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EPA Superfund
Explanation of Significant Differences:

KOPPERS CO., INC. (OROVILLE PLANT)
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KOPPERS SUPERFUND SITE
OROVILLE, CALIFORNIA

EXPLANATION OF SIGNIFICANT DIFFERENCES

U.S. Environmental Protection Agency
Region IX - San Francisco, California
January 1991

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Koppers Superfund Site
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I. Introduction

The purpose of this document is to explain the significant differences between the Record of Decision (ROD) signed by the U. S. Environmental Protection Agency (EPA) in September 1989 and reissued on April 4, 1990, and the remedy that will be implemented at the Koppers Superfund Site. Under-Section 117 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. § 9617, EPA is required to publish an Explanation of Significant Differences (ESD) whenever a significant change is made to a remedial action plan. This document provides a brief background on the Koppers Site, describes the changes to the ROD that EPA is now making and explains the ways in which these changes affect implementation of the remedy originally selected by EPA.

Based on a review of the technical data in the administrative record, EPA is changing the ROD to provide for separate cleanup standards for subsurface soil at the Site. This change is necessary to ensure that the cleanup standards for such soil will address protection of groundwater.

EPA is also clarifying the use of institutional controls as part of the selected remedy. The ROD refers to institutional actions that will be implemented for all alternatives, but provides no further discussion of such actions. EPA is now clarifying the intent of that reference and the appropriate scope of institutional controls

EPA is issuing this ESD rather than amending the ROD because the changes and clarifications do not result in a fundamental change to the overall remedy selected in the ROD.

II. Background

A. Site name and location

The Koppers Superfund Site1 comprises an operating, 200-acre wood-treating plant located in Butte County, California, just south of the city limits of Oroville, and an area primarily south of the plant defined by a plume of contaminated groundwater originating beneath the plant. The plant itself lies in the floodplain about 3000 feet east of the Feather River, on the fringe of an area where gold mining dredge operations occurred in the early l900s. At the time the Remedial Investigation of the Site began, the plant was owned and operated by Koppers Company, Inc. (Koppers). In 1988, BNS Acquisitions, Inc. (BNS), acquired Koppers and subsequently sold the Tar and Wood Products section, including the Oroville plant, to Koppers Industries, Inc. (KII), which is the current owner and operator. However, BNS retained liability for CERCLA matters at the Site. In January 1989, BNS merged into Koppers Company, Inc., and the name was changed to Beazer Materials and Services, Inc. In April 1990, the name of Beazer Materials and Services, Inc., was changed to Beazer East, Inc. (Beazer).

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1. For purposes of this ESD, the term "Site" means both the property on which the wood treating plant is located and the areal extent of contamination originating from the property. In the ROD, the term "site" refers only to the property on which the plant is located.

B. Identification of Lead and Support Agencies

Since mid-1985, EPA has been the lead agency at the Koppers Site. The California Department of Health Services (DHS) and the California Regional Water Quality Control Board - Central Valley Region (RWQCB) are the support agencies for the Koppers Site.

C. Circumstances

As part of its Remedial Investigation (RI) work, Koppers developed a computer model to estimate the migration of contaminated groundwater from the plant. EPA expected that this model would also provide information about the movement of contaminants from soils into the groundwater. That information would have assisted EPA in establishing cleanup objectives for subsurface soils based on protection of groundwater. However, the modeling work was not completed in time for incorporation into the Endangerment Assessment and thus into the Feasibility Study (FS). As a result, EPA established a single set of soil cleanup objectives based primarily on the risk of direct contact with contaminated soil.

EPA has re-examined the basis for setting the existing soil cleanup objectives. With the exception of the objective for pentachlorophenol (PCP), these soil cleanup objectives are based on the health risk of direct exposure (either via ingestion, dermal contact or inhalation of dust) to contaminated soil. EPA has concluded that for deeper subsurface soils, the direct exposure scenario is not appropriate. However, because the contaminants in these deeper soils leach into groundwater, there is an exposure pathway through groundwater use (for example, when such water is used as a domestic water supply). Thus, EPA intends to establish cleanup standards for subsurface soils based on protection of groundwater.

EPA has also decided to clarify the ROD's requirements regarding institutional controls.

This ESD does not change the ROD's cleanup objectives or selected technologies for the treatment and cleanup of contaminated groundwater.

D. Statement RegardiDg the Administrative Record

This ESD will become part of the Administrative Record file located at:

U.S. Environmental Protection Agency, Region IX
Superfund Records Center (9th Floor)
75 Hawthorne Street
San Francisco, CA 94105

Meriam Library
California State University, Chico
Chico, CA 95929

E. Site History

Since 1955, Xoppers and subsequently KII have operated several wood treating processes at the plant. Chemical preservatives, including PCP, creosote, and chromated copper arsenate solution, have been applied in pressurized treatment vessels. Wastewaters from the creosote and PCP processes were discharged directly to unlined ponds near the western plant boundary. There have been two explosions of the PCP treatment process (1963 and 1987), the latter of which was,followed by an EPA-directed cleanup of fire debris and removal and stabilization of surface soils.

In 1971, PCP was detected in groundwater beneath the plant. In 1972, this contamination was found in residential wells south-west of the plant. In 1973, the RWQCB issued an order to Koppers, which led to cleanup activities and process changes. That order was rescinded in 1974. In 1981, the RWQCB and the DHS directed investigations of contamination at the plant. The RWQCB issued two orders in 1982 for the cleanup of contaminated soils and groundwater.

In September 1983, EPA proposed the Site for inclusion on the National Priorities List (NPL). EPA placed the Site on the NPL on September 21, 1984 (49 Fed. Reg. 37070).

The RI report was completed in August 1988, and an FS report was completed in May 1989. An operable unit ROD for soil and groundwater cleanup was signed in September 1989 and reissued on April 4, 1990.

F. Nature and Extent of Contamination

Chemical preservatives including PCP, creosote and chromated copper arsenate have been applied at the plant to wood in pressurized treatment vessels. Wood treatment solutions dripped to the ground as the treated wood was handled. Wastewaters from creosote and PCP wood treating processes were discharged directly to unlined ponds near the western boundary of the plant. The creosote wastes included polynuclear aromatic hydrocarbons, a group of compounds found in crgosote. From 1963 to 1973, Koppers used a caustic solution to rinse excess PCP from treated wood poles placed over unlined soil.

The contaminants found at the Site to date include, but are not limited to, pentachlorophenol, isopropyl ether, arsenic, polychlorinated dibenzodioxins/dibenzofurans (PCDDs/PCDFs), polynuclear aromatic hydrocarbons (PAHs), and chromium.

Wood treating operations and wastewater handling at the plant have contaminated Site soils. Contaminated soil has become airborne due to vehicular traffic and wind erosion. Water passing over contaminated soils has affected or contaminated surface waters and sediments at the plant, and soil contaminants have leached into groundwater beneath the plant. Contaminated groundwater has, in turn, migrated beyond the plant property and now extends in a plume approximately two miles south of the plant. In 1986, Koppers began providing an alternative water supply to residents whose wells were affected by the plume of contaminated groundwater.

G. Description of the ROD

The Operable Unit ROD for soil and groundwater remedies was signed in September 1989 and reissued on April 4, 1990. The ROD selected a variety of remedial actions for soil and groundwater units. Of the four soil units identified, three (S1, S2, S4) were based on the primary contaminant(s) present in each. The fourth soil unit (S3) consists of the current process area. The affected groundwater was divided into two units (on-plant and off-plant) because of the variation in the contaminants. The size and nature of these soil and groundwater units are described on page 31 of the ROD. The selected remedies are summarized below:

- Groundwater extraction, treatment (with activated carbon), and reinjection systems to reduce contamination in groundwater via two distinct systems - one at the plant and one located above the plume which extends approximately two miles south of the plant. The existing alternative water supply will-be continued until remedial objectives for the aquifer are attained.

- Soil remedies consisting of:

  i) In-situ biodegradation of soil contaminants (primarily PCP) in Unit S1;

  ii) Excavation, treatment by soil washing to remove contaminants (primarily PAHs), and on-plant disposal of soil in Unit S2;

  iii) Construction of a cap over Unit S3, and, as necessary, construction of additional extraction wells immediately downgradient of Unit S3 to contain contaminated groundwater migrating from this area. As part of the selected remedy for this unit, the contaminated soil beneath the process area, when accessible, shall be addressed in a manner consistent with soils in other soil units; and

  iv) Excavation, treatment by chemical fixation to immobilize contaminants (primarily arsenic and chromium), and on-plant disposal of soil in Unit S4.

The ROD established numerical remedial objectives for all Site contaminants of concern that are required to be met through cleanup. The remedial objectives for soil and groundwater are summarized in Table 10-1 (page 62) of the ROD. The remedial objectives for soil were derived as follows:

Basis	Exposure Scenario	Contaminant	Remedial Objective+
Health Risk	Exposure to surface soils (future residents)	PAHs	0.19 ppm
		PCDD/PCDFs	30 ppt
		Arsenic	Background*
" "	Inhalation of airborne dust	Chromium	Background*
ARAR (TTLC)	n/a	PCP	17 ppm

+ppm = parts per million
ppt = parts per trillion

*Risk-based remedial objectives are below estimated background concentrations.

These objectives would have to be attained in all contaminated soils, which are estimated to range in maximum depth from 5 feet (in Unit S4) to 25 feet (in Unit S2). As illustrated in the table above, these remedial objectives are, for the most part, based on achieving a 10-6 cancer risk for direct exposure (via ingestion, dermal contact or inhalation) to contaminated soils.

The ROD also noted that institutional actions, such as site access and groundwater use restrictions, would be implemented for all alternatives.

III. Description of Significant Differences

This ESD modifies certain portions of EPA's ROD issued on April 4, 1990. To the extent that this ESD differs from the ROD, the ESD supersedes the ROD. As explained in greater detail below, this ESD addresses the following issues:

1. The existing remedial objectives for soil remain in effect for surface soils down to a depth of five feet.

2. EPA will establish cleanup standards for subsurface soil to provide for protection of groundwater.

3. Institutional actions will be included as interim measures as part of the remedies for soil and groundwater.

A. Remedial Objectives for Surface Soil

The existing remedial objectives for soil are based on the health risks from direct exposure to such soils, either through ingestion, dermal contact or inhalation of dust. The depth of cleanup should be adequate to assure that future residential development and use of the plant property will not expose residents to soil exceeding the "direct exposure" cleanup objectives.

EPA has determined that the appropriate depth in this case is five feet. The existing remedial objectives, defined in Table 10-1 of the ROD and also in Table 2-3 of the FS, remain in effect for surface soils (that is, all soil up to five feet below ground surface).

The selection of five feet as the lower limit of "surface" soils is based upon consideration of the possible depth of soil excavation that might occur if the Site is developed for residential use. Excavations considered included those that would occur during development (for example, foundations, utilities, and/or septic systems) as well as those which could occur after initial development (for example, landscaping, additions and improvements to dwellings, or utility repair/modification).

EPA contacted local governmental agencies regarding building codes and construction practices common to residential development in the Oroville area. Discussions with these local agencies established that routine excavations are in most cases-limited to five feet or less in

depth. The Butte County Public Works Department indicated that excavations for foundations for conventional two-story houses in the area are typically eighteen inches deep. Basements are rarely found in new houses constructed in the area. Utility lines on residential lots (gas, electric and water) are buried one to two feet below the surface Sewer connections from houses to street mains are laid at a slope of 1/4 inch per foot of pipe (that is, approximately one foot deep for every fifty feet of pipe). Butte County Environmental Health Department indicated that septic system leach lines are buried two feet underground, while septic tanks require excavation of five to six feet. Discussions with area builders indicate that post-construction excavations generally range from three to five feet for such items as lawn and garden irrigation systems, fence posts and large plantings.

EPA has concluded that the revision in the depth to which surface soil remedial objectives shall apply does not result in any change to the selected remedial technologies for surface soils.

B. Cleanup Standards for subsurface Soil

For contaminants in subsurface soils, defined herein as soils five feet or more below the surface, the exposure pathway is not direct contact but exposure through groundwater that has been contaminated by leachate from the soils. Contaminated subsurface soils must be controlled as a source of groundwater contamination.

Rather than rely on a single set of remedial objectives to provide for both protection from exposure to contaminated soil and protection of groundwater quality, EPA will establish a separate set of cleanup standards for subsurface soil to provide for protection of groundwater.

In the Endangerment Assessment (EA), risks posed by contaminated groundwater were calculated assuming that existing average and maximum contaminant concentrations would remain constant over the period of exposure (see EA Section 5.4). As noted in the EA, such risks "may be underestimated if leaching from Site soils leads to increased downgradient concentrations." The FS also acknowledged that contaminated soil is a potential source of continuing groundwater degradation and that those remedial alternatives which involve removal of either contaminants or contaminated soil would aid the groundwater clean-up process. While soil cleanup based on the existing "direct exposure" scenario would reduce the potential of contaminated soils to serve as a continuing source of groundwater contamination, it is more appropriate to establish specific standards for long-term protection of groundwater.

The extent to which a contaminant will leach from soils into groundwater is a function of numerous Site-specific factors. As part of its RI/FS work, Koppers performed some computer modeling studies regarding leaching and degradation of contaminants. However, this information is not sufficient to determine the appropriate cleanup standards (based on source control) for contaminants in subsurface soils.

During remedial design, additional data will be collected to evaluate the leachability and degradation of soil contaminants under conditions that exist at the Site. Data collected will cover the variation in both soil and contaminant types present among the soil units. Such data will then be used to evaluate the "source potential" of the contaminated soil and the resulting impacts on groundwater quality. EPA wil1 then select, through a future ESD or ROD amendment, cleanup standards for subsurface soil that, when achieved, will protect groundwater. Among the factors that will be considered is whether these soil cleanup standards will extend the time frame identified in the ROD for achieving groundwater remedial objectives. After selection of cleanup standards for subsurface soils, EPA will reexamine the technologies selected in the ROD for cleaning subsurface soils to determine if they are still appropriate.

C. Institutional Actions

The FS makes several references to institutional actions that are part of the various alternatives for soil and groundwater remedial action. Section 4.15 of the FS reaffirms that such actions are common to all alternatives. That section discusses the possible institutional actions, including groundwater monitoring, Site access restrictions and restrictions on the use of properties on the Site, including the Koppers plant.

Access restriction to the plant property currently consists of signs and security patrols.

The property is staffed 24 hours/day. EPA may evaluate Site access to determine whether additional measures such as fencing, electronic monitoring or posting of guards may be warranted to reduce the possibility of unintentional contact with contaminated areas of the Site during design and implementation of remedial actions.

Deed restrictions shall be imposed on future residential use of the plant property as an interim measure until such time as EPA determines that the Site is clean enough to remove those restrictions. Despite current zoning restrictions and the presence of the KII plant, residential development could occur zoning restrictions are not permanent, and KII could sell the property to residential developers. The plant is near other residential property and is otherwise suited for residential use. Substantial time will be required to complete remedial actions for the Site, and the deed restrictions are therefore appropriate interim measures.

IV. Support Agency Comments

The State of California concurs with the changes to the ROD proposed by EPA.

V. Affirmation of the Statutory Determinations

Considering the changes that have been made to the selected remedy by this ESD, EPA believes that the remedy remains protective of human health and the environment, complies with all ARARs, uses permanent solutions and alternative technology to the maximum extent practicable, and is cost-effective. In addition, the remedy satisfies the statutory preference for treatment as a principal element and for use of permanent solutions and innovative technologies to the maximum extent practicable for this Site (See Section 121 of CERCLA, 42 U.S.C. S 9621).

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Date

Daniel W. McGovern
Regional Administrator