



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

SEP 9 2008

MEMORANDUM

SUBJECT: Request for Approval of Explanation of Significant Differences
Annapolis Lead Mine Superfund Site, Operable Unit 1
Annapolis, Missouri

FROM: Jason Gunter, RPM
SPEB



THRU: Gene Gunn, Chief
SPEB



TO: Cecilia Tapia, Director
Superfund Division

Attached for your approval is an Explanation of Significant Differences (ESD) for the Annapolis Lead Site in Annapolis, Missouri. The site was the location of a former lead mine. The remedy for the site included a time-critical removal action in May 2004. The time-critical removal action minimized both the potential for human exposure to lead through contact with the soil and the potential for transport of the tailings by surface runoff, wind, or human activity. Monitoring and Site control measures were conducted during the removal action work to ensure removal activities did not expose nearby populations and Site workers to harmful levels of contaminants. This ESD describes changes to the ROD. Work that was included in the ROD that will be omitted from the Remedial Action includes the following:

Addition of phosphate to floodplain soils (away from the outer edge of riparian zone) during the dry season to improve the density of vegetation and to reduce the bioavailability of lead to terrestrial receptors.

This change represents a significant change in the selected remedy with respect to scope and cost. The U.S. Environmental Protection Agency (EPA) is issuing this ESD with support and concurrence from the Missouri Department of Natural Resources.

Attachment

EXPLANATION OF SIGNIFICANT DIFFERENCES
ANNAPOLIS LEAD MINE SUPERFUND SITE
OPERABLE UNIT-1
August 2008

This Explanation of Significant Differences (ESD) is being issued for the Annapolis Lead Mine Superfund Site (Site), Operable Unit-1 (OU-1), in Annapolis, Missouri (CERCLIS ID # MO0000958611). The selected alternative, or cleanup plan, was described in a Record of Decision (ROD) for the Site in September 2005. The purpose of this document is to provide an explanation of significant differences between the ROD for the Site, OU-1, and the Remedial Action for the Site.

This ESD describes changes to the ROD. Work that was included in the ROD that will be omitted from the Remedial Action includes the following:

Addition of phosphate to floodplain soils (away from the outer edge of riparian zone) during the dry season to improve the density of vegetation and to reduce the bioavailability of lead to terrestrial receptors.

This change represents a significant change in the selected remedy with respect to scope and cost. The U.S. Environmental Protection Agency (EPA) is issuing this ESD with support and concurrence from the Missouri Department of Natural Resources (MDNR). The issuance of an ESD is required by the National Oil and Hazardous Substances Pollution Contingency Plan and Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, more commonly known as Superfund.

This ESD, and supporting information, will be added to the administrative record for the Site by means of an administrative record addendum. The availability of the addendum will be announced by public notices in local newspapers. The administrative record file and all associated addendums are available for public review during normal business hours at EPA's Region 7 office at 901 North 5th Street in Kansas City, Kansas, and at the Site repository located at the Annapolis City Library at 204 School Street in Annapolis, Missouri.

Summary of Site Background and the Selected Remedy

The Site is located approximately one mile east-northeast of Annapolis, Missouri, adjacent to and within the Sutton Branch Creek Flood Plain. The Site includes the mine works. The mine lies on the east side of the county road. Runoff from the mine area enters Sutton Branch Creek. The area affected by the mining wastes is rural/residential.

The dominant feature of the Site was a chat/tailings residue pile that covered approximately 10 acres in the northern portion of the Site. The pile was composed of grey- to tan-colored material that resembled coarse- to fine-grained sand. The material was highly erodible, resulting in steep-sided features and an outwash area that fanned westward to Sutton Branch Creek. The creek flows north to south on the west side of Iron County Road 138. Prior to the response action by EPA, the chat/tailings residue dominated the substrate of Sutton Branch Creek for approximately 0.75 mile, where it merges with Big Creek.

Galena ore (lead-bearing ore) was mined from the Site beginning in the 1920s. Mining activities continued sporadically until 1940. The mine had one shaft extending 450 feet below the ground surface with several hundred feet of laterals to work the ore bodies. In addition to mining the ore, various equipment on Site was used to crush and mill the ore to concentrate the lead. An appraisal report prepared in 1934 stated that Annapolis Lead Company, a now-defunct company, owned/operated the mine from 1919 to 1931, when the majority of ore was extracted. Production figures from 1923 to 1931 indicated that approximately 1,173,000 tons of mining waste was generated during that time period. The Ozark Lead Mining Corporation, a defunct company, owned the property from 1931 to 1934 but apparently did not conduct mining activities. Basic Metals Mining Corporation, also defunct, owned the mine from 1934 to 1941 and conducted mining activities for a short time between 1938 and 1940 (no production figures were located for that time period). Apparently, no mining occurred on Site after that time. American Waste Material Corporation owned the property for several months in 1941 then sold the property to H. Hoffman *et al.* St. Joseph Lead Company owned the mine from 1952 to 1982 and retained the mineral rights until 1987. Doe Run Company has owned the mineral rights from 1987 until present.

Other Site features included numerous former mining operation buildings, located primarily in the northern portion of OU-1. Most of the buildings have deteriorated to where only foundations are present. An exception is a single story of a once multi-storied structure near the center of the Site, which was being used as a residence. Mining refuse is interspersed among the former buildings.

In September 2003, EPA proposed a time-critical removal action for the Site. The goal of the removal action was to identify, consolidate, and stabilize the lead contaminated waste mine tailings on Site. The time-critical removal action work began at the Site in May 2004. When the removal action began at the Site, settling basins were constructed to manage storm water runoff. Earth moving equipment was used to form the tailings and contaminated soil into a mound in the middle of the ravine where the pile was originally located. All areas in the tailings pile vicinity that had a mean lead surface concentration greater than 1,000 parts per million (ppm) were delineated and excavated. Excavations proceeded to the lesser of a depth of 18 inches or until a lead level below 400 ppm in the soil was achieved. All excavated areas were backfilled with clean material (<240 ppm lead) and excavated soil was consolidated into the on-Site tailings pile. The tailings pile was graded and compacted. And finally, an engineered protective cover was installed over the tailings. The protective cover consists of uncontaminated clay and topsoil, allowing for the establishment of vegetative cover.

The time-critical removal action minimized both the potential for human exposure to lead through contact with the soil and the potential for transport of the tailings by surface runoff, wind, or human activity. Monitoring and Site control measures were conducted during the removal action work to ensure removal activities did not expose nearby populations and Site workers to harmful levels of contaminants.

A ROD was issued in 2005 by EPA with support of MDNR and the community of Annapolis. The ROD specified the following cleanup plan for the Site:

- Addition of phosphate to floodplain soils (away from the outer edge of riparian zone) during the dry season to improve the density of vegetation and to reduce the bioavailability of lead to terrestrial receptors.
- Mining wastes in heavily forested, thickly vegetated areas, such as the riparian buffer, will not be subject to excavation, consolidation, or capping.
- Excavation of sediments from Sutton Branch Creek in pockets, or depositional areas. The amount of excavation will be determined during the Remedial Design (RD phase).
- Placement of excavated sediments in the existing repository area and cap with a soil cover.
- Stabilization of the Sutton Branch Creek channel with large rock and/or other material to prevent wash-outs and stream channel meandering. The extent of stabilization will be determined during the RD phase.
- Implementation of Institutional Controls.
- Performance of annual monitoring to determine remedial effectiveness. The monitoring frequency will be evaluated to determine whether it should be more frequent or can be extended to periods beyond annual monitoring.
- Regular water quality monitoring (including phosphorus) will be carried out by MDNR at established monitoring stations, pursuant to the Clean Water Act.
- MDNR will manage post-removal maintenance of the protective cover consistent with all federal and state laws.

Basis for the Document

A vegetative cover over lead-contaminated soils reduces the potential human exposure to the lead because the vegetation minimizes direct contact with the contaminated soils and the vegetation keeps the soil in place. The primary purpose for the application of phosphate to lead-contaminated riparian areas as described in the ROD was to increase the density of vegetation in the field. A secondary purpose for the phosphate application was the reduction in bioavailability of lead in the treated soils/sediments.

The use of phosphate described in the ROD was to be focused on the south side of Highway 49 and within the Sutton Branch Creek floodplain. The density of vegetation in the proposed area is currently sufficient.

Pilot testing of phosphate application to residential soils has been conducted in Region 7 and reductions in bioavailability have been achieved. These reductions in bioavailability were achieved by tilling phosphoric acid into the soil.

A second recent finding of the pilot testing was that surface application of fertilizer-grade phosphate was not effective in reducing bioavailability. This means that to have an impact upon bioavailability, phosphoric acid would have to be tilled into the lead-contaminated riparian areas.

A vegetative cover reduces the potential for human exposure to lead in soils under the vegetation. Tilling up the established vegetation would, for at least the short term, increase the exposure potential to lead in such soils until regrowth of the vegetative cover.

The efficacy of applying the phosphate fertilizer to the riparian areas as described in the ROD has been reevaluated. EPA, in consultation with MDNR, has decided it would be to better leave the vegetation in place and not apply the fertilizer treatment because (1) the current vegetative cover is sufficient and removing it could cause more harm than good, and (2) surface application of phosphate fertilizer would not result in significant reductions in bioavailability of the lead in the target soils/sediments. Applying the phosphate fertilizer would be a waste of money.

Description of Significant Difference or New Alternative

The significant difference under this ESD is the exclusion of phosphate application as part of the remedy. Phosphate application will not be required as part of the remedy.

Institutional Controls

Institutional controls are a legal method to attempt to control or prohibit the drilling, construction, and any other penetration of the soil surface within the boundaries of the area of contamination. The major institutional controls objectives are to prevent

human exposure to soil impacted by lead and prevent surface disturbance to the floodplain vegetation which may have a detrimental ecological impact on the Sutton Branch Creek floodplain.

Statutory Determinations

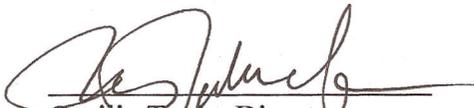
The original remedy selected in the 2005 ROD, modified by this ESD, is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate, utilizes permanent solutions to the maximum extent possible, and is cost efficient. The selected remedy meets the protectiveness requirements of CERCLA section 121.

Community Involvement

The EPA and the MDNR will solicit public input on this ESD. The release of the ESD and an opportunity to comment will be provided to the public by announcements in local newspapers. The ESD and supporting documents will be made available to the public by placement of these materials in the local Site repository. Moreover, a thorough public involvement process will be conducted for the selected remedy and will include an informal public availability session held in the community of Annapolis, Missouri, on September 4, 2008. The availability session will highlight the completion of construction activities and pending institutional controls.

Documents and information that support this ESD are compiled in an administrative record for the Site. The complete administrative record is located at the City Hall in Annapolis, Missouri (Site repository), and at the EPA office in Kansas City, Kansas. The public is encouraged to review the administrative record to gain a more comprehensive understanding of the Site and the environmental activities that are planned or have been conducted.

Signature



Cecilia Tapia, Director
Superfund Division
U.S. EPA Region 7

9-9-08
Date