Port of Vancouver
FSN 1023

DEPARTMENT OF ECOLOGY

In the Matter of the	)	Remedial Action Order
	)	
Port of Vancouver	)	No. DE 90-S189
Post Office Box 1180	)	
Vancouver, Washington 98666	)	

I

Jurisdiction

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

II.

Statement of Facts

1. The Port of Vancouver, WA (POV) has operated an ore concentrate transfer facility since 1982, at its dock-front site on the north bank of the Columbia River at river mile 104.4 in Section 20, Township 2 North, Range 1 East, in Southwest Vancouver. The POV office is located at 3103 Lower River Road, Clark County, Washington. The location and the boundaries of the project area (the "site") in this matter are depicted by the diagram that is Exhibit A of this Order.

2. Prior to 1987, a short portion of the POV ship bulk loading conveyor system operated without protection against spillage loss to the Columbia River. On August 25, 1987, the Department of Ecology (Department) discovered a release of copper concentrate to the river from this bulk loading facility.

3. A dangerous waste designation static rainbow trout bioassay was completed on the copper concentrate and produced 80% mortality at 100 ppm and 97% mortality at 1000 ppm. An EP TOX analysis showed 1 ppm cadmium (1ppm - 100ppm designates as Dangerous Waste in accordance with Chapter 173-303 WAC). The static bioassay test performed on the raw copper concentrate characterized the concentrate as an extremely hazardous waste due to aquatic toxicity

Subsequent analyses of the copper concentrate identified copper, chromium, lead, zinc, mercury, and arsenic. Copper is highly toxic to aquatic life and considered the leading cause of the concentrate's aquatic toxicity.

4. The Department issued a Compliance Order No. DE 87-S225 and penalty effective November 5, 1987. The Compliance Order required implementation of an approvable Sampling and Analysis Plan to define the limits of the copper concentrate plume in the Columbia River. A Work Plan, dated January 29, 1988, was prepared by the POV which included sample collection and analysis protocols and procedures in a Sampling and Analysis Plan and a Quality Assurance Project Plan.

5. The Department approved the Work Plan on February 4, 1988.

6. On May 31, 1988, a Report of Findings (ROF) was completed, which delineated the approximate boundaries of the metals contamination. In the study area metals concentrations were found to be significantly greater than background concentrations.

7. The project was reclassified as a cleanup action and given to the Hazardous Waste Investigation and Cleanup Program on July 7, 1988; all outstanding orders and penalties were withdrawn.

8. After review of the ROF, the Department met with other resource agencies on July 24, 1988, to determine additional studies needed prior to remediation. The following studies were determined to be necessary: (1) define the copper concentrate plume in the vicinity of the bulk loading facility, (2) study various zones within the plume to evaluate the impact, if any, of the copper concentrate on the biological community and (3) develop and evaluate potential remedial action alternatives.

9. On November 22, 1988, the Phase II Work Plan was approved by the Department and implemented immediately by the POV

10. A Report of Findings was submitted to the Department on March 17, 1989, containing the results of the investigations that were completed under the Phase II Work Plan.

a. A physical parameters investigation was conducted of the Columbia River in the vicinity of the bulk loading facility which included grain size distribution analyses and core samples. Sediment samples were also collected and analyzed in these areas to determine concentration of copper in the sediment.

b. The data collected during these investigations show that the highest concentrations of copper are found in the immediate vicinity of the bulk loading facility. The grain size distribution curves also indicate an abundance of sediment with a greater amount of fines in this area. This conclusion is directly supported by the core sampling which indicates a thin layer of softer material in the vicinity of the bulk loading facility

c Acute static bioassay tests and a study of the benthic organisms were also conducted. The data collected during the Acute Static Bioassay Testing Program shows that none of the zones within the plume contain sediment which would be classified as an Extremely Hazardous Waste. The data further shows that only the sediment beneath the bulk loading facility is potentially a Dangerous Waste

d The completed benthic abundance and diversity study does not indicate a quantifiable chronic impact to the benthic community.

e. Benthic bioassays (Hyallela and Daphnia) showed statistically significant mortality, and qualitative mortality that appears to correlate with increasing levels of copper in the sediments. Based on this information, an initial removal level of 1300 ppm was selected since it did not demonstrate mortality in any of the bioassays The Department feels that removal of the copper ore concentrate and contaminated sediments to a level of 1300 ppm should provide a conservative environmentally protective remediation

11. Consultants to the POV submitted to the Department a Draft Dredging and Disposal Feasibility Evaluation for the Ore Dock Site on December 29, 1989. Due to limited clearances beneath the dock it was determined that special adaptation of small, maneuverable dredging equipment for effective removal of the sediment prism in and around the closely spaced dock pilings will be required. Due to these conditions three cleanup alternatives were evaluated. Both mechanical and hydraulic methods are applicable to the project.

a. Hydraulic dredging using an articulated boom in place and maneuver the dredge intake.

b. A combination of mechanical dredging by clamshell outside the dock, supplemented by hydraulic dredging as described above for beneath the dock.

c. Hydraulic dredging with a small conventional pipeline dredge with the intake ladder modified to allow direct insertion between the dock piling.

12. The POV applied for a U.S. Army Corps of Engineers Section 404 Permit April 1, 1990. A Public Notice with opportunity for comment for the

Corps permit application was issued from April 18, 1990 to May 18, 1990 A Nationwide Permit was authorized June 22, 1990. This was dependant upon the approval of the Water Quality Modification from the Department of Ecology which was authorized May 31, 1990.

13. As a requirement to obtain a Hydraulic Project Approval (HPA) from the Department of Fisheries, an Environmental Determination of Nonsignificance was completed April 19, 1990 pursuant to the SEPA Rules (Chapter 197-11, Washington Administrative Code) A 15 day comment period was initiated on April 19, 1990 and concluded on May 4, 1990. The HPA was authorized May 28 1990.

III.

Ecology Determinations

1. The Port of Vancouver is an "owner or operator," as defined at RCW 70.105D.020(6).

2 The site described above is a "facility" as defined at RCW 70.105D.020(3).

3. The substances found at the facility and as described above are "hazardous substances" as defined at RCW 70.105D.020(5)

4 Based on the presence of these hazardous substances 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(10).

5 The Department has found the Port of Vancouver to be 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. Based on the forgoing 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 the Port of Vancouver take the following remedial actions

1. The POV shall implement the maintenance dredge and upland disposal of the approximately 5000 cubic yards of material within the 1300 ppm total copper contour as presented in the March 17, 1989 Report of Findings. (Refer to Exhibit A)

2. The POV shall implement the maintenance dredge, sample collection and monitoring in accordance to those provisions as descibed in this Order and in the final Cleanup Action Plan. A Cleanup Action Plan has been attached to this Order as Exhibit B

3. Approximately 500 cubic yards of sediment within the 9000 ppm copper contour have been designated as a dangerous waste under Chapter 173-303 WAC. This material shall be removed from the river by hydraulic dredge. The sediments shall be discharged to a lined diked sedimentation pond on the POV property, to allow settling of the solid material. The return flow from the pond shall be discharged to the Columbia River as qualified in the Water Quality Modifications to the Corps permit. Should any dredge water escape the sedimentation pond it shall be collected and treated at the POV Waste Water Treatment Facility prior to discharge. The solids will be returned to the export pile for future copper export shipments.

4. The additional material between the 9000 to 1300 ppm copper contour, approximately 4,500 cubic yards, shall be removed as a protective measure to limit any impact on the Columbia River environment. This material shall be dredged from the river by either a hydraulic or clamshell dredge. If hydraulic dredging is used, the material shall be pumped to an upland sedimentation pond/disposal site on the POV property. The return flow from the pond shall be discharged to the Columbia River as qualified in the Water Quality Modification to the Corps permit. If a clamshell dredge is used the dredged material may be initially deposited to a haul barge. The material shall then be transferred to a Department approved upland disposal site on the POV property

5. All sediments dredged but not recycled shall be stored in an upland disposal site at a distance of greater than 200 feet from the shoreline and emplaced in an area with no runoff to surface waters of the state.

6. In-river dredging is expected to commence on or about July 15 1990. The project shall be completed by August 15, 1990.

7. Water quality standards pertaining to fresh waters of the Columbia River (Class A) shall apply to this project except in the authorized dilution zone, which in this case shall extend 150 feet radially from the point of dredging and the point of hydraulic pipeline return flow; except that, the dilution zone may be extended an additional 300 feet in the direction of the prevailing current flow

8. The POV shall monitor turbidity during the first week of work in the water, at a minimum. Sampling shall be done twice a day with the purpose of measuring water quality during different flow conditions

9. Two to three sampling events shall be conducted downcurrent of the work at the midpoint of the dilution zone and at the dilution zone boundary for dissolved copper analysis. Samples shall be obtained from near the surface, mid-depth and just above the bed of the river, but high enough above the bed to be out of the zone of naturally moving bed load material. The first sampling event is to be collected during the dredging of the most highly contaminated material. The sample shall be taken the first day that dredging and a discharge from the sedimentation pond occur concurrently. The second sample is to be collected two days later under the same conditions if the primary area is still being dredged. A sample event shall also be conducted on the first day that dredging begins in the lesser contaminated area, also under the same conditions. Sampling upcurrent of the work shall be done to establish background conditions.

10. Initial return flow from the sedimentation pond(s) shall be sampled for dissolved and total copper analysis daily. The degree of sample analyses shall be determined on a day to day basis. Discharge samples collected on the same day as the dilution zone samples shall be analyzed. Analysis turn-around time shall not exceed one day. The detection limit for the analysis of these samples is set at 5 ppb.

11. Verification samples shall be collected for copper analysis at the completion of the project to ensure that the dredge operation has been performed efficiently and completely. Sample numbers and locations shall be derived following a stratified pattern.

12. Prior to the beginning of the project, the POV shall submit a Sample Plan to the Department for review, comment and approval

13. The sampling and analysis regime may be altered with the approval of Ecology if the results indicate a negligible effect to water quality. If results indicate otherwise, then work will have to be modified to reduce water column impacts to an acceptable level.

14. If the edge of the dilution zone sample indicate an exceedance of water quality standards, 12 ppb Copper, the Department shall take action to mitigate the situation, the Department actions may include an alteration of dredge techniques or in the extreme case a cessation of dredging.

15. Dredging shall stop if distressed or dead fish are observed in the work area. The State Department of Fisheries (Neil Rickard) and Ecology shall be notified immediately AT (206) 753-2353.

16. If a hydraulic dredge is used, it shall be operated with the intake on or below the surface of the material being removed. Reverse purging of the intake line shall be held to an absolute minimum. Should purging become necessary, the intake end is not to be raised more than three feet (3') above the bed material.

17. If a clamshell is used it shall be operated to minimize turbidity. During excavation, each pass with the clamshell or dragline bucket shall be done so as to minimize suspended sediment concentrations. Dredged material shall not be stockpiled in the water.

18. Precautions shall be taken to ensure that petroleum products chemicals, or other toxic or deleterious materials do not enter the water.

19. Should any surface water runoff be generated in the work area or any incidental spillage occurs, the runoff shall be treated in the POV Waste Water Treatment Plant.

20. The Department of Ecology representative shall be contacted seven days prior to the start of the work in the water.

21. A plan for the maintenance dredging of the area from the ore loading dock to the west end of the dock number 9 shall be completed within six months from the date of this order and sent to the Department for review, comment and approval. Normal maintenance dredge timing parameters such as rate and depth of sedimentation etc. for this area should be compiled and incorporated into the dredge plan that shall include at a minimum: upland disposal that will not impact surface water, an explanation of normal maintenance dredge parameters (where, when and how), and a historically based estimation of when dredging will be required.

22. At the completion of the project the POV shall submit a report with all the sampling results and findings generated during the cleanup process for the Department's review, comment and approval

V

Terms and Conditions of Order

1. Public Notice

Chapter 70 105D RCW and Chapter 173-340 WAC require that, at a minimum this Order be subject to concurrent public notice. RCW 70.105D 030(2)(a) The Department 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 the Department that the Order is inadequate and improper in any respect

2. Oversight Costs

The Port of Vancouver shall pay to Ecology those costs incurred by the Department for investigative, remedial actions and orders, including costs

incurred by Ecology in the oversight or administration of this Order. The Port of Vancouver shall pay the required amount within sixty (60) days of receiving summary statement of Ecology's expenses, payable to the State Toxics Control Account.

3. Designated Project Coordinators

Within ten (10) days of the effective date of this Order, the Port of Vancouver shall designate a project coordinator. The project coordinator shall be responsible for overseeing the implementation of this Decree. To the maximum extent possible, communications between Ecology and the Port of Vancouver 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 coordinators. Should the Port of Vancouver change its project coordinator, written notification shall be given to Ecology at least ten (10) calendar days prior to the change

Ecology's project coordinator is Pamela B Marti of the Ecology Southwest Regional Office.

4 Performance

All remedial work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer, or equivalent, with experience and expertise in hazardous waste site investigation and cleanup. The Port of Vancouver shall notify Ecology as to the identity of such engineer(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.

5. Access

Ecology or any Ecology authorized representative shall have the authority to enter and freely move about all property at the site 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 Decree; 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 the Port of Vancouver. Ecology shall provide reasonable notice before entering property unless an emergency prevents notice. Ecology shall split any samples taken during an inspection unless the Port of Vancouver fails to make available a representative for the purpose of splitting samples, or splitting samples is otherwise impracticable.

6. Retention of Records

The Port of Vancouver 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 to be undertaken through contractors or agents of the Port of Vancouver, a record retention requirement meeting the terms of this paragraph shall be required of such contractors and/or agents.

7. Dispute Resolution

The Port of Vancouver may request Ecology to resolve factual or technical disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the signatory of this Order. Ecology resolution of the dispute shall be binding and final. The Port of Vancouver 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.

8. Reservation of Rights

Ecology reserves all rights to issue additional orders or take any action authorized by law in the event or upon the discovery of a release or threatened release of hazardous substances not addressed by this Order, upon discovery of any factors not known at the time of issuance of this Order or in order to abate an emergency.

In the event Ecology determines or concurs in a determination by another local, state, or federal agency that activities implementing or in noncompliance with this Order, or any other circumstances or activities, are creating or have the potential to create a danger to the health or welfare of the people on the site or in the surrounding area or to the environment. Ecology may order the Port of Vancouver to stop further implementation of this Order for such period of time as needed to abate the danger.

9. Compliance With Other Applicable Laws

All actions carried out by the Port of Vancouver pursuant to this Decree shall be done in accordance with all applicable federal, state, and local requirements.

VI

Enforcement

In the event the Port of Vancouver refuses, without sufficient cause, to comply with any term of this Order, this Order may be enforced as follows:

a. The Attorney General may bring an action to enforce this Order in state or federal court.

b In any such action, the Port of Vancouver may be liable for up to three times the amount of any costs incurred by the State of Washington as a result of the refusal to comply with the Order

c. Additionally, in any such action, the Port of Vancouver may be liable for civil penalties of up to $25,000 per day for each day the Port of Vancouver refuses to comply.

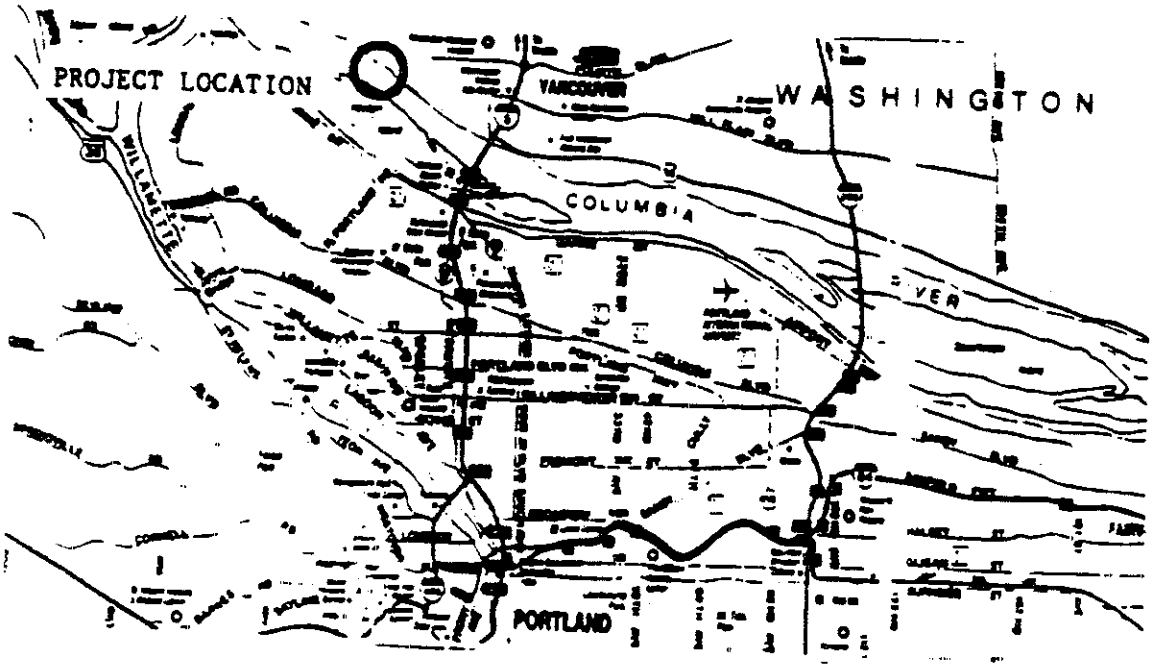
d Should Ecology conduct or provide for conducting the remedial action the Attorney General will bring an action to recover all costs incurred by he state for such action.

Effective date of this Order: July 13, 1990

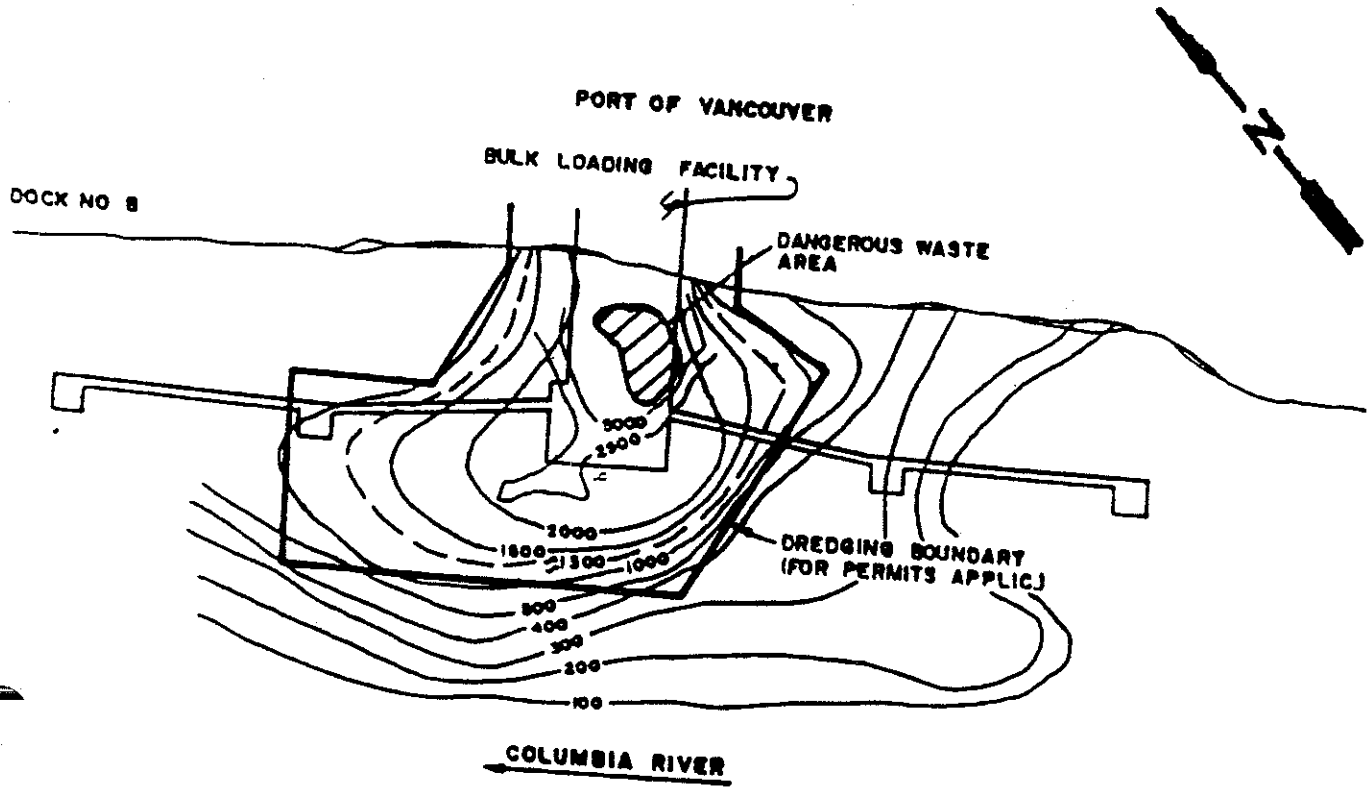
DATED this 13 day of July, 1990

Meena Wilson for
Michael A. Wilson
Southwest Region Supervisor
Toxics Cleanup Program

EXHIBIT A



PROJECT LOCATION MAP



TOP VIEW OF PROJECT SITE

EXHIBIT B
CLEANUP ACTION PLAN
PORT OF VANCOUVER

PURPOSE

This decision document presents the selected cleanup action for the Port of Vancouver (POV) site located on the north bank of the Columbia River in Southwest Vancouver, Washington. This decision is based on a remedial investigation and feasibility study conducted for the potentially liable person (PLP) by Century West Engineering Corporation during 1988 and 1989

DESCRIPTION OF REMEDY

The proposed cleanup involves the maintenance dredge of Columbia River sediments contaminated with copper ore concentrate which spilled from a ship loading conveyor system. Sediments in the area to be dredged contain copper concentrations of 1300 ppm to greater than 9000 ppm. All sediments with a copper concentration of greater than 9000 ppm have been designated as a dangerous waste under Chapter 173.303 WAC (approximately 500 cubic yards). This material shall be removed from the river, recycled, and returned to the export pile for future copper export shipments. The additional material with copper concentrations between 1300 and 9000 ppm (approximately 4,500 cubic yards) shall be removed as a conservative measure to limit any potential for current or future impacts on the Columbia River environment. This material shall then be transferred to a Department approved upland disposal site on the Port property.

DECLARATION

The selected remedy will be protective of human health and the environment. The Department gives preference to permanent solutions to the maximum extent practicable. As stated previously, the material that has been designated as a dangerous waste shall be recycled and exported with future copper ore concentrate shipments. Although upland disposal of the remaining waste does not meet the preferred goal of the Department, it has been determined to be an acceptable solution. The upland disposal site (in excess of 200 feet from the Columbia River) has been determined to be a safe location for the disposal of these sediments due to the materials limited potential for leaching. The material stored under these conditions should pose minimal or no risk to human health and the environment.

Applicable Cleanup Standards

There are currently no promulgated standards for the cleanup of contaminated sediments. However, the removal of the contaminated sediments from the Columbia River shall ensure that the Class A Ambient Water Quality standards are maintained.

CLEANUP ALTERNATIVES

Three cleanup alternatives were evaluated in the feasibility study conducted by the PLP. These alternatives include:

* Hydraulic dredging using an articulated boom in place and maneuver the dredge intake.

* A combination of mechanical dredging by clamshell outside the dock, supplemented by hydraulic dredging as described above for beneath the dock.

* Hydraulic dredging with a small conventional pipeline dredge with the intake ladder modified to allow direct insertion between the dock pilings.

The alternative of capping the material in place was not considered for this cleanup action due to the fact that the Port is an operating facility. Capping of the material in place would require long term maintenance of the cap and would interfere with the working operations of the Port's facilities. This solution would also not meet the statutory preference for permanent treatment to the maximum extent possible. For this reason, removing the material by dredging was considered to be the only alternative for this cleanup action. Due to site conditions, specifically the difficulty of working around the closely spaced dock pilings, variations of hydraulic dredging have been determined to be the best cleanup method for this site

PROPOSED CLEANUP ALTERNATIVE

The proposed cleanup alternative involves the maintenance dredge of copper ore concentrate contaminated river sediments. The volume of material to be removed is estimated to be 5000 cubic yards. As discussed previously, 500 cubic yards of the material has been designated as a dangerous waste (material with a copper concentration greater than 9000 ppm). This material shall be removed from the river by hydraulic dredge. The sediments shall be discharged to a lined diked sedimentation pond on the Port property, to allow settling of the solid material. The return water flow from the pond shall be discharged to the Columbia River as qualified in the Water Quality Modification to the U.S. Army Corps of Engineers Nationwide permit. The solids will be recycled and returned to the export pile for future copper export shipments.

The additional material with copper concentrations between the 1300 and 9000 ppm, approximately 4,500 cubic yards, shall be removed as a conservative measure to limit any impact on the Columbia River environment. This material shall also be dredged from the river by a hydraulic dredge. The material shall be pumped to a Department approved upland sedimentation pond/disposal site on the POV property. The return flow from the pond shall be discharged to the Columbia River as qualified in the Water Quality Modification to the U.S. Army Corps of Engineers Nationwide permit.

Tests have been conducted on the pure copper ore concentrate to ensure that the material to be stored on the upland disposal site on the POV property meets all safety standards. The upland disposal site (in excess of 200 feet from the Columbia River) has been determined to be a safe location for the disposal of these sediments due to the materials limited potential for leaching. The material stored under these conditions should pose only minimal or no risk to human health and the environment.

Once the dredge operation has been completed, verification samples of the river sediments will be collected to ensure that the area of the copper plume with a concentration of greater than 1300 ppm has been removed.

Overall Protection of Human Health and the Environment

This alternative is protective of both human health and the environment in that contaminated river sediments will be removed from the Columbia River. This is especially important for the aquatic environment since copper is highly toxic to aquatic life.

Attainment of Clean-up Standards and Meeting ARARs

There are currently no promulgated standards for cleanup of contaminated sediments. However, this cleanup will meet the standards set for surface water in the Ambient Water Quality standards. Other applicable and relevant or appropriate requirements (ARARs) will be complied with through the approval/permitting process as previously described.

Short-Term Effectiveness

During the dredging process, human health will be protected by restricting site access to all but properly trained personnel. All on-site personnel will be required to comply with applicable federal and state health and safety regulations. Also during the dredging operation, turbidity levels will be monitored and samples of the return flows and dilution zone shall be collected to ensure the protection of the environment.

Long-Term Effectiveness

The dredging of the copper contaminated river sediments will remediate the primary risk that the copper ore currently poses by remaining in the river. All material that has been designated as a dangerous waste shall be removed and recycled as copper ore concentrate. The remaining dredge material is being removed as a protective measure to limit any impacts to the Columbia River environment. Tests have been conducted on the pure copper ore concentrate to ensure that the material to be stored on the upland disposal site on the POV property meets all safety standards. The upland disposal site (in excess of 200 feet from the Columbia River) has been determined to be a safe location for the disposal of these sediments due to the materials limited potential for leaching. The material stored under these conditions should pose only a minimal risk to human health and the environment.

Permanent Reduction of Mobility, Toxicity and Volume Through Treatment

RCW 70.105D.030(1)(b) requires that the Department give preference to "permanent solutions to the maximum extent practicable." Treatment of hazardous substances so that mobility, toxicity, and volume are reduced to acceptable levels is considered a permanent solution. Upland disposal of the remaining dredge material does not meet this goal. However, in this case, the Department has determined that the upland disposal of this material will be an acceptable solution due to the materials limited potential for leaching. The

material stored under these conditions should pose only minimal or no risk to human health or the environment.

Implementability

Hydraulic dredging is a readily available technology which is known to be an effective method for sediment removal. Adequate sampling will be conducted at the completion of the dredging operation to ensure that all contaminated sediments at concentrations above 1300 ppm copper have been removed.

Other Concerns

Public comments and concerns have been addressed throughout the dredge permit process. A Public Notice with opportunity for comment for the U.S. Army Corps of Engineers Section 404 permit application was issued from April 18, 1990 to May 18, 1990. As a requirement to obtain a Hydraulic Project Approval (HPA) from the Department of Fisheries, an Environmental Determination of Nonsignificance was completed April 19, 1990 pursuant to the SEPA Rules (Chapter 197-11, Washington Administrative Code) A 15 day comment period was initiated on April 19, 1990 and concluded on May 4, 1990.

Any additional community concerns will be addressed during the 30 day public comment period of the Enforcement Order.

As stated previously, the material that has been designated as a Dangerous Waste will be recycled and exported in the future as copper ore concentrate.

In-river dredging is expected to commence on or about July 15, 1990. The project shall be completed by August 15, 1990. The schedule of implementation is based on the specifications of the Hydraulic Project Approval.

Prepared by

Pamela B. Marti
Site Manager

Approved

Megan White for
Michael A. Wilson
Southwest Region Supervisor
Toxics Cleanup Program