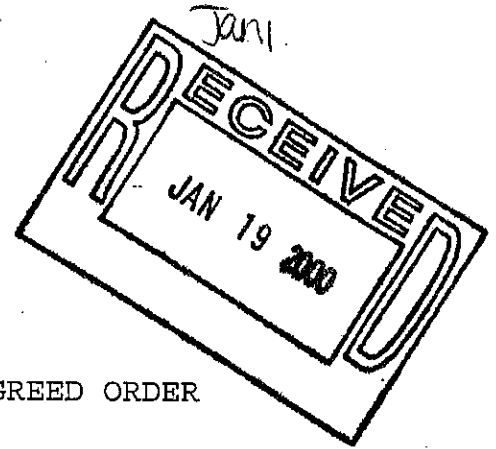


STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY



In the Matter of Remedial Action by:)
)
) AGREED ORDER
Kaiser Aluminum & Chemical Corp.)
2111 East Hawthorne Road) No. DE 99TCPIS-95
Mead, Washington 99021)

TO: Mr. Wayne R. Hale
President, Primary Products Business Unit
Kaiser Aluminum & Chemical Corporation
407 West Riverside Ave. Suite 1150
Spokane, Washington 99201

I.

Jurisdiction

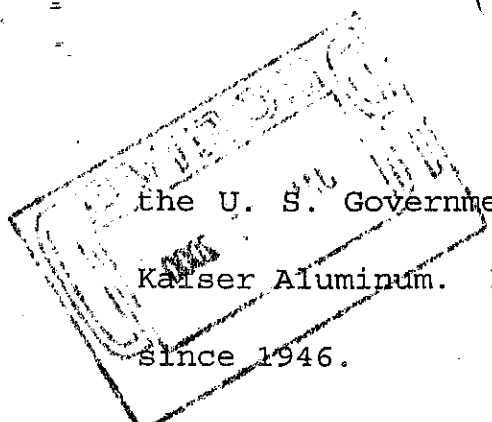
This Agreed Order ("Order") is issued pursuant to the authority of RCW 70.105D.050(1).

II.

Findings of Fact

Ecology makes the following Findings of Fact, without admission of such facts by Kaiser Aluminum & Chemical Corporation.

1. Kaiser presently owns property at 2111 East Hawthorne Road; Mead, Washington; 99021. The property is a primary aluminum reduction smelter that was established in 1942 by



the U. S. Government. In 1946, the plant was purchased by Kaiser Aluminum. Kaiser has owned and operated the property since 1946.

2. Studies conducted at the facility have found cyanide and fluoride in groundwater, surface soils, and subsurface soils on the site. The major source of the cyanide and fluoride contamination is spent potlining material located in a large disposal pile (SPL Pile). Spent potliner is also found in the adjacent solid waste rubble pile (Rubble Pile). The two large piles are located directly northwest of the smelter. The SPL Pile is covered with asphalt and sealing materials and currently contains approximately 94,000 cubic yards of spent potliner with a weight of approximately 128,000 tons.

3. Investigations conducted at the facility have found contamination in soils and groundwater beneath the SPL Pile. Levels of total cyanide range as high as 945 milligrams per kilogram in soils beneath the SPL Pile and 89.2 milligrams per liter in groundwater near the SPL Pile. Levels of fluoride in groundwater are as high as 91.0 milligrams per liter. The average level of total cyanide northwest of the

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SPL Pile has decreased from 262.7 milligrams per liter (1982) to 88.1 milligrams per liter (1991) as measured in monitoring well TH-8. Contamination is documented in an Engineering Assessment Report by CH2M Hill, December 1988.

4. Cyanide and fluoride contamination is found in a subsurface plume that is 800 to 1500 feet wide and travels approximately 2.5 miles from the aluminum smelter to the Little Spokane River, where it discharges into a series of springs. The pollutants in the plume have contaminated a portion of the Spokane-Rathdrum Prairie Aquifer and the Little Spokane River. The Spokane-Rathdrum Prairie Aquifer has been designated a sole source aquifer by the Environmental Protection Agency and requires the protection necessitated by that designation. Total cyanide contamination found in the Spokane-Rathdrum Prairie Aquifer ranges from 89.2 milligrams per liter at the aluminum smelter to 0.88 milligrams per liter in the Van Gelder Spring adjacent to the Little Spokane River. Total cyanide concentrations in the contaminated springs found along the Little Spokane River range between 0.18 and 0.88 milligrams per liter (1991 mean annual average), while the Little
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Spokane River has consistently maintained concentrations that range between 0.008 and 0.054 milligrams per liter. The contamination in the plume is documented in an Engineering Assessment Report by CH2M Hill, December 1988, as well as semi-annual groundwater monitoring summaries by Hart Crowser.

III.

Ecology Determinations

1. Kaiser Aluminum & Chemical Corporation is an "owner or operator" as defined at RCW 70.105D.020(11) of a "facility" as defined in RCW 70.105D.020(4).
2. The "facility" is known as the Kaiser Mead smelter and is located at 2111 East Hawthorne Road, Mead, Washington and includes all areas where hazardous substances from the facility have come to be located.
3. Cyanide and fluoride found at the facility as described above are "hazardous substances" as defined at RCW 70.105D.020(7).
4. Based on the presence of cyanide and fluoride at the facility and all factors known to the Department, there

is a release or threatened release of hazardous substances from the facility, as defined at RCW 70.105D.020(19).

5. By letters dated March 28, 1989 and January 29, 1990, Ecology notified Kaiser Aluminum & Chemical Corporation of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment.

6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, the Department may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

7. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that Kaiser Aluminum & Chemical Corporation

take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein. Within 210 calendar days of the effective date of this Order, Kaiser shall submit to Ecology for approval a Engineering Design Report with construction plans and specifications for the cleanup of the facility. Within 90 days of the effective date of this Order, Kaiser shall submit for approval a substantial and disproportionate analysis of the six cleanup options considered for the Site. Kaiser shall submit progress reports on the Engineering Design Report 90 days and 180 days after the effective date of this Order. The progress reports shall describe the actions taken during the previous 90 days to implement this Order. The reports shall also describe any current deviations or planned deviations from the 210 day time schedule. If requested by Kaiser, Ecology can extend the time schedule for completion of the pump and treat section of the Engineering Design Report. The extension shall not exceed a maximum of 180 days. If the time schedule is extended, Kaiser Aluminum & Chemical Corporation shall continue to submit 90 day progress reports

until the final completion of the Engineering Design Report. The preferred cleanup action for study in the Engineering Design Report consists of five items: (a) consolidation of the potliner contained in the SPL Pile and the Rubble Pile into one pile (Consolidated Pile), (b) covering of the Consolidated Pile with a multi-component composite cap equivalent to a 173-303 WAC final cover, (c) covering of the Rubble Pile and Butt Tailings Pile with a multi-component composite layer cap equivalent to a 173-304 WAC final cover (d) evaluation of piping found around the Consolidated Pile and repair piping if necessary, and (e) pump and treat groundwater beneath the SPL Pile for total or weak acid dissociable cyanide and fluoride. The treatment technologies to be evaluated are chemical precipitation, catalytic oxidation, and alkaline hydrolysis for both total and weak acid dissociable cyanide and chemical precipitation for fluoride. The Engineering Design Report shall meet and fulfill the specific requirements of chapter 173-340-400(4)(a)(b) of the Washington Administrative Code (WAC), entitled Cleanup Actions - Engineering Design Report and Construction Plans and Specifications. The Report shall

include sufficient information for the review of construction plans and specifications, which shall be included as appendixes. The following information shall be included in the Engineering Design Report and Appendixes:

1. Introduction. Goals, purpose and regulatory requirements of the preferred cleanup action. Facility background and plan overview. Other administrative requirements by federal agencies, state agencies, and local governmental bodies.
2. Facility Conditions. Brief overview of facility surface and subsurface conditions.
3. Remediation System Design. The general design of the preferred cleanup action. The assumptions and rationale for each of the individual design elements. The construction plans and specifications, including the detailed design information, for the cleanup action. A description and conceptual plan of the two engineered caps and water treatment system including flow diagrams. The characteristics, quantity and location of the contaminants treated

by the pump and treat system or contained by each of the engineered caps. A description of the pump and treat system and the engineered cap containment systems with an engineering justification for the design and operation parameters, including: (1) design criteria, assumptions, and calculations for all components of the cleanup actions; (2) expected treatment or containment efficiencies and documentation on how that degree of effectiveness is determined; and (3) demonstration that the treatment systems used will achieve compliance with the cleanup goals by citing results from similar operations, literature, or pilot or treatability studies. All facility specific characteristics which may affect design, construction, or operation of the preferred cleanup action including relationship of the proposed cleanup systems to the existing plant water treatment system and/or ground water system characteristics. The rationale used in

determining the disposal method of the pump and treat waste water.

4. Remediation System Construction. The construction procedures that will take place and their general sequence.

5. Post Construction Considerations and Activities.
A general description of the compliance monitoring which will be performed during and after

construction, including a compliance monitoring plan prepared for the facility following WAC 173-340-410.

6. Time Schedule. A schedule for the implementation of the preferred cleanup action. A description of procedures for determining the efficiencies of the pump and treat system and a time schedule for the shut down of the system. A description of how the operating parameters of the pump and treat system will be used to determine compliance with MTCA cleanup standards outlined in ch. 70.105D RCW and ch. 173-340 WAC.

In addition to the Engineering Design Report, Kaiser Aluminum & Chemical shall prepare a substantial and disproportionate cost analysis of the five cleanup scenarios described below and a sixth Option F which consists of total removal of both potliner and contaminated soil along with pump and treatment of ground water. The six options to be studied are described below: Option A which consists of no actions regarding potliner, no actions regarding remediation of contaminated soil and ground water, and ground water monitoring with institutional controls on ground water withdrawal, Option B which consists of additional capping around Potliner Pile for infiltration control, covering of Rubble Pile and Butt Tailings Pile with a multi-component composite layer cap equivalent to a 173-304 WAC final cover, pipe leak inspection and control consisting of slip lining, replacement or repair, and ground water monitoring with institutional controls on ground water withdrawal, Option C which consists of excavating or recycling Potliner Pile, covering contaminated soil with a composite layer cap equivalent to a 173-304 WAC final cover, covering of Rubble Pile and Butt Tailings Pile with a multi-component composite

layer cap equivalent to a 173-304 WAC final cover, infiltration control consisting of pipe leak inspection and control consisting of repair, slip lining or replacement, and institutional controls on ground water withdrawal, Option D which consists of the preferred cleanup option, Option E which consists of excavating or recycling all potliner, covering the soil beneath the potliner with a multi-component composite layer cap equivalent to a 173-304 WAC final cover, covering the Rubble Pile and Butt Tailings Pile with a multi-component composite layer cap equivalent to a 173-304 WAC final cover, and pumping and treating contaminated ground water, and Option F which consists of excavating or recycling potliner, excavating contaminated soil beneath the Potliner Pile, covering the Rubble Pile and Butt Tailings Pile with a multi-component composite layer cap equivalent to a 173-304 WAC final cover and pumping and treating the contaminated ground water plume. The substantial and disproportionate cost analysis shall be submitted to the Department for approval within 90 days of the effective date of this Order.

V.

Terms and Conditions of Order

1. Definitions. Unless otherwise specified, the definitions set forth in ch. 70.105D RCW and ch. 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notices. Pursuant to WAC 173-340-600(10)(c), Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs. Kaiser Aluminum & Chemical Corporation shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for facility investigations, and remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Kaiser Aluminum & Chemical Corporation shall pay the required

amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. If Kaiser Aluminum & Chemical Corporation disagrees with cost calculations due to alleged accounting errors, Kaiser Aluminum & Chemical Corporation may request Ecology to recalculate the required costs to determine the appropriate amount. Any disputes regarding required costs of direct activities and support costs shall be resolved under Section 9 of this Agreed Order. A general description of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs, other than those contested under Section 9 of this Agreed Order, within 90 days of receipt of the itemized statement of costs will result in interest charges.

Designated Project Coordinators. The project coordinator for Ecology is:

Mr. Paul Skyllingstad
Department of Ecology
Industrial Section
Post Office Box 47706
Olympia, WA 98504-7706

The project coordinator for Kaiser Aluminum & Chemical Corporation is:

Mr. Michael Sawatzky
Environmental Manager
Kaiser Aluminum & Chemical Corporation
2111 East Hawthorne Road
Mead, Washington 99021

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and Kaiser Aluminum & Chemical Corporation, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinator(s). Should Ecology or Kaiser Aluminum & Chemical Corporation change project coordinator(s), written notification shall be provided to Ecology or Kaiser Aluminum & Chemical Corporation at least ten (10) calendar days prior to the change.

5. Performance. All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and

expertise in hazardous waste site investigation and cleanup. Kaiser Aluminum & Chemical Corporation shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Site. Kaiser Aluminum & Chemical Corporation shall provide a copy of this Order to all agents, contractors and subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors and subcontractors will be in compliance with this Order.

Except where necessary to abate an emergency situation, Kaiser Aluminum & Chemical Corporation shall not perform any remedial actions at the facility documented in an Engineering Assessment Report by CH2M Hill, December 1988 outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

6. Access. Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the facility at all reasonable times for the purposes of, inter alia: inspecting records, operation logs,

and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by Kaiser Aluminum & Chemical Corporation. By signing this Agreed Order, Kaiser Aluminum & Chemical Corporation agrees that this Order constitutes reasonable notice of access, and agrees to allow access to the facility at all reasonable times for purposes of overseeing work performed under this Order. Ecology shall allow split or replicate samples to be taken by Kaiser Aluminum & Chemical Corporation during an inspection unless doing so interferes with Ecology's sampling. Kaiser Aluminum & Chemical Corporation shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity. The foregoing notice requirement shall be deemed satisfied upon Kaiser's submittal to Ecology of a proposed sampling schedule for the facility. Kaiser may modify the

schedule from time to time provided Kaiser gives Ecology forty-eight hours advanced notice of changes in the schedule.

7. Public Participation. Kaiser and Ecology shall prepare and/or update a public participation plan for the facility. Ecology shall maintain the responsibility for public participation at the facility. Kaiser Aluminum & Chemical Corporation shall help Ecology coordinate and implement public participation for the facility.

8. Retention of Records. Kaiser Aluminum & Chemical Corporation shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of Kaiser Aluminum & Chemical Corporation, then Kaiser Aluminum & Chemical Corporation agrees to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

9. Dispute Resolution. Kaiser Aluminum & Chemical Corporation may request Ecology to resolve disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the signatory, or his/her successor(s), to this Order. Ecology resolution of the dispute shall be binding and final. Kaiser Aluminum & Chemical Corporation is not relieved of any requirement of this Order during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

10. Reservation of Rights/No Settlement. This Agreed Order is not a settlement under ch. 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against Kaiser Aluminum & Chemical Corporation to recover remedial action costs paid to and received by Ecology under this Agreed Order. In addition, Ecology will not take additional enforcement actions against Kaiser Aluminum & Chemical Corporation to require those remedial actions required by

this Agreed Order, provided Kaiser Aluminum & Chemical Corporation complies with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the facility should it deem such actions necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from facility.

In the event Ecology determines that conditions at the facility are creating or have the potential to create a danger to the health or welfare of the people on the facility or in the surrounding area or to the environment, Ecology may order Kaiser Aluminum & Chemical Corporation to stop further implementation of this Order for such period of time as needed to abate the danger.

11. Transference of Property No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the facility shall be consummated by Kaiser Aluminum & Chemical Corporation without provision for continued implementation of all

requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest Kaiser Aluminum & Chemical Corporation may have in the facility or any portions thereof, Kaiser Aluminum & Chemical Corporation shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, Kaiser Aluminum & Chemical Corporation shall notify Ecology of the contemplated transfer.

12. Compliance with Other Applicable Laws.

A. All actions carried out by Kaiser Aluminum & Chemical Corporation pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in paragraph B of this section.

B. Pursuant to RCW 70.105D.090(1), the substantive requirements of chapters 70.94, 70.95, 70.105, 75.20, 90.48, and 90.58 RCW and of any laws requiring or authorizing local

government permits or approvals for the remedial action under this Order that are known to be applicable at the time of issuance of the Order have been included in Section IV Work To Be Performed and are binding and enforceable requirements of the Order.

Kaiser Aluminum & Chemical Corporation has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order. In the event Kaiser Aluminum & Chemical Corporation determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify Ecology of this determination. Ecology shall determine whether Ecology or Kaiser Aluminum & Chemical Corporation shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, Kaiser Aluminum & Chemical Corporation shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the

remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by Kaiser Aluminum & Chemical Corporation and on how Kaiser Aluminum & Chemical Corporation must meet those requirements. Ecology shall inform Kaiser Aluminum & Chemical Corporation in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. Kaiser Aluminum & Chemical Corporation shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Ecology shall ensure that notice and opportunity for comment is provided to the Kaiser Aluminum & Chemical Corporation, public, and appropriate agencies prior to establishing the substantive requirements under this section.

C. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency which is necessary for the State to

administer any federal law, the exemption shall not apply and Kaiser Aluminum & Chemical Corporation shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon Kaiser Aluminum & Chemical Corporation's receipt of written notification from Ecology that Kaiser Aluminum & Chemical Corporation has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Agreed Order have been complied with.

VII.

Enforcement

1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

- A. The Attorney General may bring an action to enforce this Order in a state or federal court.
- B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

C. In the event Kaiser Aluminum & Chemical Corporation refuses, without sufficient cause, to comply with any term of this Order, Kaiser Aluminum & Chemical Corporation will be liable for:

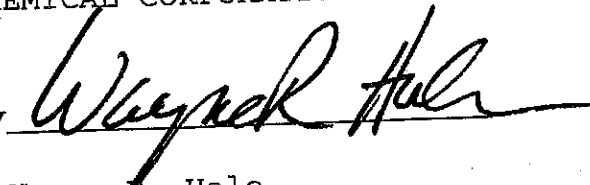
- (1) Up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and
- (2) Civil penalties of up to \$25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under Section 6 of ch. 70.105D RCW.

Effective date of this Order: January 10, 2000.

KAISER ALUMINUM &
CHEMICAL CORPORATION

By



Wayne R. Hale
President
Primary Products
Business Unit

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By



Carol Kraege, P.E.
Industrial Section Manager
Solid Waste and Financial
Assistance Program