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Final Explanation of Significant Differences
Boston & Maine Wastewater Lagoons
Operable Unit 1, Iron Horse Park Superfund Site

I. INTRODUCTION

A. Site Name and Location

Site Name: Boston & Maine Wastewater Lagoons
Iron Horse Park

Site Location: High Street, Billerica
Middlesex County, Massachusetts

B. Lead and Support Agencies

Lead Agency: United States Environmental Protection Agency

Contact: Don McElroy, RPM
(617) 223-5571

Support Agency: Massachusetts Department of Environmental Protection (MADEP)

Contact: Janet Waldron
(617) 556-1156

C. Legal Authority for ESD

Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that, if any remedial or enforcement action is taken under Section 106 of CERCLA after adoption of a final remedial action plan, and such action differs in any significant respects from the final plan, the EPA shall publish an explanation of the significant differences (ESD) and the reasons such changes were made.

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CONCURRENCES								
SYMBOL	HBO	HBO	HBO	SES	HIO			
SURNAME	McElroy	Cochran	Brill	Peterson	Laing			
DATE	10/1/97	10/1/97	10/1/97	10/1/97	10/1/97			

D. Public Record

In accordance with Section 117(d) of CERCLA, the Final ESD will be part of the Administrative Record File, which is available for public review at the two locations listed below at the given times:

EPA Region I Records Center
90 Canal Street
Boston, MA 02114
(617) 573-5729
Monday-Friday: 10:00am - 1:00pm
2:00pm - 5:00pm

Billerica Public Library
25 Concord Road
Billerica, MA 01821
(508) 671-0949
Monday-Thursday: 9:00am - 9:00pm
Friday-Saturday: 9:00am - 5:00pm

II. Summary of Site History, Contamination, Selected Remedy, and Circumstances Leading to an ESD

A. Site History

The entire Iron Horse Park Superfund Site (Site) consists of approximately 552 acres of land in North Billerica, near the Tewksbury town line. The Site is an active industrial complex and railyard with a long history of activities that have resulted in contamination of soils, groundwater, and surface water. The Site includes open storage areas, landfills, and lagoons. A more complete description of the Site can be found in the Phase 1A Remedial Investigation Report (July, 1987).

The Site was placed on the National Priorities List in September 1984 following investigations by the Massachusetts Department of Environmental Quality Engineering (now the Massachusetts Department of Environmental Protection or MADEP) in the early 1980's and a Site Investigation Report completed by the NUS Corporation for EPA in August 1984.

In August 1984, EPA, under its removal authority, covered a portion of the

Site known as the Johns-Manville Asbestos Landfill with gravel and topsoil to prevent asbestos in the landfill from becoming airborne.

In 1985, EPA began investigations of the Site to determine the nature and extent of contamination. Under the first phase of the evaluation, EPA conducted a broad study of the Site to define the potential problem areas. This study was entitled the Phase 1A Remedial Investigation (RI). As a result of the Phase 1A RI, EPA concluded that the size and complexity of the Iron Horse Park Site necessitated using a phased approach for subsequent, more detailed studies. Under this approach, the Site was separated into a number of different problem areas. Where possible, the areas studied and the decisions on how to clean them up are made as operable units. An operable unit is defined as a discrete portion of an entire response action that, by itself, manages migration or eliminates or mitigates a release, threat of release, or pathway of exposure.

The Boston & Maine Wastewater Lagoons (B&M Lagoons) were grouped together as the first operable unit for the Site. In May 1988, EPA completed a study, referred to as the Phase 1B RI, which focused on the nature and extent of contamination in and around the B&M Lagoons. The Feasibility Study (FS) of potential remedial alternatives for the cleanup of the B&M Lagoons was issued in June 1988.

B. Contamination Problems

The B&M Lagoons are a series of lagoons (two active, one "overflow" and one inactive) which were initially constructed and put in use around 1915. The two active lagoons received untreated wastewater from various facilities in Iron Horse Park from 1915 until 1992. Over this time period, sludge was periodically dredged from the bottom of the active lagoons and placed in piles nearby. Investigations of the B&M Lagoons identified contamination in sludge located on the lagoon bottoms, as well as contamination in the piles of material dredged from the lagoons. The RI detected poly-aromatic hydrocarbons, volatile organic compounds, metals and other compounds in the lagoons and the associated soil piles. Of the contaminants detected, poly-aromatic hydrocarbons (PAH) and total petroleum hydrocarbons (TPH) require cleanup.

C. Summary of Remedy Originally Described in the Record of Decision

The September 15, 1988 Record of Decision (ROD) called for treatment of contaminated soil and sludge from the lagoons by bioremediation, returning the treated material to the lagoon area, covering it with clean

soil and establishing a vegetative cover. The ROD also required decontamination and disposal of piping and pumps associated with the lagoons. In 1990 a settlement was reached whereby Boston and Maine Corporation agreed to undertake the cleanup of the B&M Lagoons Operable Unit.

D. Summary of Circumstances That Gave Rise to the Need for an ESD

A Pre-Design Evaluation Report was produced by Boston & Maine Corporation in January 1991. This Report was significant in that it:

- delineated the limits of material to be excavated and treated;
- identified, based on the cleanup criteria, which dredged soil piles would require excavation and remediation; and
- concluded, based on treatability studies that cleanup results could be achieved in a given batch within approximately 40 days.

A Remedial Design produced by Boston & Maine Corporation was approved by EPA in July of 1991. The Remedial Design called for development of an unlined treatment cell. Contaminated soils and sludge would be placed in the treatment cell in 6-9 inch "lifts" or layers. Once placed, conditions within each lift in the treatment cell (oxygen, moisture and nutrients) would be optimized to allow biological treatment by soil microorganisms to take place. The cleanup requirements for the B&M Lagoons are: Total PAH -60% removal or 1part per million (ppm) and TPH - 5,000 ppm.

Despite conclusions reached in the Pre-Design Evaluation, experience at full scale in the treatment cell was significantly different. Progress to achieve cleanup levels was significantly slower than predicted. The remedy has taken an inordinate amount of time to reduce contamination levels, and has had difficulty in achieving cleanup levels.

The first lift of contaminated material (approximately 1,200 cubic yards) was placed in the treatment cell in October 1991. It contained moderate levels of TPH and had no detectable levels of PAH. This lift was considered to be complete in July 1993. A second lift containing elevated levels of PAH and TPH was placed in the treatment cell in October 1993. By November 1994, TPH cleanup levels had been achieved. PAH sampling results indicated that PAH levels were approaching cleanup levels asymptotically (i.e., getting closer and closer but never meeting).

This second lift has never been considered to be complete.

Bioremediation has not proven to be an effective remediation method at the B&M Lagoons. The process has had difficulty in achieving cleanup levels and in addition, the time involved has been extensive(one year or more per lift when 40 days was predicted). Under this extended time scenario, if it is assumed that cleanup levels could be attained, the remedy would still require ten years or more to complete. The ROD estimated that utilizing bioremediation the remedy would be completed within a five year period.

III. Description of Significant Differences and the Basis for these Differences

A. Significant Differences

Due to the lack of success of bioremediation, alternative remedial alternatives evaluated during the June 1988 Feasibility Study (FS) of B&M Lagoons were reinvestigated. In particular, the on-site stabilization alternative utilizing concrete was reevaluated in light of changes in stabilization technology. Since the release of the ROD, stabilization through asphalt batching has become an economical means by which contaminated materials can be stabilized and recycled for beneficial reuse. Asphalt batching has become an accepted treatment technology that can be used to produce a cleanup that is more cost effective than the on-site stabilization option considered in the FS. This technology would result in off-site treatment and reuse which eliminates the need to utilize a costly on-site cap over the concrete-stabilized material as is discussed in the FS.

A Supplemental Feasibility Study (SFS), which is in the Administrative Record, was conducted which reevaluated the stabilization alternative utilizing off-site asphalt batching.

The SFS analyzed this alternative in light of seven of the nine criteria under Section 121 of CERCLA and Section 300.430(e)(9)(iii) of the National Contingency Plan (NCP) and concluded that the alternative satisfied these criteria: overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements (ARARs); long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. The eighth criterion, state acceptance, is addressed in Section IV of this document. The ninth criterion, community acceptance, is addressed in Section VI of this

document.

The B & M Lagoons contaminated material will undergo treatment at an off-site, state-approved, soil recycling facility which treats contaminated soils through asphalt batching. Contaminated material will be excavated and transported off-site to a hot mix or cold mix asphalt batching plant. At the plant, the material will be blended with asphaltic material to produce a stabilized mixture in which the contaminants of concern will be permanently immobilized. This stabilized mixture is suitable for use as a base for paving.

The asphalt batching process consists of three stages. The first stage consists of producing material of uniform size through screening and/or crushing and blending. Stage two involves feeding the pre-processed soil into a mixing unit where it is blended with asphaltic emulsions. The third stage involves stockpiling the asphalt emulsion-coated material for "curing." Curing consists of evaporation of the water component of the emulsion. This stabilized mixture is suitable for use as a base for paving.

B. Basis for Change

The basis for this change is the inability of bioremediation to achieve cleanup levels in a timely manner, and possibly at all, at this Site. The experience to date has shown that the original remedy is inordinately difficult to implement, and may never result in the overall protection of human health and the environment. In contrast, as analyzed in the SFS, asphalt batching will satisfy the statutory criteria.

Asphalt batching provides numerous benefits. A bench-scale test was performed to evaluate the effectiveness of asphalt batching on the B&M Lagoons material. This test demonstrated that asphalt batching provides permanent immobilization of the contaminants of concern. In contrast to cement-based stabilization, which was considered in the original Feasibility Study, asphalt batching would result in little or no increase in volume of material. Asphalt batching will be easy to implement. Several permitted batching plants are available to treat soil. Asphalt batching is a very reliable technology that can be controlled and monitored by the operator. Periodic samples of treated soil are collected and analyzed to verify that contaminants have been immobilized.

Asphalt batching is consistent with the Massachusetts policy for managing petroleum contaminated soils. The material will be asphalt batched at a Massachusetts permitted soil recycling facility. As the

batched material is a useable product, i.e., base paving material, it will be beneficially used. An obvious advantage of this is that the treated material will not be left at the B&M Lagoons or placed in a landfill.

The primary community impacts of asphalt batching will be associated with the transportation of contaminated material to the asphalt batching facility. Iron Horse Park is approximately 3 miles from Route 495 and Route 3. Protective measures will be implemented to minimize transportation through residential areas, and to prevent spillage of material during transportation. In addition, controls will be implemented during handling of materials at the Lagoons to prevent the creation of excess dust.

It is estimated that the asphalt batching process will be completed by the end of 1998. Approximately 6,000 cubic yards of material will be asphalt batched this fall (1997). Activities to be conducted in 1998 are:

- sampling to delineate the remainder of contaminated material which must be excavated and treated;
- excavation and asphalt batching of the remaining material; and
- verification sampling to ensure that all material requiring treatment has been excavated and that any material left at the lagoons does not contain contamination above cleanup levels.

While a final volume of material to be asphalt batched is not known, it is estimated that a maximum of 28,000 cubic yards may require treatment. This volume is consistent with the volume utilized in the Feasibility Study and is being retained for comparative purposes. Using this volume, the estimated remedial cost is $3.3 million. This cost is very comparable to a number of the alternatives previously considered.

IV. Supporting Agency Comments

In a letter to EPA dated August 20, 1997, MADEP expressed its agreement with the changes documented in the draft ESD.

V. Statutory Determinations

This ESD documents the EPA's modification of the ROD to use removal of contaminated soils to an asphalt batching facility and treatment by asphalt batching, rather than treating through bioremediation.

EPA believes that the remedy as modified herein remains protective of human

health and the environment, complies with all Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site.

VI. Public Participation Activities

Notice and information regarding these proposed changes to the ROD were disseminated by (1) a mailing to all parties on the Community Relations Mailing List and (2) a published notice and a brief description of the draft ESD on September 8, 1997 in the Lowell Sun. In addition, the draft ESD was made available as part of the Administrative Record for this matter, which is available for public review at the locations and times stated in Section I.D. A public comment period was conducted from September 8 through September 26, 1997. During this time no comments were received by EPA on this matter. In addition, a public meeting was held at 7:00 p.m. on September 16, 1997 at the Billerica Town Hall to provide information and answer questions regarding this matter.

Harley F. Laing, Director
Office of Site Remediation & Restoration
EPA-New England

10-1-97
Date