STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF COMPLIANCE BY PORTAC, INC. AND PORT OF TACOMA Respondents. PROCEEDINGS UNDER CH. 90.48 RCW	Docket No. DE 88-S326 ORDER ON CONSENT

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Exhibit A - Site Location/Boundary Map

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This Order is issued to the Respondents named above by the State of Washington, Department of Ecology (Ecology) pursuant to RCW 90.48.120. By signing this Order, the Port of Tacoma and Portac, Inc. (hereinafter Respondents) consent to its issuance.

I.

INTRODUCTION

The objective of this Order on Consent is to provide for Site stabilization at properties owned and/or operated by Respondents in Tacoma, Washington. The property, located in the Commencement Bay Tideflats Area has historically been used as a log sort yard with an associated lumber mill and pentachlorophenol lumber treatment tank. That property is commonly known as "PORTAC." A portion of the "PORTAC" property, which is used as a log sort yard, has been identified as a source of heavy metals contamination to soils and surface water in Wapato Creek and Blair Waterway. That portion of the "PORTAC" property only as identified in Exhibit A is the "Site" for the purposes of this Order on Consent. The work to be performed by Respondents is an action that will abate metals contamination of Wapato Creek and Blair Waterway by controlling the quality of surface water runoff from the Site. This Order on Consent requires that the Respondents pave the Site, perform groundwater monitoring, and install additional groundwater monitoring wells as outlined in Exhibits B and C.

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II.

JURISDICTION

A. This Consent Order is issued pursuant to the authority vested in the State of Washington, Department of Ecology (Ecology) by ch. 90.48 RCW, the Water Pollution Control Act.

B. On the basis of the results of the testing and analysis described in the Statement of Facts, infra, and Ecology files and records, Ecology has determined that past practices at the Portac log sort yard have given rise to a release of metals into surface water runoff. Ecology has further determined that that release is causing surface water contamination, and that the release will continue to cause contamination of surface water unless the release is abated.

C. The Port of Tacoma and Portac, Inc. (Respondents herein) are persons responsible within the meaning of ch. 90.48 RCW and are strictly liable, jointly and severally, for violations of that statute for purposes of enforcement of this Order.

III.

STIPULATIONS

By the signatures appearing below, Respondents hereby consent and agree to:

1. The issuance of this Order;

2. Perform and comply with Respondents' obligations as specified in this Order;

3. Not to contest or legally challenge the issuance of this Order on Consent and not to appeal said Order pursuant to RCW 43.21B.110.

IV.

SCOPE OF ORDER

The scope of this Order on Consent is limited to mitigation of surface water metals contamination at the Site.

V.

STATEMENT OF FACTS

A. The Port of Tacoma, a municipal corporation, owns the Site.

B. Portac, Inc. leases the Site from the Port of Tacoma and operates a log sort yard on the Site. Portac, Inc. has leased the Site since July, 1978.

C. The Site is situated in the Port of Tacoma Industrial Development District. The Site is landlocked and has an indirect discharge to Blair Waterway via Wapato Creek and Storm Drain Outfall #120 (Drainage map of Commencement Bay - Nearshore/Tideflats Area - Tacoma-Pierce County Health Department).

D. The Site is a 30-acre log yard portion of the Portac, Inc. facility. (See Exhibit A.) The Site was constructed in 1974, adjacent to a new sawmill. The Site has been continuously used since that time. At the time of construction, manufactured gravel

ballast material was used to fill and grade the Site. The ballast was produced from Asarco smelter slag which, in 1974, was considered inert.

E. A remedial investigation conducted by the State of Washington indicates that the ballast materials on the Site can release contaminants which migrate off the Site and enter waters of the state. See: Completion Report of WQIS Project 1 for the Commencement Bay Nearshore/Tideflats Remedial Investigations: Assessment of Log Sort Yards as Metals Sources to Commencement Bay Waterways, November 1983 - June 1984, February 27, 1985.

F. The principal contaminants migrating from the Site are heavy metals, including: Arsenic (As); Copper (Cu); Lead (Pb); and Zinc (Zn). Analysis of soils and ballast materials indicate the presence of these contaminants at unacceptable levels. Elevated levels of these contaminants have been detected in Wapato Creek, downstream of the Site's stormwater discharge points.

G. Wapato Creek is tidally influenced and receives surface and groundwater discharges from numerous other properties near the Site. This Order on Consent does not directly address sediment contamination in Wapato Creek.

H. Based on the above facts, Ecology has determined that action must be taken to abate the release of contaminants to waters of the state.

I. By consenting to this Order, Respondents neither admit nor deny the above Statement of Facts.

VI.

WORK TO BE PERFORMED

This Order on Consent contains a program designed to abate contaminant loading to waters of the state due to a release of contaminants from the Site. The Respondents shall implement the following:

(1) The Respondents shall pave the site as outlined in Exhibit B (with addendum) and specified in Exhibit C (with addendum).

(2) The Respondents shall implement a surface water quality monitoring program as described in Exhibit B (with addendum). Surface water runoff shall not violate ch. 90.48 RCW.

(3) The Respondents shall implement a groundwater monitoring program as described in Exhibit B (with addendum).

(4) The Respondents shall repair any cracks or other failures in the pavement which allow surface water runoff to infiltrate the bark/slag surficial fill. These repairs shall be completed in a timely manner. The Respondents shall conduct inspections on a monthly basis for the first year following completion of the paving project. Inspections shall be conducted on a quarterly basis after

the first year. A log book shall be kept to record these inspections and shall be signed by the person(s) conducting them.

(5) The Respondents shall coordinate construction activities with Ecology. The Respondents shall not pave those portions of the central drainage ditch which have been contaminated with pentachlorophenol and/or polynuclear aromatic hydrocarbons (PAHs) until Respondents receive written approval to do so from Ecology.

The overall program is set forth in Exhibit B, the Remediation Plan, and shall be augmented by Exhibit C (Portac Log Sort Yard Paving Project-Plans and Specifications). Exhibits B and C are integral and enforceable parts of this Order on Consent.

VII.

ECOLOGY NOT BOUND TO ACT

Any conduct by Ecology described herein by means of the words "will," "may," "shall," etc., does not create a promise, undertaking, or any legal duty on the part of Ecology. Instead, any such expressions indicating an act or omission contemplated on the part of Ecology shall operate at most, and only if legally appropriate, as a condition precedent to a duty of Respondents to perform some act or to refrain from acting as appropriate under the terms of this Order.

VIII.

JUDICIAL REVIEW

This is an Administrative Order on Consent, and is subject to review only on the commencement of judicial proceedings by Ecology which prays for relief in the form of:

A. Specific enforcement of this Order.

B. A declaratory judgment action.

C. Civil sanctions provided by the Stipulated Penalties Section.

Respondents may petition the Superior Court for a declaratory judgment regarding Ecology's final decisions pursuant to Dispute Resolution, Section XVI.

Except for a factual determination of whether a violation of this Order has occurred resulting in a stipulated penalty, review of any Ecology decision is strictly limited to an arbitrary and capricious standard.

IX.

DESIGNATED PROJECT COORDINATORS

Ecology and Respondents shall each designate a project coordinator. By agreement between the Port of Tacoma and Portac, Inc., the Port of Tacoma will take the lead in coordinating with Ecology. By agreement, the project coordinator is acting on behalf of both Portac, Inc. and the Port of Tacoma in oversight, design and implementation, and post-construction monitoring of the work

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addressing metals contamination from use of slag ballast. Each project coordinator shall be responsible for overseeing the implementation of this Order on Consent. The Ecology project coordinator will be Ecology's designated representative at the Site. To the maximum extent possible, communications between Ecology, and Respondents' project coordinator, and all documents, including reports, approvals and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order on Consent, shall be directed through the project coordinators. The project coordinators may designate working level staff contacts for all or portions of the remedial plan implementation. Either the Respondents or Ecology may change its respective project coordinator. To the extent possible, notification shall be given to the other party, in writing, at least ten (10) calendar days prior to the change.

X.

PERFORMANCE

All construction work performed pursuant to this Order on Consent shall be under the direction and supervision, as necessary, of a qualified professional engineer, biologist, environmental professional, and certified hydrogeologist, or equivalent, with experience and expertise in contaminated Site investigation and cleanup, and such supervisor may be Respondents' project coordinator. Ecology shall have the right to approve such

supervisor, which consent shall not be unreasonably withheld. The Respondents' project coordinator shall inform Ecology as to the identity of such professional(s) and of the principal contractors and subcontractors to be used in carrying out the terms of the Order on Consent in advance of their involvement at the Site where possible.

XI.

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 implementing or enforcing the work to be performed, including inter alia: inspection records, operation logs, and contracts related to the Site; 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 Respondents. The Respondents shall allow such persons to inspect and copy all records, files, photographs, documents, and other writing including all sampling and monitoring data, in any way pertaining to work undertaken pursuant to this Order. All parties with access to this Site pursuant to this action shall comply with applicable health and safety regulations. The Respondents

shall have the right to accompany any Ecology employees or representatives at the Site. Unavailability or unwillingness to accompany Ecology employees or representatives shall not preclude access. To the extent possible and without limitation on its discretion, Ecology shall endeavor to consult with Respondents' project coordinator prior to entering and moving about the Site.

XII.

SAMPLING, DATA REPORTING AND AVAILABILITY

The Respondents' project coordinator shall submit reports summarizing the data for requirements cited in Section XII to the Southwest Regional Office of Ecology.

The Respondents' project coordinator shall make the results of all sampling and/or tests or other data generated by Respondents, or on Respondents' behalf, with respect to the implementation of this Order on Consent, available to Ecology and shall submit these results in progress reports as described in Section XII of this Order on Consent. Ecology will make available to Respondents' project coordinator the results of any sampling and/or tests or other data similarly generated by Ecology.

At the request of Ecology, Respondents shall allow split or duplicate samples to be taken by Ecology and/or its authorized representatives, or any samples collected by the Respondents pursuant to the implementation of this Order on Consent. The

Respondents shall notify Ecology not less than forty-eight (48) hours in advance of any sample collection activity.

XIII.

PROGRESS REPORTS

The Respondents shall submit to Ecology written progress reports for each 30-day period of the paving project. The first 30-day period shall begin upon award of the contract. The progress reports shall be submitted within ten (10) days of the end of the reporting period. A final summary report shall be submitted within fifteen (15) days of the completion of the paving project. The progress reports shall include a detailed statement of the manner and extent to which the requirement and time schedules set out in the Order are being met. Unless otherwise specified, progress reports and any other documents submitted pursuant to this Order shall be sent by certified mail, return receipt requested, and addressed to:

Scott Morrison
Department of Ecology
Southwest Regional Office
7272 Cleanwater Lane, LU-11
Olympia, Washington 98504-6811

XIV.

CONFIDENTIAL INFORMATION

The Respondents may assert that documents or information provided pursuant to this Order are confidential, if appropriate, pursuant to RCW 43.21A.160. Such an assertion may be adequately

substantiated when the confidentiality claim is made. Analytical data shall not be claimed as confidential by the Respondents.

Information determined to be confidential by Ecology will be afforded the protection specified by law. If no such claim accompanies the information when it is submitted to Ecology, it may be made available to the public by Ecology without further notice to the Respondents.

XV.

RETENTION OF RECORDS

The Respondents shall preserve, during the pendency of this Order and for ten (10) years thereafter, all records, reports, documents, and underlying data in its possession relevant to the implementation of this Order and shall insert in contracts with project contractors a similar record retention requirement. Upon request of Ecology, Respondents shall make all non-archived records available to Ecology and allow access for review. All archived records shall be made available to Ecology within a reasonable period of time.

XVI.

TRANSFER OF INTEREST IN PROPERTY

The Port of Tacoma will include in any conveyance of an interest in the property, including a lease-hold interest, notification to the transferee of the fact and contents of this Order.

XVII.

RESOLUTION OF DISPUTES

If Respondents object to any Ecology disapproval, proposed modification, or decision made pursuant to this Order on Consent, they shall notify Ecology in writing of their objections within fourteen (14) calendar days of receipt of such notice. Thereafter, the parties shall confer in an effort to resolve the dispute. If agreement cannot be reached on the dispute within fourteen (14) calendar days after receipt by Ecology of such objections, Ecology shall promptly provide a written statement of its decision to Respondents.

If Ecology's final written decision is unacceptable to Respondents, Respondents have the right, subject to the limitations set out in Section VII, Judicial Review, to submit the dispute to a Superior Court for resolution. Ecology reserves the right to seek specific enforcement of this Order. The parties agree that one judge should retain jurisdiction over this case and shall, as necessary, resolve disputes arising under this Order pursuant to the Judicial Review section. The parties agree that this is an administrative regulatory Order on Consent. In the event Respondents present a dispute to the Court for review, the Court shall review the action or decision of Ecology on the basis of whether such action or decision was arbitrary and capricious and render a decision based on such standard of review. Ecology and

Respondents agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used.

Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Order, unless Ecology agrees in writing to a schedule extension or the Court so orders. Where either party utilizes the dispute resolution in bad faith or for purposes of delay, the other party may seek sanctions.

XVIII.

ENDANGERMENT

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 Respondents to stop further implementation of this Order for such period of time as needed to abate the danger or may petition the Court for an order as appropriate. During any stoppage of work under this part, Respondents' obligations with respect to the work ordered to be stopped shall be suspended and the time periods for performance of that work, as well as the time period for any other work dependent upon the work which is stopped, shall be extended,

pursuant to Section XVIII of this Order, for such period of time as Ecology determines is reasonable under the circumstances.

In the event Respondents determine that activities undertaken in furtherance of this Order or any other circumstances or activities are creating an imminent and substantial endangerment to the people on the Site or in the surrounding area or to the environment, Respondents may stop implementation of this Order for such periods of time necessary for Ecology to evaluate the situation and determine whether the Respondents should proceed with implementation of the Order or whether the work stoppage should be continued until the danger is abated. The Respondents shall notify either Ecology field personnel on-site or the project manager as soon as is possible, but no later than twenty-four (24) hours after such stoppage of work, and provide Ecology with documentation of its analysis in reaching this determination. If Ecology disagrees with Respondents' determination, it may order Respondents to resume implementation of this Order. If Ecology concurs in the work stoppage, Respondents' obligations shall be suspended and the time periods for performance of that work, as well as the time period for any other work dependent upon the work which was stopped, shall be extended, pursuant to Section XVIII of this Order, for such period of time as Ecology determines is reasonable under the circumstances. Any disagreement pursuant to this clause shall be resolved through the dispute resolution procedures.

XIX.

EXTENSION OF SCHEDULES

A. An extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion and good cause exists for granting the extension. All extensions shall be requested jointly by the Respondents in writing. The request shall specify the reason(s) the extension is needed. A requested extension shall not be effective until approved by Ecology. Ecology shall act upon any written request for extension in a timely fashion. It shall not be necessary to formally amend this Order when a schedule extension is granted.

B. The burden shall be on Respondents to demonstrate to the satisfaction of Ecology that the request for such extension has been submitted in a timely fashion and that good cause exists for granting the extension. Good cause includes, but is not limited to, the following:

(1) Circumstances beyond the reasonable control and despite the due diligence of the Respondents including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by the Respondents; or

(2) Acts of God, including fire, flood, blizzard, extreme temperatures, storm, wave or water conditions, or other unavoidable casualty; or

(3) Endangerment as described in Section XVII.

However, neither increased costs of performance of the terms of the Order nor changed economic circumstances shall be considered circumstances beyond the reasonable control of the Respondents.

C. In addition, Ecology may extend the time schedules contained in the Order if an extension is needed as a result of:

(1) Delays in the issuance of a necessary permit which was timely applied for; or

(2) Judicial review of the issuance, non-issuance, or reissuance of a necessary permit; or

(3) Other circumstances deemed exceptional or extraordinary by Ecology.

Ecology shall give Respondents written notice in a timely fashion of any extensions granted pursuant to the Order.

XX.

AMENDMENT OF ORDER ON CONSENT

A. This Order may only be amended by a written stipulation between Respondents and Ecology. Agreement to amend shall not be unreasonably withheld by any party to the Order.

B. If Respondents wish to initiate an amendment, the Respondents shall jointly submit any request for modifications to the work to be performed or project schedule to Ecology for approval. The parties shall, within ten (10) working days of the submittal, meet to discuss the proposed modification. Ecology

shall indicate its approval or disapproval of the proposed modification in a timely manner after such meeting. Reasons for any disapproval shall be stated in writing. If the Respondents disagree with Ecology's final position, the disagreement may be addressed through the dispute resolution procedures described in Section XVI of this Order.

C. Any proposed modification of this Order on Consent which materially expands the scope of work to be performed as described in Exhibit B shall not be initiated pursuant to this paragraph. Such a modification is beyond the scope of this Order.

D. No guidance, suggestions, or comments by Ecology will be construed as relieving Respondents of their obligation to obtain formal approval as may be required by this Order. No verbal communication by Ecology shall relieve Respondents of the obligation specified herein.

E. If Ecology wishes to initiate an amendment, Ecology shall notify Respondents in writing of any Ecology proposal for modifications to the work to be performed or project schedule and the basis for such proposal. The Respondents may thereafter request a meeting to discuss the proposed modifications. Any such meeting will be held within ten (10) working days of the request. If after such a meeting Ecology affirms the modifications, the Respondents shall thereafter comply with such modifications, or if it does not agree with those modifications, the disagreement shall

be addressed through the dispute resolution procedures described in Section XVI of this Order.

XXI.

STIPULATED PENALTIES

In the event that Respondents fail to make a submittal to Ecology in accordance with this Order or comply with any time schedule approved in writing by Ecology pursuant to this Order, or otherwise fail to comply with this Order, Respondents stipulate they shall be strictly, jointly, and severally liable to pay a civil penalty into an account of the State of Washington designated by Ecology in an amount of one thousand dollars ($1,000) per day, up to a maximum amount of $25,000. Any penalty shall accrue from the date Ecology provides written notice to Respondents that an alleged violation of the Order on Consent has occurred.

Upon determination by Ecology that Respondents failed to make a submittal referenced herein or otherwise failed to comply with this Order, Ecology shall give written notice to Respondents of the alleged failure. Said notice shall specify the provision(s) of the Order which Ecology believes had (have) not been complied with and shall state the amount of the penalty assessed.

The Respondents agree to not appeal said penalties pursuant to RCW 43.21B.110 but may petition the Court for a declaratory judgment of whether a violation in fact has occurred.

XXII.

INDEMNIFICATION

Insofar as the Constitution and the laws of the State of Washington allow, Respondents agree to indemnify and save and hold Ecology, its agents, employees, and contractors, harmless from any and all claims or causes of action arising from, or on account of, acts or omissions of Respondents, its officers, employees, agents, or contractors in entering into and implementing this Order; provided, however, that Respondents shall not indemnify Ecology, nor save or hold its employees, contractors, and agents, harmless from any claims or causes of action arising out of the negligent acts or omissions of Ecology, or the employees, and contractors, and agents of Ecology, in implementing the activities pursuant to this Order.

XXIII.

OTHER ACTIONS

Ecology reserves its rights to institute remedial action(s) at the Site pursuant to ch. 70.105B RCW and subsequently pursue cost recovery, and Ecology reserves its rights to issue orders and/or penalties pursuant to available statutory authority under the following circumstances:

1. Where Respondents fail to adhere to any requirement of this Order;

2. In the event or upon the discovery of a release or threatened release not addressed by this Order;

3. Upon Ecology's determination that action beyond the terms of this Order is necessary to abate an emergency situation which threatens the public health or welfare or the environment; or

4. Upon the occurrence or discovery of a situation beyond the scope of this Order as to which Ecology would be empowered to perform any remedial action or to issue an order and/or penalty, or to take any other enforcement action. This Order is limited in scope to the precise geographic Site described in Exhibit A and to the stormwater runoff problem defined herein.

5. Should the groundwater monitoring to be conducted by Respondents indicate a release or threatened release of hazardous substances from the Site, Ecology may invoke the provisions of ch. 70.105B RCW.

XXIV.

COMPLIANCE WITH APPLICABLE LAWS

All actions carried out by Respondents pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits.

XXV.

CLAIMS AGAINST THE STATE

The Respondents hereby agree that they will not seek to recover any costs accrued in implementing the work to be performed under this Order against the State of Washington or any of its agencies pursuant to any state or federal statute or other law or equity.

XXVI.

NO ADMISSION OF LIABILITY

Respondents neither admit not deny Ecology's allegations in this Order; and Respondents neither admit nor deny liability under ch. 90.48 RCW.

XXVII.

EFFECTIVE DATE

This Order is effective upon the date it is executed by Ecology and Respondents.

The undersigned approve this Order and represent that they have authority to bind the parties they represent.

APPROVED BY:

FOR THE PORT OF TACOMA

By _____
Port Commissioner/President

Date 9/22/88

FOR STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Greg Sorlie

Date 9/21/88

By _____
Port Commissioner, Secretary

Date 9/27/88

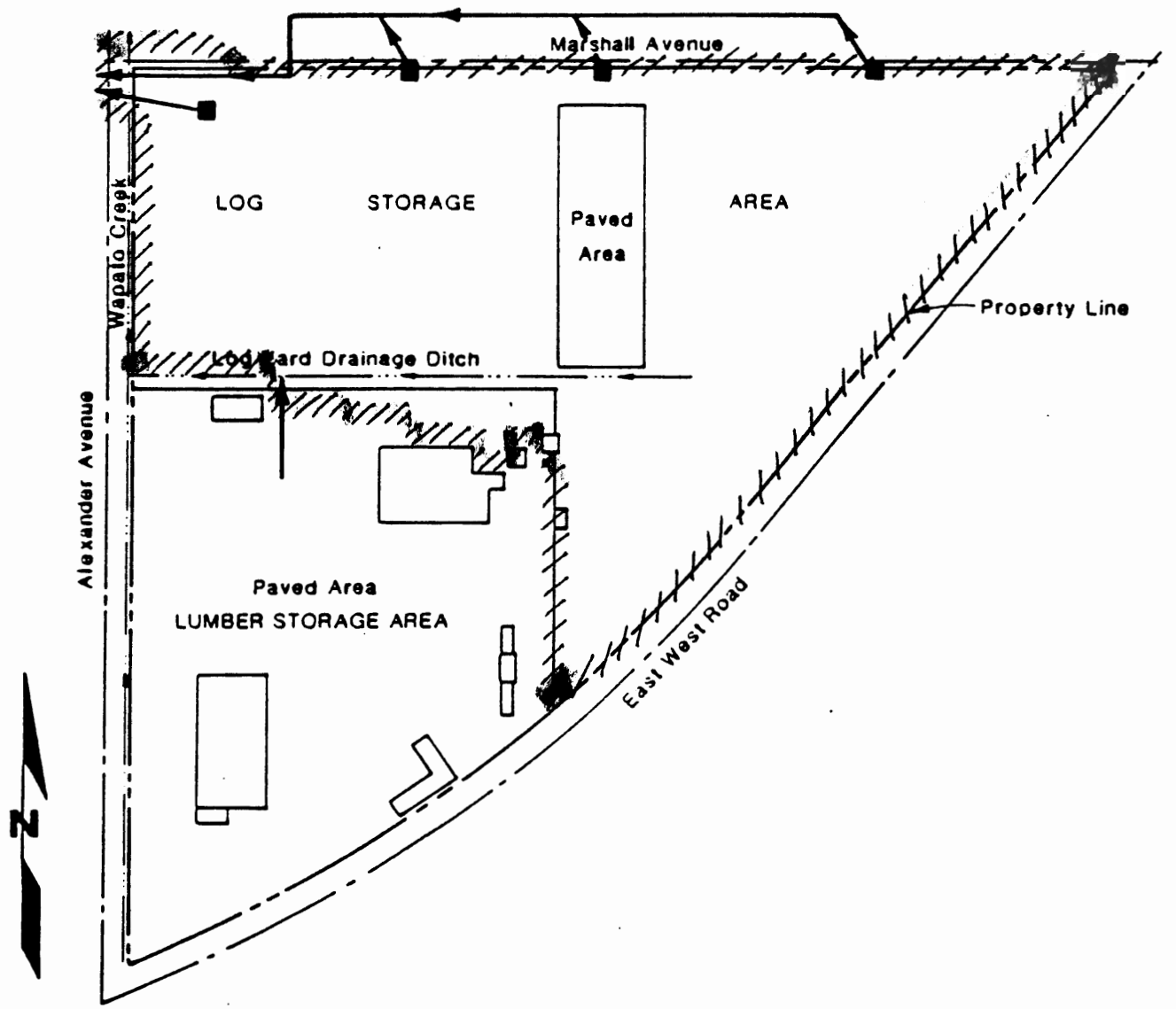
PORTAC, Inc.

By _____

Date September 21, 1988

SITE MAP

EXHIBIT A*



Project Boundary (approximate)

Surface Drainage

Subsurface Drainage

Catch Basin

PT057469

(Modified from Hart Crowser)

* for addtional detail, refer to:
Exhibit C - Sheet 2 of 20

0 400 800

Scale in Feet

HARTCROWSER

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SEPTEMBER 14, 1988-ADDENDUM 1 TO EXHIBIT B
VOLUME I, REMEDIATION PLAN JUNE 17, 1988
PORTAC LOG SORT YARD
PORT OF TACOMA, WASHINGTON

This document amends and adds to Volume I of the June 17, 1988 Remediation Plan for the Portac Log Sort Yard. This addendum together with Volume I and Volume II of the Remediation Plan constitute Exhibit B. Additional material is divided into the following areas:

- Engineering
- Geohydrology
- Cleanup Goals and Performance Standards
- Text Revisions

ENGINEERING

Pavement Thickness

In our preliminary analysis of pavement thickness, we estimated the required concrete thickness to be 14 to 19 inches thick. Final design pavement thickness is within this range of estimated thickness.

Settling and Bearing Capacity

The organic content of the surficial material (upper 1 to four feet) is 50% or greater. As of September 1987, the on-site quantity of organic material was estimated at 20,000 tons. Organic material provides marginal support for the pavement. Design is based on the actual elastic properties of organic material as measured by field results. The pavement is of sufficient strength to compensate for marginal support.

Methane Gas

One result of decomposition of the wood waste may be generation of methane gas. Methane gas of itself is not a potential hazard unless it is generated faster than it dissipates and accumulates in an area accessible to people. If methane does accumulate, it may then present an explosion or confined space entry hazard for personnel. The concern is not the generation of methane gas, but the accumulation of the gas.

The design of the Portac paving presents several possible zones of accumulation:

- o beneath the pavement slab
- o within the sewer pipe
- o within catch basins
- o within the spill containment vessel

Accumulation of methane gas beneath the pavement slab or in the sewer pipe is not a hazard because these areas are inaccessible to people. In

addition, the sewer pipe will be installed below the gas generating wood waste so will not likely collect methane (which is lighter than air and thus tends to rise). For similar reasons, the catch basins do not present a significant methane gas hazard.

It is not expected that methane gas will accumulate in the spill containment vessels. However, the spill containment vessels are closed containers below ground. Oxygen content may be low or hazardous vapors may be present within the vessel. Therefore, only personnel trained in confined space entry and properly equipped will enter the vessel.

Storm Drain System Design

The surface water collection system was designed for a 25-year, 24-hour storm event. The system is designed to address potential for water quality impacts from operations and must meet requirements of the pending NPDES permit application.

Coordination with Pentachlorophenol Contamination

To coordinate with the cleanup of the pentachlorophenol contamination, paving construction will be set back 25 feet from the centerline of the central drainage ditch as indicated on Sheet 3 of the construction drawings (Exhibit C of the Consent Order). The drainage line from the area of current wood treatment activities will not be hooked up to the new drainage system until establishment of suitable effluent guidelines for the current wood treatment discharges.

GEOHYDROLOGY

The geohydrology of the PORTAC site is presented in a report dated April 24, 1987 entitled Groundwater Assessment PORTAC Log Yard (Appendix E, Remediation Plan, Volume II) and in a follow-up summary presented as Appendix G are Volume II of the Remediation Plan. Some of the data and analyses is rediscussed below to provide additional back-up information and clarify some of the evaluations presented in those reports. Data sources referenced below are included in the Remediation Plan for the PORTAC Log Yard dated June 17, 1988. A timetable for the site sampling is attached as Table 2.

Also discussed below is the groundwater monitoring program that will be conducted following the site paving. This monitoring plan will be supplemental to the plan presented in Appendix H, Section 3.0.

Groundwater occurs as a shallow unconfined system at the Portac site. The water table is encountered in the native and dredge silts which underlie the site, at depths of roughly 6 to 13 feet. The occurrence and depth to groundwater was determined from test pits excavated in July 1986 (Appendix B, Figures 5 through 7) and from borings drilled in March 1987 (Appendix E, A-2 through A-7). In the 1986 test pits some interstitial water was observed within the bark and slag fill layer in 2 of the 11 test pits. An additional 23 test pits were excavated in April 1988 to observe the nature and thickness of the slag and bark fill. Of these, 8 were observed to have small amounts of water in the slag fill layer at depths of 1 to 3 feet.

Groundwater versus Surface Water

Surface water is defined as overland flow and shallow subsurface storm flow. Groundwater is considered to be saturated soils below the water table. Groundwater flow and surface water flow are the two potential pathways for metals migration from the site to Wapato Creek. Our observations from the site investigations indicate that precipitation falling on the Portac site either runs off the site and discharges to

surface water or slowly infiltrates to the water table. See Figure 1 attached.

Surface water runoff is discussed in Appendix E, pg. 5 and in the Site Remediation Plan, Volume I, pg. 30. Because of the thick bark mat which occurs over much of the site, all runoff does not directly flow overland. Some of it flows to shallow subsurface drains located throughout the log yard area that collect water released from the bark and discharge this water to storm drains and the central ditch. Our studies have considered this very shallow water to be surface water as it is well above the saturated zone, and occurs only intermittently as shallow underground pipes drain and direct it to surface water discharge points. No monitoring wells have been constructed to date in the shallow bark/slag fill material (at interface with the underlying silts) because these wells would have generally been dry. Paving of the site will cut off precipitation infiltration, eliminating the shallow subsurface runoff. Within a short period of time any residual water occurring in small, isolated pockets within this shallow fill zone will be gone.

Groundwater flow is discussed in the Appendix E report, pg. 8. The groundwater flows predominately westward as shown in Appendix E, Figure 3. The groundwater flow direction is based on water level data collected from 6 on-site monitoring wells. To date, over 9 months of water level data have been collected. These data are presented in the attached Table 1. The water level monitoring data indicates only minor changes in the flow pattern with seasonal fluctuations. The attached Figure 2 presents the April 1987 data from Appendix E Figure 3, the high groundwater level (April 6, 1988), and the low water level (August 1, 1988) obtained during the 9-month monitoring period.

Groundwater Fluctuations

The monitoring data collected to date in the PORTAC wells are used with other data in the area to assess the groundwater fluctuations. Seasonal and tidal fluctuations indicate the range in groundwater conditions which could occur at the site. Of particular interest is whether water levels could rise into the slag layer, and if so, how often and for how long. We have made a reasonable estimate of expected fluctuations under normal conditions based on existing information. This is presented in Appendix E, pgs. 7 and 8 based on data collected through the April 1987, and in Appendix G based on data collected through May 1988. We now have data collected through September 1988 as shown in Table 1. A summary of the expected fluctuations and clarification of data sources for previous estimates is discussed below.

A study of the tidal fluctuation was accomplished on April 15th and 16th 1988. The data indicate that only well B-5 responds to tidal fluctuations which occur in Wapato Creek. The other wells do not respond to the tides presumably due to the low soil permeability and/or distance from Wapato Creek. Well B-5 showed a maximum tidal fluctuation of 1.5 feet. The data are presented in Appendix G, pg. G-5 and in Figure G-5.

Seasonal fluctuations are estimated to be a maximum of 4 to 5 feet with the low occurring during late summer/early fall and the high occurring in early spring. This estimate is based on the following data:

- Table 1 which presents actual site data for the Spring of 1987 and Spring through Fall of 1988. The maximum observed fluctuation in the wells unaffected by tides is 2 feet. The highest water level is in March or April and the lowest is in August and September. Precipitation data are not yet available for Tacoma but data from the SeaTac weather station indicate that March and April of 1987 were +1.94 and +0.21 inches, respectively, above the normal rainfall for these months, while April 1988 was +0.8 inches above normal. July and August

1988 are -0.23 and -0.99 inches below normal. A comparison of the precipitation data with the monitoring data indicates the water level data collected to date can be used to reasonably estimate seasonal fluctuations.

- Hart Crowser has performed or reviewed water level monitoring in wells which tap the water table aquifer in similar silty soils in the Port of Tacoma area. At the Pennwalt Tacoma Plant monitoring data collected in the summer and fall of 1981 and again from January through September 1986 indicated a maximum fluctuation in the shallowmost wells (unaffected by tides) of 3.5 feet. The highest water levels were observed in the winter and the lowest in the late summer/early fall. At the Reichold plant in Tacoma, 12-month data collected in 1987 indicate the seasonal water table fluctuation is 3 feet with a similar high and low level period.

- In general, seasonal water level fluctuations are moderated in a hydrologic environment such as the Port area because it lies in a groundwater discharge area and is surrounded by surface water bodies largely unaffected by seasonal variations.

The water level fluctuations were used to assess whether the water levels will rise into the slag. Because the ground surface, slag occurrence, and groundwater levels vary across the site it was necessary to compare elevation data at various points across the site. Our analyses of the base of slag elevation and the water level elevation are presented in detail in Appendix F. Figure 3 (attached) presents a plan of the site showing the thickness of the unsaturated soil between the bottom of the slag and the water table using 4/87 data which is close to the high water level.

Based on our estimated maximum fluctuation of 4 to 5 feet and the reasonable assumption that the April 1987 data are close to the high level, it still appears unlikely that the groundwater level will rise into the slag. Even a 2-foot higher water level than the highest recorded to date

will leave at least 1 foot of unsaturated conditions between the bottom of the slag and the water table (as can be seen from Figure 3).

Metals Discharge to Wapato Creek

Metal loadings from groundwater were compared to metal loadings from surface water because Wapato Creek acts as the common receptor. These data were compared to determine if it was appropriate for the remedial action to focus predominantly on surface water. There was no intention of directly relating (in time and space) the surface water and groundwater samplings. We have no data to assess whether the metals leaching has decreased since the study conducted by Ecology (Appendix A). It is conservative to assume that it has not.

The analysis of the discharge rates and metal loading to the Creek from the groundwater system was referred to as conservative for the reasons presented with the analysis discussion on pg. 11 of Appendix E. Specifically, these are:

- The hydraulic conductivity value used was for a silty sand (5×10^{-3} cm/sec) when the more common soil at the site is a sandy to clayey silt (10^{-4} to 10^{-6} cm/sec); and

- The average and highest metal concentrations were used when the majority of the wells had levels below detection limits.

Groundwater discharge and metal loading calculations are attached for a matter of record (Attachment A). These calculations present the average conditions and the extreme deviations from average. These calculations are based on the updated permeability estimates and additional water quality sampling presented in Appendix G. The average conditions presented in these calculations indicate a discharge to the creek of 56 gals/day and an arsenic loading of 8×10^{-5} lbs/day. The difference between this estimate and the original estimate of 100 gals/day and 10^{-4} to 10^{-5} lbs/day is within the variability of the data.

Groundwater Monitoring Plan

This groundwater monitoring plan is supplemental to the plan presented in Appendix H, Section 3.0. Paving the site is designed to keep water out of the slag thus controlling the source and protecting the groundwater from any additional metal leaching. Water level monitoring and water quality sampling will be conducted following paving to verify that metal concentrations in the groundwater do not worsen as a result of paving.

As discussed in Appendix H, groundwater monitoring will be conducted in 6 wells at the site. If the existing wells are damaged during construction, a new well will be installed in approximately the same location.

In addition to the existing wells we will install two shallow wells to the bottom of the slag layer (just above the interface of the slag and underlying silt) to verify our assessment that groundwater does not occur within this layer. These wells will be located in the vicinity of the existing B-1 and B-3.

Groundwater quality sampling will be conducted biannually for two additional years beyond the planned first year of monitoring to verify that the metal concentrations in the groundwater do not worsen. The groundwater will be sampled for arsenic, copper, zinc, and lead during the high water level period (February or March) and low water level period (September) for three successive years. This amounts to a total of six sampling events following the site paving.

The new shallow wells will be sampled if water can be measured in the well. The well will be purged once prior to sampling. If the purging drys the well we will return monthly to determine if additional water has entered the well. A sample will be obtained without purging, the next time water can be measured in the well. An assessment of the water source will be conducted when any water is indicated in the well.

Monthly water level monitoring will continue through March 1989 so that a complete water year of data is obtained. Following that the well water levels will be measured at the time of the sampling. This will provide useful information to compare the high and low water levels with the previous years.

The methods, analysis, and QA/QC will be as presented in Appendix H.

CLEANUP GOALS AND PERFORMANCE STANDARDS

The proposed remedial action is to mitigate surface water metals contamination at the site. The remedial action will also serve as a source control protecting groundwater by preventing surface water infiltration and associated mobilization of metals. Post-construction monitoring of both surface and groundwater are proposed.

Following paving of the site, surface water quality will be monitored and will meet conditions of the required NPDES permit. The NPDES permit will cover two aspects of the project: 1. The effectiveness of the remedial action in abating release of metals to surface waters; and 2. The quality of surface water runoff as impacted by future operation of the log storage sort yard following paving of the project. An NPDES permit application has been made.

Groundwater monitoring must show no increase in metals contaminations following paving. Groundwater will be monitored for three years following paving. The performance goal is that no statistically significant increase in metals (As, Pb, Zn, Cu) will occur. Groundwater quality is expected to improve over time

TEXT REVISIONS

1. Section 2.1 should read "Site Setting" instead of "Site Settling".

2. Change the first sentence of Section 2.3 to read: "In our opinion, the Hart Crowser studies showed that the major contamination migration pathway for metals was through surface runoff."

3. Section 2.3, Introduction, should be amended to read "Refer to expanded discussion of environmental concerns in Section 4.2".

TABLE 1 - GROUNDWATER AND SURFACE WATER ELEVATIONS

Water Elevation in Feet (Port of Tacoma Datum: Mean Low Low Water)

STATION	B-1 (B-1R)	B-2	B-3 (B-3R)	B-4	B-5	B-6 (B-6R)	DDW	DDC	DDE	WAPATO
MEASURE PT ELEV. (*)	21.43 (21.12)	21.44	23.93 (24.32)	23.51	24.35	22.39 (22.13)	15.55	16.60	18.75	10.94
DATE OF MEASUREMENT:										
3/20/87	13.63	13.74	15.63	14.81	9.15	12.89	--	--	--	--
3/24/87	13.23	13.74	15.43	14.51	9.85	12.79	14.90	14.90	--	--
4/02/87	13.23	13.64	15.73	14.21	8.85	12.69	--	--	--	--
4/07/87	13.13	13.64	15.43	14.21	8.85	12.59	14.70	14.90	--	--
3/01/88	13.09	13.53	15.25	13.87	10.03	12.31	--	--	--	--
4/06/88	13.23	13.98	15.51	15.16	10.83	12.59	--	--	--	--
4/11/88	12.92	13.94	15.47	14.76	9.05	12.53	--	--	--	--
4/15/88	12.83	13.81	15.41	14.46	9.18	12.50	15.01	15.69	15.68	5.84
5/11/88	12.45	13.40	15.29	14.20	8.88	12.31	14.60	15.25	16.89	5.37
6/23/88	12.34	13.68	15.54	13.73	8.50	12.21	14.60	15.25	16.82	5.85
7/06/88	12.34	13.34	15.00	13.51	8.61	12.12	14.60	15.25	16.63	5.22
8/01/88	12.22	13.62	14.85	13.23	9.07	12.12	DRY	13.70	DRY	5.22
9/06/88	11.99	13.26	14.61	13.10	10.47	12.61	DRY	15.04	DRY	--

(*) Elevation reference point is top of PVC casing in monitoring wells and survey markers at surface water stations.

(21.34) Elevations for replacement wells 1R, 3R, and 6R installed near the original wells on 5/4/88.

Original wells were abandoned by pressure grouting due to poor condition.

DDW - Drainage Ditch West

DDC - Drainage Ditch Central

DDE - Drainage Ditch East

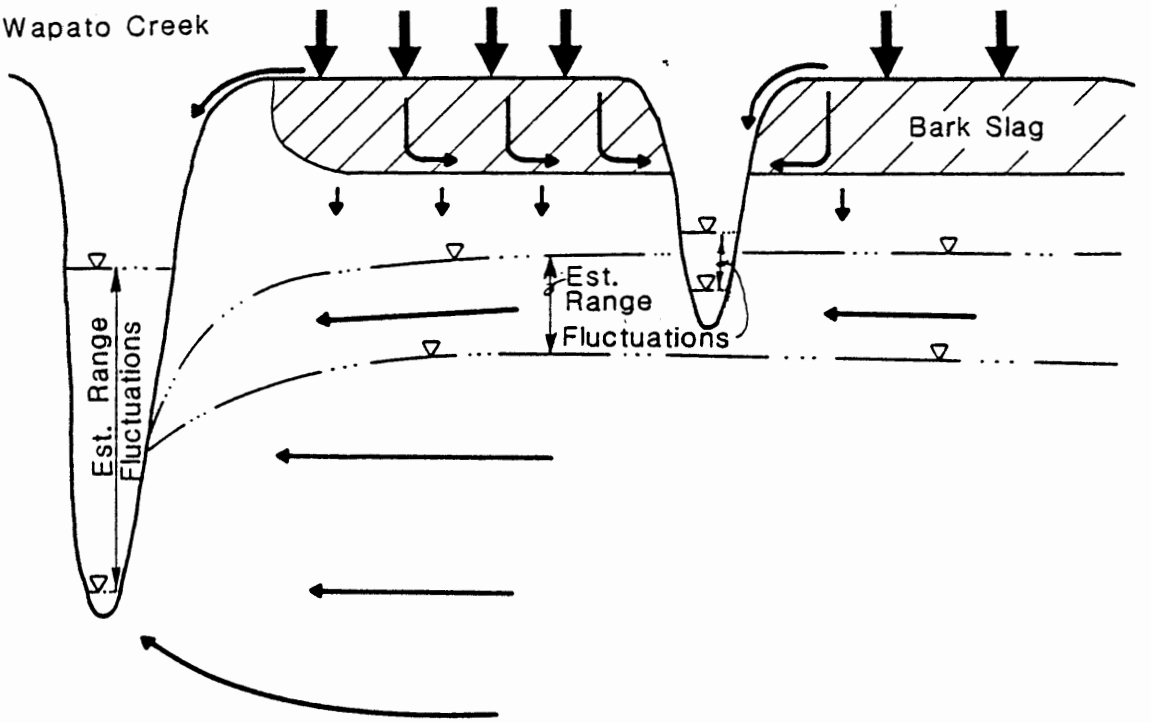
WAPATO - Wapato Creek, northwest of site

Table 2 - Time Table of Site Sampling

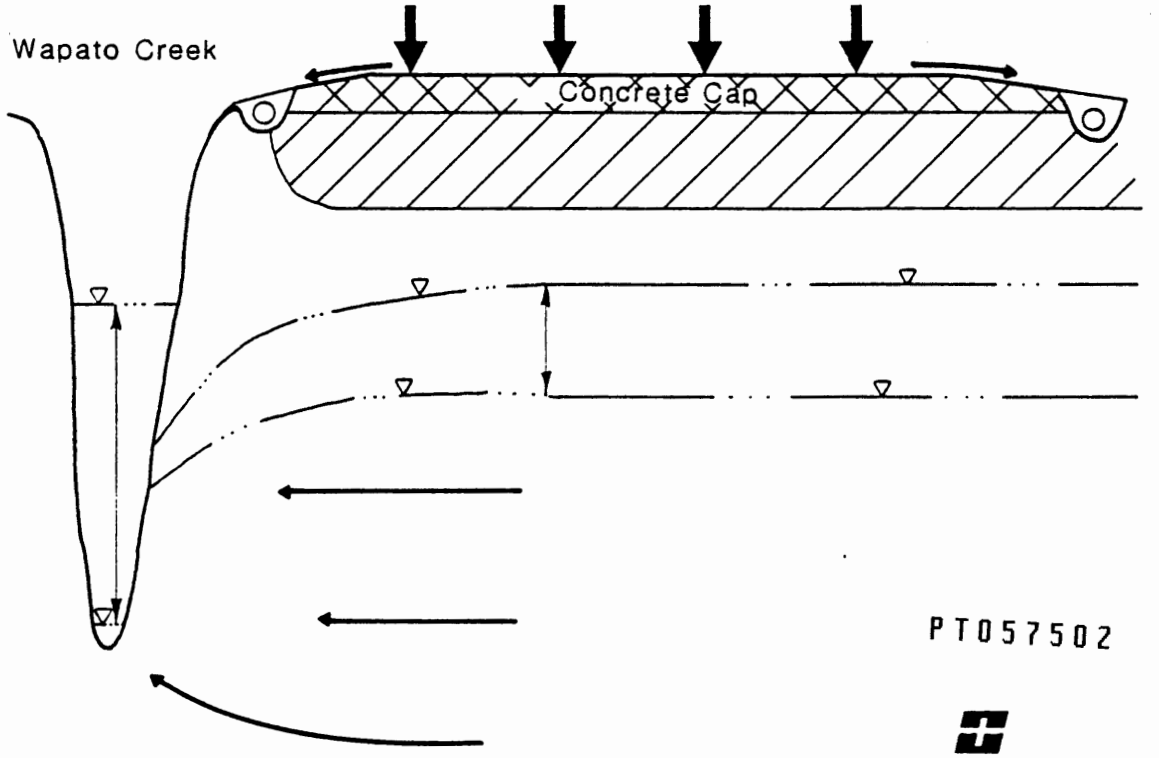
Sample Date	Sampling Party	Sample Type	Type of Chemical Tests for Metals
11/83	Ecology	Surface Water Runoff	Total Metals (As, Zn, Cu, Pb, Ni, Sb, Cd)
12/83	Ecology	Surface Water Runoff	Total Metals (As, Zn, Cu, Pb, Ni, Sb, Cd)
3/84	Ecology	Surface Water Runoff	Total Metals (As, Zn, Cu, Pb, Ni, Sb, Cd)
4/84	Ecology	Surface Water Runoff	Total Metals (As, Zn, Cu, Pb, Ni, Sb, Cd)
5/84	Ecology	Surface Water Runoff	Total Metals (As, Zn, Cu, Pb, Ni, Sb, Cd)
5/84	Ecology	Wapato Creek Water	Total Metals (As, Zn, Cu, Pb, Ni, Sb, Cd)
6/84	Ecology	Wapato Creek Water	Total Metals (As, Zn, Cu, Pb, Ni, Sb, Cd)
7/86	Hart Crowser	Portac Site Slag, Bark, and Soil	E.P. Toxicity (As, Zn, Cu, Pb)
3/87	Hart Crowser	Portac Site Slag, Bark, and Soil	E.P. Toxicity (As, Zn, Cu, Pb)
3/87	Hart Crowser	Portac Site Groundwater	Dissolved Metals (As, Zn, Cu, Pb)
9/87	Hart Crowser	Portac Site Slag & Bark	E.P. Toxicity (As, Zn, Cu, Pb)
2/88	Hart Crowser	Portac Site Slag & Bark	Total Metals (As, Zn, Cu, Pb)
5/88	Hart Crowser	Portac Site Groundwater	Dissolved Metals (As, Zn, Cu, Pb)

Conceptual Diagram of Hydrologic System

Before Paving



After Paving



PT057502

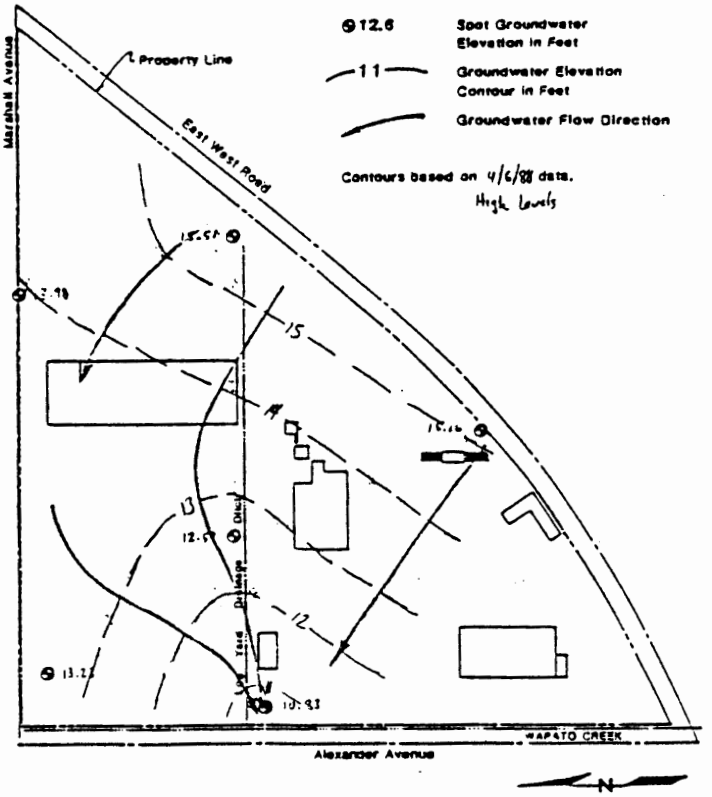
HARTCROWSER

J-1773-04 9/88

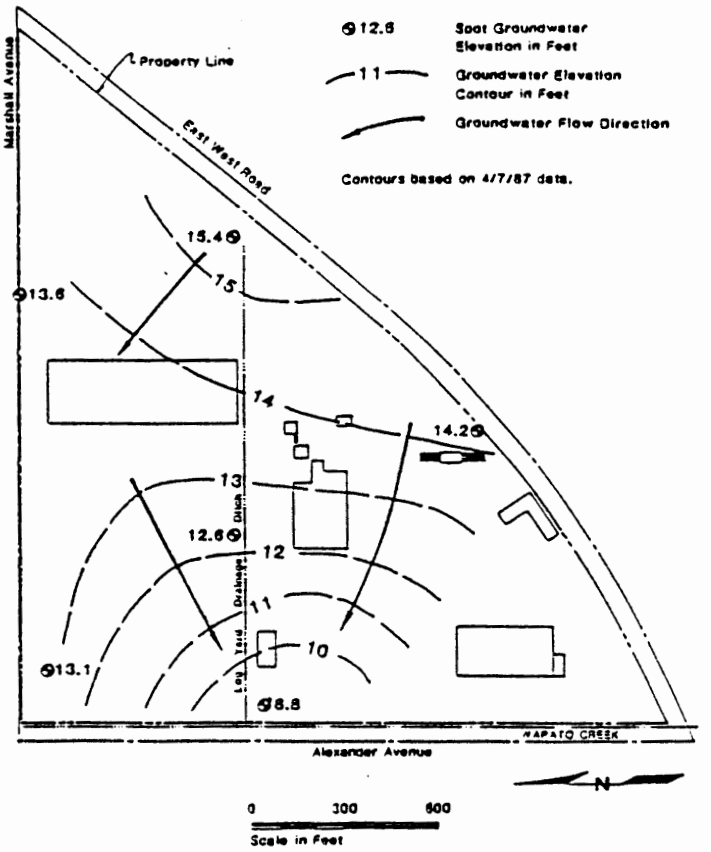
Figure 1

Groundwater Elevation Contour Maps

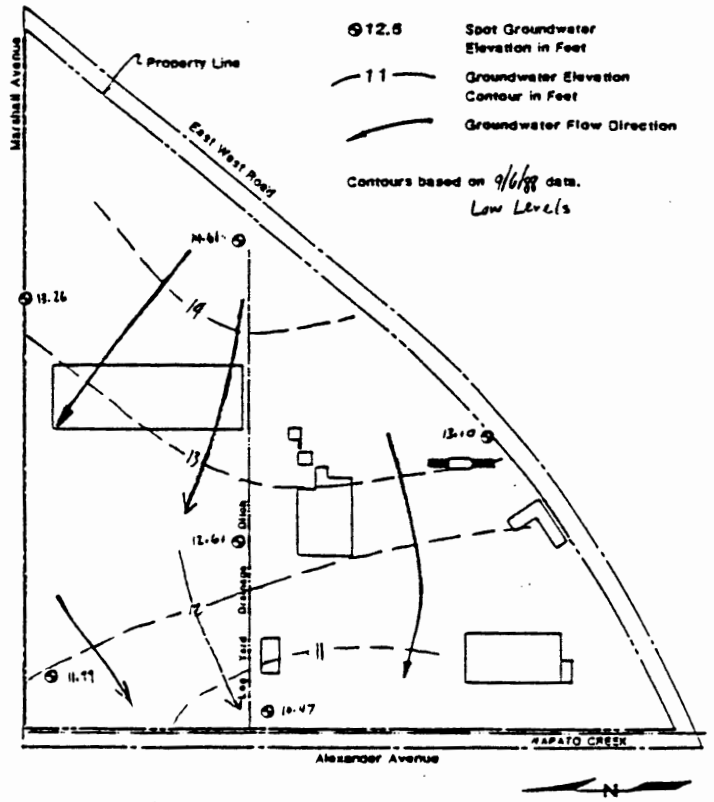
4/6/88 High Levels



4/7/87



9/6/88 Low Levels



PT057503

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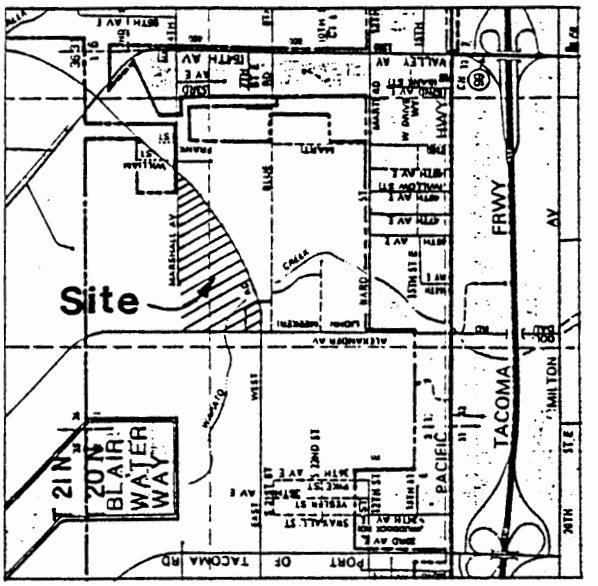
J-1773-04 9/88

Figure 2

Site and Exploration Plan



Vicinity Map

Property Line

Marshall Avenue

East West Road

B'

A'

A

B

6.5' TP-10

3' B-3

5.5' TP-2

6.5' TP-8

6' TP-4

B-2

TP-11

Paved Area

4

4.5' TP-7

4.5' TP-6

4' TP-9

B-4

3

5

3.5' B-6

Log Storage Area

2

1

6

8

Lumber Storage Area

Paved Area

5' TP-1

8' TP-5

8' TP-3

B-1

Log Yard Drainage Ditch

7

B-5

WAPATO CREEK

Alexander Avenue

3 Thickness of unsaturated soil between the bottom of the slag layer and the shallowest water table measurement (March 20, 1987) (See report dated April 24, 1987)

Near-surface Drainage

B-1 Monitoring Well Location and Number

1 Boring Location and Number by Others

Ecology Sampling Location

TP-1 Test Pit Location and Number

N

0 300 600

Scale in Feet

PT057504

Hart Crowser, Inc.
J-1773-04 9/88
Figure 3

ATTACHMENT A

HARTCROWSER

Memorandum

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
206.324-9530

To

From

Page 1 of 3

Date 9/13/88

Project PORTAC

Job Number 1773-04

Subject Groundwater Flux and Metals Loading

I) Groundwater Flow From Site

Use Darcy's Law: $Q = KIA = KI(w \cdot b)$

where: Q = GW flux
K = Hydraulic Conductivity
I = Hydraulic Gradient
w = Aquifer width
b = Aquifer thickness
] — Cross Sectional Area

Hydraulic Conductivity

Assume flow is through uniform silty sands which could range in conductivity from 10^{-3} to 10^{-5} cm/sec.

Avg = 10^{-4} cm/sec = 3.3×10^{-6} ft/sec

High = 10^{-3} cm/sec = 3.3×10^{-5} ft/sec

Low = 10^{-5} cm/sec = 3.3×10^{-7} ft/sec

Hydraulic Gradient

Water level elevations recorded in B-4 and B-5 during wet, dry, and intermediate periods were used to calculate a range of hydraulic gradients accross the site.

Avg = 0.004 High = 0.005 Low = 0.003

Average Linear Velocity (assume porosity = 0.25)

PT057505

Avg. = 0.005 ft/day High = 0.06 ft/day Low = 0.0003 ft/day

HARTCROWSER

Memorandum

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
206.324-9530

To

From

Project PORTAC

Subject Groundwater Flux and Metals Loading

Date 9/13/88

Job Number 1773-04

Cross Sectional Area

Groundwater discharge from the site is focused through a zone approximately 600 ft wide, located near well B-5 (see Groundwater Elevation Contour Maps).

Avg = 600 ft High = 900 ft Low = 400 ft

The portion of the shallow aquifer discharging to Wapato Creek is assumed to be from the water table surface to approximately sea level (elevation -0). From wells B-1 and B-5, which are located nearest Wapato Creek, the saturated thickness ranges from 8.5 to 13.6 ft.

Avg = 11 ft High = 14 ft Low = 8 ft

Groundwater Discharge from Site

PT057506

$$\text{Avg: } Q = \frac{3.3 \times 10^{-6} \text{ ft} \mid 0.004 \mid 600 \cdot 11 \text{ ft}^2}{\text{sec}} = 8.7 \times 10^{-5} \text{ ft}^3/\text{sec}$$

$$= 56 \text{ gal/day}$$

$$\text{High: } Q = \frac{3.3 \times 10^{-5} \text{ ft} \mid 0.005 \mid 900 \cdot 14 \text{ ft}^2}{\text{sec}} = 2.1 \times 10^{-3} \text{ ft}^3/\text{sec}$$

$$= 1343 \text{ gal/day}$$

HARTCROWSER

Memorandum

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
206.324-9530

To

From

Date 9/13/88

Project PORTAC

Job Number 1773-04

Subject Groundwater Flux and Metals Loading

Groundwater Discharge from Site -(Con't)

$$\text{Low: } Q = \frac{3.3 \times 10^{-7} \text{ ft}}{\text{sec}} \left| \frac{0.003}{} \right| \frac{400.8 \text{ ft}^2}{} = 3.2 \times 10^{-6} \text{ ft}^3/\text{sec}$$

$$= 2 \text{ gal/day}$$

II) Metals Loading

Chemical data collected in May 1988 is used to calculate an average As concentration in the 6 site wells. It is then assumed that this average value represents a conservative estimate (because it is weighted by the two largest detections) of the As concentration in the groundwater being discharged from the site.

As Concentration: 0.18 mg/l

$$\text{Avg: } \frac{56 \text{ gal}}{\text{day}} \left| \frac{0.18 \text{ mg}}{\text{l}} \right| \frac{3.785 \text{ l}}{\text{gal}} \left| \frac{\text{lb}}{453600 \text{ mg}} \right. = 8.4 \times 10^{-5} \text{ lb/day}$$

$$\text{High: } \frac{1343 \text{ gal}}{\text{day}} \left| \frac{0.18 \text{ mg}}{\text{l}} \right| \frac{3.785 \text{ l}}{\text{gal}} \left| \frac{\text{lb}}{453600 \text{ mg}} \right. = 2.0 \times 10^{-3} \text{ lb/day}$$

$$\text{Low: } \frac{2 \text{ gal}}{\text{day}} \left| \frac{0.13 \text{ mg}}{\text{l}} \right| \frac{3.785 \text{ l}}{\text{gal}} \left| \frac{\text{lb}}{453600 \text{ mg}} \right. = 3.0 \times 10^{-6} \text{ lb/day}$$

PT057507

$\frac{2.2 \text{ lbs}}{\text{kg}}$ $\frac{2 \times 10^{-3} \text{ lbs}}{2.2 \text{ kg}}$

ANDREA BEATTY RINIKER
Director

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

MEMORANDUM

September 1, 1988

TO: Carol Fleskes

FROM: Scott Morrison SSM

SUBJECT: PORTAC Log Sort Yard Remediation Plan
Comments by Scott Morrison, Mike Kuntz, and Dave Cummings

The following comments have been generated in response to the Portac Log Sort Yard Remediation Plan, Volumes I and II. The plan was prepared by Hart Crowser for the Port of Tacoma and submitted on June 17, 1988. These comments are to be included as Exhibit D in a consent order addressing the paving project on the Portac log sort yard.

Page	Comment
1	The proposed action is not a "cleanup", but a remedial action which will abate metals contamination of Wapato Creek and Blair Waterway by controlling the quality of surface water runoff. Because the study addresses metals contamination only, the consent order will not include the lumber mill, log treatment and storage area, associated buildings, or central drainage ditch.
6	Section 2.1 should read "Site Setting" not "Site Settling". Section 2.2 - refer to hydrogeology comments following the general comments.
7	Section 2.3 "Hart Crowser studies <u>suggest</u> that the major contamination pathway..." rather than "Hart Crowser studies <u>showed</u> that the major contamination pathway..." The environmental concerns are expanded in Section 4.2. This should be noted in Section 2.3. The metals concentrations in the log yard runoff must be reduced to levels below marine <u>chronic</u> toxicity standards.
9	If the pavement thickness is less than outlined on page 8, due to the use of imported fill subbase or base, adequate documentation of loading calculations and structural integrity as a result of this change must be provided and approved by Ecology before construction begins.

PT017194

Exhibit D

13 The organic content of the fill unit is generally 50% or greater. How will this affect the emplacement of the paved surface in terms of settling and/or bearing capacity? Is there a potential for methane gas production due to decomposition of organic matter after the site is paved? Design criteria, calculations, and assumptions must be furnished for Ecology review and approval before construction begins.

14 Section 3.6 - Is the length of time of ground water assessment adequate to characterize ground water conditions? Please refer to hydrogeology comments. Are the ground water levels, rainfall amount, and saturation of soils representative of normal conditions?

Ground water is typically > 3 feet below the slag with seasonal fluctuations on the order of 2 to 4 feet. This suggests some contact between the ground water and the slag on a seasonal basis. Please refer to hydrogeology comments re: ground water as the transport mechanism for contaminants.

20 Estimates from Table 2 show organic material on the site to be equal to 20,000 tons as of September, 1987.

28 Section 4.3.2 - Please refer to hydrogeology comments.

30 "Most rainfall infiltrates through the bark and slag materials and flows along the silt 1 to 3 feet below the surface." Why wasn't this interface screened for ground water sampling? If this interface serves as a major migration route for water, a method of sampling this interface must be included in any plan for post-construction monitoring.

32 Table 8 shows increases in As, Pb, Zn, and Cu downstream of the Portac site.

33 Chronic, not acute, marine toxicity values are to be used for metals concentrations in the log sort yard runoff.

38 See the previous comment.

56 Table 9 - Two alternatives ranked equally as preferred alternatives, but the alternative to cap without stabilization was chosen. Why was this choice made?

61 Section 7.2.2 - Design Assumptions. The pipes sized for 10 year storm events have extra capacity which, "in many cases is sufficient to accommodate the 25 year storm event". More specific information regarding the sizing and capacity of the pipes must be included, specifically, if the capacity of the pipe(s) was insufficient to accommodate the runoff from a 25 year storm event, how would this affect the stormwater runoff quality? How many of the pipes will have extra capacity and where will they be emplaced? Will the runoff overflow and seek an alternate path of discharge?

63 7.3 Coordination with Pentachlorophenol Cleanup - It is essential that the paving construction be set back from the central drainage ditch until a final agreement is reached regarding cleanup of the penta

contamination. Portac is no longer using pentachlorophenol as a wood preservative. The product currently being used, NP-1, is comprised of didecyl di-methyl ammonium chloride, ethanol, and 3-iodo-2 propynyl butyl carbamate. It is considered a combustible liquid under USDOT guidelines. Before any discharge from the wood treatment/storage area can be tied into the log sort yard drainage system, appropriate testing and establishment of effluent guidelines will have to occur. This will take place in conjunction with the consent decree addressing the pentachlorophenol cleanup.

Appendix H

Section 2.0 - Monitoring requirements will be set forth in the NPDES permit. The performance monitoring will begin immediately upon completion of paving.

Section 3.0 - Monitoring must occur on a more frequent basis than twice in the year following paving. The potential for the ground water to become the sole source of migration for metals, as outlined in the hydrogeology comments, means there must be a comprehensive sampling/monitoring plan in place. The plan must include enough data to be statistically significant and show a trend of decreasing ground water contamination. See hydrogeology comment #12.

HYDROGEOLOGY COMMENTS

These are general comments addressing previous investigations on the PORTAC site as summarized in the PORTAC Log Sort Yard Status Report, March 30, 1988.

1. The report does not explain to what degree, if any, slag will be separated from bark, or whether or not any source material will be removed from the site.

2. The report lacks a framework for the passing of events. At a minimum, a table should be constructed to display the dates of the various field tests. Because both Ecology and private contractors were involved in the tests, the tables should identify the parties who conducted the tests.

3. Putting pavement over source material will eliminate the surface run-off component of contaminant migration, but may eventually increase the ground water component because ground water will become the sole medium of migration.

4. Table 3 of the letter on ground water assessment is the technical backbone of the consultant's argument that surface water is the principal contributor of metals loading to Wapato Creek. While the numerical values for the surface water are significantly higher than the values for ground water, the following factors should be addressed:

   a. The ground water and surface water samples were taken at different times, by different parties. How do the seasonal fluctuations and varied technical procedures impact the assessment?

b. The surface water concentrations are reported as flow-weighted average concentrations. How were the concentrations calculated and how do they relate to concentrations from ground water samples?

5. If the bark/slag mixture has been exposed to precipitation for ten years, is there a possibility that the leaching rate has decreased, thereby reducing metals loading due to surface water run-off?

6. The "conservative analysis" referenced on p. 11 of the ground water assessment, which indicates that surface water contributes 10,000 to 100,000 times more metals than ground water should be made a part of Ecology's record.

7. Most of the metals loading from the ground water would be expected to travel along the interface between the surficial fill and the older fill. If none of the monitoring wells monitor this interface, how conservative can the "conservative analysis" be?

8. Regarding the conservative analysis, what was the value of the ground water gradient used to calculate the ground water flow?

9. In Table 2 of the ground water assessment, why is the range of As and Cu in the silt and sand reported as a single value? What is the size of the sample population?

10. One year of post-construction monitoring is not sufficient to gauge the effectiveness of the remedial action. The amount of analysis and frequency of sampling must be adequate to reveal any substantial, long-term trends. The duration of monitoring should be several years.

11. If the site is paved, a ground water performance standard should be placed on the remedial action. The standard need not be an absolute number, but could be a demonstration that a trend of decreasing ground water contamination has been established.

12. The ground water flow pattern may change as a result of paving the site. Ecology must be assured that adequate monitoring of ground water will occur in this event. The interface between the surficial fill and the older fill must be monitored as well.

13. A single set of ground water measurements cannot form the basis to predict or model the ground water system. The scant discussion of flow direction and fluctuation is also absent of references to substantiate reported numerical values.

PAVING PLAN COMMENTS

1. Clearing and grubbing specifications allow large pieces of debris and bark in place. Debris removal, where easily separated from slag would greatly increase subgrade capacity. Large amounts of organics in the subgrade could lead to large settlements followed by extensive cracking. Allowing woodwaste grading into 12 inch layers is an excessively

permissive specification. The description implies piles of woodwaste which could be removed, rather than graded.

2. Dewatering for pipe trenches must not be discharged to surface waters or be reinjected without adequate chemical analysis.

3. Performance data for paving machine(s) under the Roller Compacted Concrete option must be specified if the RCC option is chosen.

4. The pre-qualification of design mix by preparing 3 Proctor tests is insufficient. Normally, a test fill is constructed which calibrates contractors' crews, QA and QC personnel, and assures regulatory people that the project will conform to performance standards, such as cold joint treatment, placement and compaction procedures, lift bonding, etc.

5. Specifications should include procedures for placement at high temperatures. Concrete with a high cement factor has a high heat of hydration which, coupled with high temperatures, could lead to excessive cracking.

6. Allowances for "excessively wet mixtures" in Section 3362 - 3.07b should be precluded by constructing a test fill and following recommended procedures for mix design and placement. Excessively "wet" concrete may very easily be "out-of-spec".

7. Mix design for cold joint application of cement grout should be specified. Specifications should be for:

   lbs. cement & type (I or II)
   lbs. water
   lbs. sand (with gradation)

8. A design report should have been submitted with the plans and specifications, but must be submitted before construction begins. The report shall include the data upon which the paving design is based, any assumptions made based upon the data, and calculations for the design.

9. Any failure of the paved surface which would render it ineffectual in prohibiting surface water runoff from infiltrating the bark/ slag subgrade must be repaired immediately. Ecology must be assured that the Port and/or Portac will assume this responsibility.

SM:dr

ANDREA BEATTY RINIKER
Director

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

September 2, 1988

Ms. Leslie Sacha
Port of Tacoma
1 Sitcum Plaza
P.O. Box 1837
Tacoma, WA 98401

Dear Ms. Sacha:

Attached are two copies of Order on Consent No. DE 88-S326. Included with these documents are copies of Exhibits A and D, the Site Map and Ecology's Comments on the Remediation Plan and Log Sort Yard Paving Project Plans and Specifications, respectively. Exhibits B and C, the Remediation Plan and PORTAC Log Sort Yard Paving Plans and Specifications, prepared by the Port of Tacoma and their consultants, are already in your possession.

If you have any comments or questions regarding this document, please contact either Scott Morrison (regarding technical aspects) at 596-2719 or Lee Rees (regarding legal aspects) at 459-6155.

Sincerely,

Scott E. Morrison
Inspector

Attachment

PT017164