your views about the *Proposed Plan* modifications. There are two ways to express your opinion during the public comment period. It runs April 11, 2003, to May 12, 2003.

You may send comments to Gwen Massenburg, Remedial Project Manager or Stuart Hill, Community Involvement Coordinator. Comments must be postmarked by May 12, 2003. The mailing addresses are:

- Gwen Massenburg (SR-6J)
  U.S. EPA, Region 5
  OERR
  77 W. Jackson Blvd.
  Chicago, IL 60604
  Phone: 312-886-0983
- Stuart Hill (P-19J)
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  Office of Public Affairs
  77 W. Jackson Blvd.
  Chicago, IL 60604
  Phone: 312-886-0689

A public meeting will be held at the City Council Chambers, 2nd floor, Municipal Building, 229 S. Second St., Elkhart, on April 23, 2003, from 7 to 9 p.m. You may submit oral and written comments at the meeting. A court

Information continues on back page

Introduction

The U.S. Environmental Protection Agency Region 5, in consultation with the Indiana Department of Environmental Management (IDEM), is proposing to change the original cleanup plan, described in the ***1993 Record of Decision (ROD)***[1] for the Himco Dump Superfund Site (Site), located in Elkhart, Indiana. For details on previous investigations and design reports, including other pertinent documents, consult the **Administrative Record** or the **Information Repository.**

EPA is issuing a ***Proposed Plan*** for an amendment to the ***1993 Record of Decision***. This Proposed Plan is intended to be a short summary of EPA's reasons for recommending a change in the Site's cleanup plan. For those members of the public who wish to evaluate this proposal, EPA has placed the detailed supporting documents in the local Information Repository at the Elkhart Public Library, Pierre Moran Branch, 2400 Benham Ave. EPA encourages any member of the public to review those documents for further information. A file in the repository has been created to make the review of the *Proposed Plan* easier. It includes evaluations of landfill cover systems technology, guidance on **monitored natural attenuation**, and the analyses of the **ground water** data, soil data, and **soil gas** data collected from the Site. The repository also contains copies of the *1993 ROD*, the original *1993 Remedial Investigation/Feasiblility Study (RI/FS)* and the *1996 Remedial Design*. In addition to the local repository, all documents related to the Site are available for review at EPA's regional office located at 77 W. Jackson Blvd., Chicago, IL.

Your input on the proposed cleanup changes and supporting information is valuable in the final remedy selection for the Site. EPA encourages the public to participate in this remedy selection process by reviewing and commenting on the proposed changes presented in this *Proposed Plan*. The *Proposed Plan* is required by Section 117(a) of the ***Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by Superfund Amendments and Reauthorization Acts (SARA) 1986.*** Before a final decision is made to amend the *1993 ROD*, EPA will hold a public meeting and a public comment period to accept comments from residents and other individuals interested in the Site. As a result of new information or comments received, EPA may modify the proposed *ROD amendment*. Therefore, the public is encouraged to review and comment on the proposed modifications to the original *ROD*. For more information regarding the Site

[1] *Words in* **bold** *are defined in the glossary section.*

and the *Proposed Plan*, see the Site documents that are available in the Information Repository.

The 30-day public comment period begins April 11, 2003 and extends through May 12, 2003 (see section entitled "Public Comment Invited").

Site Location and Background

Himco Dump is a closed landfill covering approximately 60 acres. The Site is located at County Road 10 and the Nappanee Street Extension in the town of Elkhart, Elkhart County, Ind. The Site was privately owned and operated by Himco Waste-Away Services Inc., represented by Charles Himes, and was in operation between 1960 and 1976. The area was initially a mixture of marsh and grassland. There was no liner, leachate collection, or gas recovery system constructed as part of the landfill. An estimated two-thirds of the waste in the landfill was calcium sulfate from Miles Laboratories. As many as 360 tons per day were dumped over an unknown time period. Other waste accepted included household and commercial refuse, construction and demolition debris, and industrial and medical waste. In 1976, the landfill was closed and covered. The cover consisted of approximately 1-foot of sand overlying a calcium sulfate layer. The area bordering the southern perimeter of the landfill consists of construction rubble mixed with a non-native soil and has been named the construction debris area. The construction debris area boundaries were defined primarily from 13 test trenches excavated in 1991 during the second phase of the field studies conducted for the *RI/FS* published in August 1992 (Donohue).

Previous Site Activities and Enforcement

- **1971** - Indiana State Board of Health (ISBH) first identified the Site as an open dump.
- **1974** - ISBH analyzed samples from shallow residential wells located immediately south of the landfill after receiving complaints about the color, taste, and odor of the ground water from the shallow wells, finished at a depth of approximately 22 feet below ground surface (bgs). The analyses indicated the presence of high levels of manganese and iron. ISBH advised Mr. Himes to replace six shallow water wells with deep wells for the residences immediately south of the landfill on County Road 10. The new wells were finished at depths ranging from 152 to 172 feet bgs. Well logs indicated that these wells were finished below a clay confining layer. The existence of a confining layer was not verified in EPA's 1992 *Remedial Investigation.*
- **1975** – Charles Himes, Sr., owner and operator of the Site, signed a consent agreement with the ISBH Stream Pollution Control Board to close the dump by September 1976 with the application of final cover consisting of calcium sulfate overlain by sand.
- **1981** – The United States Geologic Survey (USGS), in cooperation with the Indiana Department of Natural Resources and the Elkhart Water Works, completed a three-year study to determine the extent of the leachate plume potentially emanating from the Site by using bromide concentration in the ground water as an indicator. This study is detailed in the *Hydrologic and Chemical Evaluation of the Ground Water Resources of Northwest Elkhart County, Indiana,* published in October 1981 (Imbrigotta and Martin).
- **1984** – EPA Field Investigation Team (FIT) prepared a Hazard Ranking System (HRS) scoring package for the Site. Monitoring wells previously installed by the USGS that were sampled and analyzed showed that the ground water downgradient of the Site was contaminated with inorganics, semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs). The inorganics included aluminum, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, mercury, selenium, and zinc. The organic compounds included acetone, benzene, 2-butanone, chloroethane, trans-1,2-dichloroethene, Freon, 4-methylphenol, phenol, and pyrene.
- **June 1988** – The Site was proposed for the National Priorities List (NPL).
- **1989** – A *RI/FS* was initiated by SEC Donohue, under contract for EPA.
- **February 1990** – The Site was placed on the NPL.
- **April 1990** – Due to reports from community interviews indicating that residents with private wells living south of the landfill were complaining about the taste, odor, and the color of their water, EPA's Emergency Response Branch sampled 27 residential wells in late April 1990. The water quality analysis indicated relatively high concentrations of iron, manganese, and sodium. After review of the results, the Agency for Toxic Substances and Disease Registry (ATSDR) recommended an alternative source of potable water due to the high levels of sodium–3,600 **parts per million (ppm)** –had profound implications for persons who suffered from hypertension, diabetes, and heart ailments.
- **September 1991** – Test pits were excavated to characterize the Site's constituents during the *RI*. During one of the excavations, large quantities of **leachate** were observed flowing from the landfill's fill materi-

als. The leachate was observed near the southern edge of the landfill. The leachate was analyzed and found to contain, among other hazardous substances, organic solvents including ethylbenzene (6,400 ppm), 2-hexanone (29,000 ppm), toluene (480,000 ppm), and xylene (44,000 ppm). These contaminants all have an inhalation and contact hazard to persons near the hazards and have flash points ranging from 40 to 90 degrees Fahrenheit. The test pits where the hazardous substances were found were located within 50 yards of the private residences.

- **November 1991** – Municipal water service was provided to the residents living south of the landfill. Himco Waste-Away Services Inc., Miles Laboratories, and the City of Elkhart paid for the municipal water services extension to the residences.
- **May 19, 1992** – Charles Himes, Jr., president of Himco Waste-Away Services Inc., signed an *Administrative Order by Consent (AOC)* to undertake and complete emergency removal activities to abate conditions that would present an imminent and substantial endangerment to the public. An additional requirement of the *AOC* was to excavate near the test pits identified (TL-5) in order to locate the buried VOCs and their source, and also to conduct limited extension of contamination surveys along the southeast central periphery of the Site to assure that no additional VOCs were encountered.
- **May 22, 1992** – EPA initiated an emergency removal action that located and removed 71 55-gallon drums containing VOCs, including ethylbenzene and toluene.
- **1992** – The *Himco Dump Remedial Investigation and Feasiblilty Study* (Donohue, 1992) report was completed. The *RI* field work included geophysics, surveying, trenching, soil sampling, monitoring well installation, ground water leachate sampling, landfill waste mass sampling, residential basement gas sampling, surface water and sediment sampling, and wetland determination.
- **1992** – The results of the *Baseline Risk Assessment* indicated that the potential excess lifetime cancer risk for the Site exceeded the acceptable Superfund **carcinogenic risk** range of $1x10^{-4}$ to $1x10^{-6}$, primarily from the assumed use of on-site contaminated ground water under the future use scenario. Risk from ingestion of, dermal contact with, and inhalation of volatiles from ground water presented carcinogenic risk in the range of $4\ x10^{-4}$ to $1x10^{-1}$. South (downgradient) of the landfill, the estimated excess cancer risks to a future adult resident described in the *RI* report (Donohue, 1992), was $5x10^{-3}$. The method for calculating risk included two assumptions:

1. Chemicals detected in the soil represented chemicals leaching into the ground water, even though the chemicals were not detected in any ground water samples collected.
2. For the ground water wells located south of the landfill, if chemicals were detected in at least one ground water sample, those chemicals were evaluated at one-half the detection limit, even if the chemicals were not detected in a given exposure point (including leachate samples). Therefore, approximately 80 percent of the estimated risk downgradient of the landfill was attributable to "not detected" chemicals in the ground water. If these chemicals were truly absent, the total population cancer risk would have been estimated at $1x10^{-3}$, due primarily to the presence of arsenic and beryllium in ground water and polynuclear aromatic hydrocarbons (PAHs) in soil (representing leaching to ground water).

   The Hazard Index for humans interacting with the Site exceeded the acceptable Hazard Index of 1.0 (Hazard Index of 1.0 or less is desired). For future use of the ground water beneath the landfill, the Hazard Index values were 500 to1,000. Antimony was the primary contributor to that risk. The other chemicals contributing to risk included arsenic, beryllium, cadmium, chromium, vanadium, alpha-chlordane, and nitrate/nitrite. In addition to ground water, there was an estimated excess cancer risk of $1x10^{-1}$ to a future resident living south of the landfill where PAHs were detected in the soil.

- **September 1992** – The *Proposed Cleanup Plan* was issued to the public for review and comment.
- **September 30, 1993** – EPA issued the *ROD* for the Site. The purpose of the selected remedial action, as specified in the *ROD*, was to eliminate or reduce the migration of contaminants to ground water and to reduce risks associated with exposure to the contaminated materials. The major elements of the remedial action per the *1993 ROD* were:

  1. Construction of a composite barrier, landfill cover (cap) consisting of the following components:
     - An 18-inch-thick vegetative soil layer;
     - A 6-inch-thick sand drainage layer;
     - 40-mil high density polyethylene flexible membrane liner;
     - 2-foot-thick low permeability ($1\ x10^{-7}$) clay liner; and
     - A soil buffer layer of variable thickness to attain the State of Indiana grade requirements (4 percent minimum).
  2. Use of institutional controls on landfill property to limit land and ground water use.

3. Installation of an active landfill gas collection system including a vapor phase carbon system to treat the off-gas from the landfill.
4. Ground water monitoring to ensure effectiveness of the remedial action and to evaluate the need for future ground water treatment.
5. Mitigative measures to be taken during the remedial construction activities to minimize adverse impacts to wetlands.

Post-ROD Site Activities

The overall objectives of the post-ROD activities were to gather additional data to supplement the existing data such as a soil gas investigation needed to supplement the *Final Pre-Design Technical Memorandum, Himco Dump Superfund Site* (USACE, 1996), and a supplemental human health risk evaluation needed for the construction debris area to the south of the Site. The purpose of the recent *Supplemental Risk Assessment* was to conduct human health risk evaluations for the Site's off-property areas that were not addressed in the *1992 Baseline Risk Assessment* for the construction debris area. Additional ground water data was needed to ensure the effectiveness of the 1993 remedial action and to evaluate the need for future ground water treatment.

The supplemental investigations include the September 1995 sampling event (detailed in the *Final Pre-Design Technical Memorandum, Himco Dump Superfund Site*, USACE, March 1996), and the 1996 Supplemental Site Investigation, characterizing data involving the ground water downgradient of the landfill. In the 1996 and the 1998 investigations, data was collected from the construction debris area soils, soil gas, and ground water (down gradient) of the landfill. The investigations conducted during April and May and November 2000 involved characterizing ground water migrating east and southeast (side-gradient) of the landfill. All the investigative and risk evaluation data as collected in order to get additional information to determine whether further remedial elements were necessary and warranted in the construction debris area and the area surrounding the landfill affected by the ground water migrating from the Site. A complete list of contaminants and sampling results for the sampling analysis of 1995 - 2000 may be found in the *Himco Dump Superfund Site Supplemental Site Investigation/Site Characterization Report* (USACE, 2002).

Summary of Site Risk

The 1992 risk assessment estimated the risk from exposure to ground water and the landfill proper but did not address the construction debris area or the eastern off-site residential area. The construction debris area is approximately 4 acres in size and is subdivided into seven residential and one commercial property parcels. The residential properties are occupied, but the commercial parcel is vacant. The existing homes on the residential parcels are connected to the local municipal water supply. However, these homes also have operable water wells. The *2002 Supplemental Risk Assessment* identified the construction debris area and the eastern residential area as **exposure pathways** for the Site. The **exposure routes** for these areas are dermal contact with the ground water (showering or bathing); contact with the soil; inhaling vapors from the ground water or the soil; drinking the ground water; and ingesting the soil.

EPA generally attempts to reduce the excess lifetime cancer risk at Superfund sites to a range of 1×10^{-4} to 1×10^{-6}; (1 in 10, 000 to 1 in one million). The excess lifetime cancer risk levels are determined by multiplying the intake levels by the **cancer potency factor** for each contaminant of concern and summing across all relevant chemicals and pathways. These risks are probabilities expressed in scientific notation (e.g., 1×10^{-4}). The hazard index is an expression on non-carcinogenic toxic effects that measures whether a person is being exposed to adverse levels of non-carcinogens. The hazard index for non-carcinogenic health risks is the sum of all contaminants for a given target organ. Any hazard index value greater than 1.0 suggests that a non-carcinogen potentially presents an unacceptable health risk. For detailed information pertaining to the risks associated with the Site, consult the *Himco Dump Superfund Site Supplemental Site Investigation/Site Characterization Report* (USACE 2002).

Construction Debris Area

Although the Maximum Contaminant Level (MCL) for drinking water has not been exceeded recently (1998 - 2000) for any constituent in ground water samples from the Construction debris area, the non-cancer hazard risk for the child resident is unacceptable for ground water in the Construction debris area. The total (across all exposure routes) Hazard Index is 46.0 due to the metals antimony, arsenic, iron, manganese, and thallium and the organics 1,2-dichloropropane, benzene, and vinyl chloride.

For surface soils, EPA's *Soil Screening Guidance: User's Guide, Office of Solid Waste and Emergency Response*, EPA/540/R-96/018. PB96-963505, April 1996 uses 400 mg/kg (same as 400 ppm) as a lead screening level for

residential soil as an appropriate screening level for inorganic lead. In the construction debris area, lead was detected above the residential screening level in one of the land parcels at the concentration of 695 mg/kg (695 ppm). Lead was also detected in other surface, near-surface, and subsurface soil samples for several other parcels. However the concentrations detected were below the screening level, and the samples collected were not sieved. It has been determined that lead is enriched in the fine particle fraction from sieved soil samples. Therefore, the soil concentrations measured may be an underestimate of the actual concentration of lead found in the other parcels.

The soil gas data collected in this investigation as not included in the risk assessment. Some uncertainty in the total media risk calculated for the land parcels is assumed based on the extent of soil migration that is shown to have occurred.

Eastern Residential Ground water

The MCL for 1,2-dichloropropane (5 µg/L or 5 ppb), a suspected carcinogen, was exceeded in a private well in this area. The estimated Site-related incremental lifetime cancer risk for this area was 5.5×10^{-4}, which exceeds the 1×10^{-4} to 1×10^{-6} acceptable risk range for an adult resident. Contributing to the adult risk level from ground water is the potential for ingestion of arsenic and the inhalation of benzene during household use. Due to the high levels of sodium detected in the drinking water, there is also concern for the adult resident who may have hypertension, diabetes, and other heart ailments.

The hazard index value of 28.95 for the child resident is unacceptable due to the metals arsenic, chromium, iron, manganese, and thallium and the volatiles benzene and 1,2-dichloropropane for all exposure routes.

Recomended Changes to the Cleanup Remedy for the Site

EPA proposes to amend the Site's *ROD* to modify the 1993 landfill composite cap design, and to establish a contingency for further ground water containment and remediation. If during the long-term monitoring of ground water a hazardous constituent exceeds the "trigger" number, a contingency remedy will be implemented. The contingency remedy will be developed at that time to meet the performance standards of a remedial action implemented to decrease the hazardous constituent's ground water concentration to below the trigger number within a 12-month period of the initial exceedence. EPA's trigger levels will be based on the multiple exposure routes for ground water for the individual hazardous constituent; i.e., inhalation, dermal contact, and ingestion. For potential human carcinogens, the trigger level corresponds to the 1×10^{-4} excess lifetime cancer risk level. This number also corresponds with the comparison values from the ATSDR risk category definition, where there is a low increased risk from exposure to a particular carcinogen. For example, the suggested trigger for 1,2-dichloropropane, a carcinogen, would be 16 ppb. For non-carcinogens, the trigger levels measured would be any Hazard Index value greater than 10.0 for drinking water.

The rationale for modifying the 1993 cap is as follows:

- Since the landfill waste mass is in contact with the water table, the effectiveness of the 1993 cap is minimized and therefore not cost effective.
- The 1993 cap will not remove the potential threat to the receptor. In this *Proposed Plan*, receptors (residents) will be connected to the local municipal water supply; therefore, the increased cost of the 1993 cap is not necessary.
- The architectural/structural requirement of 1993 to protect the cap's integrity would have increased the cost or prohibited potential redevelopment of the Site. A brownfields grant has been recently awarded to the City of Elkhart for the Site to ascertain the feasibility of restoring the property to productive reuse.
- An extensive ground water monitoring system will be implemented to ensure the protectiveness of all potential receptors.

A modified soil cover will be constructed over the "footprint" of the entire 60-acre landfill, which will consist of the following:

- Contour and grade the existing cover;
  - Add 30 inches of vegetated soil cover, of which 6 inches must be topsoil, seeded, if possible, with the current on-site plant species to preserve the Site's prairie plant community;
  - An erosion layer of at least 6 inches of soil capable of sustaining the growth of native plants;
  - A barrier layer consisting of at least 24 inches of compacted low permeability (1×10^{-5} cm/sec) soil cover. The rationale for the 30-inch soil cover had to do with that area of Indiana having a 24-inch freeze/thaw depth. Therefore, the bottom 6 inches of soil will not be impacted by the potential freeze/thaw phenomenon;
  - Random fill/existing waste;
- Institutional controls on landfill property will limit

the land reuse to industrial, recreational, or commercial.

- Construction of the cover will be implemented to avoid or minimize adverse effects on the wetland,
- Final grading of the total cover to no less than a 2 percent slope, after an accounting for the anticipated settlement.
- Install an active landfill gas collection system to remove the gas generated in the landfill waste mass, and vent the gas to the atmosphere after treatment with vapor-phase activated carbon to remove VOCs and control odors. If necessary, a thermal oxidation process with a flare stack will be constructed as required by Indiana Administrative Code (IAC) 326,
- Quarterly monitoring of the soil gas to assure that the performance standards of the active gas collection system are functioning properly for a duration of one year; semiannually for the next four years; and then re-evaluated to determine the monitoring schedule for the next 25 years.
- Periodic inspections. A complete inspection of the landfill cover system, drainage structures, landfill gas (LFG) collection and treatment system, and ground water wells. LFG monitoring probes will be conducted periodically during the post-closure period. Periodic inspections will be performed on a quarterly basis during the first two years post-closure. Following this period, periodic inspections will be conducted semiannually.
- Operation and maintenance (O&M) of the vegetative cover for 30 years.

For the construction debris area:

- Excavate the lead from the parcel that exceeded the screening level of 400 ppm and backfill with clean soil. Excavated soil will be disposed of per land disposal requirements.
- Remove all construction debris and rubble from the construction debris area, and backfill with clean soil.
- Abandon the 10 private wells in the construction debris area. Residential wells must be abandoned after municipal water is provided to the resident according to the Indiana Department of Natural Resources'requirements listed in 312 IAC 13-10-2. Once the private wells are abandoned at a residence, a deed restriction will be applied to that property to prohibit future private well installation and future ground water use.

For the residential area east and southeast of the landfill:

- Connect select residents (including a buffer zone) living on the east and southeast side of the landfill to the local municipal water supply (20 select and 15 buffer zone residents for a total of 35 residents).
- Abandon all residential private wells once the municipal water supply has been established. An appurtenant deed restriction will be applied to each property to prohibit future private well installation and future ground water use.
- Complete a ground water investigation on the south and east sides of the Site to determine the extent of detected contaminants. The investigation will involve vertical characterization of the contaminants to optimize placement of additional long-term monitoring wells.
- Establish a long-term ground water monitoring program to monitor the future ground water conditions from all the monitoring wells associated with the landfill, including the newly installed monitoring wells. The purpose is to determine if the ground water threshold trigger has been initiated or to determine if a municipal water supply should be extended past the buffer zone.
- The trigger for extending municipal water to the residential properties is reached when a monitoring well sample from the buffer zone meets or exceeds the MCL for four consecutive sampling events. This is to ensure that the elevated level is representative of ground water conditions. **Nested** monitoring wells will be installed in the buffer zone, not in the area where the residents are still using private wells. The purpose of the monitoring wells is to find a potential problem before it can impact the receptors. Residential wells must be abandoned once municipal water is provided to the resident according to the requirements listed in 312 IAC 13-10-2.

Long-Term Ground water Monitoring at the Landfill

- Monitor all ground water monitoring wells associated with the landfill for a minimum of 10 years; quarterly for the first two years. Based on the results, ground water monitoring may be decreased to semiannually for the next three years. The monitoring results will be evaluated to aid in predicting contaminant trends, and evaluate seasonal effects. At the five-year review periods (Superfund requirement for all sites where waste remain onsite), the ground water long-term monitoring requirements will be reassessed to determine the continued frequency and duration at that time.
- Implement institutional controls with deed restrictions limiting future ground water use, prohibiting the installation of new private ground water wells in the Site's vicinity, and no drilling or digging into the landfill cover.

- The land use restriction in the *1993 ROD* is no longer applicable. However, a future land use feasability study must be conducted by the entity responsible for the redevelopment of the property to determine the property's suitability for a particular reuse scenario. For example, any anticipated building constructed on the Site will have to be evaluated to determine the soil gas interaction/impact on any structures on the landfill, as well as the displacement of contaminated soils, wastes, etc.
- Install a perimeter fence around the entire Site for security.

At each five-year review, or earlier if necessary, EPA in consultation with IDEM will evaluate the following criteria to determine the need for more or less remedial measures:

- Ground water data collected during the previous monitoring period years to determine trends in contaminant concentrations, if any;
- Effectiveness of the source control measures to prevent contaminant migration beyond the downgradient boundary; and
- Potential for the contaminants in the ground water to meet or exceed trigger levels.

Additional measures may be necessary if an evaluation of the above criteria indicates:

- Concentrations in the ground water have not decreased; and
- Source control measures do not meet their remedial objectives.

IDEM Concurrence

IDEM concurs with the recommendation for the Site.

Next Steps

EPA will accept written comments on its recommendation during a public comment period from April 11 through May 12, 2003. EPA will evaluate comments received during the public comment period before selecting a cleanup plan for the Site. The cleanup plan will be described in the *ROD amendment*. After the remedial action is chosen, EPA will meet with the parties believed responsible for the Site. If the parties are unable to reach an agreement with EPA or are unwilling to perform the cleanup activities, Superfund monies may be used to pay for the cleanup action. EPA would then seek to recover these costs in federal court.

Glossary of Terms

Administrative Record – A compilation of all pertinent documents associated with any Superfund site used to make a cleanup decision for that site.

Carcinogenic Risk – Risk that is obtained by an exposure event, condition or effect that produces cancer.

Cancer Potency Factor (CPFs) – have been derived by EPA using the upper 95 percent confidence limit on the slope of a given dose-response curve for carcinogenic responses. CPFs are used to estimate potential incremental lifetime cancer risks by the appropriate route of exposure and are chemical-specific.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – More commonly know as Superfund, a federal law passed in 1980, and revised in 1986 by the Superfund Amendments and Reauthorization Act (SARA). CERCLA created a special tax that goes into a trust fund, commonly known as the Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Ground water – Underground water that fills pores in soil or openings in rocks to the point of saturation. Where ground water occurs in significant quantity, it can be used as a water supply.

Exposure Pathway – The course a chemical takes from the source to the exposed individual. An exposure pathway analysis links the sources, locations, and types of environmental releases with population locations and activity patterns to determine the significant pathways of human exposure.

Exposure Route – The way a chemical comes into contact with a person (e.g., by ingestion, inhalation, dermal contact).

Information Repository – A file containing current information, technical reports, and reference documents regarding a Superfund site. The information repository is usually located in a public building convenient to local residents, such as a library, public school, or city hall. In order to provide better public access, there is often more than one information repository for a particular Superfund site.

Leachate – A liquid, usually water from rain or snow, that has percolated through landfill wastes and contains contaminants from those wastes, that subsequently contaminate the ground water.

Maximum Contaminant Level (MCL) – The maximum concentration of specific contaminants allowed under the federal Safe Drinking Water Act.

Monitored Natural Attenuation – The use of natural processes, within the context of a carefully controlled and monitored site cleanup approach, to reduce contaminant concentrations to levels protective of human health and the environment within a reasonable time period.

Nested – A group (usually three) of monitoring wells screened at different sampling depths near each other in order to identify what depth the contaminants are located in the ground water.

Parts per Million (ppm) – A common basis for reporting water analysis. One ppm equals one unit of measurement per million units of the same measurement.

Proposed Plan – A document that describes the remedial alternative analyzed for a Superfund site and identifies the preferred alternative and the rationale for the preference.

Record of Decision (ROD) – A document outlining the selected remedy for a Superfund Site. The ROD includes the Responsiveness Summary, which addresses concerns presented to EPA during the public comment period. The ROD is signed by the director of EPA Region 5 Superfund Division.

Soil Gas – The vapors occupying the pore spaces of soils resulting from the decomposition of organic matter. Methane is the most common type of soil gas.

COST ESTIMATE SUMMARY

1. Present Worth Cost Estimates were based on a 7 percent Multi-Year Discount Factor of 12.409.
   a. Reference: *A Guide To Developing and Documenting Cost Estimates During Feasibility Study*; EPA 540-R-00-002; OSWER 9355.0-75; July 2000.
   b. Present Worth or Present Value cost estimate is defined as the amount of funds that needs to be set aside at the initial point in time (base year) to assure that funds will be available in the future as they are needed to fund annual costs.
2. The *1993 ROD* costs were taken from *1993 ROD* Table 10 Cost Summary.

Table 1. 2003 PROPOSED PLAN COST ESTIMATE SUMMARY

REMEDY COMPONENTS	COST ($)
Cover	3,833,200
Construction debris area Removal	194,400
Active Landfill Gas Collection and Treatment System	1,430,300
Monitoring Well Installation	80,300
South and East Side Ground water Investigation	192,500
Construction debris area Residential Well Abandonment	4,600
East Side Residential Well Abandonment	331,200
Real Estate Filing Fees	13,900
5-Year Reviews (6)	165,000
Future Land Use FS	110,000
Residential Well Municipal Water Connections (35)	355,000
Total (Capital Cost)	**6,710,400**
LONG-TERM OPERATION, MAINTENANCE, AND MONITORING	
Annual O&M Cost	623,500
30-Year Landfill Cap O&M	18,705,000
Present Worth Cost (Single Payment 30-Year O&M)	**7,738,000**
Total Present Worth Project Cost (Single Payment Capital = O&M Cost)	**14,448,400**
CONTINGENT REMEDY COMPONENTS	
Ground water Treatment System	1,658,700
30-Year Ground water Treatment System O&M	17,003,800
Additional Residential Commections (30 properties)	323,100

3. The *1993 ROD* cost estimate did not contain detailed information how the estimate was developed.
4. The 1993 Cost Estimate did not contain the following cost items:
   a. East Side Ground water Investigation
   b. Construction debris area Residential Well Abandonment
   c. East Side Residential Well Abandonment
   d. Real Estate Filing Fees
   e. Five-Year Reviews (6)
   f. Future Land Use FS
   g. Residential Municipal Water Connections (35)
5. The 2003 Revised *1993 ROD* cost estimate was based on the 1993 cost with a 2 percent cost escalation over a 10-year period.
6. The Draft Proposed Plan Cost Estimate Summary was based on the "Recommended Changes to the Cleanup Remedy for the Site" section of the Draft *Proposed Plan* which included and outline of the recommended remedy with assumptions and comments.

Table 2. 1993 ROD REMEDY COST ESTIMATE

1993 ROD REMEDY SUMMARY	COST ($)
1993 ROD Remedy	8,931,000
Consisting of:	
Composite Barrier Solid Waste Cap	
Active Landfill Gas Collection and Treatment System	
Ground water Monitoring and Institutional Controls	
Total (Capital Cost)	**8,931,000**
LONG-TERM OPERATION, MAINTENANCE, AND MONITORING	
Annual O&M Cost	210,000
30-Year Landfill Cap O&M	2,890,000
Total Present Worth Cost (1993)	**11,821,000**
CONTINGENT REMEDY COMPONENTS	
Ground water Treatment System	1,658,700
30-Year Ground water Treatment System O&M	17,003,800

Table 3. 2003 REVISED 1993 ROD REMEDY COST ESTIMATE

2003 REVISED 1993 ROD REMEDY SUMMARY	COST ($)
2003 Revised ROD Remedy	10,889,000
Consisting of 1993 ROD Components:	
Composite Barrier Solid Waste Cap	
Active Landfill Gas Collection and Treatment System	
Ground water Monitoring and Institutional Controls	
Total (Capital Cost)	**10,889,000**
LONG-TERM OPERATION, MAINTENANCE, AND MONITORING	
Annual O&M Cost	623,500
30-Year LF Cap O&M	18,705,000
Present Worth Cost (Single Payment 30-Year O&M)	**7,738,000**
Total Present Worth Project Cost (Single Payment Capital = O&M Cost)	**18,627,000**
CONTINGENT REMEDY COMPONENTS	
Ground water Treatment System	1,658,700
30-Year Ground water Treatment System O&M	17,003,800

Evaluating the Alternatives Against the Nine Evaluation Criteria

EPA evaluated the alternatives against eight of the nine evaluation criteria (see the table below describing the nine criteria EPA uses to evaluate an alternative). The community acceptance criterion will be evaluated after public comments are received by EPA. The degree to which the alternatives meet the evaluation criteria, as determined by EPA, is shown in the table below. EPA believes that the proposed plan *ROD amendment* meets the evaluation criteria better than the September 1993 ROD remedy or the no further action alternative.

Nine Evaluation Criteria	No Further Action	1993 ROD Remedy: Selection Composite Cap with Line and Gas Collection System	2003 Proposed Plan: Soil Cover, Gas Collection System, Soil Removal, New Water Supply and Long-Term Ground water Monitoring
1. Overall Protection of Human Health and the Environment	☐	■	■
2. Compliance with ARARs	☐	■	■
3. Long-Term Effectiveness and Permanence	☐	■	■
4. Reduction of Toxicity, Mobility, or Volume through Treatment	☐	◧	◧
5. Short-Term Effectiveness	☐	■	■
6. Implementability	☐	■	■
7. 2003 Total Present Worth Cost (Single Capital Payment with O&M Cost)	$ 0	$ 18,627,000	$ 14,448,400
8. State Acceptance	Accepted by Indiana Department of Environmental Management		
9. Community Acceptance	Will be evaluated after the public comment period.		

■ Meets Criterion ◧ Partially Meets Criterion ☐ Does Not Meet Criterion

Explanation of the Nine Criteria

EPA uses the following nine criteria to evaluate the cleanup alternatives. A table comparing the alternatives against these criteria is provided.

1. Overall Protection of Human Health and the Environment. Assessment of the degree to which the cleanup alternative eliminates, reduces, or controls threats to public health and the environment.
2. Compliance with Applicable or Relevant and Appropriate Requirements. An evaluation of whether or not the alternative attains applicable or relevant and appropriate requirements under federal environmental laws and state environmental or facility siting laws.
3. Long-Term Effectiveness and Permanence. The cleanup alternative is evaluated in terms of its ability to maintain reliable protection of human health and the environment over time.
4. Reduction of Toxicity, Mobility, or Volume Through Treatment. An evaluation of how well a cleanup alternative reduces the harmful nature of the contamination at the site; the ability of the contamination to move from the site into the surrounding area; and the amount of contaminated material.
5. Short-Term Effectiveness. The length of time needed to implement a cleanup alternative is considered. EPA also assesses the risks that carrying out the cleanup alternative may pose to workers and nearby residents.
6. Implementability. An assessment of how difficult the cleanup alternative will be to construct and operate, and whether the technology is readily available.
7. Cost. A comparison of the costs of each alternative. Includes capital, operation, and maintenance costs.
8. State Acceptance. EPA takes into account whether the state agrees with the recommended change, and