Site: Hocomonco
Break: 5.4
Other:

FINAL EXPLANATION OF SIGNIFICANT DIFFERENCES

I. INTRODUCTION

This document constitutes a final Explanation of Significant Differences ("ESD") between the remedial actions as specified in the Record of Decision ("ROD") and those now planned under this final ESD. It also documents the conditions that give rise to its need.

Site Name, Location, and Description

Site: Hocomonco Pond Site

Site Location: Westborough, Massachusetts

Site Description: The Hocomonco Pond Site ("Site") is a partially wooded area, encompassing approximately 23 acres in the Town of Westborough, Worcester County, Massachusetts. The Site is bordered on the northwest by Hocomonco Pond, a 27-acre shallow, freshwater pond. Otis Street and Smith Valve Parkway border the site on the east and south, respectively. The Site was used for wood treating operations which consisted of saturating wood products with creosote for wood preservation. Wastes from the wood treating facility were discharged into an unlined lagoon (1.7 acres) south of Hocomonco Pond, and into a small pond called "Kettle Pond" (1 acre) which is located southeast of Hocomonco Pond along Otis Street. A former wood treating building, several tank bases, as well as the unlined lagoon and Kettle Pond mentioned above, are all located on-site. Contamination from the Site extends into the Hocomonco Pond and its discharge stream.

The Site is zoned for industrial use, and several light industries/manufacturing facilities are located within one-half mile of the Site. The closest residential area is located approximately one-half mile south of the Site. The Otis Street municipal well is located approximately 2,000 feet northwest of the Site. In the vicinity of the Site, the Boston-Worcester Turnpike, i.e., Route 9, and the Massachusetts Turnpike, located 1 mile and 3 miles from the Site, respectively, transport the majority of traffic east to the metropolitan Boston area, and west to the City of Worcester.

A more complete description of the Site can be found in "Hocomonco Pond Site, Westborough, Massachusetts, Remedial Investigation Report, Final" dated September 1985.

SDMS DocID 000200486

Identification Of Lead And Support Agencies

Lead Agency:	United States Environmental Protection Agency (EPA)
Contact:	Robert J. Leger Remedial Project Manager (617) 573-5734
Support Agency:	Massachusetts Department of Environmental Protection (MA DEP)
Contact:	Harish Panchal Remedial Project Manager (617) 556-1118

Citation Of The Comprehensive Environmental Response, Compensation And Liability Act Of 1980 ("CERCLA") Section 117(c) That Requires The ESD

Section 117(c) of CERCLA sets forth the circumstances for which an ESD is required. Specifically, Section 117(c) provides: "After adoption of a final remedial action plan - (1) if any remedial action is taken, (2) if any enforcement action under section 106 of this title is taken, or (3) if any settlement or consent decree under section 106 of this title or section 122 of this title is entered into, and if such action, settlement or decree differs in any significant respects from the final plan, the President or the State shall publish an explanation of the significant differences and the reasons such changes were made."

EPA has determined that certain changes in the remedial action significantly differ from the remedial action originally selected in the September 30, 1985 Record of Decision ("ROD") for the Site. This document describes these differences and the reasons why these changes to the remedy described in the ROD are necessary.

Summary Of The Changes In The Selected Remedy Which Require An ESD

EPA's issuance of this final ESD is necessary because of changes in the remedy for the cleanup of contamination in Kettle Pond, as originally specified in the ROD. The changes involve eliminating the requirement in the ROD for sheet piling and "dry" excavation of the sediments and soils in Kettle Pond, and requires "wet" excavation of the shallow contaminated material. The changes also eliminate the requirement in the ROD for excavating, dewatering and landfilling the deeper contaminated soil beneath Kettle Pond, and require the use of other technologies such as in-

situ bioremediation and soil flushing. Another technology, product recovery, with either on- or off-site treatment, or possible product reuse off-site, is also required. While significant, EPA has determined that these changes do not fundamentally alter the remedy selected in the ROD.

Public Comment Period And Announcement Of Statement That The ESD Will Become Part Of The Administrative Record File

Although not required, EPA provided a public comment period on the proposed ESD pursuant to Section 300.825(b) of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), in order to ensure full community involvement. The comment period lasted 21 days commencing May 12, 1992, and ending June 1, 1992. EPA solicited public comments only on the issues presented in the proposed ESD.

The public comment period resulted in the submission of one (1) comment letter, from the Massachusetts Department of Public Health("MA DPH").

Changes In The Final ESD

The comments from DPH did not significantly alter the changes discussed in the proposed ESD, therefore, the proposed ESD now substantially represents the ESD in its final form.

The proposed and final ESD, public comment on the proposed ESD, and response to comments, are included in the Administrative Record file for the Site.

Addresses Of Locations Where The Files Are Available And Hours Of Availability Of The Files

In addition to the public information meeting on the proposed ESD which was held at 7:30 P.M. on Monday, May 11, 1992 in the Westborough Town Hall, at 34 West Main Street, Westborough, Massachusetts, information pertinent to EPA's decision making process in publishing the proposed ESD was available for public review at information repositories at the following locations:

EPA Records Center
90 Canal Street, First Floor
Boston, Massachusetts
(617) 573-5729
Hours:
Mon-Fri: 10:00 a.m. - 1:00 p.m.
2:00 p.m. - 5:00 p.m.

Westborough Public Library
55 West Main Street
Westborough, Massachusetts
(508) 366-3050
Hours:
Mon-Thur: 10:00 a.m. - 9:00 p.m.
Fri: 10:00 a.m. - 6:00 p.m.
Sat: 10:00 a.m. - 5:00 p.m.
Sun: 1:00 p.m. - 5:00 p.m.

II. SUMMARY OF SITE HISTORY, RESPONSE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY

Site History and Contamination Problems

The property has had a long history of industrial use beginning in the early 1900's with ice recovery and distribution from Hocomonco Pond. From 1928 to 1946, the Site was used for wood-treating operations by Montan Treating Company and American Lumber and Treating Company. This business consisted of saturating wood products (e.g., telephone poles, railroad ties, pilings and fence posts) with creosote to preserve them. During operations, wastes were discharged to a pit referred to herein as the "former lagoon". (See map attached to this final ESD as Attachment 1). The lagoon was excavated on the property to intercept and contain spillage and waste from the wood-treating operation. As this lagoon became filled with waste creosote, sludges and water, its contents were pumped to two depressions located east of the operation near the west side of Otis Street. These depressions are referred to as the "Kettle Pond". Available records indicate that no creosote was used or stored on the Site by any person who owned or occupied the Site after March 26, 1946.

Subsequent to this, the Site was converted to an asphalt mixing plant. Discarded aggregate and asphalt are common throughout the Site. In the 1950's, Beazer East, Inc. ("Beazer") (formerly Beazer Materials and Services, Inc.; formerly Koppers Company, Inc.), purchased the stock of the company which operated the wood treating facility. The last use of the Site was a cement plant from which dry cement was distributed in bulk. Smith Valve Company purchased the property of the former operations on April 2, 1976, and operated a manufacturing plant on a separate parcel on the southwest shore of Hocomonco Pond.

In 1976, a storm sewer was installed to collect surface drainage from a roadway and to contain a small watercourse which passed through the property. At the order of the Westborough Conservation Commission, the storm pipe was laid with open joints, and unknowingly, was placed adjacent to

the former lagoon. During periods of heavy rain, water passing into this open-jointed storm drainage system allowed creosote contaminated leachate to migrate through the drain and enter Hocomonco Pond.

The highest levels of wood treating constituents in Hocomonco Pond sediments have been found near the storm sewer outlet to the pond. Creosote contaminated leachate not only affected sediments along the southern shoreline of Hocomonco Pond, but also affected the discharge stream (approximate length 2,400 feet), which is located at the southeastern portion of the pond. Stream sediments have been contaminated with creosote as far downstream as 1,100 feet.

On November 21, 1979, the Massachusetts Division of Fisheries and Wildlife investigated a fish kill at Hocomonco Pond. Another fish kill was investigated on April 16, 1982. Both fish kills were reported to be attributed to creosote from the storm drain that passes next to the former lagoon. A sample of the oily fraction of the storm drain discharge contained several contaminants, collectively known as polynuclear aromatic hydrocarbons ("PAHs"). These PAHs include: phenanthrene, naphthalene, anthracene, pyrene, and fluoranthene. Water from the storm drain contained anthracene, phenanthrene, and fluoranthene.

During the reconstruction of Otis Street by the Massachusetts Department of Public Works in 1983, it was necessary to excavate soil adjacent to Kettle Pond. As a result of the excavation, some contaminated soil was unknowingly disturbed and redistributed within the roadway embankment on the Kettle Pond side (west side) during reconstruction.

Response History

The Hocomonco Pond Site was placed on the National Priorities List ("NPL") on September 8, 1983. The NPL listing resulted in the initiation of remedial investigation ("RI") studies in January 1984 at the Site to determine the exact nature and extent of the contamination. Results of the RI were published in a report entitled, "Hocomonco Pond Site, Westborough, Massachusetts, Remedial Investigation Report, Final" dated September 1985.

The RI identified four primary areas of contamination. These areas included: (1) the Former Lagoon; (2) Kettle Pond; (3) the southern portion of Hocomonco Pond and its discharge stream; and (4) Otis Street and isolated areas.

A brief discussion of the extent of contamination at these four areas, as determined in the RI, is provided below:

Former Lagoon - The areal extent of soil contamination associated with this area was found to be approximately 1.7 acres. The depth of soil contaminated with creosote compounds typically ranged from 15 feet with isolated depths to 20 feet. The volume of contaminated soil was estimated to be 18,000 cubic yards.

Kettle Pond - The areal extent of soil contamination associated with the Kettle Pond was found to be approximately one acre. The depth of soil contaminated with creosote compounds extended to 20 feet (maximum depth sampled and analyzed). Exploratory borings and sampling did not extend below 20 feet. The volume of contaminated soil was estimated at approximately 24,000 cubic yards. Groundwater immediately downgradient of the Kettle Pond was found to be contaminated with creosote compounds. Surface soil samples within the area adjacent to Hocomonco Pond were also contaminated with creosote compounds.

Hocomonco Pond - Sediments contaminated with creosote compounds were found to exist along the southern portion of Hocomonco Pond and in the stream channel bottom extending downstream of Otis Street. Sediments contaminated with creosote compounds were found at a distance of 1,100 feet downstream of Otis Street. Surface water within Hocomonco Pond was not found to be contaminated.

Otis Street and Isolated Areas - Creosote contaminated soil was detected in the Otis Street embankment, but was included in the Kettle Pond contamination area for evaluation purposes. Contamination was also found in three isolated areas including: (1) soil near a monitoring well (MW-1) immediately south of Smith Valve Parkway; (2) tank bases adjacent to the former lagoon; and (3) storm drainage channel sediments, southwest side of the Site.

Summary Of The Remedy As Originally Described In The ROD

The Record of Decision ("ROD"), signed September 30, 1985, described each of the alternatives evaluated in remediating the contamination on the Site, and described in detail the chosen alternative for each contaminated area of the Site as follows:

Former Lagoon - The remedial action selected included site grading, capping and relocation of the former storm drain pipe located adjacent to the east side of the former lagoon. Relocation of the storm drain was completed in January, 1990.

Kettle Pond - The remedial action selected consisted of dewatering the pond and lowering the groundwater level in the immediate area which would expose the contaminated material, "dry" soil/waste excavation, dewatering of sediments and disposal of sediments in an on-site landfill. Effluent water would be treated for discharge to surface water and recharge to the aquifer. Prior to the removal of material, sheet piling would be placed to insure the stability of Otis Street. A landfill which meets the standards and requirements of the Resource Conservation and Recovery Act ("RCRA") would be constructed on site to dispose of the waste material. Following completion of the excavation, groundwater would be treated, as necessary, to meet EPA established groundwater quality criteria.

Hocomonco Pond and Discharge Stream - The remedial action selected consisted of mechanical dredging and disposal of contaminated sediments in an on-site landfill.

Otis Street and Isolated Areas - The remedial action selected for Otis Street consisted of sealing the storm drain. The remedial action selected for the isolated areas consisted of removal of the contaminated material at these locations and disposal in an on-site landfill.

A Consent Decree was entered into between the EPA, the Commonwealth of Massachusetts, and the Potentially Responsible Parties ("PRPs"), i.e., Beazer East, Inc. (formerly Koppers Company, Inc.), Chicago Bridge and Iron Company, Smith Valve Corporation, Massachusetts Department of Public Works, and the Town of Westborough. The Consent Decree was entered by the United States District Court for the District of Massachusetts on January 10, 1988. The Consent Decree required that Beazer carry out work specified in the Remedial Design/Action Plan, which is attached as Appendix I to the Consent Decree. The other PRPs agreed to make various payments to Beazer.

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE BASIS FOR THOSE DIFFERENCES

Summary Of The Information That Gave Rise To Significant Differences From The Selected Remedy As It Was Originally Specified

Shallow Overburden At Kettle Pond

Since January 10, 1988, in accordance with the Consent Decree, several pre-design investigations have been performed by Beazer in order to implement the remedial activities as outlined in the ROD and Consent Decree. The pre-design investigations conducted in the Kettle Pond area have revealed new information indicating that the selected remedy as it was originally specified in the ROD may not be fully implementable and effective.

Test borings, monitoring wells and piezometers installed in the Kettle Pond area revealed the existence of large boulders which caused difficulties during drilling. Additionally, pre-design studies indicated that the transmissivity of the aquifer (i.e., capacity to transmit water), is much greater than estimated during the 1985 RI. Finally, during the field work conducted in December 1989, it became evident that the vertical extent of visible contamination included a significant thickness of saturated soils beyond the 20 feet identified in 1985 RI studies. Soils exhibiting a "creosote odor - oily sheen" and soils "creosote saturated" were observed intermittently throughout the deeper soils, extending down to approximately 45 feet below the level of Kettle Pond. Subsequent investigations conducted in September 1990, revealed the presence of creosote product extending down to approximately 140 feet immediately to the west of Kettle Pond.

The presence of boulders within the glacial drift presents a serious impediment for the installation of sheet piles as specified in the ROD. Boulders can deflect the piles, causing the sheeting to bend and separate, thereby compromising the hydraulic and structural integrity of the system. To reduce the inflow of groundwater from the deep permeable aquifer, the sheet piling would need to be installed throughout the entire aquifer to depths of 60-80 feet. Installation of sheet piling to that depth is not feasible due to boulders. In addition, installation of sheet piling would necessitate operating large equipment and relocating overhead transmission lines which might interrupt and impede traffic in this industrial area.

Pre-design study results indicated that the groundwater lowering in Kettle Pond is impractical and could cause

subsidence of Otis Street, a heavily travelled road. Preliminary groundwater modeling performed by Beazer indicates that substantial volumes of groundwater (440 to 880 gpm) would have to be pumped from the Kettle Pond area in order to achieve the required drawdown for "dry" excavation of the soil as specified in the ROD. Additionally, substantial volumes of groundwater would still have to be pumped from the Kettle Pond area to de-water soils and permit even shallow excavations of 5-10 feet.

A stability evaluation performed by Beazer determined that the maximum depth of excavation that would maintain stability of the existing side slopes of Kettle Pond (without sheet piling) is less than 5 feet. Excavation deeper than this could cause subsidence of Otis Street.

In conclusion, the installation of sheet piling and lowering groundwater 20 feet for "dry" excavation is impractical. Contaminated sediment/soil in Kettle Pond will be excavated only to a maximum depth of 5 feet by means of "wet" excavation. Contamination beyond this depth will be remediated by alternative technologies.

Change In Technology

A preliminary evaluation of currently available site characteristics data indicates that in-situ bioremediation technology may effectively remediate the deeper contaminated soils and groundwater in the Kettle Pond area. In-situ bioremediation is to be undertaken targeting both the contamination dissolved in the groundwater and the contamination adhering to the soil which can act as a source of groundwater contamination.

The ultimate goal of the in-situ bioremediation process would be to degrade contaminants to carbon dioxide and water. This would be accomplished by stimulating indigenous microorganisms which normally use organic compounds as a source of carbon in their diet. The technology involves enhancing the natural biodegradation of organic compounds (such as contaminant compounds found in Kettle Pond) by injecting small quantities of nutrients, such as nitrogen and phosphorus, large quantities of an oxygen source, and if needed, cultured bacteria strains that have specific metabolic capabilities. However, at this Site, every attempt will be made to enhance the growth of the indigenous microorganisms. (On April 9, 1992 Beazer collected soil and groundwater samples in the Kettle Pond area to determine the kinds and numbers of the indigenous microorganisms and their suitability for the in-situ bioremediation process. The results of Beazer's investigation will be available in the near future).

In the in-situ bioremediation process, groundwater would be withdrawn from the soil to confine the groundwater flow in the immediate area and to increase the flow rate of nutrients through the soil. The captured water would be treated to remove contaminants and nutrients/oxygen would be added to a portion of the water and re-injected into the soil.

EPA believes that in-situ bioremediation will prove to be effective in remediating the PAH contamination in the Kettle Pond area. Bioremediation of creosote and related PAH compounds is the technology presently in use or being planned for over 50 other Superfund/RCRA sites. The form of bioremediation to be implemented at the Site, i.e., in-situ bioremediation, is considered an innovative technology, and is presently in use or being planned for at least 18 other creosote/PAH contaminated Superfund/RCRA sites in the nation (Bioremediation In The Field, EPA/540/N-92/001, No. 5, March 1992).

Cleanup levels for sediment, soil and groundwater at the Site are presently being developed by EPA. The subsurface soils below Kettle Pond will meet soil cleanup levels that are protective of the groundwater which flows through the contaminated soil. Significant reductions in groundwater concentrations of all the potentially carcinogenic PAHs will also be required during in-situ bioremediation to meet the anticipated groundwater cleanup levels. Ultimately, if the in-situ bioremediation does not result in meeting these cleanup levels within a reasonable time period as determined by EPA, then other technologies such as in-situ soil flushing will be implemented. This technology involves the injection of surfactants into the soil to induce the contaminants to dissolve into the groundwater. The captured groundwater would simultaneously be pumped and treated to remove the contaminants.

Deep Overburden And Shallow Bedrock Adjacent To Kettle Pond

In December 1988 creosote product was discovered in the deeper soils to the west of Kettle Pond. Evidently creosote entered the subsurface as a dense non-aqueous phase liquid ("DNAPL") and had not dissolved entirely in the groundwater environment. This new information prompted Beazer to investigate the occurrence of DNAPLs in the deeper soils (overburden) and shallow bedrock beneath the entire Site. Results of this investigation revealed the presence of DNAPLs above the clay "till" soil and/or weathered bedrock (i.e.,saprolite), at depths up to 140 feet below land surface. DNAPLs (being denser than water) had evidently migrated downward through the soil until encountering a significant barrier, such as the dense clay "till" soil

and/or bedrock. The DNAPL contamination appears to have collected above these areas in a deep "basin" west of Kettle Pond. Since DNAPLs were found only in the area immediately west of Kettle Pond, the source of this contamination appears to be the shallower contamination found directly below Kettle Pond as discussed above.

Since DNAPLs can act as a continuing source of dissolved constituents to the groundwater, as much of this contamination that can be practically recovered will be removed through pumping at existing and/or additional wells prior to and/or during in-situ bioremediation. The recovered product will either be transported off-site for reuse or treatment, or will treated on-site. The remaining creosote contamination that cannot be removed through pumping will be treated by in-situ bioremediation. If the creosote contamination cannot be remediated to cleanup goals within a reasonable time period as determined by EPA, then other technologies, such as in-situ soil flushing, will be implemented.

Significant changes to the remedy selected in the ROD require EPA, pursuant to CERCLA Section 117(c), to publish an ESD. The publishing of this final ESD also provides EPA with the opportunity to specify how previously unknown DNAPL contamination, which was discovered subsequent to the ROD, will be remediated. All other remedial activities at the Site, i.e, dredging, dewatering and RCRA landfilling of sediments in Hocomonco Pond and the discharge channel remain the same, as well as capping the former lagoon, and excavating contaminated soils at isolated areas of the site and depositing the contaminated soils in the RCRA landfill.

IV. SUPPORTING AGENCY COMMENTS

The Massachusetts Department of Environmental Protection ("MA DEP") believes that in-situ bioremediation has the potential to remediate the contaminated sediment/soils and groundwater in the Kettle Pond area. A final determination from the MA DEP, which concurs with the remedial activities outlined in the proposed ESD, is found in the Administrative Record File.

V. AFFIRMATION OF THE STATUTORY REQUIREMENTS

Considering the new information that has been developed and the change that has been made to the selected remedy, EPA and MA DEP believe that the remedy remains consistent with the requirements of the ROD in that it remains cost effective (i.e. the remedy continues to be the lowest cost alternative that is technologically feasible and reliable

and which effectively mitigates and minimizes damage to and provides adequate protection of public health, welfare, or the environment).

VI. PUBLIC PARTICIPATION ACTIVITIES

Notice That Administrative Record Is Available For Review

In addition to the public information meeting which was held on May 11, 1992, the proposed and final ESD, accompanied by any supporting information and analysis, is available for public review and can be found in the Administrative Record File. See Section I of this final ESD for the addresses of the locations where this final ESD is kept and maintained.

July 22 1992
Date of Issuance

By: Julie Belaga
Julie Belaga
Regional Administrator