ALCOA

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Site Names and Numbers

The Aluminum Company of America (ALCOA) Massena Operations, Massena, New York; sites -

- Oily Waste Landfill - #645016
- Spent Potlining Pile I - #645001
- Spent Potlining Pile A #645003
- Primary Lagoon and Dredge Spoils Area - #645005 Unit 3
- Soluble Oil Lagoon - #645005 Unit 1
- Dennison Road - #645004
- West Marsh - #645017
- Unnamed Tributary - #645019

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the above listed ALCOA sites developed in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USL Section 9601, et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Section IX of this record lists the documents that comprise the Administrative Record for the ALCOA sites. The documents in the Administrative Record are the basis for the selected remedial action.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from these site, if not addressed by implementing the response action selected in this Record of Decision (ROD), present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDIES

OILY WASTE LANDFILL - 645016

All wastes and visibly waste contaminated soils will be excavated in accordance with clean up goals established in Section VI of the ROD. Lightly contaminated material that complies with the Land Disposal Restrictions (LDRs) will be placed in an on-site secure vault. ALCOA will further investigate the feasibility of waste treatment via the solvent extraction process which concentrates the contaminants in a waste oil stream. This waste oil stream will be incinerated off-site, while the treated material will be placed in an on-site secure vault.

Confirmatory sampling will be performed after the initial excavation to determine if clean up goals have been satisfied. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment. Upon completion of the excavation work, the area will be backfilled and capped. Contaminated groundwater will be recovered and treated as determined in FS II. If ALCOA can show, to the Department's satisfaction, that an alternative treatment technology exists that significantly and permanently treats the waste, or that no feasible treatment alternative exists, the Department may amend the ROD in accordance with O&D memorandum 89-05-9.

POTLINING PILE I - ID #645001

The existing cap will be upgraded to conform to the cap requirements for an approved hazardous waste disposal facility. A deeper leachate collection system will be installed outside the existing system. This will be enclosed by a soil-bentonite barrier keyed into the underlying clay. The depth of the barrier will be determined during Remedial Design. Operation of the leachate collection system will continually lower the groundwater level within the barrier, thereby creating an inward hydraulic gradient toward the disposal cell. The collected leachate will be treated on-site, or properly disposed off-site. Deeper groundwater recovery and treatment will be evaluated in FS II.

POTLINING PILE A - ID #645003

The waste and contaminated soils at Pile A will be excavated and placed in an on-site secure vault. Confirmatory sampling will be performed after the initial excavation to determine if clean up goals have been met as explained in Section VI of the ROD. If the goals are not met, a decision will be made regarding the need for additional actions to protect public health and the environment. The area will be backfilled and capped after completion of the excavation work. Groundwater recovery and treatment will be addressed in FS II.

PRIMARY LAGOON AND DREDGE SPOILS AREA - ID #645005 UNIT 3

The dredge spoils and lagoon sludge and underlying soil will be excavated and dewatered, if necessary, solidified, and placed in an on-site secure vault. The lagoon wastewater will be decanted and treated to satisfy the facility's discharge limits. Confirmatory sampling will be performed in both instances to determine if clean up goals have been met. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment. Once the excavation is complete, the entire area will be backfilled and capped. Groundwater recovery and treatment will be evaluated in FS II.

SOLUBLE OIL LAGOON - ID #645005 UNIT 1

Initially, the wastewater will be decanted and treated to satisfy the facility's discharge requirements. The sludge and underlying soils will then be excavated and treated via the solvent extraction process. The concentrated waste oil stream resulting from the extraction process will be incinerated off-site, and the treated materials will be placed in the on-site vault. Confirmatory sampling will be performed after the initial excavation to determine if clean up goals have been satisfied. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment. Upon completion of excavation activities, the area will be backfilled and capped. Groundwater recovery and treatment will be evaluated in FS II.

DENNISON ROAD - ID #645004

The drum disposal area, and any additional waste and visibly waste contaminated soil within the drum disposal area will be excavated. Additional exploratory borings are necessary to define the extent of contamination, and need for additional remediation to meet clean up goals, in the adjoining former ravine. If further excavation is deemed infeasible due to site conditions, or technical constraints, the Department may amend the ROD in accordance with O&D memo 89-05-9. The PCB - contaminated surface soil south of the trench will also be removed. Materials which meet the Land Disposal Restrictions (LDRs) will be placed in the on-site vault. Empty drums or other debris which cannot physically undergo treatment will also be placed in the vault. The remaining material will be subjected to solvent extraction in order to concentrate the contaminants in a waste oil stream. This stream will be incinerated off-site, while the "treated" material will be put in the vault. If treatability studies show that solvent extraction cannot meet the LDRs, alternative treatment technologies will be considered in an amended ROD. Confirmatory sampling will be performed after the initial excavation to determine if clean up goals have been satisfied. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment. After the excavation work is complete, the area will be backfilled and capped. Groundwater recovery and treatment will be evaluated in FS II.

WEST MARSH - ID #645017

A drainage system will be installed along the existing marsh channel, and the area will be backfilled and capped to create an upland region. The cap will comply with the requirements for closure of an industrial waste disposal area. Water collected from the drainage system will be monitored and treated as

necessary to meet the facility's discharge limits. The 2 acres of lost wetlands will be relocated to an area acceptable to the Department. This location will be specified in the ROD following FS II. The area will be monitored for 5 years to insure that the remedy has effectively abated impacts on biota.

UNNAMED TRIBUTARY - ID #645019

The section of the tributary between the IRM work zone and Route 131 (ALCOA's property line) will be sampled for residual contamination. Any areas of PCB contaminated sediment/soil above 1 ppm will be excavated and placed in an on-site secure vault. Confirmatory sampling will be performed. Excavation will continue until all PCB levels are below 1 ppm. The original grades in the tributary will be re-established using clean fill and rip-rap, as needed, to control erosion. Biological monitoring will be conducted for 5 years to determine the effectiveness of the clean up.

The length of the tributary between Route 131 and the Grasse River will be evaluated further prior to developing a remedial program. ALCOA shall submit a work plan to the Department to further evaluate remedial alternatives for this segment of the tributary.

DECLARATION

The selected remedies are designed to be protective of human health and the environment, are designed to comply with applicable State Environmental Quality standards and are cost effective. These remedies satisfy the Department's preference for treatment that reduces the toxicity, mobility or volume of hazardous substances, pollutants or contaminants as the principal goal.

MAR 1 1 1991

Date

Edward O. Sullivan
Deputy Commissioner

RECORD OF DECISION

for

THE ALUMINUM COMPANY OF AMERICA
MASSENA OPERATIONS
MASSENA, NEW YORK

prepared by

THE NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION - REGION 6
WATERTOWN, NEW YORK

MARCH 1991

TABLE OF CONTENTS

I. INTRODUCTION

This document is the first of two Records of Decision (ROD) to be issued concerning the remediation of hazardous waste at the Aluminum Company of America (ALCOA) facility in Massena, New York. Of the 14 areas of concern identified in previous investigations, the following 8 locations are the focus of this report:

Oily Waste Landfill - 645016
Spent Potlining Pile I - 645001
Spent Potlining Pile A - 645003
Primary Lagoon and Dredge Spoils Area - 645005 Unit 3
Soluble Oil Lagoon - 645005 Unit 1
Dennison Road - 645004
West Marsh - 645017
Unnamed Tributary - 645019

The remaining sites will be addressed in the second ROD scheduled for release in September 1991.

This document has been assembled as authorized by ECL Article 27, Title 13 (the New York State Superfund Program), and in accordance with New York State Department of Environmental Conservation (NYSDEC, the Department) and United States Environmental Protection Agency (USEPA) guidelines. Much of the information has been provided by ALCOA's consultant, Engineering-Science. The selected remedies are essentially those recommended by the NYSDEC in the November 30, 1990 Proposed Remedial Action Plan (PRAP). Any modifications are the result of comments received during the recently concluded public review period.

II. SITE LOCATION AND DESCRIPTION

ALCOA's Massena Operations are located on 3,500 acres in the Town of Massena, St. Lawrence County, New York (Figures 1 and 2). The facility is bordered on the north by the St. Lawrence River, on the southwest by the Massena Power Canal, and on the southeast by the Grasse River. The Village of Massena (population 15,000) is located to the west and to the south. The municipal water supply is obtained from the St. Lawrence River via an intake at the head of the Power Canal. An additional residential area is situated along Dennison Road to the northeast. Water in this area is furnished by private wells.

The site topography is generally characterized by two northeast/southwest trending ridges surrounded by relatively low-lying areas. The subsurface geology consists of 50 to 150 feet of unconsolidated deposits overlying bedrock. More specific information on the environmental setting was provided in the PRAP.

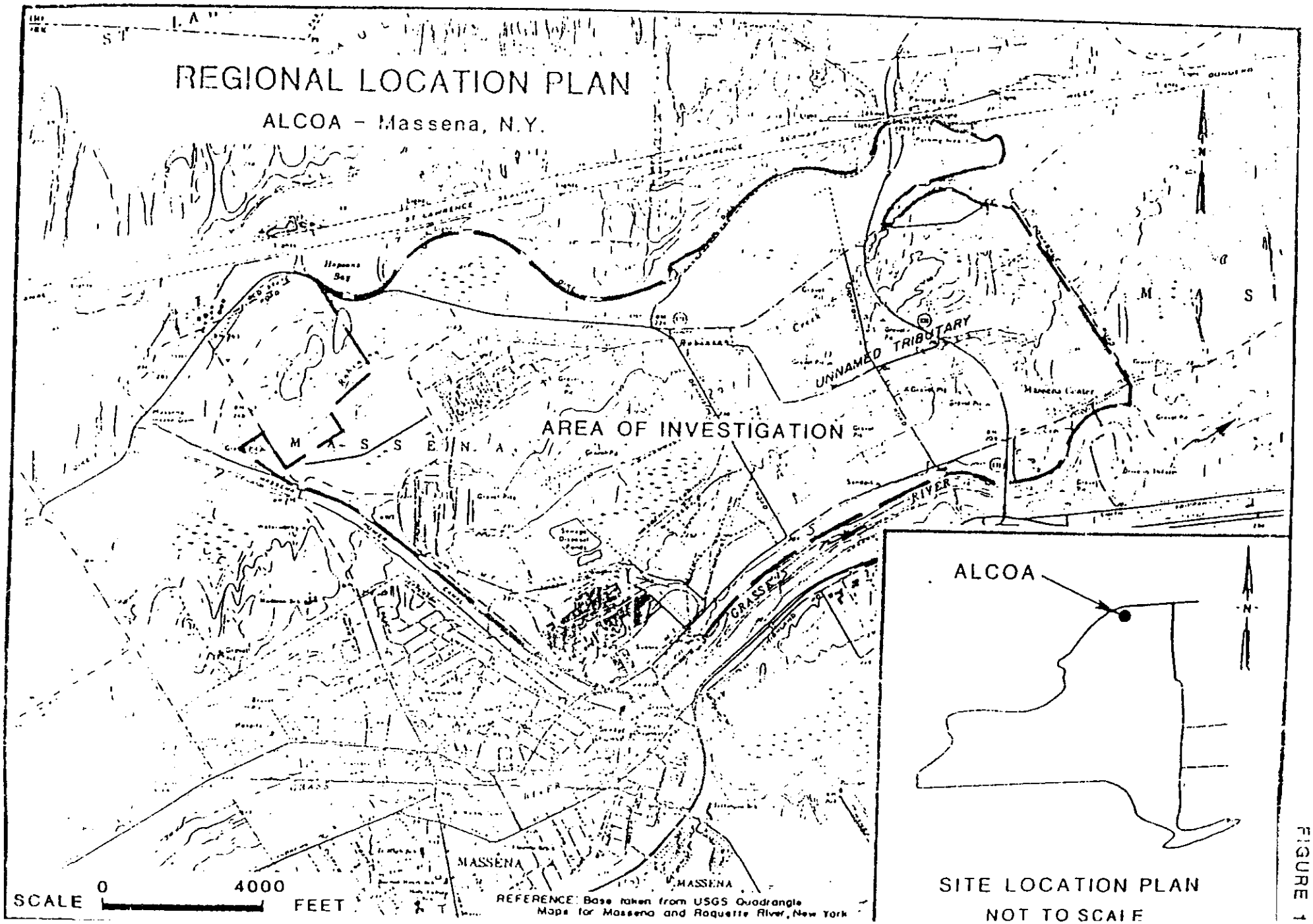

REGIONAL LOCATION PLAN
ALCOA – Massena, N.Y.
AREA OF INVESTIGATION
UNNAMED TRIBUTARY
GRASSE RIVER
MASSENA
SCALE 0 4000 FEET
REFERENCE: Base taken from USGS Quadrangle Maps for Massena and Raquette River, New York
ALCOA
SITE LOCATION PLAN
NOT TO SCALE

FIGURE 1

SITE PLAN

ALCOA - Massena, N.Y.

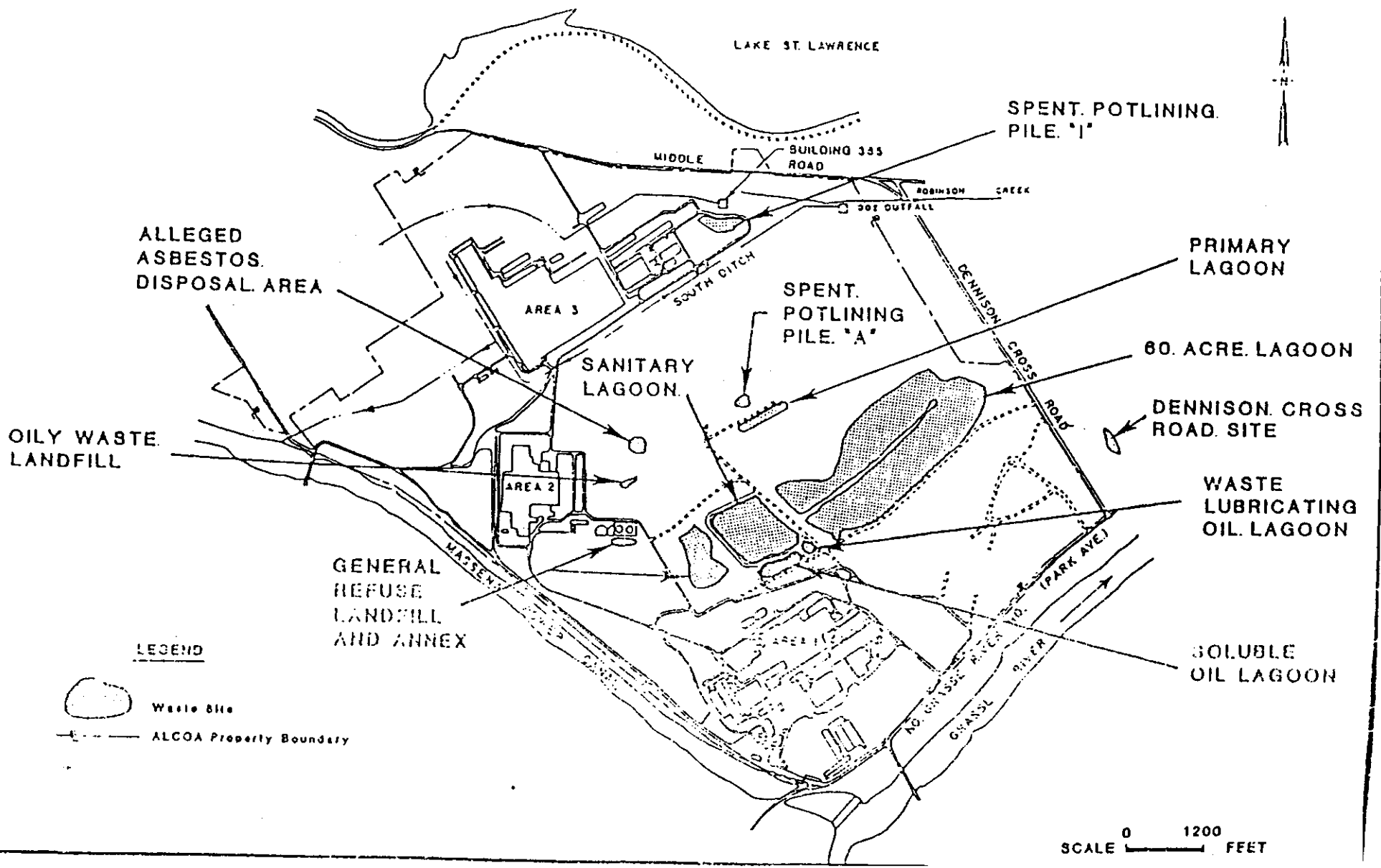


FIGURE 2

III. SITE HISTORY

Aluminum and aluminum products have been manufactured continuously at the plant since 1903, resulting in the generation of various types of industrial and hazardous wastes. These were disposed at a number of locations throughout the facility, as the table below indicates.

TABLE I
HISTORY OF WASTE DISPOSAL

DISPOSAL LOCATION	PERIOD OF OPERATION
Oily Waste Landfill	1979-1984
Spent Potlining Pile I	1951-1976
Spent Potlining Pile A	1976-1983
Primary Lagoon and Dredge Spoils Area	1972-Present
Soluble Oil Lagoon	1959-1986
*Waste Lubricating Oil Lagoon	1969-1980
Dennison Road	1969-1979
Unnamed Tributary	1958-Present
West Marsh	Unknown
*General Refuse Landfill	1955-1990
*Landfill Annex	1942-1951; 1976-1977
*60 Acre Lagoon	1972-Present
*Sanitary Lagoon	1962-Present
+Alleged Asbestos (Dross) Disposal Area	1955-1977

*To be addressed in the second ROD.
+No longer considered a hazardous waste site.

In 1985, ALCOA initiated a remedial investigation (RI) to characterize the nature and extent of contamination at each of these disposal sites, and to determine the impact of the contamination on public health and the environment. A number of additional investigations have been undertaken since that time in order to fill existing data gaps or confirm earlier findings. Table 2 provides a chronological history of these investigations.

TABLE 2
REMEDIAL INVESTIGATION HISTORY

INVESTIGATION	DATE
Waste Site Investigation	Summer 1985-03/87
Supplemental Field Investigation	10/87-03/88
West Marsh Field Investigation	09/88-10/88
Comprehensive Biota Sampling Program	07/89-06/90
General Refuse Landfill & Annex Inves.	11/89-01/90
Bedrock Monitoring Well Program	11/89-01/90
Groundwater Modeling Program	11/89-Present

In conjunction with this work, a series of treatability studies have also been performed. These involve the application of a variety of treatment technologies to the wastes or contaminants of concern at the ALCOA facility to aid in selecting suitable remedies. Some studies are ongoing, though much of the work has been completed.

During the field investigations, a number of conditions were encountered that either required immediate attention, or could be remediated without any further studies. To address such situations, several Interim Remedial Measures (IRMs) were implemented. Each is discussed briefly below:

General Refuse Landfill

A leachate collection system was installed in 1989 along the south and east side slopes to intercept contaminant migration to the East Marsh. Collected leachate is presently being shipped off-site for treatment.

West Marsh

In the Fall of 1990, roughly 8,000 cubic yards of PCB-contaminated sediments were excavated to a depth of 1 to 3 feet and shipped off-site for disposal.

Unnamed Tributary

In conjunction with the West Marsh IRM, approximately 1,500 cubic yards of PCB-contaminated sediments were removed from the first 400 feet of the stream bed. This waste was also sent off site for disposal.

IV. CURRENT STATUS

Upon completion of the initial field investigations, it was determined that the Alleged Asbestos (Dross) Disposal Area did not contain hazardous waste. Accordingly, it was closed pursuant to Solid Waste regulations (6 NYCRR Part 360).

With respect to the other sites, the presence of hazardous waste was confirmed. Each has been listed as a Class 2 site on the state-wide Registry of Inactive Hazardous Waste Disposal Sites. This designation indicates that existing conditions pose a significant threat to public health or the environment, and action is required.

Hazardous waste was also found in a section of the Grasse River adjacent to the facility. Further investigation and remediation of this area is under the management of the USEPA.

Five of the disposal areas (Waste Lubricating Oil Lagoon, General Refuse Landfill, Landfill Annex, 60 Acre Lagoon, Sanitary Lagoon) have had to undergo additional characterization prior to remedy selection. In accordance with the existing Consent Order, ALCOA developed a remedial plan for the Waste Lubricating Oil Lagoon in the initial Feasibility Study (FS). The Department, however, has requested that this be re-evaluated using additional site information and treatability studies. Although ALCOA has satisfied the terms of the Order for this site, they are nonetheless obligated to undertake the additional work pursuant to the Department's Organization and Delegation Memorandum #89-05, paragraph 9.a.(1).

The nature and extent of contamination at each of the 8 remaining sites is discussed below, and summarized in Table 3.

SITE CHARACTERISTICS

OILY WASTE LANDFILL

The Oily Waste Landfill was opened in 1979 as a replacement for the Dennison Road site. It is approximately 1 acre in size, and includes 2 solidification pits utilized for the disposal of heavy lubricating oil, sludges, and debris (eg. speedy dry, rags). The pits had a combined capacity of 1,400 cubic yards. They were closed in 1982 and 1984, respectively by removal of free liquids and in-place solidification of the residual waste.

Two dewatering cells were excavated north of the solidification pits in 1980 to treat oily sludges containing significant quantities of water. They were closed in 1984 by in-place solidification of the sludges, and removal of the solidified material to an off-site disposal facility. The entire site was covered by 18 to 24 inches of clay in 1985.

Waste analyses have revealed the presence of several organic compounds, including 1,1,1 trichloroethane (6 to 7 ppm), phenols (180 ppm), PCBs (26 ppm), benzene (trace), trans-1,1-dichloroethene (4 ppm), and xylenes (19 ppm).

1,1,1 Trichloroethane, toluene, PCBs, phenols, and other semi-volatile compounds have been detected in shallow groundwater downgradient of the site. Benzene, toluene, PCBs, 2,4 dichlorophenol, and other semi-volatile compounds have been detected in deep groundwater downgradient of the site. NYSDEC groundwater quality standards (6 NYCRR Part 703.5) and guidance values have been exceeded for 1,1,1 trichloroethane, PCBs, phenol, 2,4 dichlorophenol, and other semi-volatile compounds.

SPENT POTLINING PILES I AND A

These two sites received potlining waste generated during the aluminum smelting process. Pile I is approximately 1.7 acres in size, and was utilized from 1951 until 1976. It contains an estimated 32,000 cubic yards of material. Capping was begun in 1977, and was completed in 1983. A shallow leachate collection system installed around the toe of the site removes 50,000 to 100,000 gallons of leachate per year for off-site disposal. This system has been shown to be only partially effective in preventing contaminant migration.

Pile A is 2.9 acres in size, and operated from 1976 until 1983. It contains roughly 79,000 cubic yards of waste. It was capped in 1984.

Typical potlining waste contains up to 2,000 ppm of cyanide. The resulting leachate contains cyanide (150 to 1,300 ppm), fluoride (1,200 to 8,500 ppm), ammonia (180 to 230 ppm), and heavy metals.

Cyanide and fluoride have been detected in shallow groundwater downgradient of these sites above NYSDEC groundwater quality standards. In addition, elevated levels of cyanide and fluoride have been found in the groundwater collected from downgradient bedrock monitoring wells. Fluoride levels, in some instances, have exceeded NYSDEC groundwater quality standards.

PRIMARY LAGOON AND DREDGE SPOILS AREA

The Primary Lagoon and Dredge Spoils Area occupy approximately 5.3 acres. The lagoon was excavated in 1972 as a settling basin for lime-treated scrubber water from the anode bake plant in the Smelting Area. Other miscellaneous process wastewaters and run-off water are also directed to the lagoon, which is unlined and still active. The effluent is discharged to the 60 Acre Lagoon. In 1977, the lagoon was dredged and the sludge placed into the Dredge Spoils Area.

Elevated levels of PCBs (83 ppm) were detected in the Dredge Spoils Area. PAHs (62,500 ppm), cyanide (510 ppm), fluoride (170,000 ppm), and heavy metals were detected in both the lagoon sludge and the Dredge Spoils Area.

Cyanide, fluoride, PCBs, PAHs, and benzene have been detected in shallow groundwater downgradient of the site above NYSDEC groundwater quality standards. In addition, concentrations of cyanide and fluoride in excess of NYSDEC groundwater quality standards have been found in samples collected from a downgradient bedrock monitoring well.

SOLUBLE OIL LAGOON

The Soluble Oil Lagoon is 2.8 acres in size and approximately 8 feet deep. It is unlined, and has a capacity in excess of 5,000,000 gallons. From 1959 until 1986, it received waste oil and soluble oil from the rolling mills and saw operations. It was also utilized for the disposal of solvents, and caustics and acids from the etching operations.

The lagoon contains 13,300 cubic yards of sludge contaminated with PCBs (33,000 ppm), trichloroethylene (650 ppm), tetrachloroethylene (4 ppm), other volatile organic compounds, and heavy metals.

Phenols, fluoride, cyanide, and organics (including PCBs) were detected in shallow groundwater at concentrations in excess of NYSDEC groundwater quality standards.

DENNISON ROAD

This .75-acre site was operated as an open dump from 1969 until 1979. It was utilized for the disposal of solvent degreasing still bottoms, drawing and soluble oil sludges, and debris containing chlorinated solvents. In 1979, free liquids were removed, and the residual wastes were covered. It is estimated that 1,900 cubic yards of waste still remain.

PCBs at levels between 50 and 100 ppm were detected in surface soils, test pit samples, soil boring samples, and sediments. Elevated levels of volatile organic compounds and fluoride were also present in these samples, as well as in leachate emanating from the site.

WEST MARSH

The West Marsh is about 3 acres in size and drains to the Grasse River via the 001 outfall. PCBs have been detected in the marsh sediments in excess of 29,000 ppm. The suspected source of the contamination is leaking hydraulic fluid in the Ingot Extrusion Area, which subsequently drained to the marsh.

UNNAMED TRIBUTARY

The Unnamed Tributary is a 1.5 mile water course which receives run-off water and untreated anode-bake scrubber water from the Smelting Area via the 002 outfall. It discharges to the Grasse River near Massena Center.

PCBS have been found in the stream sediments in excess of 18,000 ppm near the outfall. PAHs have been detected at levels as high as 16,420 ppm.

SITE RISKS

An evaluation has been conducted to identify potential public health impacts associated with the migration of contaminants from the facility.

A major concern is the ingestion of contaminated drinking water by nearby residents. Cyanide, fluoride, benzene, toluene, xylene, and other compounds have been detected in off-site groundwater monitoring wells at parts per billion levels. In addition, cyanide and benzene have been found in private wells, although their levels were well below New York State Department of Health (NYSDOH) drinking water standards. ALCOA is monitoring these wells on a continuous basis to ensure the safety of the residents.

Another potential problem is the human consumption of biota from off-site surface water bodies. Elevated levels of PCBs and other compounds have been found in the tissue of fish taken from the Grasse River. As a result, the NYSDOH has issued an advisory recommending no more than one meal per month of smallmouth bass, brown bullhead, or walleye. A similar advisory is in force for species taken from the St. Lawrence River. Women of childbearing age, infants, and children under the age of 15 have been advised against the consumption of any fish from these waters. It is suspected that waterfowl inhabiting the area may also be bioaccummulating contaminants.

Other possible exposure routes include workers coming into contact with or ingesting on-site wastes, and area residents or sportsmen coming into contact with or ingesting off-site contaminated soils, sediments, or surface water.

In addition to public health impacts, the effects of site contaminants on the biota itself was also addressed during the investigative process. The initial results of these studies have been reviewed by the Department, and ALCOA's consultant is currently revising the report in accordance with Department comments. The report should be available for public review by May 1991.

TABLE 3
DISPOSAL AREA CHARACTERISTICS

DISPOSAL AREA	TYPE/ SIZE	WASTE/ QUANTITY	AFFECTED MEDIA	CONTAMINANTS OF CONCERN
OILY WASTE LANDFILL	PITS/ 1 ACRE	RESIDUALS FROM HEAVY LUB OILS AND SLUDGES/ 1,400 CY	RESIDUALS SOIL GROUNDWATER	PCBs, PHENOLS VOCs
SPENT POTLINING PILE I	LANDFILL/ 1.7 ACRES	POTLINING/ 32,000 CY	POTLINING LEACHATE GROUNDWATER	CYANIDE, FLUORIDE HEAVY METALS AMMONIA
SPENT POTLINING PILE A	LANDFILL/ 2.9 ACRES	POTLINING/ 79,000 CY	POTLINING LEACHATE GROUNDWATER	CYANIDE, FLUORIDE HEAVY METALS AMMONIA
PRIMARY LAGOON/ DREDGE SPOILS AREA	LAGOON/ 2.4 ACRES PILES/ 2 ACRES	SLUDGE FROM TREATED SCRUBBER WATER/ 42,000 CY	SLUDGE DREDGE SPOILS GROUNDWATER	PAHs, PCBs HEAVY METALS CRESOLS BENZENE
SOLUBLE OIL LAGOON	LAGOON/ 2.8 ACRES	WASTE OIL SLUDGES SOL OIL SLUDGES ETCHING WASTES/ 13,300 CY	SLUDGE SOIL GROUNDWATER	PCBs PHENOLS, VOCs HEAVY METALS AMMONIA
DENNISON ROAD	LANDFILL/ 3/4 ACRES	STILL BOTTOMS SOL OIL SLUDGES DRAW OIL SLUDGES CHLOR SOLVENTS	RESIDUALS SOIL, SEDIMENT SURFACE WATER GROUNDWATER	PCBs VOCs PAHs
WEST MARSH	MARSH/ 3 ACRES	SEDIMENT/ 8,000 CY	SEDIMENT SURFACE WATER	PCBs
UNNAMED TRIBUTARY	STREAMBED/ 400 FT	SEDIMENT/ 1,500 CY	SEDIMENT SURFACE WATER	PCBs PAHs

V. ENFORCEMENT STATUS

On January 16, 1985, the NYSDEC entered into a consent order with ALCOA to investigate and remediate all areas of hazardous and industrial waste at the facility.

On September 14, 1989, the Department entered into an amended order with ALCOA that required further investigation of the General Refuse Landfill and Landfill Annex, and operation of the landfill in accordance with Solid Waste regulations. The site ceased accepting waste on December 1, 1990, and an interim cap was completed over the landfill.

On August 16, 1990, the Department entered into two additional amended orders to address IRMs at the West Marsh and Unnamed Tributary.

In early 1990, it became apparent that the project had become so complex that a completely revised consent order was needed. A new order was drafted, segmenting the project into three feasibility studies (FS I, FS IA [General Refuse Landfill and Landfill Annex], and FS II), each with its own time frame. The order also updated the remedial process by requiring a Commissioner's ROD, Remedial Design, and implementation of a Remedial Program, including the operation and maintenance of the in-place remedial systems for a period of year to be determined by the NYSDEC. The order became effective on October 31, 1990.

ALCOA has also entered into an Order with the USEPA to address contamination in the Grasse River.

VI. GOALS FOR THE REMEDIAL ACTIONS

In order to insure the proper development of a remedial program, a number of objectives were established for each of the disposal areas. These are identified in Table 5.

The NYSDEC has determined that many of these objectives are best achieved through excavation of contaminated wastes, soils, sludges, and sediments. The degree of excavation is dependent upon soil clean-up goals, which are based on such site-specific criteria as location, contaminants of concern, potential human and environmental receptors, and controls to be implemented.

For those sites designated for excavation, the following soil clean-up goals are recommended. They are considered protective of groundwater quality.

TABLE 4

COMPOUND	AREAS OUTSIDE GROUNDWATER MANAGEMENT UNITS*	AREAS WITHIN GROUNDWATER MANAGEMENT UNITS*
1,1,1-Trichloreothane	0.76 ppm	7.6 ppm

Benzene	0.04 ppm	.4 ppm
Tetrachloroethene	0.02 ppm	.2 ppm
Trichloroethene	0.13 ppm	1.3 ppm
Toluene	0.15 ppm	1.5 ppm
Total Xylene	0.12 ppm	1.2 ppm
Phenanthrene	2.2 ppm	2.2 ppm
Pyrene	6.6 ppm	6.6 ppm
Other PAHs	0.3 ppm	.3 ppm
PCBs	1.0 ppm	10.0 ppm

*Areas "within" groundwater management units are considered areas within the influence of groundwater pumping wells, groundwater drains, or groundwater monitoring wells. Areas "outside" of groundwater management units are all other areas.

For the Primary Lagoon and Dredge Spoil Area and, Spent Potlining Pile A, the soil clean-up levels will also be determined using the leachate extraction procedure also (TCLP) on the soils beneath the excavated material. The pH of the extraction fluid will be adjusted to background overburden groundwater pH conditions. The extracted leachate will be analyzed, and the results compared to NYS effluent standards (6 NYCRR Part 703.6) for cyanide, fluoride, and sulfate.

In general, excavation will proceed at a given disposal area until all visible waste and waste contaminated soil is removed but not greater than one foot beyond the pre-determined waste-soil boundary. The in-place soils will then be analyzed to

determine if the clean-up goals have been met. A determination will be made at that time regarding the feasibility of, and the need for, additional remediation. If the clean-up goals are not achieved, and significant soil contamination remains, in situ permanent treatment alternatives or a more stringent cap and groundwater monitoring and/or a pumping system, will be given preference over continued excavation.

The clean-up goals for sediment in the Unnamed Tributary is 1 ppm PCBs. The Department recognizes that the clean-up goals may result in residual risk to biota in the Unnamed Tributary. It is also recognized that, due to analytical and construction constraints, and widespread dispersion of contaminants, clean-up goals below these levels become more difficult to determine when they are achieved. The potential injuries related to residual risk will be quantified and evaluated from a natural resources damages stand point. ALCOA is encouraged to eliminate as much of the contamination in these sensitive areas as possible while in the process of remediation, and to pursue the lowest possible cleanup level that is feasible under conditions existing.

The goals for treatment of wastes and contaminated soils are based on the USEPA Land Disposal Restrictions, 40 CFR 268. Also, treatment of PCB waste must comply with USEPA TSCA requirements contained in 40 CFR 761. For the purposes of this ROD, the goal for those PCB waste requiring treatment is treatment to less than 2 ppm PCBs.

Alternative treatment technologies not approved in this ROD may be evaluated further by ALCOA's consultant, and evaluated by this Department using the criteria contained in TAGM 4030. Use of such alternative technologies will be subject to an amended ROD, as specified in O&D memo 89-05.9.

TABLE 5
REMEDIAL OBJECTIVES

DISPOSAL AREA	AFFECTED MEDIA	REMEDIAL OBJECTIVES
OILY WASTE LANDFILL	RESIDUALS, SOIL	Prevent direct contact. Prevent adverse impacts on groundwater and surface water.
	GROUNDWATER	Prevent further migration of contaminants, and remediate existing contamination.
SPENT POTLINING PILE I	POTLINING	Prevent direct contact. Prevent adverse impacts on groundwater and surface water.
	LEACHATE GROUNDWATER	Prevent further migration of contaminants, and remediate existing contamination. Prevent adverse impacts on aquatic biota and downstream surface water.
SPENT POTLINING PILE A	POTLINING	Prevent direct contact. Prevent adverse impacts on local biota, groundwater, and surface water.
	GROUNDWATER	Prevent further migration of contaminants, and remediate existing contamination.
	LEACHATE SURFACE WATER	Prevent adverse impacts on aquatic biota and downstream surface water.
PRIMARY LAGOON/ DREDGE SPOILS AREA	SLUDGE DREDGE SPOILS	Prevent direct contact. Prevent adverse impacts on local biota, groundwater, and surface water.
	GROUNDWATER	Prevent further migration of contaminants, and remediate existing contamination.
	SURFACE WATER	Prevent exceedance of water quality standards in downstream surface water.
SOLUBLE OIL LAGOON	SLUDGE, SOIL	Prevent direct contact. Prevent adverse impacts on local biota, groundwater, and surface water.
	GROUNDWATER	Prevent further migration of contaminants, and remediate existing contamination.
DENNISON ROAD	RESIDUALS, SOIL	Prevent direct contact. Prevent adverse impacts on local biota, groundwater, and surface water.
	SEDIMENT SURFACE WATER	Meet water quality standards in downstream surface water.
	GROUNDWATER	Prevent further migration of contaminants, and remediate existing contamination.
WEST MARSH	SEDIMENT SURFACE WATER	Prevent adverse impacts on marsh biota, downstream aquatic biota, and any users of downstream surface water.
UNNAMED TRIBUTARY	SEDIMENT SURFACE WATER	Prevent adverse impacts on aquatic biota and any users of local surface water.

VII. DESCRIPTION AND EVALUATION OF THE ALTERNATIVES

Subsequent to the establishment of remedial action objectives for each disposal area, the following general response actions were developed:

TABLE 6
GENERAL RESPONSE ACTIONS

No Action
Containment (control & isolation)
Source Removal (excavation)
Treatment
Disposal

These were utilized to identify and screen various remedial technologies which could be used to satisfy the remedial action objectives. To aid in this screening process, the media of concern at the facility were separated into two groups:

wastes, soils, sludges, sediments
surface water, groundwater, leachate, filtrate

The candidate technologies were evaluated on the basis of technical implementability, and the results are presented in Tables 3.1 and 3.3 of the September 1990 FS (FS I).

After this initial evaluation, a number of process options, if available, were identified for each of the remaining technologies. These were screened for effectiveness and implementability in order to select a single process option for each technology. The results are shown in Tables 3.4 and 3.5 of FS I.

The technologies and process options were then assembled into remedial alternatives for each disposal area. These were evaluated on the merits of implementability and effectiveness. In instances where two similar alternatives emerged for a given site, cost was used as a deciding factor. The intent of this screening process was to preserve a set of alternatives representative of the entire range of general response actions. Tables 4.2 through 4.8 in FS I detail the results for each of the disposal areas.

As a final step, a Detailed Analysis was performed on each alternative proposed for a given site, utilizing the following criteria:

Short-term Impacts and Effectiveness
Long-term Effectiveness and Permanence
Reduction of Toxicity, Mobility, or Volume
Implementability
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
Overall Protection of Human Health & Environment
Cost

A comparison of the results was then conducted to enable the selection of a final remedy for each site. A brief description of each set of alternatives follows. The results of the Detailed Analysis are discussed in the PRAP.

OILY WASTE LANDFILL

Alternative 1 - No Action with Long-term Monitoring

Under this option, present conditions would be maintained. A fence would be erected around the site to restrict access, and a long-term groundwater monitoring program would be implemented. The total cost is estimated at $450,000.

Alternative 2a - Groundwater Recovery and Treatment

This alternative involves the installation of a groundwater and leachate collection system around the perimeter of the site. The recovered liquids would either be treated on-site or off-site at an approved wastewater treatment facility. The evaluation of various collection and treatment schemes will be included in FS II. Costs for leachate collection and treatment have been projected at $1,600,000.

Alternative 2b - Supplemental Cap/Groundwater Recovery and Treatment

This alternative includes improvements to the existing cap, and installation of a groundwater and leachate collection system. The cost associated with the cap is $1,300,000. Groundwater and leachate recovery and treatment options will be evaluated in FS II. Costs for this alternative has been projected at $2,400,000.

Alternative 3 - Excavation/Treatment/On-Site Vault

This alternative consists of excavation of the waste material, segregation and treatment of any material determined to be restricted from land disposal, disposal of all waste and treated residual in an on-site vault, and back-filling and capping the excavated area. Installation of a groundwater recovery and treatment system will be evaluated in FS II. The total estimated cost, excluding groundwater recovery and treatment, is $820,000 to $4,930,000, depending on the quantity of waste needing treatment.

SPENT POTLINING PILE I AND A

Alternative 1 - No Action with Long-term Monitoring

For this alternative, no remedial activities would be undertaken at either site. A long-term groundwater monitoring program would be implemented at a total cost of $520,000.

Alternative 2 - Improve Caps/Improve and Install Leachate Collection Systems/Groundwater Recovery and Treatment

Alternative 2 includes upgrading the caps over both sites, installation of a deeper leachate collection system and vertical barrier outside the existing system at Pile I, installation of a leachate collection system around Pile A, and shallow groundwater recovery and treatment. Groundwater recovery and treatment from deeper zones will be addressed in FS II. The total cost, including shallow groundwater recovery and treatment is $12,530,000.

Alternative 3a - Excavation/On-Site Vault

Alternative 3a includes the excavation of waste materials and disposal in an on-site vault, backfilling the excavated areas, and installation of caps. The total cost is $22,780,000.

Alternative 3b - Excavation/On-Site Incineration

Alternative 3b includes the excavation of waste materials and incineration in an on-site incinerator, the disposal of residual ash in an on-site vault, and backfilling and capping the excavated areas. The total cost is $115,500,000.

Groundwater recovery and treatment for Alternatives 3a and 3b will be addressed in FS II.

PRIMARY LAGOON AND DREDGE SPOILS AREA

Alternative 1 - No Action with Long-Term Monitoring

Under this alternative, present site conditions would be maintained. A long-term groundwater monitoring program would also be instituted. The total expected cost is $240,000.

Alternative 2 - In-Place Solidification/Cap/Groundwater Recovery and Treatment

This alternative includes the excavation of sludge and soils, followed by the installation of a clay liner. The excavated materials would be solidified and placed on top of the clay, and then be capped. Surface water in the lagoon would be decanted and treated, along with the filtrate. Groundwater recovery and treatment will be evaluated in FS II. The total cost, excluding groundwater recovery and treatment, is $5,600,000 to $6,050,000.

Alternative 3a - Excavation/Solvent Extraction/On-Site Vault

This alternative involves the excavation of sludge and soils, followed by solvent extraction. The treated materials would be placed in an on-site vault, and the excavated areas would be backfilled and capped. Surface water in the lagoon would be decanted and treated prior to excavation. Groundwater recovery and treatment will be evaluated in FS II. The total cost, excluding groundwater recovery and treatment, is $26,600,000.

Alternative 3b - Excavation/Dewatering/Solidification/On-Site Vault

This alternative includes the excavation and dewatering of sludge and soils. Surface water in the lagoon would be drained prior to excavation, and both the filtrate and surface water would be treated prior to discharge. Once the material is dewatered, it would be solidified and placed in an on-site vault. The excavated area would be backfilled and capped. A groundwater recovery and treatment system will be evaluated in FS II. Total cost, excluding groundwater recovery and treatment, is estimated at $12,040,000.

Alternative 3c - Excavation/Incineration/On-Site Vault

This alternative includes the excavation of sludge and soils, followed by on-site incineration. The residual ash would be placed in an on-site vault, and the excavated areas would be backfilled and capped. Surface water in the lagoon would be decanted and treated prior to excavation. A groundwater recovery and treatment system will be evaluated in FS II. Total cost, excluding groundwater recovery and treatment, is estimated at $39,100,000.

SOLUBLE OIL LAGOON

Alternative 1 - No Action with Long-Term Monitoring

Present conditions would be maintained under this alternative. A fence would be installed around the site to restrict access, and a long-term groundwater monitoring program would be implemented. The surface water in the lagoon would be pumped out and treated along with other wastewater from the facility. The estimated cost, excluding surface water treatment, is $440,000.

Alternative 2 - Dewater/Solidification/Slurry Wall/Cap/Leachate Collection and Treatment/Groundwater Recovery and Treatment

This alternative includes the in-place dewatering and solidification of sludge and contaminated soils, followed by capping. A slurry wall would be placed around the site, and a leachate collection system would be installed inside the slurry wall. A groundwater recovery and treatment system would also be installed. The surface water in the lagoon would be pumped out and treated along with other wastewater. Groundwater recovery and treatment options will be evaluated in FS II. The total cost, excluding groundwater recovery and treatment and surface water treatment is $14,020,000.

Alternative 3a - Excavation/Incineration/Groundwater Recovery and Treatment

The alternative involves dewatering the lagoon, followed by dredging and dewatering the sludge and contaminated soils. This material would be incinerated on-site, and the residual ash would be placed in an on-site vault. The decanted surface water would be treated along with other wastewater. A groundwater recovery and treatment system would also be installed. The total cost, excluding groundwater recovery and treatment and surface water treatment is $41,000,000.

Alternative 3b - Excavation/Solvent Extraction/Groundwater Recovery and Treatment

This alternative is similar to Alternative 3a, except the excavated material would undergo solvent extraction versus on-site incineration. The total cost, excluding groundwater recovery and treatment and surface water treatment is $19,400,000.

It is important to note that each of these alternatives was designed to address remediation of the Waste Lubricating Oil Lagoon as well, and this has been reflected in the costs. Since action on the Waste Lubricating Oil Lagoon has been deferred until additional treatability studies are completed, the costs associated with remediation of the Soluble Oil Lagoon alone will be less than those indicated above.

Two additional alternatives (3c and 3d) were also proposed, although they are merely different combinations of the same elements contained in the other alternatives. For this reason, they are not discussed here.

DENNISON ROAD

Alternative 1 - No Action with Long-Term Monitoring

Existing conditions would be maintained. A fence would be placed around the perimeter of the site to restrict access, and a long-term groundwater monitoring program would be implemented. The total cost is $270,000.

Alternative 2 - Cap/Leachate Collection and Treatment

This alternative includes placement of a cap over the site, and installation of a leachate collection system. Treatment of the collected leachate would be addressed as part of FS II. A perimeter fence would also be erected to control access. The estimated total cost, including leachate treatment, is $5,670,000.

Alternative 3a - Excavation/On-Site Incineration/Cap/Leachate Collection and Treatment

This alternative involves excavation and incineration of the 1,900 cubic yard drum disposal area, backfilling the excavated area, and placing a cap over the entire site. A leachate collection system and perimeter fence would be installed. Leachate treatment will be evaluated in FS II. Total cost, including leachate treatment, is $8,690,000.

Alternative 3b - Excavation/Solvent Extraction/Cap/Leachate Collection and Treatment

This alternative includes excavation of the 1,900 cubic yard drum disposal area, and treatment of the waste using the solvent extraction process. The excavated area would be backfilled, and the entire site capped. A leachate collection system and perimeter fence would be installed. Treatment of the leachate will be addressed in FS II. Total cost, including leachate treatment, is $6,840,000.

WEST MARSH

Alternative 1 - No Action with Long-Term Monitoring

Under this alternative, the post - IRM conditions would be maintained. Long-term monitoring of sediments and surface water would be implemented to verify the effectiveness of the IRM. The estimated cost is $104,000.

Alternative 2 - Install Drainage System/Fill to Grade/Cap/ Relocate Marsh

Under this alternative, perforated drain pipes would be installed along the existing marsh channel, and the area would be backfilled and capped to create an upland region. The three acres of lost wetlands would be relocated nearby, such as along Middle Road north of the Smelting Area. The estimated cost is $710,000.

Alternative 3 - Excavation/Dewatering/On-Site Vault

This alternative includes the dredging and/or excavation at PCB contaminated marsh sediments, followed by dewatering and disposal in an on-site vault. PCB concentrations would range from 1 ppm to less than 10 ppm as a result of the IRM work. The marsh would be restored at the present location. The estimated cost is $1,860,000.

UNNAMED TRIBUTARY

Alternative 1 - No Action with Long-Term Monitoring

Under this alternative, the post-IRM conditions would be maintained and long-term monitoring of biota, sediments, and downstream surface water would be conducted. The estimated cost is $470,000.

Alternative 2 - Excavation/Dewatering/On-Site Landfill

Alternative 2 involves the excavation and dewatering of PCB contaminated sediments downstream of the IRM work zone, followed by disposal of the material in an on-site vault. One foot of sediments would be removed in any area where PCB concentrations exceed 1 ppm. Additional removal would be required in areas where residual concentrations are greater than 10 ppm. Removal would continue until the levels are below 10 ppm. Existing grades would be re-established using clean fill. The estimated cost ranges between $78,000 and $2,810,000, depending upon the extent of excavation required.

VIII. SUMMARY OF THE GOVERNMENT'S DECISION

The NYSDEC's initial recommendations are discussed in detail in the PRAP. The set of criteria utilized by ALCOA's consultant during the Detailed Analysis formed the basis for the Department's decisions. Moreover, emphasis was placed on those alternatives which afforded a permanent and significant reduction in the toxicity, mobility, or volume of waste to be treated. Pursuant to the Department's Technical and Administrative Guidance Memorandum (TAGM) #HWR-90-4030, technologies and process options resulting in the destruction, separation and treatment, or solidification and chemical fixation of the waste are considered permanent remedies. Both the Department and the Federal Superfund and Reauthorization Act (SARA) require that preference be given to such remedies.

Below are the NYSDEC's final remedy selections for each of the disposal areas addressed in this document. The rationale for the Department's selections is included. In instances where ALCOA's recommendation differs, a brief explanation is provided.

OILY WASTE LANDFILL - 645016

All wastes and visibly contaminated soils will be excavated in accordance with clean up goals established in Section VI of this document. Lightly contaminated material that complies with the Land Disposal Restrictions (LDRs) will be placed in an on-site secure vault. ALCOA will further investigate the feasibility of waste treatment via the solvent extraction process which concentrates the contaminants in a waste oil stream. This waste oil stream will be incinerated off-site, while the "treated" material will be placed in the on-site vault. The vault will be constructed in accordance with the design parameters set forth in a following section of this document (On-Site Vault). Confirmatory sampling will be performed after the initial excavation to determine if cleanup goals have been satisfied. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment as explained in Section VI. Upon completion of the excavation work, the area will be backfilled and capped. Contaminated groundwater will be recovered and treated as determined in FS II. If ALCOA can show, to the Department's satisfaction, that an alternative treatment technology exists that significantly and permanently treats the waste, or that no feasible treatment alternative exists, the Department may amend the ROD in accordance with O&D memorandum 89-05-9.

Rationale:

1. This alternative offers a permanent remedy for the relatively small volume of waste present. The lightly contaminated material will be effectively immobilized in an on-site vault, while the highly contaminated material will be destroyed through solvent extraction/incineration. The recovery and treatment of groundwater, if needed, will prevent the further migration of contaminants.

2. There will be no significant short-term risks to then community or environment during construction activities. Worker exposure will be minimized during excavation and waste handling through implementation of a health and safety plan.

3. Long-term protection from all routes of contaminant migration is assured since the waste is removed from the disposal site and treated to destroy the most toxic portions. All low level contamination and treatment residuals will be placed in a secure on-site vault.

4. Groundwater sampling in the vicinity of this site indicates that some contamination is migrating downward into the bedrock aquifer.

The selected remedies for the ALCOA sites must effectively prevent the release of contaminants to this aquifer.

It is possible that the operation of a groundwater recovery and treatment system could successfully prevent the lateral migration of contaminants from the Oily Waste Landfill, but it probably would not prevent, over the long term, the continued downward migration of contaminants to the bedrock aquifer. In addition, if the wastes were to remain in place, the groundwater recovery and treatment system would have to be operated and maintained for a longer time period than if it were used solely to remediate past contaminant releases. Over a long operating period, it is likely that the system's components would need to be repaired and/or replaced periodically, resulting in high maintenance costs. The efficiency of the system will most likely decrease with time.

5. This alternative is both technically and administratively feasible, although further treatability testing will be required for the solvent extraction process.

6. This alternative would comply with all chemical-specific and action-specific ARARs.

7. Overall protection of public health and the environment would be provided.

8. Although the initial capitol costs may be higher than those associated with ALCOA's recommended alternative (described below), the overallcosts may be less. Since the vast majority of the waste would be removed under the Department's alternative, the degree of groundwater recovery and treatment would be minimized.

   If the waste is left in place, a long-term groundwater recovery and treatment system (i.e., greater than 30 years) would be required. The Operation and Maintenance (O & M) costs associated with a long-term system would drive the overall cost very high. The Department estimates, based on information supplied by the consultant, the overall cost of its alternative to be between $820,000 and $4,930,000, depending upon the volume of material needing excavation and treatment.

As a result of the Detailed Analysis, ALCOA selected Alternative 2b as a final remedy. This involves upgrading the existing cap, and installing a groundwater and leachate recovery and treatment system. Since the waste would remain in place, some contamination would continue to migrate from the site. (The improved cap might reduce contaminant production, but it would not eliminate it.) As item 4 above indicates, a groundwater recovery and treatment system would not prevent the downward movement of the contamination into the bedrock aquifer. Further, it is likely the long-term O & M costs associated with this alternative would create a higher overall cost compound to the Department's proposal.

POTLINING PILE I - ID #645001

Alternative 2 will be implemented at Pile I. The existing cap will be upgraded to conform to the cap requirements for an approved hazardous waste disposal facility. A deeper leachate collection system will be installed outside the existing system. This will be enclosed by a soil-bentonite barrier keyed into the underlying clay. The depth of the barrier will be determined during Remedial Design. Operation of the leachate collection system will continually lower the groundwater level within the barrier, thereby creating an inward hydraulic gradient toward the disposal cell. The collected leachate will be treated on-site, or properly disposed off-site. Deeper groundwater recovery and treatment will be evaluated in FS II.

Rationale:

1. Alternative 2 does not meet the criteria of permanent reduction of toxicity, volume, or mobility of the hazardous waste. However, the only permanent technology that was shown to be feasible for potlining waste (incineration, Alternative 3b) does not destroy other leachable constituents and may, in fact, increase the waste volume substantially. This large volume of waste will still have to be contained in a vault.

   While Alternative 2 will not permanently treat the waste, this alternative presents the best promise of immobilizing the waste constituents in the most cost effective manner.

2. The proposed remedial alternatives would not pose a significant short-term risk to the community or the environment since a health and safety plan would be implemented during construction activity to control worker exposure and contaminant migration.

3. The proposed alternatives would be effective over the long-term, if monitoring and maintenance are ensured.

   Since Potlining Pile I does have an impervious soil layer beneath the waste, a soil-bentonite barrier tied into this layer gives assurances that leachate could be effectively collected, even if there was a partial system failure.

4. The alternatives are technically and administratively implementable.

5. The alternatives comply with ARARs.

6. The alternatives provide overall protection of human health and the environment.

7. The high cost of incineration, with no reduction in waste volume or permanent immobility of leachate constituents is not justified. The NYSDEC's estimated cost for these alternatives is $3,180,000.

ALCOA concurs with the Department's decision, except for clean up goals. The Department's response to ALCOA's comments are explained in detail in the responsiveness summary appended to this document.

POTLINING PILE A - ID #645003

In accordance with Alternative 3a, the waste and contaminated soils at Pile A will be excavated and placed in the on-site vault. The vault will be constructed pursuant to requirements addressed in a following section of this document (On-Site Vault). Confirmatory sampling will be performed after the initial excavation to determine if cleanup goals have been met as explained in Section IV of this document. If the goals are not met, a decision will be made regarding the need for additional actions to protect public health and the environment, in accordance with provisions contained in Section IV. The area will be backfilled and capped after completion of the excavation work. Groundwater recovery and treatment will be addressed in FS II.

Rationale:

1. Alternative 3a does not meet the criteria of permanent reduction of toxicity, volume, or mobility of the hazardous waste. However, the only permanent technology that was shown to be feasible for potlining waste (incineration, Alternative 3b) does not destroy other leachable constituents and may, in fact, increase the waste volume substantially. This large volume of waste will still have to be contained in a vault.

   While Alternative 3b will not permanently treat the waste, this alternative presents the best promise of immobilizing the waste constituents in the most cost effective manner.

2. The proposed remedial alternatives would not pose a significant short-term risk to the community or the environment since a health and safety plan would be implemented during construction activity to control worker exposure and contaminant migration.

3. The proposed alternatives would be effective over the long-term, if monitoring and maintenance are ensured.

   Because Potlining Pile A is not underlain by an impervious soil layer, and since a strong downward gradient exists in the groundwater system underlying the site, containment (Alternative 2) would not be effective. Any undetected failure of the containment system would allow leachate to continue to migrate toward the bedrock aquifer.

4. The alternatives are technically and administratively implementable.

5. The alternatives comply with ARARs.

6. The alternatives provide overall protection of human health and the environment.

7. The high cost of incineration, with no reduction in waste volume or permanent immobility of leachate constituents is not justified. The NYSDEC's estimated cost for these alternatives is $14,700,000.

ALCOA concurs with the Department's decision, except for clean up goals. The Department's response to ALCOA's comments are explained in detail in the responsiveness summary appended to this document.

PRIMARY LAGOON AND DREDGE SPOILS AREA - ID #645005 UNIT 3

Alternative 3b will be implemented at this disposal area. The dredge spoils and lagoon sludge and underlying soil will be excavated as explained in Section IV of this document, and dewatered, if necessary, solidified, and placed in the on-site vault. The lagoon wastewater will be decanted and treated to satisfy the facility's discharge limits. Confirmatory sampling will be performed in both instances to determine if cleanup goals have been met. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment, as explained in Section IV. Once the excavation is complete, the entire lagoon and dredge spoil area will be backfilled and capped. Groundwater recovery and treatment will be evaluated in FS II.

Rationale:

1. The PCB concentrations in the lagoon sludge (non-detectable to 18 ppm) do not justify permanent treatment. Further, bench scale testing has shown solidification to be effective in reducing the mobility of both inorganic and organic contaminants.

2. Direct exposure to the contaminated materials would be eliminated, since the materials would be removed and placed in a secure on-site vault.

3. There will be no significant short-term risk to the environment or community during implementation. Worker and community exposure will be minimized by implementation of a health and safety plan.

4. This alternative is administratively and technically feasible.

5. This alternative would comply with chemical and action-specific ARARs.

6. This alternative would provide over-all protection of human health and the environment.

The NYSDEC's estimated cost for this remedial action is $12,040,000.

ALCOA is in general agreement with this alternative, although the selection of cleanup goals has been questioned. The Department's response to ALCOA's comments are contained in the responsiveness summary.

SOLUBLE OIL LAGOON - ID #645005 UNIT 1

This site will be remediated in accordance with Alternative 3b. Initially, the wastewater will be decanted and treated to satisfy the facility's discharge requirements. The sludge and underlying soils will then be excavated as explained in Section IV of this document, and treated via the solvent extraction process. (At this time, additional testing needs to be performed to determine if solvent extraction can adequately treat the waste to address LDRs. If not, an alternative treatment technology will be considered in an amended ROD. The concentrated waste oil stream resulting from the extraction process will be incinerated off-site, and the treated materials will be placed in the on-site vault. Confirmatory sampling will be performed after the initial excavation to determine if cleanup goals have been satisfied. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment as explained in Section IV. Upon completion of excavation activities, the area will be backfilled and capped. Groundwater recovery and treatment will be evaluated in FS II.

Rationale:

1. This alternative meets the preference criteria for permanent treatment in the most cost-effective manner. Any leachable constituents remaining in the treated residuals can be effectively immobilized in a secure vault built to hazardous waste disposal facility specifications.

2. In-place solidification/stabilization of waste has not been proven to be effective at this site. Therefore, the proposed remedy of excavating and treating waste is the most effective long-term alternative.

3. This alternative would not pose a significant short-term risk to the community or the environment, since a health and safety plan would be implemented during construction activities.

4. This alternative is technically and administratively feasible, although additional testing is needed before the solvent extraction process is fully approved.

5. This alternative complies with all ARARs, assuming solvent extraction can meet treatment standards.

6. This alternative provides overall protection of human health and the environment.

7. The NYSDEC's estimated cost for this action is $9,650,000. Although this is more costly than in-place containment (Alternative 2), the increased protection to the environment makes it more cost-effective.

ALCOA agrees with this recommendation, except for the selection of cleanup goals. The Department's response to ALCOA's comments is contained in the responsiveness summary appended to this document.

DENNISON ROAD - #645004

The drum disposal area, and any additional waste and visibly waste contaminated soil within the drum disposal area will be excavated in accordance with cleanup goals described in Section IV of this document. Additional exploratory borings are necessary to define the extent of contamination, and need for remediation to meet clean up goals, in the adjoining former ravine. If further excavation is deemed infeasible due to site conditions, or technical constraints, the Department may amend the ROD in accordance with O&D memo 89-05-9. The PCB - contaminated surface soil south of the trench will also be removed. Materials which meet the LDRs will be placed in the on-site vault. Empty drums or other debris which cannot physically undergo treatment will also be placed in the vault. The remaining material will be subjected to solvent extraction (Alternative 3b) in order to concentrate the contaminants in a waste oil stream. This stream will be incinerated off-site, while the "treated" material will be put in the vault. If treatability studies show that solvent extraction cannot meet the LDRs, alternative treatment technologies will be considered in an amended ROD. Confirmatory sampling will be performed after the initial excavation to determine if cleanup goals have been satisfied. If the goals are not met, a decision will be made regarding the need for additional work to protect public health and the environment as explained in Section VI. After the excavation work is complete, the area will be backfilled and capped. Groundwater recovery and treatment will be evaluated in FS II.

Rationale:

1. Excavation, followed by solvent extraction and incineration of the concentrated waste stream, offers a permanent and significant reduction in both the volume and toxicity of hazardous waste present.

2. There will be no significant short-term risks to the community or environment during construction activities. Worker exposure will be minimized during excavation and waste handling through implementation of a Health and Safety Plan. Controls on the treatment process will protect the surrounding community.

3. Long-term protection from exposure to all routes of contaminant migration will be provided. Unlike any of the other alternatives, this action will address additional contaminated soil in the former ravine. In addition, through removal of all of the waste, this action provides the most protection to the groundwater and bedrock aquifer.

4. This alternative is both technically and administratively feasible, although testing of the solvent extraction process will be required prior to its implementation.

5. This alternative would comply with all chemical-specific and action-specific ARARs.

6. This alternative would be protective of human health and the environment with respect to soil, surface water, and groundwater contamination.

7. The Department's estimated cost is between $3,300,000 and $4,600,000, depending upon the volume of material requiring excavation and treatment. Although this is higher than the costs associated with Alternatives 1 and 2, it is the only action which satisfies all of the screening criteria. Therefore, the cost is considered justifiable.

ALCOA agrees that the drum disposal area warrants excavation and treatment, but they disagree with any additional removal due to relatively low levels of contamination found in the former ravine. They also question the selection of cleanup goals. The Department's response to ALCOA's comments are contained in the responsiveness summary.

WEST MARSH - ID#645017

Alternative 2 has been selected for this site. A drainage system will be installed along the existing marsh channel, and the area will be backfilled and capped to create an upland region. The cap will comply with the requirements for closure of an industrial waste disposal area. Water collected from the drainage system will be monitored and treated as necessary to meet the facility's discharge limits. The 3 acres of lost wetlands will be relocated to an area acceptable to the Department. This location will be specified in the ROD following FS II. The area will be monitored for 5 years to insure that the remedy has effectively abated impacts on biota.

Rationale:

1. The low level PCBs (<10 ppm) remaining in the marsh after completion of the IRM does not warrant further treatment.

2. Capping of the remaining residuals will prevent further contact with humans or biota, and greatly decrease the mobility of the residuals. Any water draining from the area will be monitored and treated as necessary. Back- filling the marsh will also serve to discourage wildlife from using the area. This alternative meets the criteria for long-term effectiveness.

3. This alternative meets the criteria for short-term effectiveness.

4. The alternative is technically and administratively feasible.

5. The alternative complies with ARARs.

6. The alternative provides overall protection of human health and the environment.

The Department's estimated cost is $710,000. ALCOA has accepted this proposal.

UNNAMED TRIBUTARY - ID#645019

This site will be remediated in accordance with Alternative 2, as modified below. The section of the tributary between the IRM work zone and Route 131 (ALCOA's property line) will be sampled for residual contamination. Any areas of PCB contaminated sediment soil above 1 ppm will be excavated and placed in the on-site vault. Confirmatory sampling will be performed. Excavation will continue until all PCB levels are below 1 ppm. If ALCOA can show that an alternative remedy exists that meets or exceeds the long-term protectiveness provided for in this remedy, the Department may amend the ROD in accordance with O&D memo 89-05.9. The original grades in the tributary will be re-established using clean fill and rip-rap, as needed, to control erosion. Biological monitoring will be conducted for 5 years to determine the effectiveness of the cleanup.

The length of the tributary between Route 131 and the Grasse River will have to be evaluated further prior to developing a remedial program. ALCOA shall submit a work plan to the Department to further evaluate remedial alternatives for this segment of the tributary in accordance with TAGM 4030.

Rationale:

1. Although placement of dredged sediment in an on-site secure vault does not meet the permanence criteria, the low level of contamination found to date in this section of the tributary does not warrant additional treatment. The mobility of the waste can be effectively controlled in a secure vault. It is likely that additional contamination in the tributary sediment will be mostly limited to the sediment, not underlying soil and, therefore, a cleanup goal of 1 ppm can be relatively easy to achieve, once additional contaminated areas are identified.

2. This alternative meets the criteria for short-term and long-term effectiveness and implementability.

3. This alternative complies with all ARARs.

4. This alternative provides overall protection of human health and the environment, although some impacts on biota may persist. Alternative 1 does not meet this criteria.

5. The Department's estimated cost for this alternative is between $782,000 and $2,810,000, depending upon the volume of sediments removal. This cost (versus Alternative 1) is well justified due to the need to protect human health and the environment.

ALCOA commented that some segments of the Unnamed Tributary may contain significantly more sediment than envisioned in the FS I report. The Department agrees with this comment, and subsequently reduced the scope of work for this ROD, as explained above.

WASTE LUBRICATING OIL LAGOON - ID #645005 UNIT 2

The Waste Lubricating Oil Lagoon was the subject of the FS I report. After reviewing this report, the Department determined that additional investigation was needed to further define the nature of the waste, site conditions, and treatment options. In accordance with O&D memo 89-05.9.1, ALCOA shall submit the additional engineering evaluations to the Department by April 1, 1991.

ALCOA agrees with this decision.

ON-SITE VAULT

Many of the selected alternatives require the use of an on-site vault to contain excavated wastes, soils, sludges, sediments, or treatment residuals.

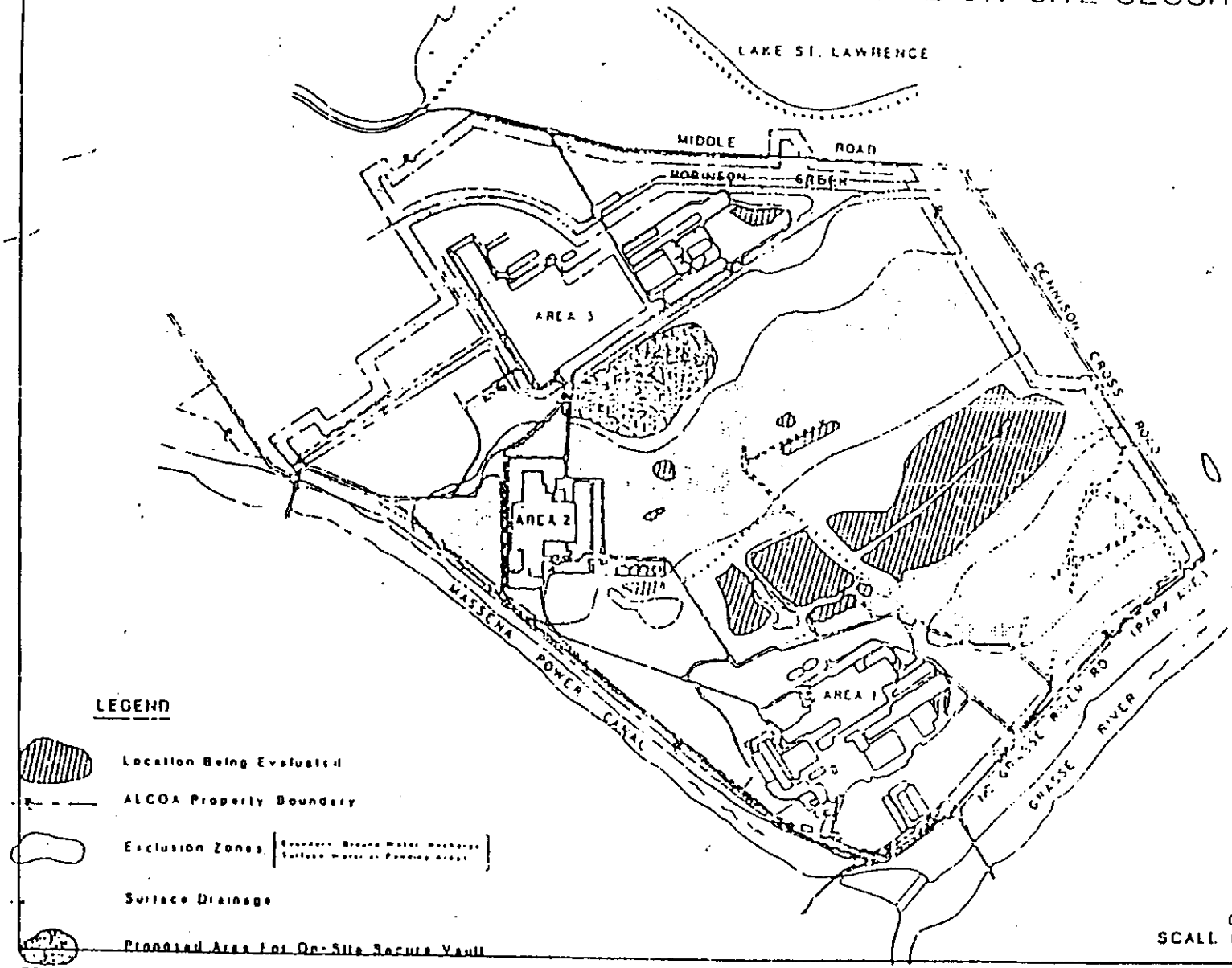
Based upon the NYSDEC site selection criteria (6 NYCRR Part 373-2), as well as geologic and environmental conditions and current land use at the ALCOA facility, the area identified in Figure 3 is considered the preferred location for a vault.

The design criteria for this facility are discussed in the FS I report. ALCOA shall submit detailed design specifications and drawing to the Department demonstrating compliance with 6 NYCRR Part 373 Surface Land Burial Facility requirements, and USEPA RSCA PCB Land Disposal requirements. Furthermore, since this facility lies within an active earthquake area, the engineer shall take into consideration appropriate engineering factors when designing the vault.

The associated costs are included with the cost estimates for each alternative. The cost is proportioned according to the volume of waste expected at each site. The construction cost has been estimated at $90 per cubic yard of waste, and the O & M cost at $.93 per cubic yard.

FIGURE

PRELIMINARY SITE SCREENING FOR POTENTIAL ON-SITE SECURE VAULT



LEGEND

- Location Being Evaluated
- ALCOA Property Boundary
- Exclusion Zones
- Surface Drainage
- Proposed Area For On-Site Secure Vault

ES ENGINEERING-SCIENCE

MONITORING AND REVISITING

As part of the design phase, ALCOA shall develop a monitoring and maintenance program for each site where waste or waste constituents are left in-place or relocated. The objective of the monitoring and maintenance program is to ensure that all remedial work is functioning according to design specifications, and to monitor environmental media to ensure that human health and the environment are being protected.

In addition, ALCOA shall provide financial assurances for monitoring and maintenance requirements of the remedial program pursuant to one of the methods set forth in 6 NYCRR Part 373-2.8.f.

At each site where untreated hazardous waste remains, the remedial work will be re-evaluated, or revisited, at least once every five years to determine if additional remedial work is appropriate.

REMEDIATION SCHEDULE

It is anticipated that remediating each of the 8 disposal areas addressed in this ROD will take from 15 to 72 months to complete. A proposed schedule is contained in attached Appendix A. However, the exact schedule will be determined as part of the remedial design. Activities at the various disposal areas may take place simultaneously. The Department will review and approve each stage of design, construction, operation, and monitoring. The Department will monitor all construction activity with on-site personnel to ensure conformance to approved design.

IX. ADMINISTRATIVE RECORD

A comprehensive assortment of reports and correspondence was utilized by the Department during the final decision-making process. Although much of the information is referenced elsewhere in this document, the table below provides a complete list of the source material. All of this is available for public review.

TABLE 7

- Waste Site Investigation

  Volumes I & II - Investigative Report, August 1987

  Volume IV - Supplemental Report, March 1989

  Volumes VI, VII A, VII B - Feasibility Study Report Number 1 (FS I), September 1990

  Volume VI, Appendix C - Baseline Public Health Assessment, July 1990

- Bedrock Monitoring Well Program, August 1990

- Revised FS I Costs, Dave Babcock, Engineering-Science to Darrell Sweredoski, NYSDEC, November 28, 1990

- Interim Remedial Measures
  Construction Certification Report, January 1991

- Proposed Remedial Action Plan (PRAP), November 1990

- NYSDEC Division of Hazardous Waste Remediation
  Technical and Administration Guidance Memoranda (TAGM)

  HWR-89-4022 Records of Decision for Remediation of Class 2 Inactive Hazardous Waste Disposal Sites, February 7, 1989

  HWR-90-4030 Selection of Remedial Actions at Inactive Hazardous Waste Sites, May 15, 1990

- Public Comments on PRAP

  St. Regis Mohawk Tribe, Ken Jock to D. Sweredoski, January 31, 1991

  David Jordan, Potsdam to D. Sweredoski

  Massena Economic Development Council, Frank Alguire to D. Sweredoski, January 31, 1991

U.S. Environmental Protection Agency, Great Lakes National Program Office, John Piper to D. Sweredoski, February 1, 1991

General Motors Corporation, Douglas Premo to D. Sweredoski, January 30, 1991

Village of Massena, Charles Boots to D. Sweredoski, January 30, 1991

Reynolds Metals Company, Jerry Newman to D. Sweredoski, January 30, 1991

St. Lawrence County Environmental Management Council, Jon Montan to D. Sweredoski

Aluminum Company of America, John Lease to D. Sweredoski, January 31, 1991

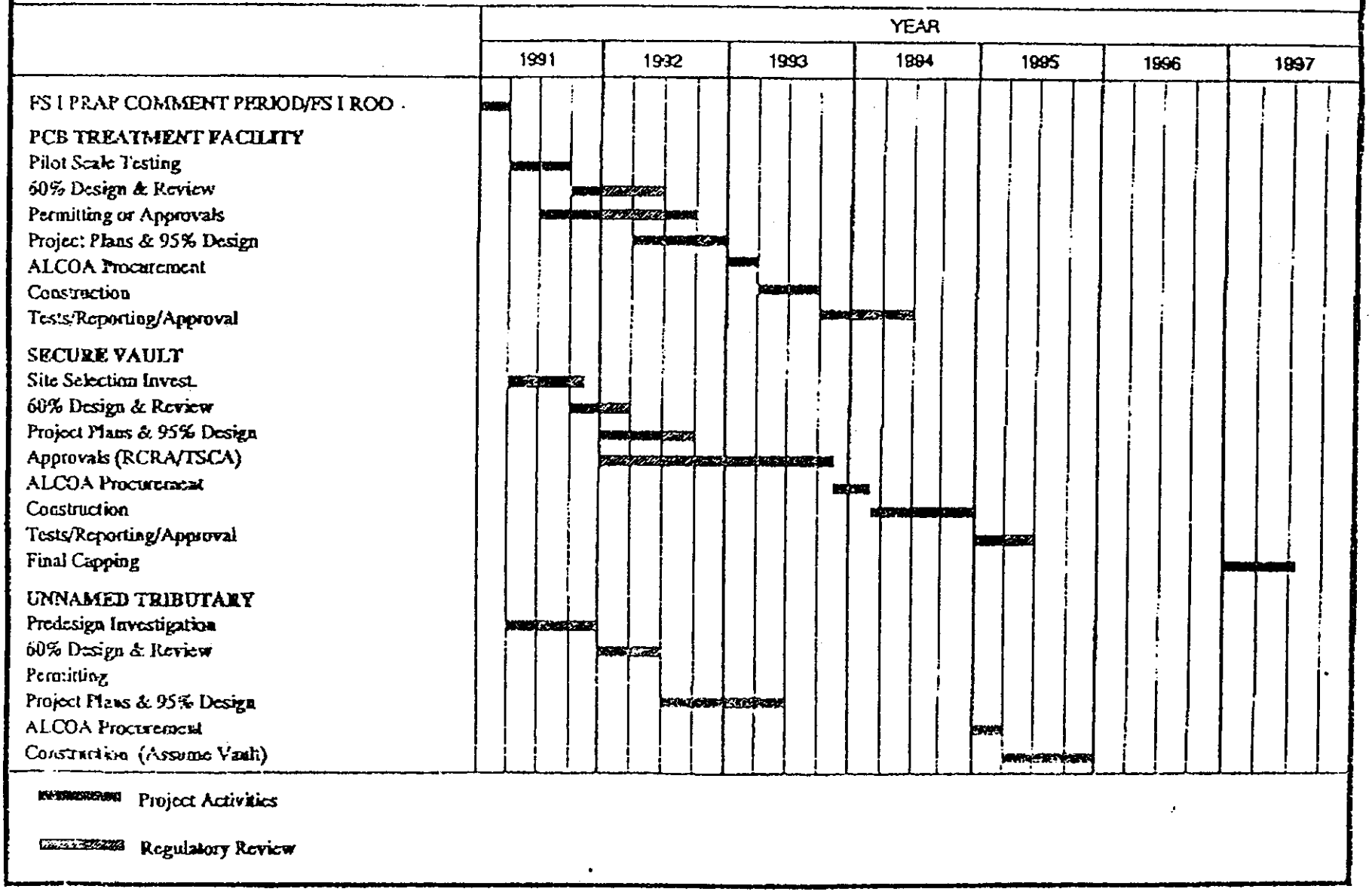
Public Advisory Committee of the Remedial Action Plan for the St. Lawrence River at Cornwall, Ontario, John Milnes to D. Sweredoski, January 24, 1991

Robin McClellan, Northern Consulting to D. Sweredoski, January 22, 1991

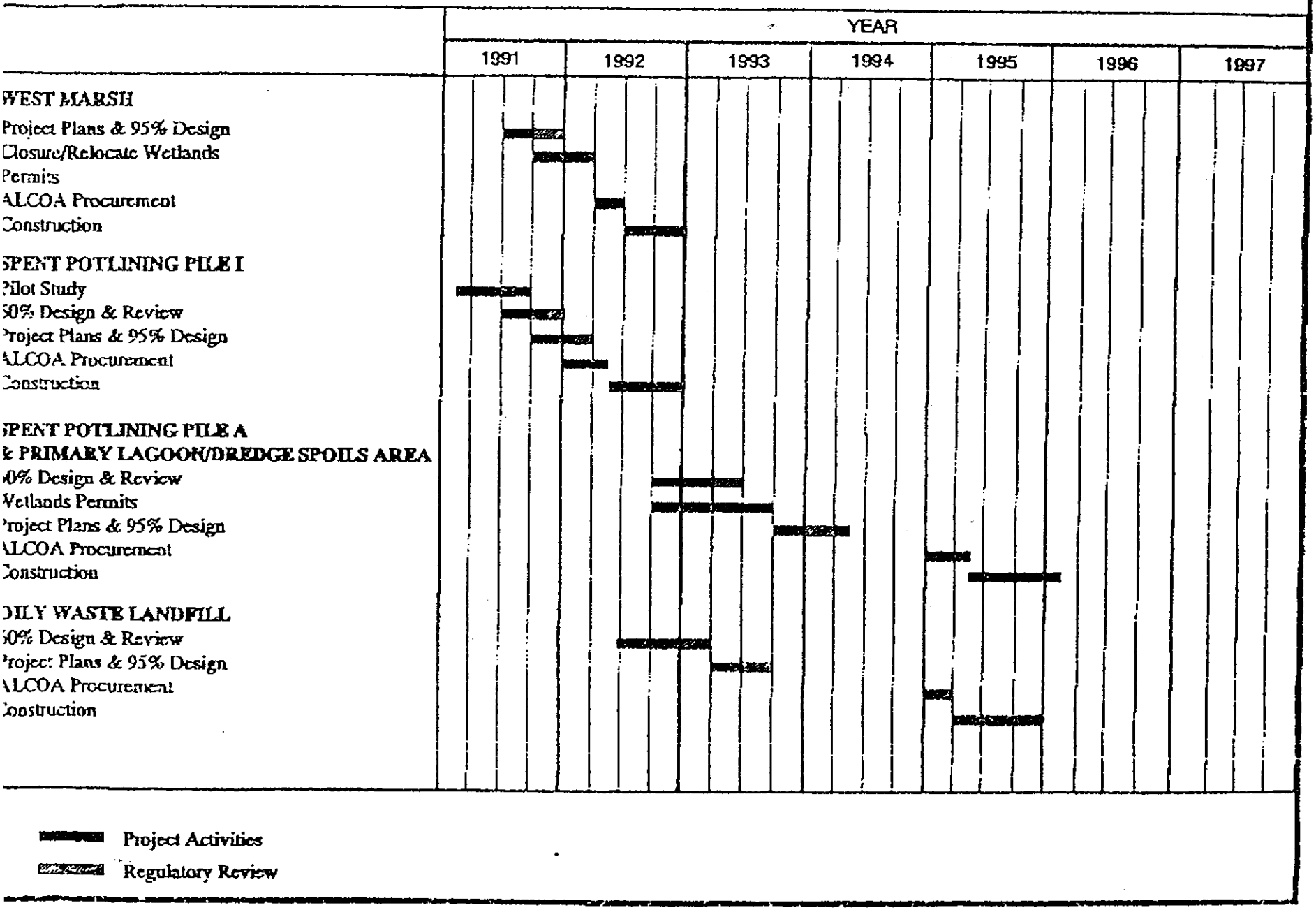
- Responsiveness Summary to Public and Industry Comments
- Responsiveness Summary to ALCOA

APPENDIX A

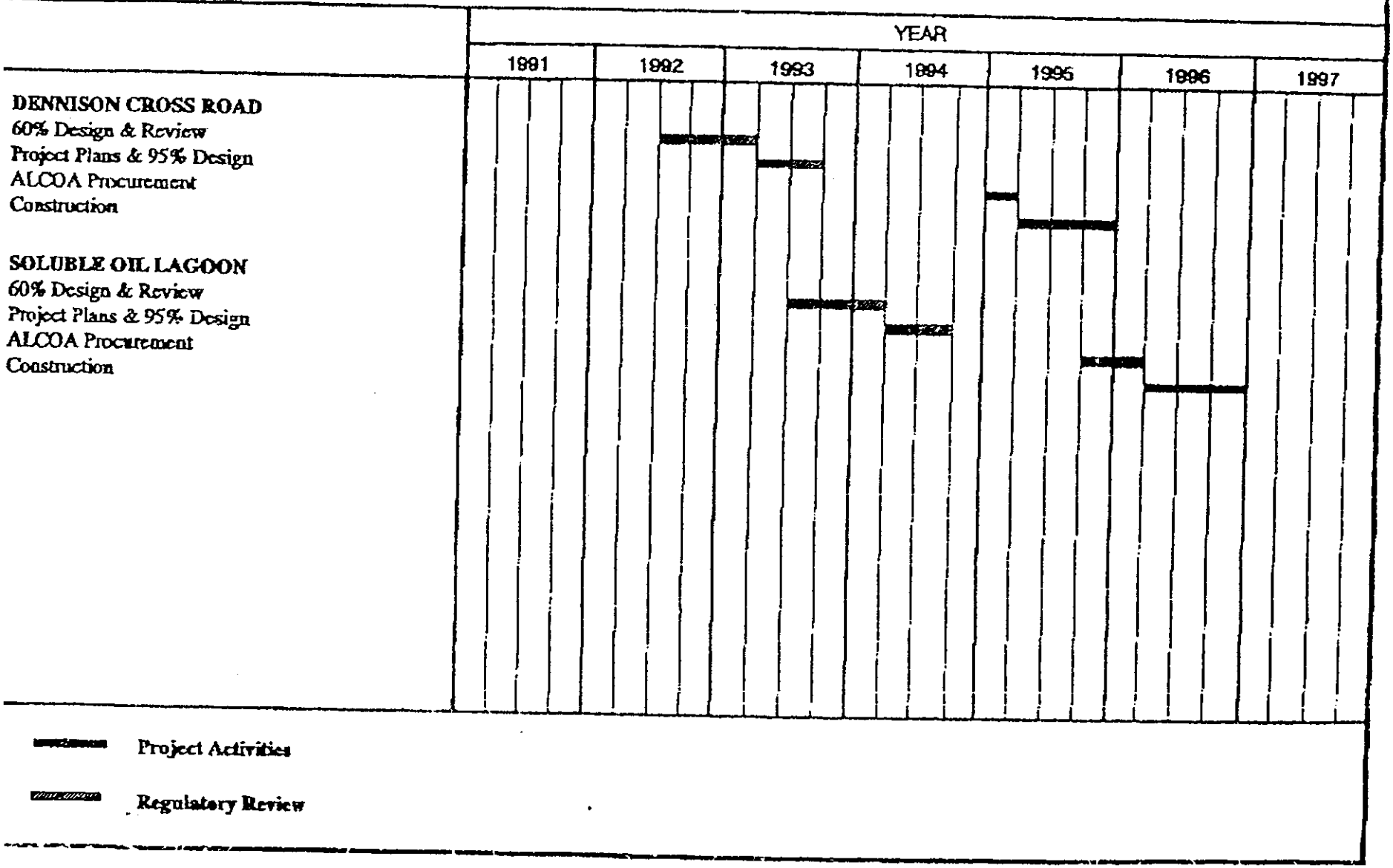
FS I REMEDIATION SCHEDULE



FSI REMEDIATION SCHEDULE (CONTINUED)



FS I REMEDIATION SCHEDULE(CONTINUED)



APPENDIX B

C The methodology proposed by NYSDEC to establish soil cleanup goals for organic compounds was developed to evaluate sediment quality.

R NYSDEC respectfully disagrees with this. Page 24 of the USEPA's manual titled "Superfund Public Health Evaluation Manual" (EPA/540/1-86/060) discusses the organic carbon partition coefficient (Koc) which NYSDEC uses to develop cleanup goals for organic compounds. This discussion specifically indicates the following: "Many other partition coefficients exist (e.g. Kom, Kd, Kow) but Koc was selected for this purpose because it is chemical-specific (essentially independent of soil conditions) and for organics is directly related to soil and sediment sorption, both of which are significant chemical fate processes at many Superfund sites." The same document further discusses (page 25) that for groundwater, low Koc values indicate faster leaching from the waste source into an aquifer and relatively rapid transport through the aquifer (i.e., limited retardation of the chemical). The USEPA's document titled "Determining Soil Response Action Levels Based on Potential Contaminant Migration to Groundwater: A Compendium of Examples" (EPA/540/2-89/057) also discusses the partition coefficient approach, and case studies of the hazardous waste sites where this approach has been used.

C Because the EqP approach only considers absorption of chemicals by organic carbon in the soil and neglects the role that metals oxides and alumino-silicate minerals may play, this method likely over-estimates the concentration of the compounds in the groundwater at the ALCOA site.

R At present, the NYSDEC has no knowledge of any scientific theory or model which estimates the extent to which metal oxides and alumino-silicate minerals influent the absorption of chemicals in soil. Also, this fact is being taken in account to some extent, by the use of dilution/attenuation multiplier (DAM) approach in determining soil clean-up goals.

C Koc values in the scientific literature exhibit a relatively wide range.

R NYSDEC uses the Koc values listed in the USEPA's manual "Superfund Public Health Evaluation Manual". If the Koc value is not listed in the manual, the emperial formula will be used to calculate a Koc value.

C The USEPA did not use the EqP approach when recently identifying soil action levels in its proposed corrective action rule to guide the clean-up of releases from solid waste management units at RCRA facilities.

R The groundwater contamination due to the leaching of contaminants at the hazardous waste site was not considered as a major environmental concern in the USEPA's proposed corrective action rule and NYSDEC has included this concern in its comments to the USEPA. NYSDEC considers any violation of the New York State groundwater standards as a risk to the environment and public health and hence the clean-up goals developed by NYSDEC are based on the protection of water quality and public health. The soil/water partition approach is being used by the NYSDEC to determine the soil clean-up goals that will protect the water quality in New York State.

C The soil clean-up goal estimates based on USEPA's MCLs are higher than the PRAP - proposed soil cleanup goals for 1,1,1-trichloroethane, tetrachloroethene, toluene and xylenes.

R As mentioned before, the NYSDEC uses New York State groundwater standards which have been promulgated, for the protection of water quality in New York State. Hence in water/soil partitioning calculations, the New York State groundwater standards and not the USEPA's MCLs, are being used. For the above mentioned chemicals, the New York State groundwater standards are more stringent than the USEPA's MCLs which will result in more stringent clean-up goals for these contaminants.

C For some reason, NYSDEC did not apply a factor of 100 to the proposed soil clean-up goals for PAHs.

R NYSDEC uses the soil/water partitioning approach to develop soil clean-up goals that will comply with water quality standards in New York State. A dilution attenuation multiplier (DAM) is used to compensate for the solubility and volatility of the contaminants. Highly volatile contaminants in soil will have a higher tendency to volatilize than to remain in the soil or contaminate groundwater. Similarly, highly soluble contaminant will have higher tendency to migrate downward and contaminate groundwater. DAM of 100 is used for volatile organics having high solubility and volatility. As PAHs have lower solubility and volatility, the DAM of 1 is used.

C The methodology proposed by NYSDEC to establish soil cleanup goals for inorganic compounds ignores both the dilution/ attenuation factor routinely applied by USEPA and site specific conditions.

R The extract procedure toxicity analysis for inorganics developed by USEPA is compared to groundwater standards multiplied by a factor of 100. The underlying assumption at that time was that the waste would be mismanaged in an approved municipal landfill. If the extract contamination exceeded the groundwater standards by 100 times, a significant threat would be created by placement of that waste in the landfill and, therefore, special waste disposal restrictions were warranted. The EPA acknowledges that the regulatory levels (EP toxicity) have been established to provide a "high degree" of certainty that waste exceeding the regulatory levels would pose hazards to human health and the environment. The EP toxicity test standards (100 times groundwater standards) is intended to differentiate a hazardous solid waste from a non-hazardous solid waste, not to determine protectiveness of groundwater from contaminated soil leachate at the ALCOA facility. By today's standards, even solid waste (including contaminated soil) that does not fail the EPA TCLP test must still be placed in an environmentally sound landfill in order to be protective of groundwater in New York State.

At present, NYSDEC has no scientific method/model to determine cleanup goals for heavy metals. Water/soil partitioning approach cannot be used to determine soil cleanup goals for contaminants that do not partition appreciably into soil organic matter, and those whose chemical behavior is highly unpredictable, such as heavy metals. Hence, for heavy metals, the NYSDEC recommends the use of the extract procedure to determine soil cleanup goals. Admittedly this procedure may not account for any dilution/attenuation that might occur, but no method for predicting such exists. Without a method, we must be conservative.

C The proposed soil cleanup goal for cyanide is improperly based on total rather than free cyanide.

R The NYCRR Part 703 groundwater standards for cyanide refer to <u>total</u> cyanide, not free cyanide. Since the soil cleanup goals are to protect groundwater as specified in Part 703, the goals are properly based on total cyanide.

NYSDEC agrees with the fact that the most toxic forms of cyanides are free cyanides and not total cyanides. These complex forms of cyanides will not be available during the waste leaching process mentioned above. However, a modified leaching procedure may be used for cyanide, which can be described in depth in the work plan. In order to accurately simulate leaching conditions, the pH of the extractant used should be adjusted to that of natural groundwater in the overburden at the ALCOA facility.

C Based on contaminant dispersion calculations using equations from two literature sources, the NYSDEC proposal for inorganic contaminant soil cleanup goals would result in cleanup goals that are much too low.

R The Department reviewed the comments and found the discussion to be difficult to follow. In addition, there appears to be some flaws in the values selected for some of the variables. After carefully reviewing the provided calculations and supporting rationale, the Department has the following comments.

Equation (1) which the consultants state is from Freeze and Cherry (1979) has a parameter Z in the denominator. It is not known where this came from since it does not seem to appear in the cited reference.

In discussing the equation referred to as Equation 1, Freeze and Cherry (page 395) state "Because these equations are based on idealized conditions, such as the instantaneous point source and uniform flow, they have limited use in the analysis of most field situations". Freeze and Cherry reference another author and state that the equations may be used to "...obtain preliminary estimates..." of contaminant migration patterns in simple hydrogeologic settings. It is the Department's opinion that the heterogeneous nature of the various geologic units, including the sandy zones in the glacial till and the solutional enlargement of fractures in the underlying carbonate bedrock do not constitute a simple hydrogeologic setting. It appears, therefore, that the calculations provided in ALCOA's response may not be appropriate for addressing subsurface contaminant migration characteristics.

The comment discussed dispersivity values for limestone and dolomite. These values were then used in the calculations which appear to have been made for a contaminant source discharging directly to a carbonate bedrock unit. This is not representative of site conditions since the facility is underlain by a thick section of unconsolidated geologic units overlying bedrock.

If dispersion calculations were to be performed to assess conditions at the facility, they should have addressed the unconsolidated geologic units which immediately underlie the sites. However, as discussed above, due to the heterogeneous nature of these deposits, it appears that the equation discussed above would not provide a realistic view of contaminant migration patterns at the site.

C The Department's proposed soil cleanup goal for sulfate is much too low.

R The justification for this proposal is that it would prevent sulfate contamination of the shallow groundwater and depending on groundwater migration patterns, deeper groundwater also. The DEC proposal stated that the soil should be cleaned up to the extent where the results of leachate extraction tests performed on the residual soils will not exceed the Part 703.6 effluent standard of 500 ppm for sulfate.

The comment discusses the high natural concentrations of sulfate in local groundwaters and its relationship to the presence of specific minerals in the soils and bedrock. The text is misleading as it suggests that the Trainer and Salvas report (1962) indicated natural groundwater both in the bedrock and overburden aquifers contains excessively high sulfate levels. However, data contained in that report indicates that samples of groundwater collected from the overburden aquifer had sulfate levels ranging from 36 to 156 ppm, which is well below the Part 703 groundwater standard of 250 ppm. It is agreed that levels of sulfate in the bedrock aquifer in some instances do exceed the sulfate groundwater standard due to natural conditions, but this is not sufficient grounds to allow further degradation, with respect to sulfate, of the overburden aquifer.

It must also be noted that the analytical results of the only background soil samples which were analyzed as part of this investigation, were collected by the NYSDEC in 1988 and indicated the presence of sulfate at concentrations of 280 and 380 ppm.

As an additional note, it is likely that some of the inorganic contaminants at the Primary Lagoon and Dredge Spoils area, such as fluoride, cyanide and sulfate, are more mobile than the PAH contaminants. Therefore, clean-up goals established for these inorganic analytes shall also be employed to determine the extent of excavation necessary to remediate the area.

C The soil cleanup goals proposed by NYSDEC are not required to eliminate any significant threat to the environment.

R All groundwater, both within and outside of the ALCOA facility boundary, is protected as GA groundwater. The best usage of class GA waters is as a source of potable water. The soil cleanup goals proposed by the Department are designed to protect that natural resource.

C During the RI/FS, contaminant-specific clean-up criteria or remediation goals were not discussed for any compounds other than PCBs.

R Section 5.1 of the FS states "a primary objective of the feasibility study is to identify and recommend the most environmentally sound remedial actions which will, among other things, achieve and maintain applicable Federal and State air, soil, surface water, and/or groundwater quality standards". Table 2.3, referenced in Section 5.2, lists 26 chemical-specific ARARs other than PCBs. The statement that "the RI/FS did not address cleanup criteria or remediation goals other than PCBs" is not correct.

C The costs presented in FS I for excavation remedies do not reflect the cost to excavate soils to meet the soil cleanup goals belatedly identified by NYSDEC.

R The cleanup goals identified by NYSDEC are not cleanup standards, but only goals. For costing purposes, the Department relied on ALCOA's consultant's cost analysis for excavation of waste and contaminated soil. The Department recognizes that the consultant's proposal to over excavate waste areas one foot in depth is somewhat arbitrary and not based on any technical justification. Because of the shortcomings of the engineering report, the Department found it necessary to base the remediation goals on a more technical basis. It was further assumed by the Department, and apparently by the consultant, that over excavation of one foot of contaminated soil would remove the vast majority of contamination. If clean up goals are not achieved at that point, the engineer will be required to determine what, if any, additional action is necessary to meet remediation goals. Evaluation of additional remedial actions will be based on the seven evaluation criteria contained in TAGM 4030. In situ remediation of residual soil contamination will have preference over excavation. The need for groundwater management will be based on the results of FS II.

C The PRAP does not provide a statistical methodology for determining when a soil cleanup goal has been met.

R ALCOA's comment that the statistical methodology to assure that soil cleanup goals have been met is not included within the FS I PRAP is correct.

The PRAP is presented as a general document listing the selected remediation options. The PRAP does not detail the specifics of how these remedial options will be conducted. The actual procedures and QA/QC requirements to document the effectiveness of these procedures are better addressed in work plans for the remedial activities. The Department will require that ALCOA follow sampling procedures contained in USEPA SW-846 Test Methods for Evaluating Solid Waste, and 40 CFR 761 TSCA PCB regulations.

C The PRAP does not define areas "within" or "outside" groundwater management units.

R Areas "within" groundwater management units are considered areas within the influence of groundwater pumping wells, groundwater drains, or groundwater monitoring wells. Areas "outside" of groundwater management units are all other areas.

C The PRAP states that SPLP I, OWL, and Primary Lagoon Sludge Area do not appear to pose any risk to biota.

R Upon review of the draft Comprehensive Sampling Biota Report by the Department, it cannot be determined at this time that these sites do not pose a risk to biota. The ROD will reflect this re-evaluation of current data.

C Regarding Dennison Road Site, the level of contamination observed in the stained soil zone of the former ravine does not exceed the DEC proposed cleanup goals and, therefore, does not warrant excavation of 80,000 cubic yards of soil.

R The Department did not propose excavation and treatment of the entire fill area outside of the drum disposal area. The Department proposed to excavate and treat as necessary only that soil which does not meet the soil cleanup goals. The Department agrees with ALCOA that this additional amount of contaminated soil is apparently limited, and used the consultant's estimated range of from 1900 to 3800 cubic yards for cost analysis.

Soil samples collected from test pits 8 and 9 had PCB levels of 100 and 47 ppm, respectively. Since the test pits were excavated at the edge of the drum disposal area, excavation beyond the limits of the area will be required. Furthermore, PCBs and several semi-volatile compounds were detected in soil samples collected from the borings drilled outside of the area. However, these borings were not sufficient to define the extent of soils/waste which need to be removed. Therefore, additional soil borings and soil sampling will be appropriate as part of remedial design.

If, during the design stage of the project, ALCOA can show, to the Department's satisfaction, with additional borings in the ravine that the contamination is minimal, or additional excavation is unwarranted for technical reasons, the Department may amend the ROD to limit excavation to the drum disposal area, in accordance with O&D 89-05 9.a.&b.

C The Dennison Road Site can be hydraulically contained by a well-designed groundwater collection system.

R As stated in NYSDEC Organization & Delegation Memorandum 89-05, the Department prefers a permanent remedy for remediation wherever technically and economically feasible. While ALCOA may be able to theoretically show that containment of contamination is feasible, this method of remediation does not have the same long-term protectiveness as a permanent remedy has. In addition, deep well pumping in fine grained soils may create constant operational and maintenance problems, decreasing the long term reliability of the system. Containment of residual contamination in a well designed secure landfill minimizes long term operational and maintenance problems.

C The soil cleanup goal for PCBs should be between 10 to 25 ppm, according to USEPA TSCA Guidance at controlled access areas.

R The Department recommended goals for cleanup of PCB contaminated soil is based on protection of groundwater, using NYS groundwater quality standards. The 10 ppm cleanup goal in areas of groundwater management is consistent with other cleanup goals established in the Massena area. The EPA cleanup goal range of between 10 and 25 ppm PCBs is based on human exposure via direct contact, ingestion, and/or inhalation.

C The solvent extraction process at the Oil Waste Landfill (OWL) may not work effectively for removal of volatile organic carbons (VOC). Other technologies, such as in situ vacuum extraction, may be more technically practicable and cost-effective.

R The Department selected solvent extraction for a permanent remedy based on ALCOA's consultant's recommendations for permanent treatment technologies. The Department recognizes that treatability studies were never completed on the OWL waste. However, since the waste in this area is typically the same waste that was disposed at Dennison Road, and ALCOA recognizes that solvent extraction is viable for Dennison Road waste, the Department still maintains at this time that solvent extraction holds the most promise to successfully treat the waste in the OWL. If, after pursuing additional treatability studies, ALCOA can demonstrate to the Department's satisfaction that other permanent treatment systems are more technically and economically viable, the Department may amend the ROD in accordance with O&D 89-05 9.a. & b.

C Containment of the Oily Waste Landfill (OWL) is preferred over permanent treatment of the waste because:

1. Waste analysis does not exceed USEPA Land Disposal Restrictions (LDRs).

2. Groundwater flow is away from residential water supply wells.

3. A groundwater recovery system can be effectively developed.

R 1. LDRs are not soil cleanup goals, but indicate if the waste must be treated prior to disposal in a hazardous waste landfill. The Department recognizes that much of the waste in the OWL may be placed directly in the hazardous waste vault without prior treatment and, therefore, lower remediation costs. However, it is the Department's position that the waste in the OWL is typically the same waste as that disposed at Dennison Road Site. In addition, it is the Department's experience that ALCOA has consistently understated or under-estimated the extent and concentration of hazardous wastes at this facility.

2. The direction of groundwater flow had little impact on the Department's preference for a permanent remedy at the OWL. All groundwater is protected as class GA (potable water supply). The Department's decision is based on the need to permanently eliminate the source of contamination to groundwater. There is ample documentation to support the fact that this site is contaminating groundwater.

3. The Department recognizes that groundwater pumping may theoretically control contaminant migration from the OWL. However, as stated in NYSDEC O&D 89-05, the Department prefers a permanent remedy for remediation whenever technically and economically feasible. Long term groundwater pumping does not have the same level of protectiveness as source removal and treatment.

C Based on costs analysis of interim remedial measures (IRMs) at the Unnamed Tributary, the cost of the PRAP's Alternative 2 would far exceed NYSDEC's estimate.

R The estimate used by NYSDEC in the PRAP is based on the cost furnished to the Department by ALCOA and its' consultant.

The consultant proposed to excavate one foot of sediment downstream of the IRM work area where PCB contamination exceeded 1 ppm, or 10 ppm at depths greater than one foot. During a site inspection on January 29, 1991, Department staff noted that sedimentation in the ditched area of the tributary is minimal. Also, ALCOA has noted that PCB contamination is evident only in sediment, not native soil.

For these reasons, the Department still believes that the assumed sediment volumes used by ALCOA's consultant to calculate cost are correct, at least for the ditched segment of the tributary. By excavating no more than one foot of sediment, the Department believes that cleanup goals can be achieved.

It was also noted during the January 29 inspection that considerable sedimentation may exist in the tributary below the ditched area and also outside of ALCOA's property line. The Department agrees that this segment of the tributary (Route 131 to the Grasse River) needs more investigation to ascertain:

1. the volume of contaminated sediment;

2. extent and trends of PCB contamination associated with the sediment: and

3. correlation of PCB contaminated sediment with surface water and biota.

Therefore, the ROD has been changed to require the remediation of the Unnamed Tributary only to Route 131. Additional investigation will be required to determine appropriate remediation from Route 131 to the Grasse River. This additional remedial action will be the subject of an amended ROD in accordance with O&D 89-05.9.a & b.

C The Department should consider closing the Unnamed Tributary by rerouting the swale.

R The Department maintains that removal of contaminated sediment in the ditched segment of the tributary is the most protective remediation measure at an economically viable cost. Contaminated sediment left in place will still be subject to leaching to surface water and groundwater. However, if ALCOA can show, to the Department's satisfaction, that an alternative remedial action is as protective to the environment as that required in this ROD, the Department may amend the ROD in accordance with O&D memorandum 89-05.9.a & b.

APPENDIX C

RESPONSIVENESS SUMMARY

GENERAL PUBLIC AND OTHER INDUSTRY COMMENTS

C The PRAP does not contain enough detail on waste volumes, hazardous waste concentrations, or ranking of health dangers.

R The PRAP is only a summary of site conditions. Detailed analysis of site conditions can be found in the Remedial Investigation Reports and Feasibility Studies located in the Massena Library, or with Canadian review agencies. Additional site data will be gathered in the design phase to support design decisions.

C More permanent treatment technologies should be employed, rather than relying on a secure landfill.

R Permanent treatment technologies are proposed wherever that treatment is considered feasible. However, other than incineration, technologies that completely destroy organic contaminants have not been found feasible for this project. Therefore, treated residuals must be placed in a secure vault.

C Solvent extraction should be considered for the Primary Lagoon Waste.

R The Department seriously considered solvent extraction for treatment of the Primary Lagoon sludge. However, solvent extraction will not treat the high levels of inorganic contaminants found in this sludge. Because of relatively low levels of PCBs found in the sludge, the successful demonstration that solidification can effectively immobilize PAHs, and lime treatment (solidification) is effective in immobilizing fluorides, the Department believes that stabilization and placement of waste in a secure vault provides the best overall protection to the environment.

C Remediation approaches which leave the ecological integrity of a marsh intact while reducing toxic loads to the environment should be given preference over remediation which destroys habitants.

R The Department agrees with their philosophy, and wherever feasible, this type of remediation is given preference.

C The soil cleanup goal for PCBs should be between 10 to 25 ppm, according to USEPA TSCA Guidance at controlled access areas.

R The Department recommended goals for cleanup of PCB contaminated soil is based on protection of groundwater, using NYS groundwater quality standards. The 10 ppm cleanup goal in areas of groundwater management is consistent with

other cleanup goals established in the Massena area. The EPA cleanup goal range of between 10 and 25 ppm PCBs is based on human exposure via direct contact, ingestion, and/or inhalation.

C With respect to short-term impacts and effectiveness, it does not appear that NYSDEC quantitatively considered potential inhalation risks to off-site residents and on-site workers resulting from excavating, handling, and transportation of soil and waste material.

R The Department acknowledges that short-term risks could be present if conditions were not controlled during site remediation. However, short-term risks are preventable by development and implementation of health and safety plans in accordance with existing guidance on that subject. In fact, completed remedial measure undertaken by ALCOA has demonstrated that ALCOA is capable of safely completing excavation and transportation of waste without any measurable impact on workers or adjoining residents.

C The PRAP did not specify treatment requirements or treatment goals for waste.

R The treatment goals for RCRA waste are the Land Disposal Restrictions (LDRs); and for PCBs, the treatment goals specified by TSCA (less than 2 ppm PCBs). These levels are considered ARARs.

C Why are treated residuals placed in an on-site vault if they are treated?

R Solvent extraction will treat organic wastes, but not inorganic waste. Due to the mixture of contaminants at ALCOA, other hazardous constituents will be left in the residuals that can still leachate out and impact ground-water quality. However, solvent extraction does meet the criteria for significant and permanent reduction of toxicity, volume, or mobility of hazardous substances.

As for stabilization of waste, again, some hazardous constituents will not be immobilized permanently and, therefore, a secure vault is needed to contain the waste over the long term.

C It is not appropriate at this time to select a remedy for the Unnamed Tributary. Resuspension of disturbed sediment will migrate further downstream.

R ALCOA has successfully demonstrated during previous remedial actions in the Unnamed Tributary that dredging of sediment can take place without undue movement of suspended sediment. ALCOA will be directed to use the same technique during

additional remedial actions (isolation and dewatering). The commenter should not try to draw analogies between dredging of harbors and major waterways, and a small, intermittent tributary.

C It is unclear how the recommended soil cleanup goals were derived.

R For organics, the Department used the partitioning coefficient equation. For inorganics, the Department used the standard EPA toxicity characterization leaching procedure identified in 6 NYCRR Part 371.

C Is there some health-risk basis for using 6 NYCRR Part 703 groundwater standards for determining cleanup goals?

R Yes, Part 703 groundwater quality standards are based on health risks and best use of groundwater as a potable water source.

C The factor-of-ten difference between areas outside and inside the groundwater management units is not explained.

R The Department recognizes that the partitioning coefficient equation yields conservative estimates of leaching potential from contaminated soils. Therefore, within areas where groundwater will be permanently monitored and controlled as necessary to protect groundwater resources, the Department believes that a factor-of-ten increase from the equation is protective. The Department emphasizes that the cleanup levels are goals, not standards.

C It may be premature to select a remedial option for Potlining Pile I until some actual measurement of soil contamination beneath the pile are taken.

R The Department based its decision on in situ containment of Pile I on the ability to reverse groundwater gradients under favorable conditions known to be present in this area, and the ability to tie a vertical clay barrier (slurry wall) into an underlying tight soil. The Department believes that by controlling the leaching mechanism, adequate protection of groundwater can be afforded.

C There should be actual measurements of groundwater contamination beneath Potlining Pile A prior to making a decision to excavate down to clean-up goals. The PRAP should attempt to estimate the increase cost of excavating soil below the stained-soil layer.

R Groundwater contamination in the immediate vicinity of Potlining Pile A is known, and results are available in the RI report. The Department believes that this analysis is indicative of groundwater quality for remediation purposes. The remedial cost for Potlining Pile A is based on an assumption of one foot of over excavation. The Department believes that the vast majority of contaminated waste and soil will be removed at that point. If cleanup goals are not obtained at that point, ALCOA will be required to evaluate other remedial alternatives to meet the protectiveness criteria.

C The Department should have the benefit of the information in FS II prior to issuing the ROD on the sites in FS I.

R The goal of the Department's decision of FS I is to implement source remediation by treating or controlling that source. The Department believes that enough information is available to move forward with that decision. Other source control measures at the remaining sites, as well as remediation of groundwater contamination, will be addressed in the FS II report.

C All sites at ALCOA should be addressed at the same time because:

1) site remediation may proceed in a more efficient manner; and
2) some of the low level contaminated material covered by this PRAP could be placed in sites addressed in FS II.

R While some minimal efficiency may be obtained by addressing all sites at the same time, this "efficiency" is at the expense of the environment because of continual, uncontrolled releases of hazardous waste constituents. The Department does not believe that the opportunity exists to place waste from sites in this phase of the project into sites addressed in the next phase because of unfavorable conditions at these sites.

C It may be possible to meet cleanup goals without treatment of the waste.

R The Department acknowledges this in the treatment requirements. Wastes that pass the USEPA land disposal restrictions (LDRs) may be placed directly in the secure vault. Cleanup goals in FS I are only applicable where excavation is part of remediation.

C Concern was expressed regarding lack of Canadian participation or involvement, dating back to the 1985 Consent Order.

R Up until recently, the Canadian government did not express an interest in reviewing this project. Also, engineering documents for this project have been in a local repository since 1987.

In the future, additional documents will be forwarded to Mike Goffin, Environment Canada Coordinator, as they become available.

C Sampling of surface water and sediment from the Grasse River and Power Canal has been inadequate.

R Remediation of the Grasse River and related waterways are under management by USEPA Region 2 Headquarters, NYC. These concerns should be directed to Ms. Lisa Carson, Project Manager, USEPA.

C Many of the proposed remedial action plans at ALCOA are premature, since details of groundwater recovery and treatment have not been finalized, but deferred until Feasibility Study II.

R The Department recognizes the inter-relationship between control and treatment of groundwater/surface water, and selection of a remedy at some of the disposal sites at ALCOA. However, the PRAP's for seven of the sites require source removal, treatment, and/or disposal. The Department believes that this can be done independently from additional groundwater remedial activities under separate investigation for these sites. Selection of remedies for other sites is being done concurrently with groundwater/surface water control and treatment studies. Because of continuing releases of contaminants from this facility, the Department believes it is appropriate to move forward with remediation as expeditiously as possible.

C Inconsistency in the application of clean-up guidelines, and future reuse of the site for other purposes, suggest that the sites should be cleaned up to the lowest possible level.

R The clean-up levels specified in the PRAP are goals, not standards. These goals are not broad, but based on impacts from the contaminants. Impacts on biota from contaminants such as PCB's can be much more severe than other potential routes of exposure, such as direct human contact. Therefore, clean-up goals are based on exposure routes and receptors.

Once the sites are remediated, these sites will remain on NYSDEC's Registry of Inactive Hazardous Waste Sites. The classification of each site in the Registry indicates if residuals remain which requires long term monitoring and maintenance. Furthermore, the Order on Consent requires

ALCOA to notify the NYSDEC if it proposes to convey the whole or any part of the site, and to notify the transferee of the applicability of the Consent Order.

C Concerns were expressed about use of incineration as a treatment technology at the site.

R At this time, on-site incineration is not proposed for waste treatment. If, in the future, on-site incineration should be considered, the public will be advised and given an opportunity to comment, as required by O&D Memorandum 89-05.9.

C Details of the secure vault design are missing.

R The PRAP is only conceptual. Detailed designs will follow the Record-of-Decision. However, the secure vault must comply with all NYSDEC and USEPA applicable or relevant and appropriate requirements for a secure landfill.

C The PRAP should acknowledge that the Massena area is subject to earthquake activity.

R The engineer will be instructed to take this factor into consideration during design of earthquake sensitive structures, including the secure vault.

C It appears that water mixed with potlining waste may generate explosive gases.

R During the design phase, ALCOA will be instructed to investigate this potential problem and design any remedial activity to address this problem if it exists.

C The St. Lawrence Public Advisory Committee (PAC) needs assurances that they will be allowed to comment on, and provide input to, various monitoring proposals, and provided results, and being consulted on a continuing basis as to any proposed changes or modifications to the program.

R The St. Lawrence PAC will be placed on the project contact list for "document availability notice". During the development of the long-term monitoring, operation, and maintenance program, the citizen participation plan ensures the involvement of the public, and keeps them informed throughout the project implementation.

C Use of the term "vault" is misleading.

R The "vault" referred to in the engineering reports and PRAP will be designed to meet all NYS and USEPA criteria for a hazardous waste landfill.

C There is little data on groundwater contamination in the area and, therefore, containment alternatives should not be selected. Reliance on groundwater recovery is a poor choice.

R The five years of engineering and geologic investigations produced an abundance of subsurface data. The Department selected a containment alternative for the Spent Potlining Pile I based on this information. Additional subsurface investigations are in progress to determine the feasibility of restoring groundwater quality in the vicinity of each site, and to further define the extend of groundwater contamination around other sites not addressed in this PRAP. The Department agrees that reliance on groundwater pumping as a remedial action is not as protective as a permanent remedy. It is the Department's strong preference to permanently treat the source of contamination so that long term groundwater pumping is not necessary.