United States Environmental Protection Agency

EPA Proposes Cleanup Plan for Residential Area, Zone 1

U.S. Smelter and Lead Refinery Superfund Site
East Chicago, Indiana November 2018

To clean up soil contamination in the USS Lead site residential area, the U.S. Environmental Protection Agency is proposing an amendment to a cleanup plan.[1] On Nov. 30, 2012, EPA signed a "record of decision," or ROD, to address soil contaminated with lead and arsenic in the residential and commercial area north of the former USS Lead facility. EPA proposed this cleanup plan after studying the site and considering several alternatives. Figure 1 on Page 2 shows the boundaries of the site.

One consideration in selecting the 2012 plan was that EPA anticipated the houses and apartment buildings, along with the sidewalks and parking lots of the West Calumet Housing Complex, would act as barriers to resident's exposure to the lead and arsenic soil contamination. However, the closing and demolition of the WCHC removed all these barriers and the risk to human health and the environment that was originally calculated in the 2012 ROD has not changed. This amended cleanup plan is for the modified Zone 1 area (*see Figure 2 on Page 2*) only. The amended plan calls for EPA to dig up and remove contaminated soil and take it to an off-site facility. Though lead is the most widespread contaminant, arsenic was also found at some locations.

Based on an assumption that the modified Zone 1 will remain residential, EPA's recommended alternative is Alternative 4B. This alternative calls for removing up to 2 feet of contaminated soil, laying down a barrier, and replacing the contaminated soil with clean soil. This alternative would protect residential redevelopment. EPA would place controls on the property to ensure the barrier stays in place. This alternative protects people and the environment, meets the applicable regulations, is cost-effective and will be effective in the long term.

Before making a final decision, EPA will hold a public meeting and seek comments from the public (*see box, left*). In consultation with the Indiana Department of Environmental Management, EPA may modify its cleanup plan or choose a new one based on public comments so your opinion is important. During the comment period, EPA officials will be watching for details that might emerge about a redevelopment plan for the modified Zone 1 or other kinds of new information. EPA could also issue a contingency plan that would select Alternative 4B but would also set one or more conditions that would enable EPA to modify 4B or select a different alternative if the conditions were met (*see Zone 1 future use on Page 3)*.

(continued on the next page)

[1]*Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERLCA, known as the Superfund law) requires the publication of a notice announcing the proposed plan. It also requires a public meeting and public comment period. This fact sheet summarizes the technically written proposed plan and other site-related environmental reports that can be viewed at two East Chicago Public Library locations at 2401 E. Columbus Drive and 1008 W. Chicago Ave., and at the EPA Region 5 office in Chicago. The Administrative Record is available online at www.epa.gov/uss-lead-superfund-site.*

Share your opinions

EPA invites your comments on this proposed cleanup plan from **Nov. 12, 2018 to Jan 14, 2019.** There are four ways for you to submit comments:

- Fill out and return the enclosed comment sheet.
- Orally or in writing at the public meeting.
- On the internet at www.epa.gov/uss-lead-superfund-site
- Send a fax to Janet Pope, 312-385-5311.

Public meeting/hearing

Nov. 29, 2018, 6 p.m.
Robert A. Pastrick Library Branch
1008 W. Chicago Ave.

After a brief presentation, EPA will hold a formal public hearing to accept comments on the proposed plan. A court reporter will record the meeting and all comments.

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You may call EPA toll-free at 800-621-8431, 9 a.m. – 4:30 p.m., weekdays

Information repository

Site documents can be viewed at the East Chicago Public Library locations: 2401 E. Columbus Drive or 1008 W. Chicago Ave., East Chicago, Ind.

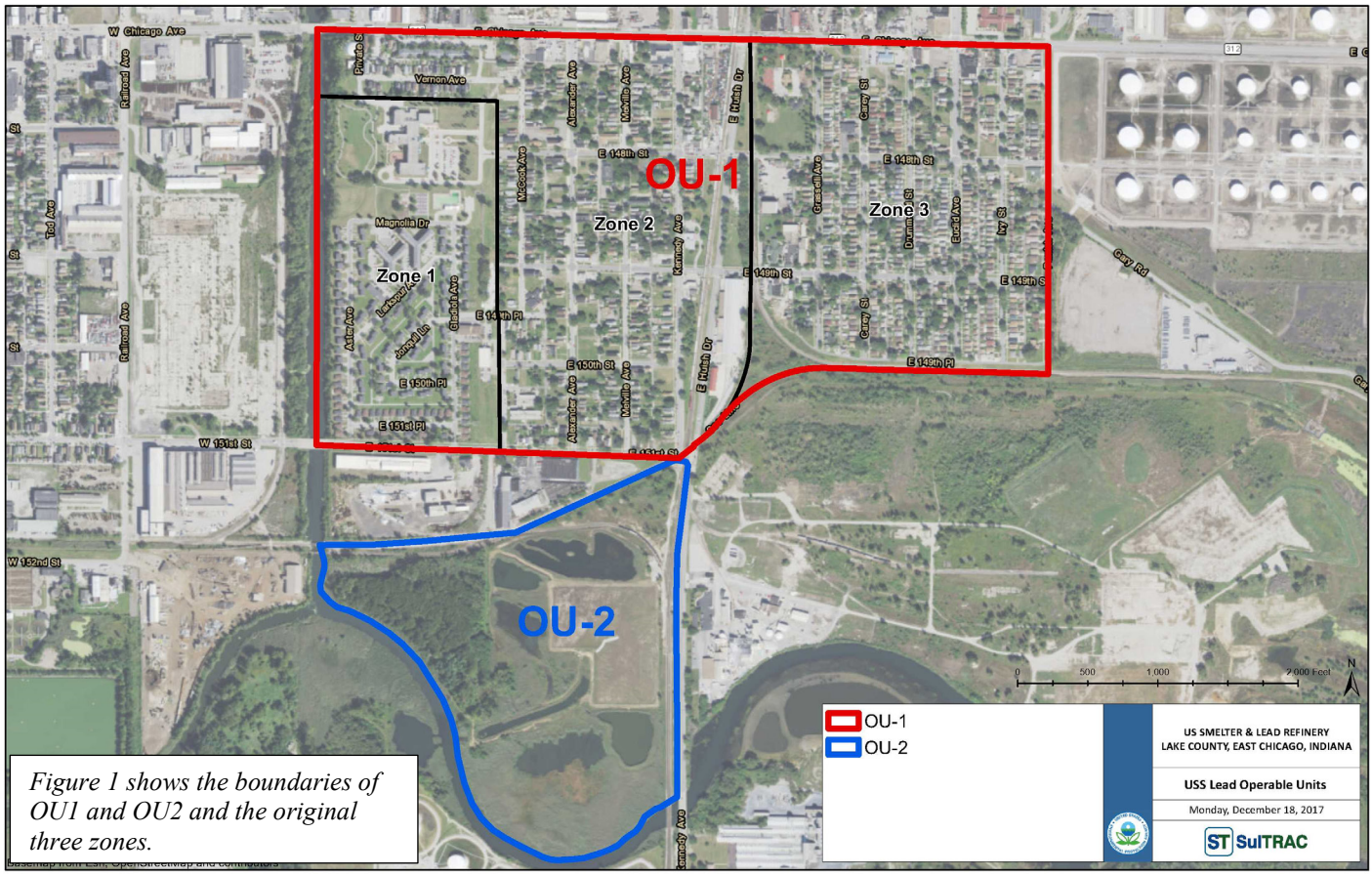

Figure 1 shows the boundaries of OU1 and OU2 and the original three zones.

Site location

Zone 1 is part of the USS Lead site and initially included the West Calumet Housing Complex, Goodman Park, the former Carrie Gosch Elementary School and a utility corridor. The former Carrie Gosch Elementary School is currently being addressed by the parties considered responsible for the contamination and is not part of this modified Zone 1. The modified Zone 1 is shown in Figure 2 to the right.

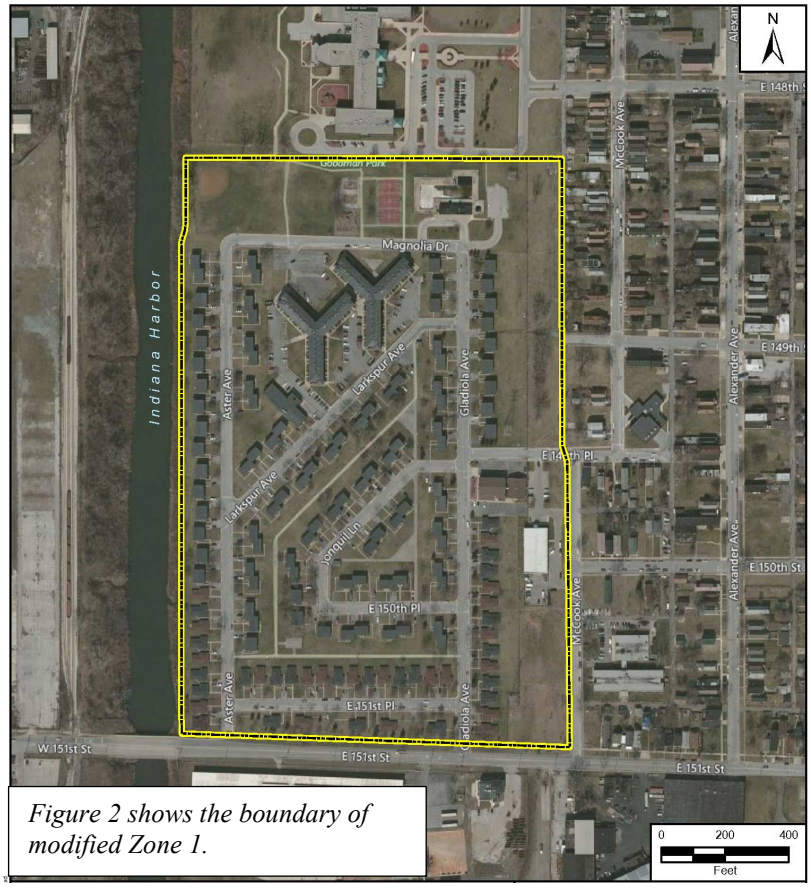

Figure 2 shows the boundary of modified Zone 1.

Summary of site risks

The closing and demolition of the WCHC have not changed the cleanup objectives, known as "remedial action objectives", or RAOs (*see box on Page 3).* Unacceptable risk to human health is present for both lead and arsenic in the soil within Zone 1. The main way people in and around Zone 1 are exposed to lead is by touching the soil or inhaling small particles of soil.

EPA considers a cleanup level of 400 parts per million, or ppm, of lead *(residential)*, 800 ppm of lead *(industrial)*, and 26 ppm of arsenic *(residential or industrial)* in soil to protect human health. Therefore, EPA evaluated alternatives with methods that would lower soil contamination to these levels or lower.

Remedial action objectives

RAOs are general descriptions of cleanup goals. The action objectives are established by considering the medium (soil, water, etc.) of concern (soil in Zone 1), risk levels of contaminants of concern (lead and arsenic), how the contaminants can get to people and what people are exposed to. The RAOs remain the same for this proposed amendment for the WCHC, Goodman Park and the utility corridor.

EPA has identified the following RAO for Zone 1: *Reduce to acceptable levels the risk for people from exposure to contaminants of concern (lead and arsenic) in surface and subsurface soil through ingestion, direct contact, or inhalation, assuming anticipated future use scenarios.*

Previous cleanup plan

The closure and subsequent demolition of the WCHC has required EPA to reevaluate the remedy for the modified Zone 1. The cleanup plan chosen in the 2012 ROD called for the removal of impacted soil that exceeded remedial action levels, or RALs (*see box, below)*, to a maximum depth of 24 inches. Contaminated soil would be excavated if greater than 400 ppm lead and 26 ppm arsenic. Soil contaminated greater than the RALs below 24 inches would be left in place and a visual barrier such as orange construction fencing or landscape fabric would be placed above the contaminated soil. Clean fill and topsoil would be placed above the visible barrier to the original grade. Properties would be restored and institutional controls would be placed on any property with soil greater than the RALs below 24 inches. Contaminated soil would not be removed from under structures and hardscapes such as houses, sidewalks, parking lots and streets.

Remedial action levels

RALs are long-term soil concentration levels used during the evaluation of the cleanup alternatives. The RALs listed in the table below meet the RAO for soil and potential health risks associated with soil at OU1.

Contaminant	OU1 Soil RAL
Arsenic	26 ppm
Lead	400 ppm (Residential) 800 ppm (Industrial)

Zone 1 cleanup status

In September 2017, the federal Housing and Urban Development department approved East Chicago Housing Authority's application to demolish the WCHC. Demolition began in April 2018 and is now complete. All buildings and hardscapes have been removed and the ground has been reseeded. Because of the WCHC demolition, the pool in Goodman Park has also been removed. The basketball court remains.

Zone 1 future use

The past use of the WCHC and Goodman Park was residential. Currently, EPA is assuming the future use of the modified Zone 1 will remain residential. However, EPA has received correspondence from East Chicago, Ind., Mayor Anthony Copeland stating the future use of Zone 1 could become commercial/industrial. This correspondence did not include a commercial/industrial redevelopment plan that would justify remediation to commercial/industrial standards at this time.

However, EPA has included and evaluated an alternative *(Alternative 4A)* that would protect human health and the environment under commercial or industrial use. Depending upon information received during public comment and the evolution of any redevelopment proposals, EPA could issue a plan amendment that either modifies Alternative 4B or selects Alternative 4A or any other alternative evaluated. A plan amendment that either modified Preferred Alternative 4B to allow some cleanup to industrial/commercial standards or selected Alternative 4A would be appropriate only if, at the time of the ROD amendment, a high level of certainty existed that an actual change in future land use to industrial/commercial would occur.

In addition, EPA could issue a contingent plan amendment. This approach would also depend upon information received during the public comment period and the evolution of any redevelopment proposals. A contingent plan amendment would select Preferred Alternative 4B – a remedy consistent with residential use – but would set forth one or more conditions that would enable EPA to either select Alternative 4A *(or any other Alternative instead of the currently Preferred Alternative 4B)* or modify Preferred Alternative 4B, if the future condition(s) identified in the plan amendment were satisfied.

A plan amendment that included a contingency to allow for either a selection of Alternative 4A or a modification of Preferred Alternative 4B to allow some cleanup to industrial/commercial standards would be appropriate only if, at the time of the plan amendment, a sufficient level of certainty existed that an actual change in future land use to industrial/commercial was probable.

Cleanup alternatives considered

EPA considered 10 alternatives for cleaning up modified Zone 1 (*see table on Page 4)*. The Agency checked each alternative against three broad criteria: protectiveness *(both short-term and long-term)*, implementability

(including technical and administrative feasibility) and relative cost *(capital and operation and maintenance)*. Each alternative must also comply with appropriate laws and regulations.

Initial Cleanup Alternatives Considered	
1	No Action
2	Institutional Controls
3A	12" on-site soil cap and ICs
3B	On-site asphalt cap and ICs
4A	12" industrial/commercial excavation and disposal
4B	24" residential excavation and disposal (***Preferred***)
4C	Residential excavation to groundwater depth and disposal
4D	Residential excavation to native sand depth and disposal
5	On-site *(in-situ)* treatment by chemical stabilization
6	Soil washing/chemical separation

This screening evaluation reduced the number of alternatives. EPA eliminated Alternative 2 *(institutional controls)* and Alternative 5 *(in-place treatment by chemical stabilization)* because they would not be effective. Alternative 2 does not reduce human health risk because the contaminated soil would remain in place. Alternative 5 was eliminated because the long-term effectiveness of in-place stabilization has not been proven. More information on the screening alternatives can be found in the Feasibility Study Addendum, which can be found at the repositories listed in the box on Page 1 or on EPA's website at www.epa.gov/uss-lead-superfund-site.

EPA also eliminated Alternative 6 *(soil washing)* from further consideration because it did not satisfy any of the screening criteria.

Seven alternatives passed the initial screening process and were evaluated against seven criteria required by Superfund law (*see box on Page 6*). State and community acceptance are evaluated after EPA proposes a cleanup plan and holds a public comment period.

Here are summaries of the seven remaining alternatives.

Alternative 1 – No action: EPA always includes this as a comparison point for other alternatives. Under this alternative, EPA would do nothing to clean up the contaminated property, so there would be no effect on potential health risks. **Cost: $0**

Alternative 3A – 12" on-site soil cap and institutional controls. Contamination would be left in place and capped with a 12-inch-thick soil cover with sod or seed. The soil cap will prevent direct contact with contaminated soil. Institutional controls such as restrictions on digging into the soil and other use restrictions would be installed so site users would not be exposed to soil pollutants. Because some contaminated soil would be left in place, EPA would conduct five-year reviews of the cleanup in accordance with Superfund requirements. **Cost: $5 million**

Alternative 3B – On-site asphalt cap and institutional controls. An asphalt cap would be placed over the entire modified Zone 1 area, which would prevent direct contact with contaminated soil. A stormwater collection system would be included with the asphalt cap to prevent local flooding. Institutional controls such as restrictions on digging in the soil and other use restrictions would be put in place so that users of the site would not be exposed to soil contaminants. Because some contaminated soil would be left in place, EPA would conduct five-year reviews of the cleanup in accordance with Superfund requirements. **Cost: $21.7 million**

Alternative 4A – 12-inch industrial/commercial excavation and disposal. This involves removing around 81,473 cubic yards of contaminated soil that exceeds industrial/commercial RALs down to a maximum depth of 12 inches. Contaminated soil would be disposed of at an approved off-site landfill. If necessary to meet off-site disposal requirements, soil with the highest concentrations would be treated with chemical stabilization.

Excavated soil would be replaced with clean soil to maintain the original grade and restored with seed or sod. Institutional controls such as restrictions on digging and other use restrictions would be implemented to protect future site users from unacceptable risks related to exposure to remaining contaminated soil. Because some contaminated soil would be left in place, EPA would conduct five-year reviews of the cleanup effectiveness in accordance with Superfund requirements. **Cost: $14 million**

Alternative 4B – 24-inch residential excavation and disposal (*EPA's Recommended Alternative).*
Like 4A except this alternative includes removing about 162,947 cubic yards of contaminated soil but leaving soil below 24 inches in place. Excavated soil would be disposed of at an approved off-site landfill. As necessary, soil with the highest concentrations would be treated with chemical stabilization. The maximum excavation depth would be 24 inches deep.

Excavated soil would be replaced with clean soil to maintain the original grade and restored with seed or sod. Institutional controls such as digging restrictions and other use restrictions would be implemented to protect future site users from unacceptable risks related to exposure to remaining contaminated soil. Because some contaminated soil would be left in place, EPA would conduct five-year reviews of the cleanup in accordance with Superfund requirements. **Cost: $26.5 million**

Alternative 4C – Residential excavation to groundwater and disposal. This alternative consists of removing around 238,408 cubic yards of contaminated soil exceeding residential RALs down to groundwater depth, followed by backfilling to grade and restoring with sod or seed. "Groundwater" is an environmental term for underground supplies of fresh water. Excavated soil would be disposed of at an approved landfill and, as necessary, soil with the highest lead concentrations would be treated using chemical stabilization. Institutional controls such as digging restrictions and other use limits would be implemented to protect future site users from unacceptable risks related to exposure to remaining contaminated soil. Because some contaminated soil would be left in place, EPA would conduct five-year reviews of the cleanup in accordance with Superfund requirements. **Cost: $39.9 million**

Alternative 4D – Residential excavation to native sand and disposal. This alternative consists of removing approximately 262,350 cubic yards of contaminated material, including debris, at the site down to the depth of native sand. Excavated soil would be disposed of at an approved landfill and, as necessary, soil with the highest lead concentrations would be treated using chemical stabilization.

Excavated soil would be replaced with clean soil to maintain the original grade and restored with sod or seed. This alternative would result in the removal of all affected soil since excavations would go down to the native sand, and the native sand layer is clean. There would be no need for institutional controls or for five-year reviews. **Cost: $48.8 million**

Evaluation of EPA's recommended alternative

EPA recommends Alternative 4B because at this time the future use of the modified Zone 1 is assumed to be residential, and this alternative has the best balance of the evaluation criteria. Once implemented it would:

- Immediately prevent exposure to contaminated soil that poses health risks to residents.
- Prevent future exposure to residents with limited property use restrictions.
- Allow residential land use to continue.

EPA's preference for digging to 24 inches *(and not deeper)* is based on its determination that digging deeper is not meaningfully more protective of residential users and so does not justify the additional cost. Based on EPA's experience, 24 inches of clean soil will generally prevent direct human contact and exposure to contaminated soil left at that depth. Gardening is the only typical activity that might extend below 12 inches.

Alternative 4B would achieve these goals within a reasonable time and at a lower cost. It requires minimal effort to maintain long-term protectiveness. Alternative 4B meets the threshold criteria, offers a high degree of long-term effectiveness and permanence, and represents the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria.

Based on the information available now, EPA and IDEM agree that Alternative 4B would protect human health and the environment, comply with regulatory criteria, be cost-effective, and use permanent solutions and alternative treatment technologies to the maximum extent practicable.

The recommended alternative may change in response to public comment, redevelopment plans for the modified Zone 1, or new information. We describe the possibilities in the section called "Zone 1 future use" on Page 3.

Evaluation of all alternatives

Nine criteria (*see chart on Page 6)* are used to evaluate the different alternatives and against each other to select a cleanup alternative. EPA concluded the "no-action" alternative would not protect people or the environment and was eliminated from consideration. Alternatives 3A, 3B, 4B, 4C and 4D would protect human health and the environment for a residential use scenario. They address potential exposure to contaminants by covering or removing the contaminated soil. Alternative 4A would not protect human health because only 1-foot of soil would be removed. However, if the future use of Zone 1 changed to industrial/commercial, Alternative 4A would then be considered protective of the health of workers.

Swallowing contaminated soil within Zone 1 is the primary expected exposure route under a residential use scenario. Residents could be exposed to contaminants through direct ingestion of contaminated soil. Alternatives 3A, 3B, 4B, 4C and 4D are all considered effective at preventing ingestion. Alternatives 3A and 3B rely on a cap, either soil or asphalt, and compliance with institutional controls for their protectiveness, while Alternatives 4B and 4C would achieve protectiveness

through the removal of contaminated soil and institutional controls. Alternative 4D would be the most protective since all material, including debris would be excavated down to native sand and disposed of off-site.

Direct contact can also result from recreational activities, gardening, landscaping or excavation. Each of the active alternatives *(those involving excavation or putting a cap on the contaminated soil)* would prevent direct contact by covering or removing the contaminated soil. However, direct contact may result from unauthorized excavation activities for all the alternatives, except 4D because the contaminated soil would remain in place either under a cap or under a soil cover.

Exposure through inhalation would most likely occur through windborne transport of contaminated dust and soil due to the contaminants' strong tendency to attach to soil particles. Each of the active alternatives would prevent exposure to contaminated dust by removing or covering the contaminated soil.

Alternatives 3A, 3B, 4A *(commercial/industrial)*, 4B, 4C and 4D address potential exposure to contaminants by covering or removing the contaminated soil. Alternative 4D would eliminate potential exposure because all contaminated soil would be removed down to native sand. Alternative 3A and 3B would leave contaminated soil behind either under a soil or asphalt cover. Alternative 4A would leave contaminated soil below 1 foot; Alternative 4B would leave contaminated soil below 2 feet; and Alternative 4C would leave contaminated soil below the groundwater. At those properties where contaminated soil remains, EPA would rely on institutional controls *(such as prohibiting excavation of contaminated soil)* to prevent exposure.

Alternatives 3A, 3B, 4A, 4B, 4C and 4D are proven technologies that meet the requirements for long-term effectiveness and permanence. Compared to Alternative 3A and 3B, Alternatives 4B and 4C provide an additional level of protectiveness because contaminated material above RALs will be removed to a depth of 2 feet or to groundwater depth and disposed of off-site. Alternative 4D provides the greatest degree of long-term effectiveness and permanence because all soil exceeding RALs would be removed from Zone 1.

Alternatives 3A and 3B require the least disturbance of lead-contaminated soil. Alternatives 3A, 3B, and 4A *(commercial/industrial)* have the shortest construction times of five months *(3A and 4A)* and seven months *(3B)*. Compared to Alternative 3, Alternatives 4A, 4B and 4C have greater short-term effects because of the amount of materials moved to and from the site, as well as the increased duration of construction. Alternative D produces the most risk to the workers and community due to the longest duration of excavation and off-site disposal

Evaluation criteria

EPA uses nine criteria to compare cleanup alternatives:

1. **Overall protection of human health and the environment** addresses whether an alternative adequately protects both human health and the environment. The cleanup plan can meet this criterion by reducing or eliminating contaminants or by reducing exposure to them.
2. **Compliance with applicable or relevant and appropriate requirements** assures that each alternative complies with federal, tribal and state laws and regulations.
3. **Long-term effectiveness and permanence** evaluates how well an alternative will work in the long term, including how safely remaining contaminants can be managed.
4. **Reduction of toxicity, mobility or volume through treatment** addresses how well the alternative reduces the toxicity (the chemical makeup of a contaminant that makes it dangerous), movement and amount of contaminants.
5. **Short-term effectiveness** is how quickly the alternative achieves protection, as well as its potential to be harmful to human health and the environment while it's being constructed.
6. **Implementability** evaluates the technical feasibility of the alternative, and whether materials and services are available to carry out the alternative.
7. **Cost** includes estimated capital or startup costs, such as the cost of buildings, treatment systems and monitoring wells. The criterion also considers costs to implement the alternative, and operate and maintain it over time. Examples include laboratory analysis and personnel to operate equipment.
8. **State acceptance** is whether the state environmental agency, in this case the Indiana Department of Environmental Management, agrees or disagrees with EPA's recommended alternative.
9. **Community acceptance** evaluates how well the community near the site accepts the alternative. EPA evaluates community acceptance after it receives and evaluates public comments on its recommended alternative.

of 14 months and the difficulty excavating in groundwater. The longer a project takes, the greater the potential for problems from truck traffic and vehicle accidents, construction-related and exposure risks to workers, and additional quality-of-life impacts to the local community such as noise and dust.

Alternatives 3A or 3B do not reduce the toxicity, mobility, or volume of contaminated materials because no treatment would be applied. Alternatives 4A *(commercial/industrial)*, 4B, 4C and 4D would reduce the toxicity and mobility of the contamination through off-site treatment of soil prior to disposal, but would not reduce the volume of contaminated material. Alternative 4D would require the most treatment, then Alternative 4C and Alternative 4B.

All the alternatives can be readily implemented and have been used successfully for other environmental cleanup projects. Alternative 3B is more difficult to implement than 3A, 4A, 4B and 4C, because it requires more detailed design plans to maintain safe grading and to install a storm water management system. Alternative 4D would be the most difficult to implement due to the challenges associated with excavating below the groundwater table. Side slope stability and dewatering of the excavation with treatment of the contaminated groundwater would be necessary for Alternative 4D.

Next steps

Before EPA makes a final decision, the Agency will consult with IDEM and review public comments. Because EPA will hold a 60-day public comment period *(instead of a typical 30-day public comment period)*, no extensions of time will be granted. (*See Page 1 for the dates of the public comment period.)*

EPA encourages you to review and comment on the proposed cleanup plan. More detail on the cleanup alternatives is available in the official documents on file at the information repository (*listed on Page 1*) or EPA's website at www.epa.gov/uss-lead-superfund-site. EPA will respond to the comments in a document called a "responsiveness summary," a part of the record of decision that describes the final cleanup plan.

The Agency will announce the selected cleanup plan in a local newspaper and will place a copy in the information repositories and post it on EPA's website.

Chart comparing cleanup alternatives with the nine Superfund remedy selection criteria under a residential cleanup scenario

Evaluation Criterion	Alt. 1	Alt. 3A	Alt. 3B	Alt. 4A	Alt. 4B*	Alt. 4C	Alt. 4D
Overall Protection of Human Health and the Environment	○	●	●	○	●	●	●
Compliance with ARARs	○	●	●	●	●	●	●
Long-term Effectiveness and Permanence	○	●	●	○	●	●	●
Reduction of Toxicity, Mobility, or Volume through Treatment	○	○	○	◉	●	●	●
Short-term Effectiveness	N/A**	◉	◉	◉	◉	◉	◉
Implementability	N/A**	●	●	●	●	●	●
Alternative Cost ($ millions)	$0	$5	$21.7	$14	$26.5	$39.9	$48.8
State Acceptance	Will be evaluated after comment period.						
Community Acceptance							

● Fully meets criterion ◉ Partially meets criterion ○ Does not meet criterion

* EPA's recommended alternative

** N/A: not applicable, since no remedy is being implemented in the No-Action Alternative

United States
Environmental Protection
Agency

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USS LEAD SITE: Proposed Plan for Zone 1

Para una copia en español de este documento

Si prefiere recibir una copia en español de este documento, por favor comuníquese con Charles Rodríguez, Coordinador de Participación Comunitaria al 312-886-7472, o por correo electrónico a rodriguez.charles@epa.gov.

Una copia electrónica en español de este plan propuesto también está disponible en www.epa.gov/uss-lead-superfund-site.