Reichhold/SSA Containers Facility
Tacoma, Washington

Consent Decree

December 2008

STATE OF WASHINGTON
PIERCE COUNTY SUPERIOR COURT

STATE OF WASHINGTON,
DEPARTMENT OF ECOLOGY,

Plaintiff,

v.

SSA TACOMA, INC.,

Defendant.

NO. 08 2 15781 0

CONSENT DECREE

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I. INTRODUCTION

A. The mutual objective of the State of Washington, Department of Ecology (Ecology) and SSA Tacoma, Inc. (SSA) under this Decree is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances. This Decree requires SSA to undertake the remedial action specified in the Cleanup Action Plan attached as Exhibit B to this Decree. Ecology has determined that the actions described in the Cleanup Action Plan are necessary to protect human health and the environment.

B. The Complaint in this action is being filed simultaneously with this Decree. An Answer has not been filed, and there has not been a trial on any issue of fact or law in this case. However, the Parties wish to resolve the issues raised by Ecology's Complaint. In addition, the Parties agree that settlement of these matters without litigation is reasonable and in the public interest and that entry of this Decree is the most appropriate means of resolving these matters.

C. By signing this Decree, the Parties agree to its entry and agree to be bound by its terms.

D. By entering into this Decree, the Parties do not intend to discharge non-settling parties from any liability they may have with respect to matters alleged in the Complaint. The Parties retain the right to seek reimbursement, in whole or in part, from any liable persons for sums expended under this Decree.

E. This Decree may not be construed as proof of liability or responsibility for any releases of hazardous substances or costs for remedial action nor an admission of any facts; provided, however, that SSA may not challenge the authority of the Attorney General and Ecology to enforce this Decree.

F. The Court is fully advised of the reasons for entry of this Decree, and good cause having been shown:

It is HEREBY ORDERED, ADJUDGED, AND DECREED as follows:

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II. JURISDICTION

A. This Court has jurisdiction over the subject matter and over the Parties pursuant to the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

B. Authority is conferred upon the Washington State Attorney General by RCW 70.105D.040(4)(a) to agree to a settlement with any potentially liable person (PLP) if, after public notice and any required hearing, Ecology finds the proposed settlement would lead to a more expeditious cleanup of hazardous substances. RCW 70.105D.040(4)(b) requires that such a settlement be entered as a consent decree issued by a court of competent jurisdiction.

C. Ecology has determined that a release or threatened release of hazardous substances has occurred at the Site that is the subject of this Decree.

D. Ecology has given notice to SSA of Ecology's determination that SSA is a PLP for the Site, as required by RCW 70.105D.020(21) and WAC 173-340-500.

E. The actions to be taken pursuant to this Decree are necessary to protect public health and the environment.

F. This Decree has been subject to public notice and comment.

G. Ecology finds that this Decree will lead to a more expeditious cleanup of hazardous substances at the Site in compliance with the cleanup standards established under RCW 70.105D.030(2)(e), Chapter 173-340 WAC, and Chapter 173-303 WAC.

H. SSA has agreed to undertake the actions specified in this Decree and consents to the entry of this Decree under MTCA.

III. PARTIES BOUND

This Decree will apply to and be binding upon the Parties to this Decree, their successors and assigns. The undersigned representative of each party hereby certifies that he or she is fully authorized to enter into this Decree and to execute and legally bind such party to comply with this Decree. SSA agrees to undertake all actions required by the terms and conditions of this Decree. No change in ownership or corporate status will alter SSA's

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responsibility under this Decree. SSA will provide a copy of this Decree to all agents, contractors, and subcontractors retained to perform work required by this Decree, and will ensure that all work undertaken by such agents, contractors, and subcontractors complies with this Decree.

IV. DEFINITIONS

Unless otherwise specified herein, all definitions in RCW 70.105D.020 and WAC 173-340-200 will control the meanings of the terms in this Decree.

A. Site: The Site is referred to as the Reichhold/SSA Containers Facility and is generally located at 3320 Lincoln Ave., Tacoma, Washington, 98421. The Site includes the Property located at 3320 Lincoln Ave., Tacoma, Washington, 98421 and any area beyond the Property where hazardous substances released at or from the Property have come to be located. The Site is more particularly described in the Site Diagram (Exhibit A). The Site constitutes a Facility under RCW 70.105D.020(4). The term "Facility" is used interchangeably with "Site" throughout this Decree.

B. Parties: Refers to the State of Washington, Department of Ecology and SSA Containers, Inc.

C. SSA: Refers to SSA Tacoma, Inc.

D. Consent Decree or Decree: Refers to this Consent Decree and each of the exhibits to this Decree. All exhibits are integral and enforceable parts of this Consent Decree. The terms "Consent Decree" or "Decree" will include all exhibits to this Consent Decree.

E. CAMU: Refers to a grandfathered Corrective Action Management Unit designated by Ecology pursuant to WAC 173-303-64640 for the purpose of implementing the corrective action requirements of WAC 173-303-64620 and subject to Second Amended Agreed Interim Action Administrative Order No. 1578.

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F. Day or Days: Refers to a calendar Day(s) unless otherwise specified. In computing any period of time under this Decree, if the last Day falls on a Saturday, Sunday, or a state or federal holiday, the period will run until the end of the next Day that is not a Saturday, Sunday, or a state or federal holiday. Any time period scheduled to begin on the occurrence of any act or event will begin on the Day after the act or event.

G. Property: Means the real property located at 3320 Lincoln Ave., Tacoma, Washington, 98421.

V. FINDINGS OF FACTS

Ecology makes the following findings of fact without any express or implied admissions of such facts by SSA.

A. Reichhold, Inc. (Reichhold) owned the Property from 1956 to 2006. Reichhold operated on the Property starting in 1956 for, among other things, the production of a variety of chemical products, including pentachlorophenol, formaldehyde, calcium chloride solution, and formaldehyde catalyst. Reichhold ceased all of its manufacturing operations at the Property in September 1990.

B. Reichhold owned and operated the Property as a dangerous waste management facility on or after November 19, 1980, the date that subjects facilities to RCRA permitting requirements pursuant to Section 3005 of RCRA and implementing regulations thereunder, including authorized state regulations promulgated in Chapter 173-303 WAC.

C. On June 30, 1986, Reichhold entered into a Consent Agreement and Order (No. 1086-04-33-3008) (1986 Order) with EPA Region 10 and Ecology to undertake an investigation to characterize the Site soils and hydrogeology and to research and identify areas at the Facility that would correspond to RCRA-regulated units, solid waste management units (SWMUs), and Areas of Concern. The 1986 Order was terminated when the 1988 RCRA Permit described below became effective.

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D. In July 1987 EPA performed a RCRA Facility Assessment (RFA) at the Facility. Pursuant to the RFA Report and the 1986 Order, among other information, EPA and Ecology identified various RCRA-regulated units, SWMUs, and Areas of Concern at the Facility. Reichhold evaluated each of these units and areas to determine whether any of them potentially could release hazardous substances into the environment. Based on the results of this evaluation, a subset of the total number of the identified RCRA-regulated units, SWMUs, and Areas of Concern was determined to warrant further investigation and possible corrective action.

E. Based on past studies, soil at the Facility is contaminated with hazardous substances and dangerous waste constituents including, but not limited to, 2-Chlorophenol, 2,3,4,6-Tetrachlorophenol, 2,4-Dichlorophenol, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, Pentachlorophenol, Tetrachloroethene, Trichloroethene, Molybdenum, and Aroclor 1248. Groundwater at the Property and beyond the Property boundaries is contaminated with hazardous substances and dangerous waste constituents including, but not limited to, 2-Chlorophenol, 2,3,4,6-Tetrachlorophenol, 2,4-Dichlorophenol, 2,4,6-Trichlorophenol, Pentachlorophenol, Tetrachloroethene, Trichloroethene, and Vinyl chloride.

F. In 1988 EPA issued a RCRA storage and corrective action permit, effective December 4, 1988 (1988 RCRA Permit). The 1988 RCRA Permit was replaced in 2004 by a Dangerous Waste Management Permit for Corrective Action, as described in paragraph I below.

G. Working with both EPA and Ecology under the 1986 Order and the 1988 RCRA Permit, Reichhold undertook several investigations and corrective actions at the Facility to address those RCRA-regulated units, SWMUs, and Areas of Concern that were determined to require further investigation. Between 1991 and 2004, Reichhold closed the wastewater treatment ponds, the drum storage area, and the pilot plant drum storage under EPA and Ecology oversight.

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H. On October 20, 2000, Reichhold submitted an application for designation of a CAMU at the Facility in the form of a document entitled *Technical Summary, RCRA Corrective Action Management Unit Summary, Reichhold, Inc., 3320 Lincoln Avenue, Tacoma, WA 98421.* Ecology reviewed the application and determined that it was substantially complete in a letter dated November 22, 2000. Reichhold submitted revised versions of this document in November 2001 and March 2004.

I. Effective July 30, 2004, under Ecology's authorization to satisfy RCRA and HWMA corrective action requirements through MTCA and the regulations promulgated thereunder, Ecology issued a Dangerous Waste Management Permit for Corrective Action; a separate enforceable order under MTCA for a remedial investigation and feasibility study (Agreed Order No. 1577); and a CAMU Order to establish a CAMU at the Facility (Agreed Interim Action Administrative Order No. 1578). The two Orders, as amended, are incorporated by reference into the Facility's Dangerous Waste Management Permit for Corrective Action, as amended.

J. Reichhold submitted the Final Focused Remedial Investigation Work Plan for the Site to Ecology on May 2, 2005. The Final Focused Remedial Investigation Report was submitted to Ecology on April 26, 2006, and Ecology provided Reichhold with formal approval of the Final Focused Remedial Investigation Report on July 26, 2006.

K. Effective July 27, 2006, Reichhold sold the Facility to SSA Containers, Inc. (SSA Containers). Under the terms of the Reichhold and SSA Containers Purchase and Sale Agreement, and as confirmed to Ecology in a letter agreement dated February 6, 2006, SSA Containers agreed to assume and accept full responsibility for compliance with the Permit and Agreed Orders as of the closing date. Effective on the closing date, Ecology approved Reichhold's request for a minor Class 1 Permit Modification to the existing Dangerous Waste Management Permit, transferring the Facility's Dangerous Waste Management Permit for Corrective Action and associated Agreed Orders from Reichhold to SSA Containers. The

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Agreed Orders were reissued as First Amended Agreed Order No. 1577 and First Amended Agreed Interim Action Administrative Order No. 1578 to reflect SSA Containers' ownership of the property and acceptance of the associated obligations.

L. On March 15, 2007, SSA Containers submitted a Focused Feasibility Study Work Plan to Ecology. Ecology subsequently approved this Focused Feasibility Study Work Plan on June 21, 2007. SSA Containers submitted the Ecology Final Focused Feasibility Study Report to Ecology on June 27, 2008.

M. SSA Containers submitted a draft Compliance Monitoring and Contingency Plan to Ecology on June 27, 2008. A proposed Cleanup Action Plan was submitted to Ecology on August 6, 2008.

N. On October 13, 2008, Ecology issued a Draft Cleanup Action Plan to address the remaining contamination at the Facility. The Draft Cleanup Action Plan established the cleanup standards and selected a cleanup action that meets those cleanup standards for the Facility and was subject to public notice and comment. After consideration of all comments received, Ecology issued a Final Clean Action Plan (FCAP) on December 16, 2008, which is attached as Exhibit B to this decree.

O. On or about December 18, 2008, SSA Containers transferred ownership of the Property to SSA. Concurrent with entry of this Decree, Ecology is approving SSA Containers' request for a minor Class 1 Permit Modification to the existing Dangerous Waste Management Permit, transferring the Facility's Dangerous Waste Management Permit for Corrective Action and associated Agreed Orders from SSA Containers to SSA. Also concurrent with entry of this Decree, First Amended Agreed Interim Action Administrative Order No. 1578 is being amended to become Second Amended Agreed Interim Action Administrative Order No. 1578, to reflect (among other matters) SSA's ownership of the Property and acceptance of the associated obligations of the order.

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VI. WORK TO BE PERFORMED

This Decree contains a program designed to protect human health and the environment from the known release, or threatened release, of hazardous substances or contaminants at, on, or from the Site.

A. The work to be performed by SSA is the work set forth in the Cleanup Action Plan (including all attachments thereto), which is attached as Exhibit B. As more fully described in the Cleanup Action Plan and its attachments, this work includes excavation and off-site disposal or treatment of in-situ soil, remedial action in soil treatment cells, development of a CAMU Closure Plan, and groundwater monitoring.

B. SSA will furnish all personnel, materials, and services necessary for, or incidental to, the planning, initiation, completion, and reporting of the work described in Exhibit B.

C. As provided in the scope of work and schedule contained in Section 7.0 of Exhibit B to this Decree, SSA will commence work and thereafter complete all tasks set forth in Section 7.0 of Exhibit B in the time frames and framework indicated therein, unless Ecology grants an extension in accordance with Section XVI of this Decree. SSA will design, construct, and operate the remedial action consistent with WAC 173-340-400.

D. Unless acting pursuant to Second Amended Agreed Interim Action Administrative Order No. 1578, SSA agrees not to perform any remedial actions at the Site that are outside the scope of this Decree unless Ecology modifies the Cleanup Action Plan to cover these actions. All work conducted by SSA under this Decree will be done in accordance with Chapter 173-340 WAC and Chapter 173-303 WAC, as amended, and all other applicable federal, state, and local laws and regulations unless otherwise provided herein.

VII. DESIGNATED PROJECT COORDINATORS

The Project Coordinator for Ecology is:

Name: Stan Leja

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Address:	Department of Ecology, SW Regional Office P.O. Box 47775 Olympia, Washington 98504-7775
Telephone:	(360) 407-6345
FAX:	(360) 407-6305
E-mail:	slej@ecy.wa.gov

The Project Coordinator for SSA is:

Name:	Skip Sahlin
Address:	SSA Tacoma, Inc. 1131 SW Klickitat Way Seattle, Washington 98134
Telephone:	(206) 654-3510
FAX:	(206) 381-5186
E-mail:	Skip.Sahlin@SSAMarine.com

Each Project Coordinator will be responsible for overseeing the implementation of this Decree. Ecology's Project Coordinator will be Ecology's designated representative for the Site. To the maximum extent possible, communications between Ecology and SSA and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Decree will be directed through the Project Coordinators. The Project Coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the work to be performed required by this Decree.

Any party may change its respective project coordinator. Written notification will be given to the other party at least ten (10) calendar Days prior to the change.

VIII. PERFORMANCE

A. All geologic and hydrogeologic work performed pursuant to this Decree will be under the supervision and direction of a geologist licensed in the State of Washington or under the direct supervision of an engineer registered in the State of Washington, except as otherwise provided for by Chapters 18.220 and 18.43 RCW.

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B. All engineering work performed pursuant to this Decree will be under the direct supervision of a professional engineer registered in the State of Washington, except as otherwise provided for by RCW 18.43.130.

C. All construction work performed pursuant to this Decree will be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of a professional engineer. The professional engineer must be registered in the State of Washington, except as otherwise provided for by RCW 18.43.130.

D. Any documents submitted containing geologic, hydrologic, or engineering work will be under the seal of an appropriately licensed professional as required by Chapter 18.220 RCW or RCW 18.43.130.

E. SSA will notify Ecology in writing of the identity of any engineer(s) and geologist(s), contractor(s) and subcontractor(s), and others to be used in carrying out the terms of this Decree, in advance of their involvement at the Site.

IX. ACCESS

Ecology or any Ecology authorized representative will have full authority to enter and freely move about all property at the Site that SSA either owns, controls, or has access rights to 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 SSA's progress in carrying out the terms of this Decree; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Decree; and verifying the data submitted to Ecology by SSA. SSA will make all reasonable efforts to secure access rights for those properties within the Site not owned or controlled by SSA where remedial activities or investigations will be performed pursuant to this Decree. Ecology or any Ecology authorized representative will give reasonable notice before entering any Site property owned or controlled by SSA unless an emergency prevents such notice. All Parties who access the

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Site pursuant to this Section will comply with any applicable health and safety plan(s). Ecology employees and their representatives will not be required to sign any liability release or waiver as a condition of Site property access.

X. SAMPLING, DATA SUBMITTAL, AND AVAILABILITY

With respect to the implementation of this Decree, SSA will make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data will be submitted to Ecology in both printed and electronic formats in accordance with Section XI (Progress Reports), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, SSA will allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by SSA pursuant to the implementation of this Decree. SSA will notify Ecology seven (7) Days in advance of any sample collection or work activity at the Site. Ecology will, upon request, allow SSA and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Decree, provided that doing so does not interfere with Ecology's sampling. Without limitation on Ecology's rights under Section IX (Access), Ecology will notify SSA prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses will be conducted by a laboratory accredited under Chapter 173-50 WAC for the specific analyses to be conducted, unless otherwise approved by Ecology.

XI. PROGRESS REPORTS

A. Until the completion of in-situ Soil Final Remedial Actions described in the Cleanup Action Plan (Exhibit B), SSA will submit to Ecology written monthly Progress

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Reports that describe the actions taken during the previous month to implement the requirements of this Decree. The Progress Reports will include the following:

1. A list of on-site activities that have taken place during the month;

2. Detailed description of any deviations from required tasks not otherwise documented in project plans or amendment requests;

3. Description of all deviations from the Implementation Schedule (Section 7.0 of Exhibit B) during the current month and any planned deviations in the upcoming month;

4. For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the schedule;

5. All raw data (including laboratory analyses) received by SSA during the past month and an identification of the source of the sample; and

6. A list of deliverables for the upcoming month if different from the schedule.

B. Following the completion of In-situ Soil Final Remedial Actions in the Cleanup Action Plan (Exhibit B), SSA will submit to Ecology a Progress Report within 45 Days after any compliance monitoring event. This Progress Report will describe the actions taken since the immediately prior Progress Report to implement the requirements of this Decree and will include the following:

1. A list of on-site activities that have taken place since the immediately prior Progress Report;

2. Detailed description of any deviations from required tasks not otherwise documented in project plans or amendment requests;

3. Description of all deviations from the Implementation Schedule (Section 7.0 of Exhibit B) since the immediately prior Progress Report and any planned future deviations;

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4. For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the schedule;

5. All raw data (including laboratory analyses) received by SSA since the immediately prior Progress Report and an identification of the source of the sample; and

6. A list of future deliverables if different from the schedule.

C. All Progress Reports will be submitted by the tenth (10^{th}) Day of the month in which they are due after the effective date of this Decree. Unless otherwise specified, Progress Reports and any other documents submitted pursuant to this Decree will be sent by certified mail, return receipt requested, to Ecology's Project Coordinator.

XII. RETENTION OF RECORDS

During the pendency of this Decree, and for ten (10) years from the date this Decree is no longer in effect as provided in Section XXVIII (Duration of Decree), SSA will preserve all records, reports, documents, and underlying data in its possession relevant to the implementation of this Decree and will insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of Ecology, SSA will make all records available to Ecology and allow access for review within a reasonable time.

XIII. TRANSFER OF INTEREST IN PROPERTY

No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site may be consummated by SSA without provision for continued operation and maintenance of any containment system, treatment system, and/or monitoring system installed or implemented pursuant to this Decree.

Before SSA's transfer of any interest in all or any portion of the Site, and during the effective period of this Decree, SSA will provide a copy of this Decree to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least ninety (90) Days before finalization of any transfer that results in a change in owner or

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operator status, SSA will notify Ecology of the contemplated transfer by submitting a request for modification of its HWMA permit. Upon transfer of any interest, SSA will restrict uses and activities to those consistent with this Consent Decree and notify all transferees of the restrictions on the use of the Property.

XIV. RESOLUTION OF DISPUTES

A. In the event a dispute arises as to an approval, disapproval, proposed change, or other decision or action by Ecology's Project Coordinator, or an itemized billing statement under Section XXIV (Remedial Action Costs), the Parties will utilize the dispute resolution procedure set forth below.

1. Upon receipt of Ecology's Project Coordinator's written decision, or the itemized billing statement, SSA has fourteen (14) Days within which to notify Ecology's Project Coordinator in writing of its objection to the decision or itemized statement.

2. The Parties' Project Coordinators will then confer in an effort to resolve the dispute. If the project coordinators cannot resolve the dispute within fourteen (14) Days, Ecology's Project Coordinator will issue a written decision.

3. SSA may then request regional management review of the decision. This request will be submitted in writing to the Southwest Region Hazardous Waste & Toxics Reduction Program Section Manager within seven (7) Days of receipt of Ecology's Project Coordinator's written decision.

4. Ecology's Regional Section Manager will conduct a review of the dispute and will endeavor to issue a written decision regarding the dispute within thirty (30) Days of SSA's request for review.

5. If SSA finds Ecology's Regional Section Manager's decision unacceptable, SSA may then request final management review of the decision. This request will be submitted in writing to the Hazardous Waste & Toxics Reduction

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Program Manager within seven (7) Days of receipt of the Regional Section Manager's decision.

6. Ecology's Hazardous Waste & Toxics Reduction Program Manager will conduct a review of the dispute and will endeavor to issue a written decision regarding the dispute within thirty (30) Days of SSA's request for review of the Regional Section Manager's decision. The Hazardous Waste & Toxics Reduction Program Manager's decision will be Ecology's final decision on the disputed matter.

B. If Ecology's final written decision is unacceptable to SSA, SSA has the right to submit the dispute to the Court for resolution. The Parties agree that one judge should retain jurisdiction over this case and will, as necessary, resolve any dispute arising under this Decree. In the event SSA presents an issue to the Court for review, the Court will 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.

C. The Parties 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. Where either party utilizes the dispute resolution process in bad faith or for purposes of delay, the other party may seek sanctions.

D. Implementation of these dispute resolution procedures will not provide a basis for delay of any activities required in this Decree, unless Ecology agrees in writing to a schedule extension or the Court so orders.

XV. AMENDMENT OF DECREE

The project coordinators may agree to minor changes to the work to be performed without formally amending this Decree. Minor changes will be documented in writing by Ecology.

Substantial changes to the work to be performed will require formal amendment of this Decree. This Decree may only be formally amended by a written stipulation among the Parties

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that is entered by the Court, or by order of the Court. Such amendment will become effective upon entry by the Court. Agreement to amend the Decree will not be unreasonably withheld by any party.

SSA will submit a written request for amendment to Ecology for approval. Ecology will indicate its approval or disapproval in writing and in a timely manner after the written request for amendment is received. If the amendment to the Decree is a substantial change, Ecology will provide public notice and opportunity for comment. Reasons for the disapproval of a proposed amendment to the Decree will be stated in writing. If Ecology does not agree to a proposed amendment, the disagreement may be addressed through the dispute resolution procedures described in Section XIV (Resolution of Disputes).

XVI. EXTENSION OF SCHEDULE

A. An extension of schedule will be granted only when a request for an extension is submitted in a timely fashion, generally at least thirty (30) Days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions will be requested in writing. The request will specify:

1. The deadline that is sought to be extended;

2. The length of the extension sought;

3. The reason(s) for the extension; and

4. Any related deadline or schedule that would be affected if the extension were granted.

B. The burden will be on SSA 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 may include, but may not be limited to:

1. Circumstances beyond the reasonable control and despite the due diligence of SSA including delays caused by unrelated third parties or Ecology, such as

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(but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by SSA;

2. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or

3. Endangerment as described in Section XVII (Endangerment).

However, neither increased costs of performance of the terms of this Decree nor changed economic circumstances will be considered circumstances beyond the reasonable control of SSA.

C. Ecology will act upon any written request for extension in a timely fashion. Ecology will give SSA written notification of any extensions granted pursuant to this Decree. A requested extension will not be effective until approved by Ecology or, if required, by the Court. Unless the extension is a substantial change, it will not be necessary to amend this Decree pursuant to Section XV (Amendment of Decree) when a schedule extension is granted.

D. An extension will only be granted for such period of time as Ecology determines is reasonable under the circumstances. Ecology may grant schedule extensions exceeding ninety (90) Days only as a result of:

1. Delays in the issuance of a necessary permit which was applied for in a timely manner;

2. Other circumstances deemed exceptional or extraordinary by Ecology; or

3. Endangerment as described in Section XVII (Endangerment).

XVII. ENDANGERMENT

In the event Ecology determines that any activity being performed at the Site is creating or has the potential to create a danger to human health or the environment, Ecology may direct SSA to cease such activities for such period of time as it deems necessary to abate the danger. SSA will immediately comply with such direction.

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In the event SSA determines that any activity being performed at the Site is creating or has the potential to create a danger to human health or the environment, SSA may cease such activities. SSA will notify Ecology's Project Coordinator as soon as possible, but no later than twenty-four (24) hours after making such determination or ceasing such activities. Upon Ecology's direction, SSA will provide Ecology with documentation of the basis for the determination or cessation of such activities. If Ecology disagrees with SSA's cessation of activities, it may direct SSA to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to this Section, SSA's obligations with respect to the ceased activities will be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, will be extended, in accordance with Section XVI (Extension of Schedule), for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Decree will limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

XVIII. COVENANT NOT TO SUE

A. Covenant Not to Sue: In consideration of SSA's compliance with the terms and conditions of this Decree, Ecology covenants not to institute legal or administrative actions against SSA regarding the release or threatened release of hazardous substances covered by this Decree.

This Decree covers only the Site specifically identified in the Site Diagram (Exhibit A) and those hazardous substances that Ecology knows are located at the Site as of the date of entry of this Decree. This Decree does not cover any other hazardous substance or area. Ecology retains all of its authority relative to any substance or area not covered by this Decree.

This Covenant Not to Sue will have no applicability whatsoever to:

1. Criminal liability;

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2. Liability for damages to natural resources; and

3. Any Ecology action, including cost recovery, against PLPs not a party to this Decree.

If factors not known at the time of entry of the settlement agreement are discovered and present a previously unknown threat to human health or the environment, the Court will amend this Covenant Not to Sue.

B. Reopeners: Ecology specifically reserves the right to institute legal or administrative action against SSA to require it to perform additional remedial actions at the Site and to pursue appropriate cost recovery, pursuant to RCW 70.105D.050 under the following circumstances:

1. Upon SSA's failure to meet the requirements of this Decree, including, but not limited to, failure of the remedial action to meet the cleanup standards identified in the Cleanup Action Plan (Exhibit B);

2. Upon Ecology's determination that remedial action beyond the terms of this Decree is necessary to abate an imminent and substantial endangerment to human health or the environment;

3. Upon the availability of new information regarding factors previously unknown to Ecology, including the nature or quantity of hazardous substances at the Site, and Ecology's determination, in light of this information, that further remedial action is necessary at the Site to protect human health or the environment; or

4. Upon Ecology's determination that additional remedial actions are necessary to achieve cleanup standards within the reasonable restoration time frame set forth in the Cleanup Action Plan.

C. Except in the case of an emergency, prior to instituting legal or administrative action against SSA pursuant to this Section, Ecology will provide SSA with fifteen (15) calendar Days notice of such action.

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XIX. CONTRIBUTION PROTECTION

With regard to claims for contribution against SSA, the Parties agree that SSA is entitled to protection against claims for contribution for matters addressed in this Decree as provided by RCW 70.105D.040(4)(d).

XX. LAND USE RESTRICTIONS

SSA will record an Environmental Covenant (Exhibit C) with the office of the Pierce County Auditor within ten (10) Days of the completion of the remedial action. The Environmental Covenant will restrict future uses of the Site. SSA will provide Ecology with a copy of the recorded Environmental Covenant within thirty (30) Days of the recording date.

XXI. FINANCIAL ASSURANCES

A. Pursuant to WAC 173-340-440(11), SSA will maintain sufficient and adequate financial assurance mechanisms to cover all costs associated with engineered and/or institutional controls. Provided, financial assurance mechanisms pursuant to WAC 173-340-440(11) will not be required if SSA can demonstrate it has sufficient financial resources available and in place to provide for the long-term effectiveness of any engineered and/or institutional controls. Because the Property is subject to a Dangerous Waste Management Permit for Corrective Action, which incorporates requirements that SSA provide sufficient and adequate financial assurance to implement operation and closure of the CAMU, SSA must also meet the financial assurance requirements of WAC 173-303-64620(1). Ecology's Financial Assurance Officer will determine when SSA's actions and submissions meet the requirements of WAC 173-303-64620(1).

B. Unless otherwise specified, the definitions and requirements for allowable financial assurance mechanisms set forth in the current financial assurance rules covering closure and post-closure (40 C.F.R. 264.143, 40 C.F.R. 264.145, 40 C.F.R. 264.151, and WAC 173-303-620) will serve as the requirements for any financial assurance required under this Decree. Acceptable financial assurance mechanisms include trust funds, surety

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bonds, letters of credit, insurance, the financial test, and the corporate guarantee. Ecology may allow other financial assurance mechanisms if they are consistent with the laws of Washington and if SSA demonstrates to the satisfaction of Ecology that those mechanisms provide adequate financial assurance.

C. In the absence of final federal regulations governing financial assurance for corrective action, Ecology's Financial Assurance Officer will use the following resources as secondary guidance:

1. The Financial Assurance for Corrective Action Proposed Rule, 51 Fed. Reg. 37853 (October 24, 1986);

2. The financial assurance provisions of Corrective Action for Releases from Solid Waste Management Units Advance Notice of Proposed Rulemaking, 61 Fed. Reg. 19432 (May 1, 1996); and

3. The Interim Guidance on Financial Responsibility for Facilities Subject to RCRA Corrective Action (U.S. EPA, September 30, 2003); or

4. Any other guidance applicable to financial assurance and corrective action that may be available at the time.

The financial assurance provisions of the Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities, 55 Fed. Reg. 30798 (July 27, 1990), may be used as secondary guidance at the discretion of Ecology.

Unless otherwise specified herein, where the language of this Decree conflicts with these rules, proposed rules, notices, and guidance documents, the language of this Decree will prevail.

D. If SSA seeks to establish financial assurance by using a surety bond for payment or a letter of credit, SSA will at the same time establish and thereafter maintain a standby trust fund acceptable to Ecology into which funds from the other financial assurance

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instrument can be deposited, if the financial assurance provider is directed to do so by Ecology, pursuant to the terms of this Decree.

E. All cost estimates must be based on the costs to the owner or operator of hiring a third party to complete the work. A third party is neither a parent nor a subsidiary of SSA. On a case-by-case basis, Ecology may also determine that a company that shares a common higher-tier corporate parent or subsidiary might not qualify as a third party. A cost estimate may not incorporate any salvage value that may be realized with the sale of wastes, facility structures or equipment, land, or other assets associated with the facility. SSA may also not incorporate a zero cost for wastes that might have economic value.

F. If SSA is required to submit an additional work plan(s) under this Decree, SSA will submit a revised cost estimate for review and approval to Ecology's Financial Assurance Officer and Project Coordinator within thirty (30) Days of approval of the additional work plan. If Ecology rejects SSA's cost estimate as submitted, Ecology will provide a revised cost estimate amount and will, if requested by SSA in writing, provide a written explanation of the variance between SSA's proposed cost estimate and Ecology's revised amount. Within thirty (30) Days after Ecology's final approval of the cost estimate amount, SSA will establish and maintain continuous coverage of financial assurance in the amount of the approved cost estimate and submit the applicable financial assurance documentation.

G. SSA currently has acceptable financial assurance mechanisms in place pursuant to the First Amended Agreed Order No. 1577 and First Amended Agreed Interim Action Administrative Order No. 1578. No increase in the costs covered by this financial assurance is anticipated as a result of the adoption of this Consent Decree. Accordingly, absent any need to revise the cost estimate as set forth in this Decree, the existing financial assurance will be deemed acceptable until the next annual renewal date of June 8, 2009.

H. SSA will annually adjust all cost estimates for inflation. Adjustments for inflation will be calculated in accordance with the procedure outlined in 40 C.F.R. 264.143(b).

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If SSA is using the financial test or corporate guarantee to meet its financial assurance obligation, the annual inflationary adjustment will occur within ninety (90) Days after the close of SSA's fiscal year. If SSA is using any mechanism other than the financial test or corporate guarantee, this adjustment will occur each year within thirty (30) Days after the anniversary of the effective date of this Decree.

I. SSA must submit the original executed or otherwise finalized financial assurance instruments or documents to Ecology's Financial Assurance Officer; facsimiles or photocopies are not acceptable to meet this requirement. In addition, SSA must also submit copies of financial assurance instruments or documents to Ecology's Project Coordinator.

J. SSA will notify Ecology's Project Coordinator and Financial Assurance Officer by certified mail of the commencement of a voluntary or involuntary bankruptcy proceeding, naming SSA as debtor, within ten (10) Days after commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if it is named as debtor as required under the terms of the corporate guarantee.

K. Once SSA has established financial assurance with an acceptable mechanism as described above, SSA will be deemed to be without the required financial assurance:

1. In the event of bankruptcy of the trustee or issuing institution; or

2. If the authority of the trustee institution to act as trustee has been suspended or revoked; or

3. If the authority of the institution issuing the surety bond, letter or credit, or insurance policy has been suspended or revoked.

In the event of bankruptcy of the trustee or a suspension or revocation of the authority of the trustee institution to act as a trustee, SSA must establish a replacement financial assurance mechanism by any means specified in WAC 173-303-620 or other financial instrument as approved by Ecology within sixty (60) Days after such an event.

L. Ecology's Financial Assurance Officer is:

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PO Box 40117
Olympia, WA 98504-0117
(360) 586-6770

Kimberly Goetz
Department of Ecology
Hazardous Waste and Toxics Reduction Program
P.O. Box 47600
Olympia, Washington 98504-7600
Telephone: (360) 407-6754
FAX: (360) 407-6715
E-mail: kgoe461@ecy.wa.gov

XXII. INDEMNIFICATION

SSA agrees to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action for death or injuries to persons or for loss or damage to property to the extent arising from or on account of acts or omissions of SSA, its officers, employees, agents, or contractors in entering into and implementing this Decree. However, SSA will not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action to the extent arising out of the intentional, reckless or negligent acts or omissions of the State of Washington, or the employees or agents of the State, in entering into or implementing this Decree.

XXIII. COMPLIANCE WITH APPLICABLE LAWS

A. All actions carried out by SSA pursuant to this Decree will be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in RCW 70.105D.090. The permits or other federal, state, or local requirements that the agency has determined are applicable and that are known at the time of entry of this Decree have been identified in the Cleanup Action Plan (Exhibit B).

B. Pursuant to RCW 70.105D.090(1), SSA is exempt from the procedural requirements of Chapters 70.94, 70.95, 77.55, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals. However, SSA will comply with the substantive requirements of such permits or approvals. The exempt permits or approvals and

the applicable substantive requirements of those permits or approvals, as they are known at the time of entry of this Decree, have been identified in the Cleanup Action Plan (Exhibit B).

SSA has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Decree. In the event either Ecology or SSA determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Decree, it will promptly notify the other party of this determination. Ecology will determine whether Ecology or SSA will be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, SSA will promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology will make the final determination on the additional substantive requirements that must be met by SSA and on how SSA must meet those requirements. Ecology will inform SSA in writing of these requirements. Once established by Ecology, the additional requirements will be enforceable requirements of this Decree. SSA will not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

C. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency that is necessary for the State to administer any federal law, the exemption will not apply and SSA will comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

XXIV. REMEDIAL ACTION COSTS

SSA will pay to Ecology costs incurred by Ecology pursuant to this Decree and consistent with WAC 173-340-550(2). These costs will include work performed by Ecology or

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its contractors for, or on, the Site under Chapter 70.105D RCW, including remedial actions and Decree preparation, negotiation, oversight, and administration. These costs will include work performed both prior to and subsequent to the entry of this Decree. Ecology's costs will include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). SSA will pay the required amount within ninety (90) Days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. Itemized statements will be prepared quarterly. Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within ninety (90) Days of receipt of the itemized statement of costs will result in interest charges at the rate of twelve percent (12%) per annum, compounded monthly.

Pursuant to RCW 70.105D.055, Ecology has authority to recover unreimbursed remedial action costs by filing a lien against real property subject to the remedial actions.

XXV. IMPLEMENTATION OF REMEDIAL ACTION

If Ecology determines that SSA has failed without good cause to implement the remedial action, in whole or in part, Ecology may, after notice to SSA, perform any or all portions of the remedial action that remain incomplete. If Ecology performs all or portions of the remedial action because of SSA's failure to comply with its obligations under this Decree, SSA will reimburse Ecology for the costs of doing such work in accordance with Section XXIV (Remedial Action Costs), provided that SSA is not obligated under this Section to reimburse Ecology for costs incurred for work inconsistent with or beyond the scope of this Decree.

Except where necessary to abate an emergency situation, SSA will not perform any remedial actions at the Site outside those remedial actions required by this Decree, unless Ecology concurs, in writing, with such additional remedial actions pursuant to Section XV (Amendment of Decree).

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XXVI. PERIODIC REVIEW

As remedial action, including groundwater monitoring, continues at the Site, the Parties agree to review the progress of remedial action at the Site, and to review the data accumulated as a result of monitoring the Site as often as is necessary and appropriate under the circumstances. At least every five (5) years after the initiation of cleanup action at the Site the Parties will meet to discuss the status of the Site and the need, if any, for further remedial action at the Site. At least ninety (90) Days prior to each periodic review, SSA will submit a report to Ecology that documents whether human health and the environment are being protected based on the factors set forth in WAC 173-340-420(4). Ecology reserves the right to require further remedial action at the Site under appropriate circumstances. This provision will remain in effect for the duration of this Decree.

XXVII. PUBLIC PARTICIPATION

A Public Participation Plan (Exhibit D) is required for this Site. Ecology will review any existing Public Participation Plan to determine its continued appropriateness and whether it requires amendment, or if no plan exists, Ecology will develop a Public Participation Plan alone or in conjunction with SSA.

Ecology will maintain the responsibility for public participation at the Site. However, SSA will cooperate with Ecology, and will:

1. If agreed to by Ecology, develop appropriate mailing list, prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, remedial investigation/feasibility study reports, cleanup action plans, and engineering design reports. As appropriate, Ecology will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings.

2. Notify Ecology's project coordinator prior to the preparation of all press releases and fact sheets, and before major meetings with the interested public and local

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governments. Likewise, Ecology will notify SSA prior to the issuance of all press releases and fact sheets, and before major meetings with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by SSA that do not receive prior Ecology approval, SSA will clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology.

3. When requested by Ecology, participate in public presentations on the progress of the remedial action at the Site. Participation may be through attendance at public meetings to assist in answering questions, or as a presenter.

4. When requested by Ecology, arrange and/or continue information repositories at the following location:

Department of Ecology
Southwest Regional Office
Central Files
300 Desmond Drive
Lacey, WA 98503
Tel: (360) 407-6300

At a minimum, copies of all public notices, fact sheets, and press releases; all quality assured monitoring data; remedial actions plans and reports, supplemental remedial planning documents, and all other similar documents relating to performance of the remedial action required by this Decree will be promptly placed in the Department of Ecology central files.

XXVIII. DURATION OF DECREE

The remedial program required pursuant to this Decree will be maintained and continued until SSA has received written notification from Ecology that the requirements of this Decree have been satisfactorily completed. This Decree will remain in effect until dismissed by the Court. When dismissed, Section XVIII (Covenant Not to Sue) and Section XIX (Contribution Protection) will survive.

XXIX. CLAIMS AGAINST THE STATE

SSA hereby agrees that it will not seek to recover any costs accrued in implementing the remedial action required by this Decree from the State of Washington or any of its agencies; and further, that SSA will make no claim against the State Toxics Control Account or any local Toxics Control Account for any costs incurred in implementing this Decree. Except as provided above, however, SSA expressly reserves its right to seek to recover any costs incurred in implementing this Decree from any other PLP. This Section does not limit or address funding that may be provided under Chapter 173-322 WAC.

XXX. PRIOR AGREEMENTS

Entry of this Decree by the Court will satisfy and replace SSA's obligations under Agreed Order No. 1577. The terms and conditions of Second Amended Agreed Interim Action Order No. 1578 will continue in force, unless inconsistent with the terms and conditions of this Decree.

XXXI. EFFECTIVE DATE

This Decree is effective upon the date it is entered by the Court.

XXXII. WITHDRAWAL OF CONSENT

If the Court withholds or withdraws its consent to this Decree, it will be null and void at the option of any party and the accompanying Complaint will be dismissed without costs and without prejudice. In such an event, no party will be bound by the requirements of this Decree.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

K Seiler

K SEILER
Section Manager
Southwest Regional Office
Hazardous Waste & Toxics Reduction Program
(360) 407-6341

Date: 12-18-08

ROBERT M. MCKENNA
Attorney General

ANDREW A. FITZ, WSBA #22169
Assistant Attorney General
(360) 586-6752

Date: December 26, 2008

SSA TACOMA, INC.

EDWARD A. DENIKE
President
(206) 623-0304

Date: 12-23-2008

ENTERED this 30th Day of DECEMBER 2008.

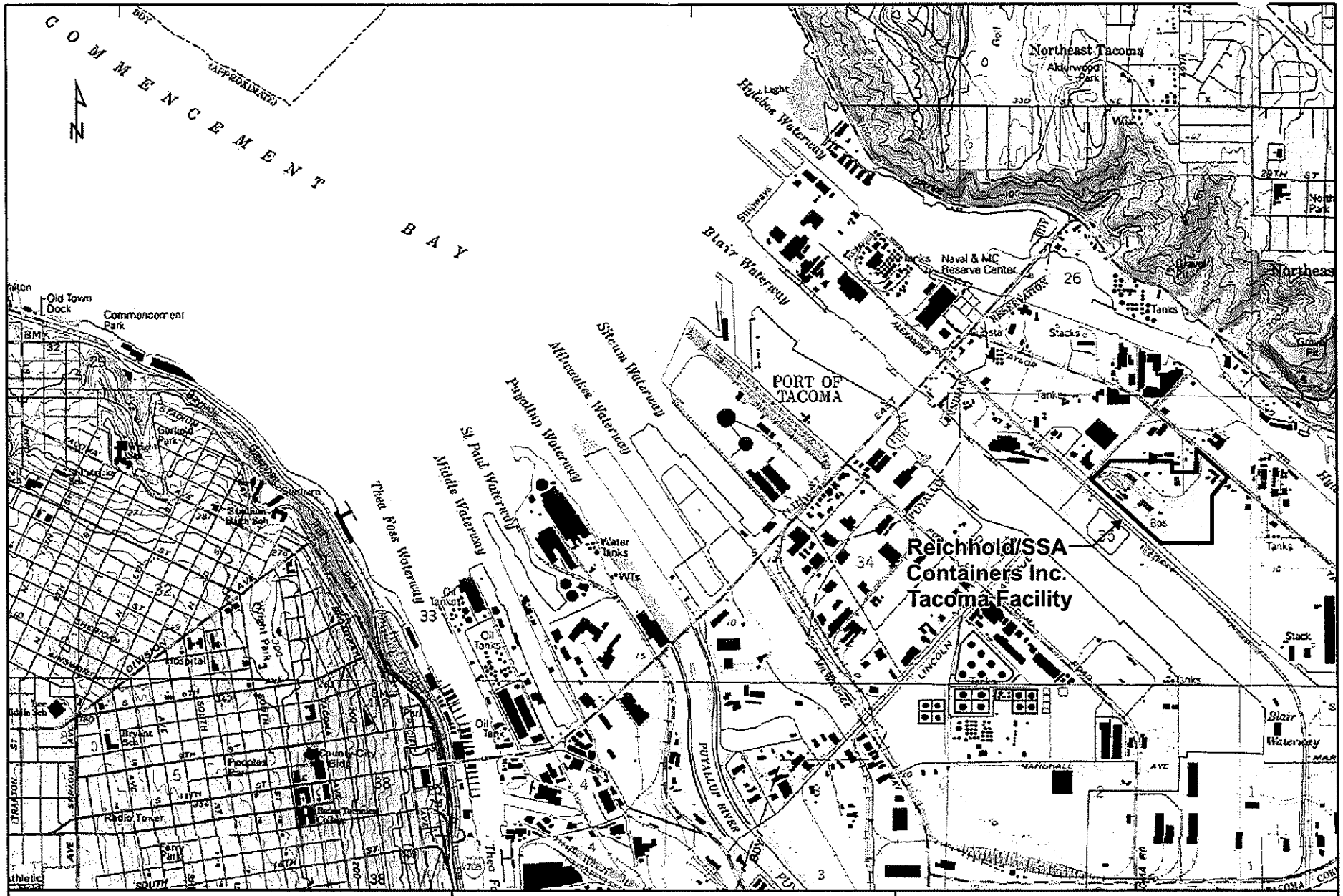
Robyn A. Lindsey
COURT COMMISSIONER

~~JUDGE~~ Commissioner
Pierce County Superior Court

Reichhold/SSA Containers Facility
Tacoma, Washington

Consent Decree

Exhibit A
Site Diagram



File: F:\projects\SSA-RHOLD\GIS\MXD_Figures\Task 08010\Exhibit A - Site Diagram.mxd
Date: 12/11/2008

Reichhold/SSA Containers Facility
Tacoma, Washington

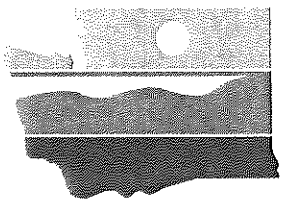
Consent Decree

Exhibit B
Cleanup Action Plan

Reichhold / SSA Containers Inc. Cleanup Action Plan

December 2008

DEPARTMENT OF ECOLOGY
State of Washington



DEPARTMENT OF
ECOLOGY
State of Washington

Reichhold / SSA Containers Inc. Cleanup Action Plan

FINAL

December 2008

Executive Summary

This document is a "cleanup action plan" or "CAP" for the Reichhold/SSA Containers Inc. site located in Commencement Bay (3320 Lincoln Avenue, Tacoma, WA). Under state environmental law (Model Toxics Control Act, Chapter 173-340 WAC), a cleanup action plan is the document in which a final cleanup decision is made for a contaminated site. This plan provides details on the site history, the nature and extent of the contamination, cleanup standards and site cleanup details, including costs and justification.

Reichhold Inc. formerly owned a 52-acre property comprising most of the contaminated site. Reichhold used the land for chemical manufacturing. From 1956-1990, Reichhold produced chemical and chemical-related products including pentachlorophenol, urea-formaldehyde resins, calcium, chloride solution, treated fiber products and a formaldehyde catalyst. In July of 2006, SSA Containers Inc., which is a subsidiary of SSA Marine, purchased the Reichhold property. SSA Containers Inc. intends to use this land as a shipping / container facility. Land ownership of the shipping container facility will eventually be transferred to the Puyallup Tribe of Indians.

Because of Reichhold's chemical manufacturing operations, the site became significantly contaminated with the wood preservative pentachlorophenol (PCP), as well as other hazardous substances. Pentachlorophenol (PCP) is a white organic solid with needle-like crystals and a phenolic odor. The greatest use of pentachlorophenol is as a wood preservative (fungicide). Though once widely used as an herbicide, it was banned in 1987 for these and other uses, as well as for any over-the-counter sales. The USEPA has determined that pentachlorophenol is a probable human carcinogen, and may cause damage to the central nervous system.

Over time, releases of pure crystalline PCP to the site soils contaminated the shallow water table. This in turn resulted in ntamination of what is known as the "intermediate" site aquifer. Site soils are chiefly comprised of dredge spoils (fine medium sand). In 1986-87, a significant off-property "plume" of PCP contaminated ground water was detected. The movement of this plume may have in part been influenced by seawater fluctuations and pumping within a former graving dock west of the site and along the Blair Waterway.

Over the last 20 years, Reichhold and SSA Containers have worked with the USEPA and the Washington State Department of Ecology on various site cleanup activities. A site ground water "pump and treat" system captured and intercepted the off-site ground water PCP plume. A shallow interceptor drain (SID) captures shallow ground water along the site periphery. Lastly, a significant amount of contaminated soil has been removed and disposed of off-site in permitted landfills or treated on-site in treatment cells. Because of all the historical cleanup activity, this site is now in the final stages of cleanup. This cleanup action plan provides details for two media: soil and ground water. Here is a brief synopsis of the final site cleanup action:

- Soil: contaminated soil (e.g. contaminated with PCP) from several site areas (e.g. "PCP plant") will be excavated and removed.

- Ground water: PCP concentrations have declined significantly. Consequently, ground water "pump and treat" will be discontinued. The proposed remedy is "monitored natural attenuation" or "MNA". In other words, the site ground water will be monitored to ensure that concentrations will continue to decline and not impact off site areas (i.e. the Blair Waterway).

This cleanup action plan represents the culmination of over 20 years of work by Reichhold, SSA Containers Inc., Ecology and EPA. Several environmental consulting firms have also worked on this site, including CH2M Hill and Floyd|Snider. ology sincerely appreciates the work done by all on this site.

DEPARTMENT OF
ECOLOGY
State of Washington

Note to the Reader

This document has two parts. This first part of this document is the "cleanup action plan" or "CAP" (pp. 1-60). The "CAP" provides details on how this site will be cleaned-up. The second part of this document is: Attachment B – Compliance Monitoring Contingency Plan (CMCP). This plan provides details on the site ground water monitoring requirements. Specifically, monitored natural attenuation or "MNA" is the proposed ground water remedial action. As part of the MNA action, you must demonstrate, by ground water monitoring, that natural attenuation is occurring. Details on future ground water compliance monitoring requirements are provided in the "CMCP".

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List of Abbreviations and Acronyms

Acronym/Abbreviation	Definition
ARAR	Applicable or relevant and appropriate requirement
BGS	Below ground surface
BPA	Butylphenol Process Area
CAMU	Corrective Action Management Unit
CAP	Cleanup Action Plan
CDA	Construction Debris Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System
CLARC	Cleanup levels and risk calculations
CMCP	Compliance Monitoring and Contingency Plan
COC	Chemical of concern
CRS	Catalyst Reclaim Sludge
CWA	Clean Water Act
DCAP	Draft Cleanup Action Plan
DWM	Dangerous Waste Management
FFS	Focused Feasibility Study
FRI	Focused Remedial Investigation
HCL	Hydrochloric Acid
KM	Kaplan Meier
LDR	Land Disposal Regulation
MNA	Monitored natural attenuation
MTCA	Model Toxics Control Act
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NPDES	National Pollutant Discharge Elimination System
NWAPA	Northwest Air Pollution Authority
ODEQ	Oregon Department of Environmental Quality
OSHA	Occupational Safety and Health Act
PCB	Polychlorinated biphenyl
PCP	Pentachlorophenol
PCOC	Potential chemical of concern
POTW	Publicly-owned Treatment Works
PPA	Pentachlorophenol Plant Area
PSCAA	Puget Sound Clean Air Authority
RAO	Remedial action objective
RBC	Risk-based calculation
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington

1.0 Introduction

This Cleanup Action Plan (CAP) sets cleanup standards and describes a cleanup action for the Reichhold / SSA Containers site (the "site"). This site was the former location of a chemical manufacturing plant located at 3320 Lincoln Avenue in Tacoma, Washington (Figure 1, p. 3).

The Washington State Department of Ecology (Ecology) is responsible for the cleanup action selection and completion of the CAP. The selected cleanup action fulfills the requirements of the Model Toxics Control Act (MTCA) RCW 70.105D. The objectives of this document are to satisfy the MTCA requirements set forth in WAC 173-340-380(1). This CAP has information on the site:

- history,
- nature and extent of contamination,
- cleanup standards,
- proposed remedial actions, including alternatives considered and justification for the selected remedial actions, and
- implementation schedule and next steps.

This CAP is one in a series of documents used by Ecology to monitor the progress of site investigation and cleanup. A summary of site investigations and the site's regulatory history are provided in Section 2.0. The CAP will be finalized pending incorporation of public comment.

1.2 APPLICABILITY

This CAP is applicable only to the Reichhold / SSA Containers Inc. site in Tacoma, Washington. The proposed site remedial actions meet the WAC 173-340-360 requirements. Site cleanup standards and remedial actions were derived under Ecology oversight using MTCA authority. Ecology's decisions for this site do not set precedent for other sites.

1.3 OWNERSHIP REVIEW AND OBLIGATIONS

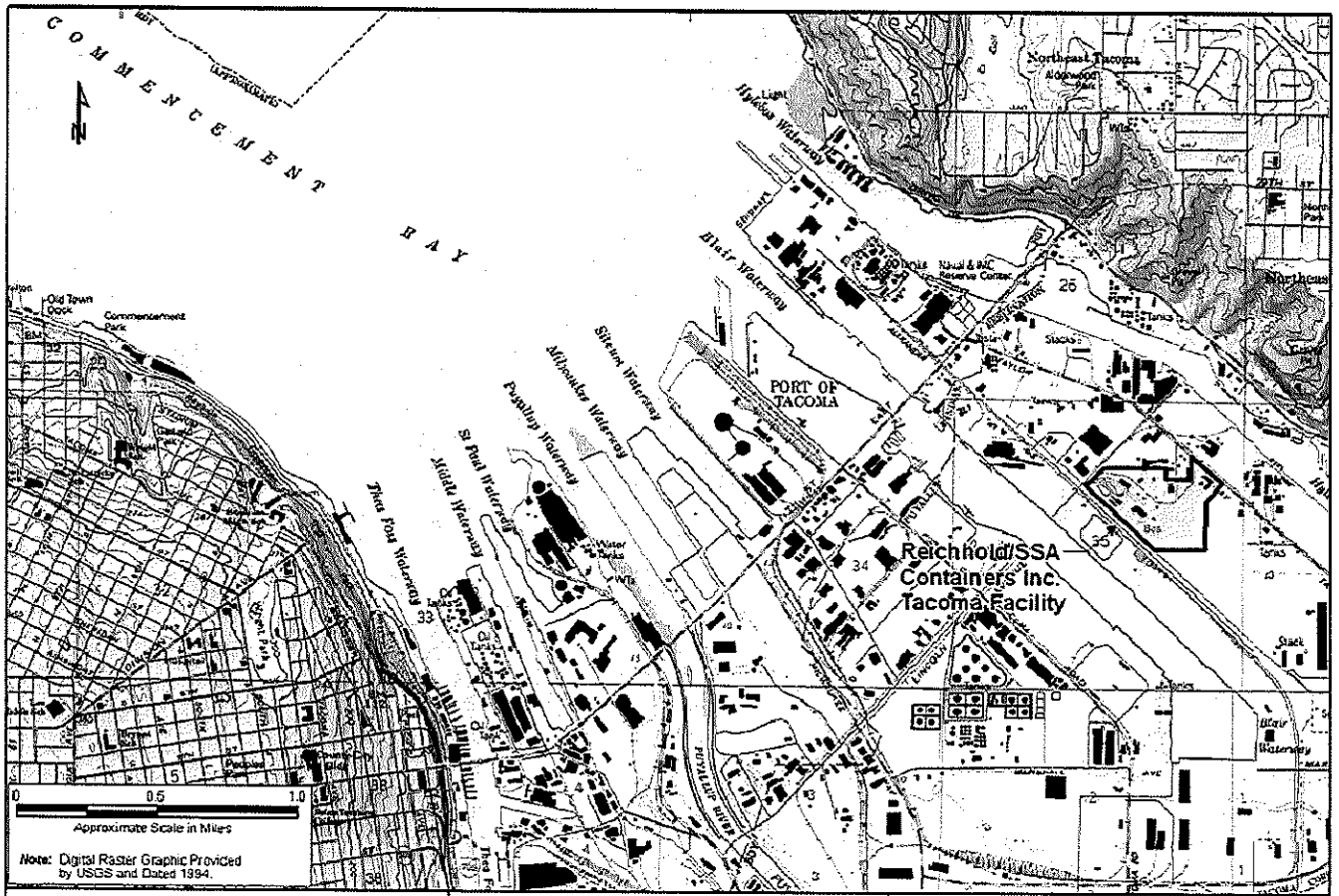
On July 27, 2006 ("closing date"), SSA Containers, Inc. (SSA) purchased a 52-acre property comprising most of the site from Reichhold, Inc. SSA has assumed all cleanup responsibilities[1] including all obligations not completed as of the closing date. Effective on the closing date, Ecology approved Reichhold's request for transfer of the existing Dangerous Waste Management Permit and the minor Class 1 permit modification to SSA. The Agreed Orders were reissued to reflect SSA's ownership of the site and acceptance of the associated obligations. Section 2.3 presents the regulatory status and history of the site. Since SSA purchased the site, it has worked with Ecology to continue site cleanup and monitoring, as specified in the Agreed Orders. This CAP describes the evaluations and recommendations for final site cleanup action.

[1] Ecology Agreed Order Nos. 1577 and 1578.

1.4 GOALS FOR COMPLETION OF REMEDIAL ACTIONS AND FUTURE SITE USE

It is anticipated that this site will be developed for marine industrial use as a portion of the planned Puyallup Tribal Terminal. In early 2008, SSA and the Puyallup Tribe reached agreement on transfer of land ownership. Specifically, following completion of cleanup actions and site development, it is anticipated this site will be transferred into long-term tribal ownership. The site development will be coordinated with implementation of final cleanup actions and will allow for long-term environmental monitoring. This cleanup action plan provides details on all of the soil and ground water remedial alternatives that were considered as well as future monitoring requirements.

Figure 1: Site Vicinity Map.



	Cleanup Action Plan **Reichhold/SSA Containers Facility** **Tacoma, Washington**	**Figure 1 – Site Vicinity Map.**

2.0 Site Description and History

2.0 Site Description and History

This ~ 52-acre site, which is now owned by SSA Containers, Inc. and formerly owned by Reichhold Inc., is located in the Commencement Bay industrial area of Tacoma, Washington. The site is located between the Hylebos and Blair Waterways (Figure 2, p. 5). The site is located on relatively flat terrain with generally less than 5 feet of topographic relief. This site is located in an area that was constructed in the early 1950s. The then-existing salt marsh was filled with dredge spoils from adjacent waterways (CH2M HILL 2006). The site is currently zoned for industrial use. SSA operates the existing site groundwater treatment system and soil treatment cells. Portions of the site are subleased on a month-to-month basis for industrial use.

In the future, this land will be used as a marine cargo facility, as specified in the Port of Tacoma's Master Plan for the East Blair Terminal. SSA plans to redevelop the site into a paved industrial site for marine cargo handling, consistent with neighboring uses and designated zoning. The site redevelopment action is anticipated to occur in 2010-2011 upon receipt of applicable land use and development permits.

2.1 PHYSICAL SETTING

2.1.1 Geology

The site is located within the Tacoma tideflats, an area of unconsolidated sediment from the Puyallup River Valley, which extends from Commencement Bay to the south flank of Mount Rainier, more than 45 miles to the east. Sediment deposited at the mouth of the Puyallup River built a large estuarine delta into Commencement Bay. The delta consisted of a tidal flat that merged landward with complex tidal marshes and sinuous tidal channels that in turn merged with the Puyallup River Valley floor.

2.1.2 Hydrogeology

The site is underlain by three aquifers and two confining layers or "aquitards". These three aquifers, which are brackish and non-potable, are referred to as the shallow, intermediate, and deep aquifers. The two aquitards are referred to as the upper and lower aquitards. The Tacoma tideflats are a regional groundwater discharge area. Groundwater flows from recharge areas (higher elevations) toward discharge areas along Commencement Bay and adjacent waterways, e.g. the Blair Waterway. Because of this situation, the vertical groundwater gradient direction is typically upward from the deep aquifer to the intermediate aquifer.

The shallow aquifer consists of fine to medium sand and silty sand that is primarily dredge spoils from the Hylebos and Blair Waterways deposited in the 1950s. The shallow aquifer is unconfined and ranges in saturated thickness from 0 to 10 feet above the upper aquitard.

Figure 2: Site Map.

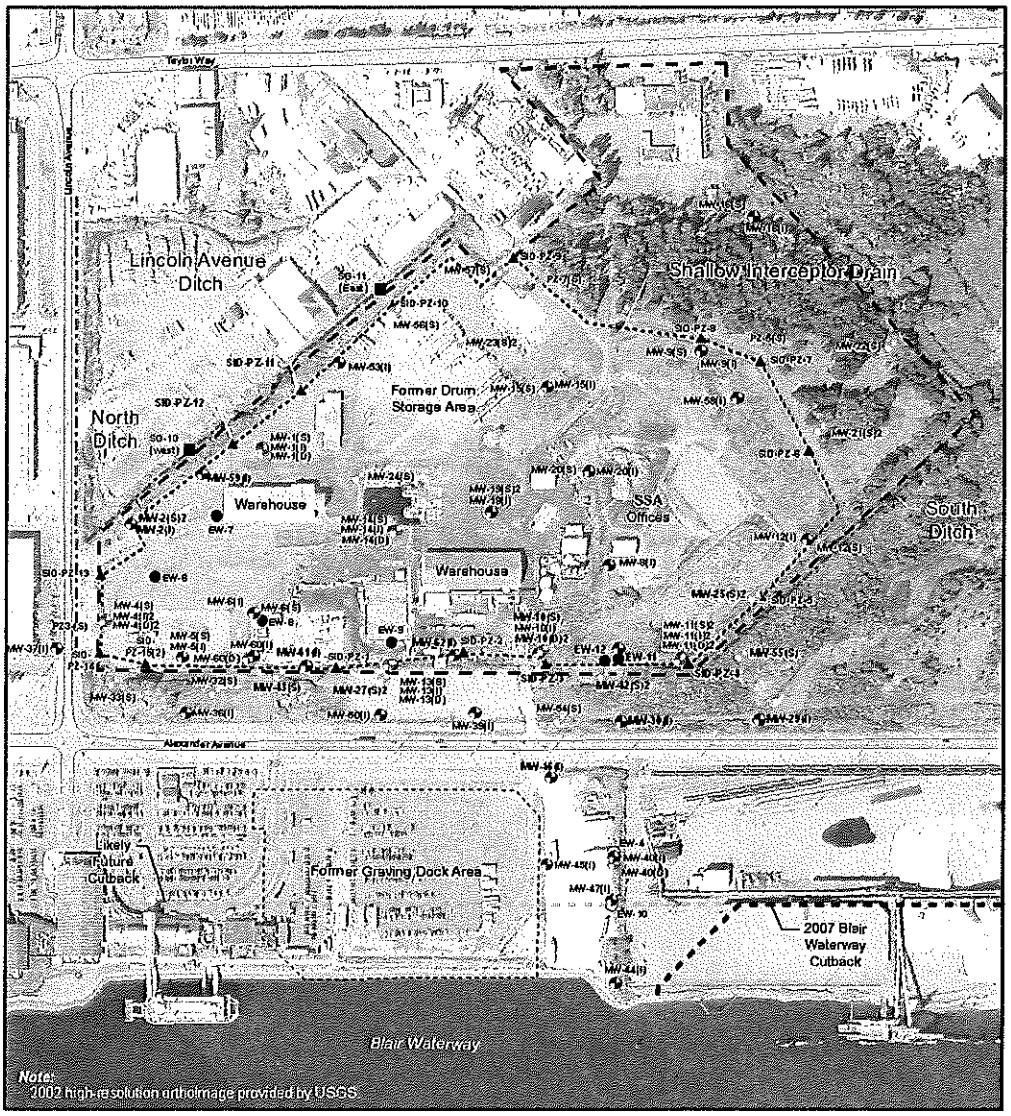


Figure 2 – Site Map

Cleanup Action Plan
Reichhold/SSA Containers Facility
Tacoma, Washington

Groundwater flow within the shallow water table aquifer is generally radial from the interior of the site toward the Shallow Interceptor Drain (SID) and drainage ditches at the perimeter of the site. This "SID" system was installed in 1989 to capture shallow ground water from the perimeter of the manufacturing arm of the site.

The upper aquitard is comprised of the uppermost native formation, which is considered to represent the former ground surface of the salt marsh that existed prior to dredge spoil filling. The unit ranges from 1 to 20 feet thick and consists primarily of silt, organic silt, and clayey silt, with zones of peat.

The intermediate aquifer consists primarily of fine to medium sand and silty sand, with zones of interbedded sand, silty sand, and silt. The intermediate aquifer ranges in thickness from 4 to approximately 31.5 feet. Groundwater elevation data indicate that the intermediate aquifer groundwater generally flows from east to west across the eastern portion of the site, toward the Blair Waterway and Commencement Bay. The intermediate aquifer is also tidally influenced (Blair Waterway), which results in gradient reversals. However, the overall or net groundwater flow direction is toward the waterway. Transient reversals in the groundwater flow direction do not prevent groundwater discharge to the waterway. Current site groundwater flow patterns are also influenced by the groundwater extraction system. Historically, the general site groundwater flow pattern across was west toward the Blair Waterway and becoming more southwesterly in the off-site area, closer to the Blair Waterway.

The lower aquitard separates the site intermediate and deep aquifers. This unit consists of silt, organic silt, and clayey silt, with occasional very fine sandy silt and peat interbeds and zones of organic material. The lower aquitard ranges in thickness from approximately 5.5 to 18 feet.

The deep aquifer consists primarily of alternating fine to medium sand and silty sand, with occasional silt interbeds. The total thickness of the deep aquifer is not known; however, regional studies indicate that the sand might reach a thickness of 80 feet or more near the site (Walters and Kimmel 1968). Groundwater flow in the Deep aquifer occurs under confined conditions, with the potentiometric surface approximately 20 to 30 feet above the top of the unit. Groundwater flow in the Deep aquifer is generally to the southwest toward the Blair Waterway. The deep aquifer is tidally influenced and experiences transient, localized reversals in the groundwater flow direction. The net groundwater flow direction in the deep aquifer is toward the Blair Waterway.

Underlying the three uppermost aquifers is up to 400 feet of generally fine-grained marine sediments. These fine-grained sediments provide a low-permeability base that separates the three uppermost aquifers beneath the site from the underlying deep regional aquifer, a glacially derived unit of alternating layers of fine- and coarse-grained materials (Walters and Kimmel 1968).

2.1.3 Surface Water

Three ditches border the site property boundary: North, South and Lincoln Avenue (Figure 2, p. 5). The North ditch runs along the northern SSA site boundary and carries stormwater runoff from SSA and other adjacent properties to the Lincoln Avenue ditch. The Lincoln Ave ditch runs along the western site boundary. The Lincoln Ave. ditch receives runoff from several industrial and urban properties northeast of the site. Lincoln Ave. stormwater then enters a concrete culvert adjacent to the site that conveys stormwater runoff to the Blair Waterway. The South ditch is located along a portion of the southeast site boundary. The North and South ditches flow only when precipitation runoff or high groundwater

levels cause inflow into them, and typically either go dry or cease to flow and become stagnant during dry summer conditions.

In 2007, the Port of Tacoma widened a portion of the Blair Waterway. This widening or cutback will extend further north to accommodate development of the Puyallup Tribal Terminal. This new cutback will decrease the distance from the site to the Blair Waterway by ~ 200 feet, which means the site property boundary is now 600 feet from the Blair Waterway.

2.2 HISTORIC USE AND INTERIM ACTIONS

Reichhold operated a manufacturing plant on its property that produced chemical and chemical-related products including pentachlorophenol, urea-formaldehyde resins, calcium chloride solution, treated fiber products and a formaldehyde catalyst between 1956 and 1990. Reichhold worked with Ecology and the U.S. Environmental Protection Agency (USEPA) Region 10 beginning in 1986 to investigate, begin remediation, and permit the property for further cleanup action (CH2M HILL 2006). Reichhold has conducted Resource Conservation and Recovery Act (RCRA) corrective actions, including a "facility assessment" and a "facility investigation".

2.3 REGULATORY STATUS AND HISTORY

Effective July 30, 2004, the regulatory guidelines for implementing site corrective action include a Dangerous Waste Management Permit (No. WAD009252891; the "DWM" Permit). This DWM permit was granted by Ecology to Reichhold, as specified in Agreed Orders 1577 and 1578. The DWM permit and associated Agreed Orders replaced the RCRA "Storage and Corrective Action" permit issued by USEPA Region 10. This permit had been in effect since December 4, 1988. USEPA delegated authority for final RCRA corrective actions to Washington State in 1997.

To facilitate transfer of the DWM Permit from Reichhold, SSA entered into an Ecology Agreed Order (No. 1577). To satisfy corrective action under WAC 173-303-646, a Focused Remedial Investigation (FRI) and FFS are required.

Reichhold completed the final FRI in April 2006. Ecology the FRI on July 26, 2006. SSA submitted the FFS work plan to Ecology in March 2007 and it was approved by Ecology on June 21, 2007. The submission of the final FFS in June 2008 is the second deliverable described in the attachment.

Through the DWM Permit, Ecology and SSA have also entered into Agreed Order No. 1578. Under the requirements of this order, a "grandfathered" site Corrective Action Management Unit (CAMU) was established. This site CAMU is actually an "interim action" that was used as part of the overall site cleanup action. A "grandfathered" CAMU is an area designated by Ecology for implementing "corrective action" requirements (WAC 173-303-64620). A CAMU may only be used for the management of "remediation" or cleanup wastes (e.g. contaminated soil). SSA operates the CAMU as approved by Ecology and in accordance with the WAC 173-340 (MTCA) requirements.

By facilitating a final cleanup under MTCA, Chapter 17.105D RCW, the CAMU helps to satisfy the corrective action requirements (WAC 173-303-64620). In accordance with the requirements of WAC 173-340-430(3)(b), the creation of the CAMU can be incorporated into a final site remedial action and does not foreclose reasonable alternatives for any additional site corrective action.

In the 1988 RCRA Storage and Corrective Action permit issued to Reichhold by USEPA, interim actions included source area cleanup, containment, and treatment of groundwater. Cleanup actions included:

- 1996 - excavation of impacted soil from, the former pentachlorophenol plant area (PPA).
- 1996 - excavation of impacted soil from the north extension area.
- Excavation of impacted soil from the off-site drum storage area and the septic tank and leach field.
- 2002- excavation of over 23,000 cubic yards of impacted soil from the construction debris area (CDA).
- 2002 - excavation of impacted soil from the PPA.

Excavated soil was either placed in the soil treatment cells for on-site biological treatment or disposed of off-site at an approved facility.

When Reichhold owned the bulk of the site, it also implemented several remedial actions. These actions significantly reduced chemicals of concern (COCs) in both soil and ground water. SSA continues to operate the ground water pump and treat (hydraulic containment) system for shallow and intermediate groundwater. The ground water pump and treat is composed of three components:

- The SID was installed in 1989 around the perimeter of the manufacturing portion of the site to intercept and collect shallow aquifer groundwater.
- The site ground water treatment system (intermediate aquifer) was also installed in 1989 to remediate areas of on and off-property groundwater contamination (west to the Blair Waterway). The current extraction well system consists of six active site extraction wells.
- Water that is captured by the SID and the groundwater extraction system is pumped to an on-site water treatment system. This treatment system uses photolysis[2] technology in combination with direct oxidation to remove dissolved-phase ground water PCP and other chlorinated phenols. This treatment system has been operational since 1990. The treatment system was upgraded in 1992 to meet the capacity (i.e. more gpm) of the extraction systems.

Treated ground water is discharged to the Blair Waterway under the conditions of National Pollutant Discharge Elimination System Waste Discharge Permit No. WA0040771 (NPDES Permit). The current NPDES permit was issued to Reichhold on May 11, 2004 and took effect July 1, 2004. The NPDES Permit was modified to reflect SSA's ownership of the site on July 12, 2006 and expires June 30, 2009. In

[2] Enhanced oxidation using photodissociation of hydrogen peroxide to hydroxyl radicals and subsequent oxidation of PCP molecules to hydrochloric acid, carbon dioxide, and water.

addition to governing discharge of treated groundwater through Outfall RC-1, the NPDES Permit also governs discharge of stormwater to Lincoln Avenue ditch through Outfall RC-2.

SSA complies with its requirements under the NPDES Permit including:

- discharge limitations and monitoring requirements for wastewater and stormwater,
- reporting requirements (including monthly discharge monitoring reports),
- operations and maintenance requirements,
- treatment residual requirements,
- stormwater source control requirements,
- annual outfall inspections, and
- semi-annual toxicity testing at Outfall RC-1.

3.0 Nature and Extent of Contamination / Cleanup Standards

3.1 NATURE AND EXTENT OF CONTAMINATION

The following subsections provide details on the nature and extent of site contamination for groundwater, soil, and soil treatment cells (WAC 173-340-700).

3.1.1 Groundwater

Pentachlorophenol (PCP) and breakdown products (other chlorinated phenols) are the key ground water contaminants associated with the site. Chlorinated solvents (i.e. trichloroethylene or "TCE") and associated breakdown products (e.g. vinyl chloride) were also detected, although at lower concentrations. A significant ground water "plume" of dissolved-phase PCP was discovered in 1986-87. This plume had migrated off-property and west to the Blair Waterway. The source of this plume appeared to be the "Construction Debris Area (CDA)". In this area, wooden pallets with bags of pure crystalline PCP were buried in shallow soils. This in turn resulted in shallow aquifer contamination, which in turn resulted in significant contamination of the intermediate aquifer. The movement of the historical off property PCP plume may have also been influenced by seawater fluctuations within a former graving dock west of the site and adjacent to the Blair Waterway.

Since 1986, the site has undergone significant investigation, monitoring, and remediation, including hydraulic control and treatment of groundwater. This includes several corrective actions that have removed contaminated soil source areas. Groundwater COCs, their fate and transport, exposure pathways, and receptors are well understood. Also, as established in this CAP, site groundwater "remediation levels" (WAC 173-340-200) were derived for "source" areas (e.g. the PCP plant). These remediation levels are considered protective of off-site receptors (Blair Waterway).

As part of the FFS work, the sampling results for the last 5 years (Mar-03 to Feb-08) for all ground water COCs were compared to cleanup and remediation levels. Aside from one substance, all site groundwater COCs are now less than the remediation levels. The one exception was the detection of 2,3,4,6-tetrachlorophenol @ 2,800 ug/L (ppb) in monitoring well MW-14(S) on two occasions. This concentration is greater than remediation levels. MW-14(S) is located immediately south of the PPA and hundreds of feet from the perimeter ditches. Concentrations of 2,3,4,6-tetrachlorophenol in samples from perimeter monitoring wells located closer to the ditches (near the off-property conditional point of compliance) are all less than surface water criteria. Thus, this seems to indicate that remnant chlorinated phenols (e.g. 2,3,4,6-tetrachloropehnol) are not likely to migrate off property and impact surface water (Blair Waterway).

Natural attenuation processes and soil removal actions have significantly reduced ground water COC concentrations. As a result, the site ground water is now in compliance, i.e. concentrations are now less than remediation levels. Concentration vs. time plots of various ground water COCs (1985-2008) are provided in the FFS, Appendix C. Because of the site cleanup and natural attenuation, it is anticipated that site ground water COC concentrations will continue to decline over time.

3.1.2 Soil

The FFS evaluated six site soil areas of concern: SWMU 6 Resin Tank Farm (RTF), SWMU 10 Hydrochloric Acid (HCL) Pond Area, SWMU 11 Catalyst Reclaim Sludge (CRS) Area, SWMU 24 (PPA), SWMU 25 Butylphenol Process Area (BPA), and SDA-9 Area. The FFS evaluation concluded that all areas, except the RTF and CRS area, would potentially require further action. The areas investigated and sample locations are shown on Figure 3, p. 13.

Each of the site areas requiring further action are described in the next subsections. Section 5.0 provides details on the proposed remedial actions (including the development and evaluation of all remedial alternatives) for these soil areas of concern.

3.1.2.1 SWMU 10—Hydrochloric Acid Pond Area

The HCL pond area was a stormwater and acid neutralization pond for hydrochloric acid that was produced as a byproduct of the pentachlorophenol process. This area was "unlined". Soil samples collected from this area during the pre-closure and focused soil investigation were analyzed for inorganic chemicals, pesticides, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs) and volatile organic compounds (VOCs). The soil sample results indicate that 3 substances exceed cleanup levels: 2,4-dichlorophenol, tetrachloroethene, and trichloroethene.

With respect to 2,4-dichlorophenol, one sample had a concentration (52.7 mg/kg) higher than the 34 mg/kg cleanup level. In order to get a "better perspective" on the impacts of one sample exceeding standards, the MTCA statistical guidance was used to evaluate sample results. Based on the statistical analysis, the remnant soil 2,4-dichlorophenol concentrations do not exceed cleanup levels established in this CAP, per the MTCA WAC 173-340-740 (7)(d) and (e) criteria:

- The upper one-sided 95 percent upper confidence limit (UCL) on the true mean soil concentration shall be less than the soil cleanup level,
- No single sample concentration shall be greater than two times the soil cleanup level, and
- Less than 10 percent of the sample concentrations shall exceed the soil cleanup level.

The standard mean and 95 percent UCL were calculated using a USEPA statistical package known as "ProUCL[3]" (version 4.0). Due to the multiple detection limits in the data set, the Kaplan Meier (KM) mean and standard deviation were used. In addition to meeting the first criterion, the sample results meet the last two criteria. Therefore, the sampling and statistical analysis confirm that the HCL Pond area soil complies with MTCA cleanup standards for 2,4-dichlorophenol. For the remaining COCs, the HCL pond area was identified for further action (Section 5.0).

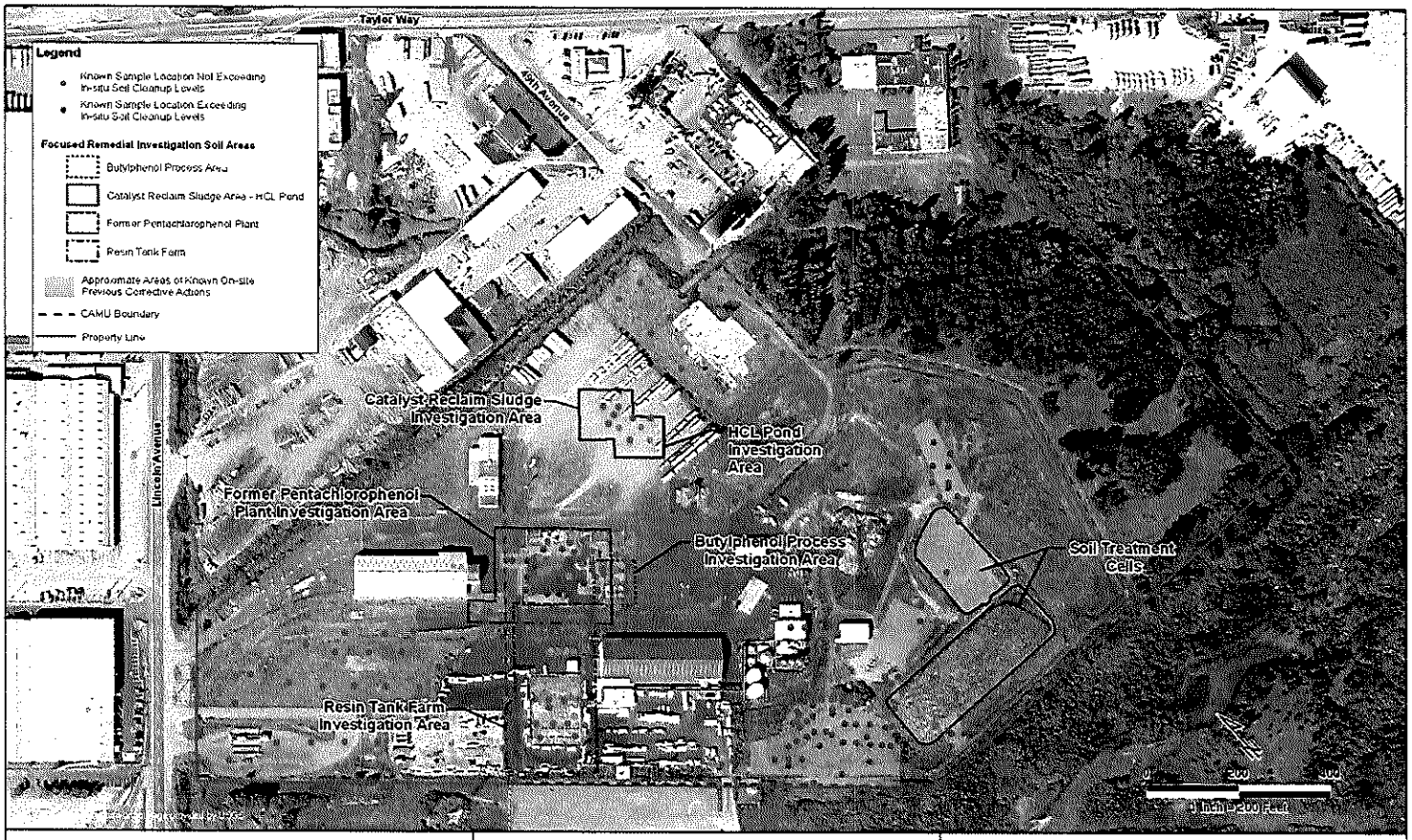
[3] "ProUCL" is a statistical software program developed by Lockheed Martin Environmental Services for USEPA. This statistical package offers a variety of tools and techniques for calculating the 95% upper confidence limit (UCL95) on the mean.

3.1.2.2 SWMU 24—Pentachlorophenol Plant Area (PPA)

The PPA was the main site pentachlorophenol (PCP) production area. Soil samples collected from this area during the preclosure, focused and supplemental soil investigations were analyzed for inorganic chemicals, pesticides, PCBs, SVOCs and VOCs. Sample results indicate that pentachlorophenol, 2,4-dichlorophenol, 2-chlorophenol, Aroclor 1248 and trichloroethene exceed cleanup levels established in this CAP.

Several previous remedial action excavations removed approximately 6,000 cubic yards of soil from the PPA area. During the latest PPA area excavation (2002), noxious odors were encountered while removing the contaminated soil. The odors were detected as the excavation neared the aquitard at depths of approximately 7- 8 feet.

Figure 3: Soil Sample and Corrective Action Locations.



	Cleanup Action Plan **Reichhold/SSA Containers Facility** **Tacoma, Washington**	Figure 3

PPA soil samples with COCs that exceed cleanup levels are shown in Figure 4, p. 15. These samples include PP1108.0A and PP1109.0A, which are co-located and are near the 2002 PPA excavation. The approximate footprints of the previous excavations are shown on Figure 4, p. 15. It is likely that these samples were used as confirmation samples to determine the extent of the excavation. However, due to extreme odors encountered during excavation, the area was backfilled prior to complete removal of all contaminated soil.

A supplemental soil investigation was conducted in November 2007. The objective of this investigation was to reassess the nature and extent of soil areas with "free product" or non-aqueous phase liquids (NAPLs). This free chemical product was thought to be the source of the odors during the 2002 excavation. The delineation of the contaminated soil provided a clearer estimate of the limits and volume of final remedial action necessary in this area. The results of this investigation are provided in the Supplemental Soil Investigation Report (Floyd|Snider 2008) and the FFS. The PPA area has been identified for further action (Section 5.0).

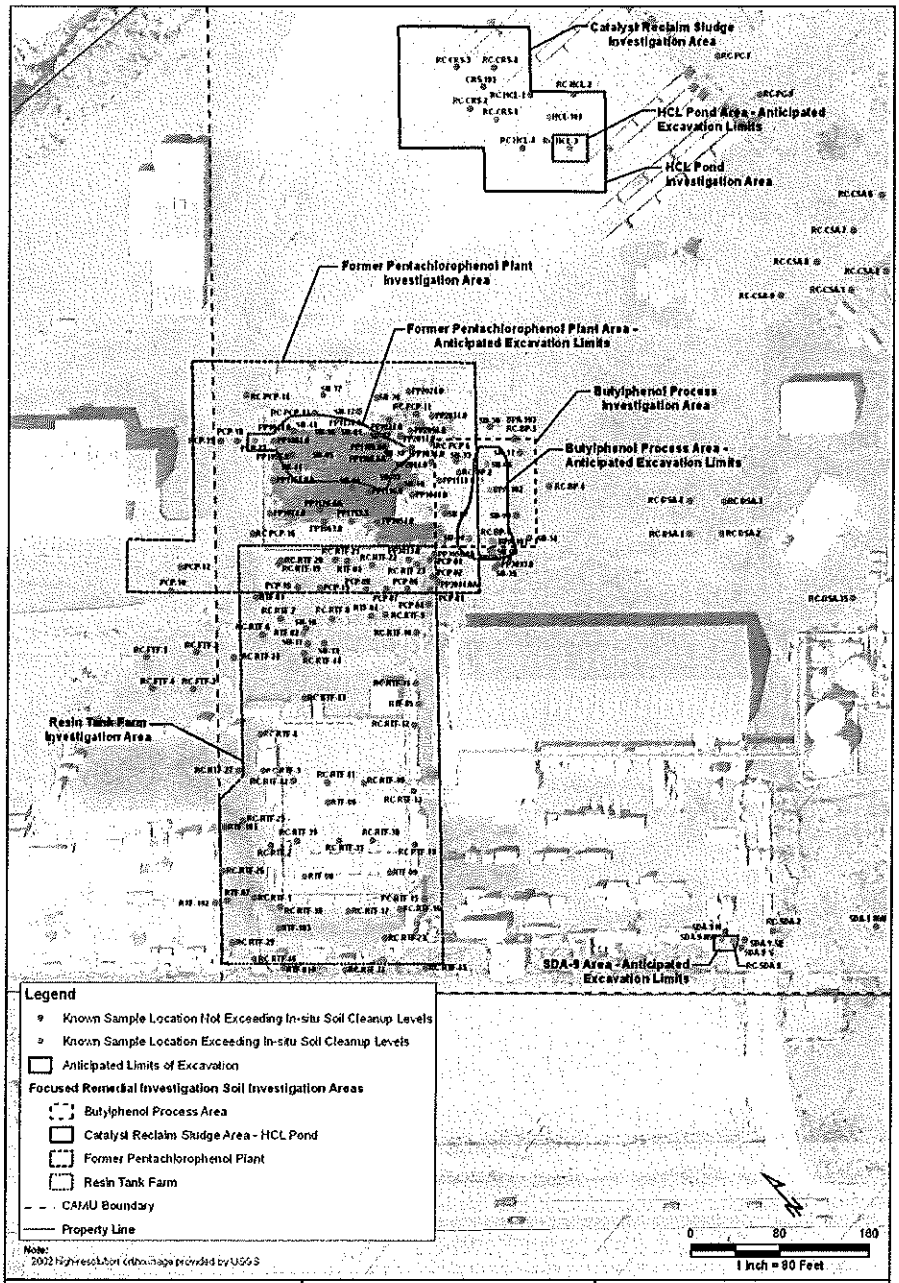
3.1.2.3 SWMU 25—Butylphenol Process Area (BPA)

The BPA formerly contained equipment that used to produce a variety of chemicals. A key "landmark" for this area was a distillation column. One of the chemical product lines produced in the BPA included the reclamation and distillation of Dowtherm™, which resulted in "still bottoms" containing PCBs. Other product lines processed through the same equipment used chlorophenols as raw materials. It is assumed that these processes were a source of soil contamination.

During the November 2007 Supplemental Soil Investigation, Geoprobe (direct push) soil borings were used to assess the nature and extent of contamination. This information was then used to estimate how much soil would need to be excavated from this area (Supplemental Soil Investigation Report, Floyd|Snider 2008).

Samples collected during the preclosure, focused and supplemental soil investigations were analyzed for inorganic chemicals, pesticides, PCBs, SVOCs, and/or VOCs. Sample results indicate that 2,4,6-trichlorophenol and 2,4-dichlorophenol exceed cleanup levels established in this CAP. The BPA has been identified for further action (Section 5.0).

Figure 4: Soil Areas of Concern.



	Cleanup Action Plan **Reichhold/SSA Containers Facility** **Tacoma, Washington**	Figure 4

3.1.2.4 SDA-9 Area

The SDA-9 area is an area to the northwest of the Construction Debris Area (CDA). It was previously identified as a location that required excavation due to exceedances of PCBs (Aroclor 1248). The excavation for this area was planned for construction in the late 1990s; however, this did not occur, as there were concerns about affecting existing utility lines. It has now been determined that the excavating soil in the SDA-9 area will not affect existing utilities.

Soil samples collected during both the 1986 preclosure Investigation and the 1994 soils characterization investigation were analyzed for inorganic chemicals, pesticides, PCBs, SVOCs, and VOCs. Sample results indicate that Aroclor 1248 exceeds cleanup levels established in this CAP. The SDA-9 has been identified for further action (Section 5.0).

3.1.3 Soil Treatment Cells

The soil treatment cells contain contaminated soil (from previous excavations) that is being treated with a biological amendment (Daramend™). The Daramend™ technology uses a solid-phase organic amendment that is applied and tilled into the top 24-inch "horizon" of soil. This horizon is then tilled and irrigated between May and October. The Daramend™ technology enhances and promotes natural bioremediation rates by adjusting "natural" soil conditions, i.e. enhance natural bacterial colonies and stimulate biodegradation of organic compounds. The technology irreversibly mineralizes soil aromatic hydrocarbons and chlorinated phenols. Additionally, rainwater infiltration leaches contamination from soil to deeper horizons within the cells, as evidenced by chlorophenol content in the cell leachate.

Each soil horizon typically takes 1 to 2 years to remediate to treatment levels, depending upon initial soil contaminant (e.g. PCP) concentrations. As the technology becomes more refined, the period for the treatment of each horizon has been reduced. Each horizon consists of approximately 5,000 cubic yards of soil for both cells. It is estimated that there are between 6,000 and 10,000 cubic yards remaining and the remaining soil will be treated by 2011. This is consistent with the timeline for anticipated site development.

3.2 DEVELOPMENT OF CLEANUP STANDARDS

Details on how to derive cleanup standards are provided in WAC 173-340-700(3). When you derive cleanup levels, you must:

1. Determine cleanup levels (CULs). Cleanup levels are concentrations of hazardous substances (i.e. COC) that are protective of both human health and the environment.

2. Determine the point of compliance or the location where the cleanup levels must be met.

3. Comply with all other applicable state and federal laws ("ARARs"; Table 1, p. 19).

Since this site is zoned industrial, MTCA Method C soil cleanup levels are established in this CAP. As for ground water, the site ground water is non-potable or unfit for human consumption (WAC 173-340-720(2)(d)). Consequently, surface water cleanup levels were used for the shallow and intermediate ground water that discharges to the Blair Waterway.

3.2.0 Ground Water Point of Compliance (POC)

For the shallow water table aquifer, the point of compliance (POC) established in this CAP is the perimeter ditches. For the intermediate aquifer, the POC established in this CAP is where ground water discharges to surface water (Blair Waterway). The conceptual site model that was used to develop cleanup standards is shown in Figure 5, p. 18.

Figure 5: Conceptual Site Model.

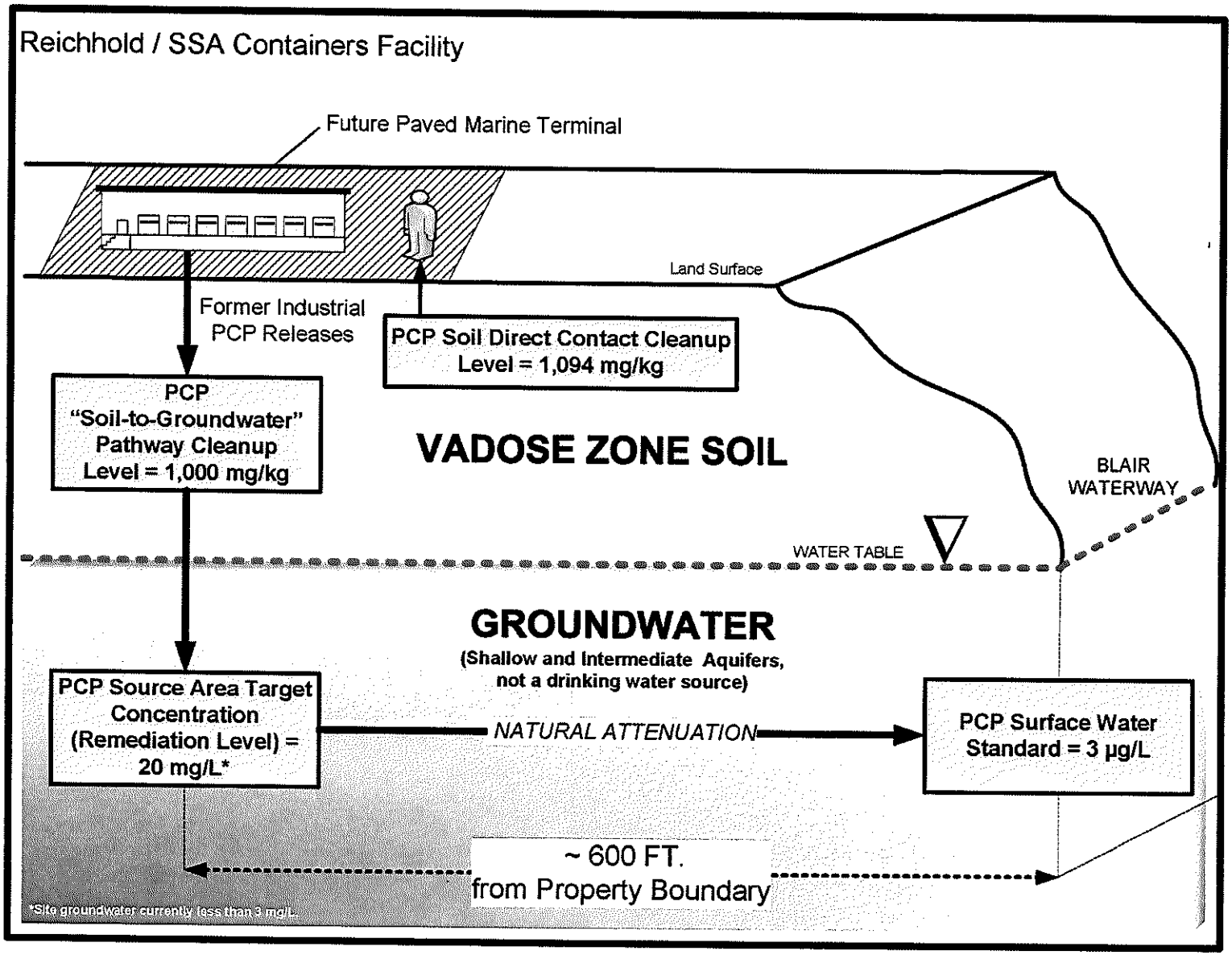


Table 1: Applicable or Relevant and Appropriate Requirements (ARARs).

	Standard, Requirement, or Limitation	Description	Applicability
Hazardous Substance-specific ARARs	***General Requirements***		
	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and National Oil and Hazardous Substances Pollution Contingency Plan (42 USC 9601 et seq and 40 CFR 300)	Establishes federal administrative processes and standards to identify, investigate, and clean up facilities where hazardous substances are located.	Although the Facility is regulated as a RCRA site with the Washington State Department of Ecology (Ecology) taking the lead on cleanup, the Facility is located within the area designated as the Commencement Bay Nearshore/Tideflats Superfund site in the USEPA Superfund CERCLA Information System (CERCLIS) database. Ecology is regulating the cleanup of this Facility under MTCA and will conduct the cleanup in compliance with Resource Conservation and Recovery Act (RCRA), CERCLA, and National Contingency Plan.
	Resource Conservation and Recovery Act (RCRA) (40 CFR 239 through 282)	RCRA, an amendment to the Solid Waste Disposal Act, was enacted in 1976 to address the huge volumes of municipal and industrial solid waste generated nationwide. RCRA has been amended and revised since; however, the goals remain: • to protect human health and the environment from the potential hazards of waste disposal, • to conserve energy and natural resources, • to reduce the amount of waste generated, and • to ensure that wastes are managed in an environmentally sound manner. CERCLA is a related statute that deals with cleaning up inactive and abandoned hazardous waste sites. RCRA, on the other hand, deals with hazardous wastes that are destined for treatment, disposal or recycling and the facilities that treat, store or dispose of such wastes. In Washington, most RCRA requirements are displaced by equivalent or more stringent requirements under the Hazardous Waste Management Act and Dangerous Waste Regulations which stand in lieu of RCRA as part of a RCRA-authorized state hazardous waste program.	This is a RCRA Facility addressed by Washington State under a RCRA-authorized state law (the Hazardous Waste Management Act) for implementation of final corrective actions.
	Surface Water Requirements		
	Model Toxics Control Act (MTCA) (WAC 173-340)	Establishes Washington State administrative processes and standards to identify, investigate, and clean up facilities where hazardous substances are located.	Facility is regulated under MTCA and must meet MTCA cleanup requirements.
	Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A)	The Surface Water Standards establish water quality standards for surface waters of Washington State. Water quality standards require that toxic substances shall not be introduced beyond the mixing zone above levels that have the potential to adversely affect characteristic water users, cause acute or chronic toxicity to the most sensitive biota, or adversely affect public health.	Applicable at the Blair Waterway and ditches that discharge into the Blair Waterway.
	Clean Water Act (CWA) (33 USC 1251 et seq.)	Section 401 of the CWA requires the establishment of guidelines and standards to control the direct or indirect discharge of pollutants to the waters of the United States. Section 402 establishes the National Pollutant Discharge Elimination System (NPDES), which provides for the issuance of permits to regulate discharges to navigable waters.	Section 401 is applicable. Requirements under Section 402 are discussed under Action-specific ARARs for NPDES issues related to construction.
	National Recommended Water Quality Standards 40 CFR 131	These water quality standards define the water quality goals of the water body by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States adopt water quality standards to protect public health or welfare, enhance the quality of water, and serve the purposes of the CWA.	Washington State Water Quality Standards have been revised and resubmitted to USEPA for approval.
	Washington Water Pollution Control Law RCW 90.48; WAC 173-220	Washington State has been delegated authority to issue NPDES permits. CWA Section 301, 302, and 303 require states to adopt water quality standards. The Washington Water Pollution Control Law and regulations address this requirement.	Substantive requirements are applicable for NPDES requirements and stormwater management under Action-specific ARARs.
	Groundwater Requirements		
	Model Toxics Control Act (MTCA) (WAC 173-340)	Establishes Washington State administrative processes and standards to identify, investigate, and clean up facilities where hazardous substances are located.	MTCA applies to cleanups of hazardous substances released to the environment and such cleanups must meet MTCA standards. Cleanup levels must consider beneficial use of groundwater, which is impact to surface water.

Table 1: ARARs (cont.)

	Standard, Requirement, or Limitation	Description	Applicability
Hazardous Substance-specific ARARs (cont'd)	***Groundwater Requirements (cont'd)***		
	Drinking Water Standards—Maximum Contaminant Levels (WAC 246-290-310)	Establishes standards for contaminant levels in drinking water for water system purveyors.	No drinking water supplies are impacted by the Facility; therefore, these standards are not applicable.
	Water Quality Standards for Ground Waters of the State of Washington (WAC 173-200)	Implements the Water Pollution Control Act and the Water Resources Act of 1971 (90.54 RCW).	Not applicable at sites operating under consent decree with USEPA or Ecology.
	Soil Requirements		
	Model Toxics Control Act (MTCA) (WAC 173-340)	Establishes Washington State administrative processes and standards to identify, investigate, and clean up facilities where hazardous substances are located.	MTCA applies to cleanups of hazardous substances released to the environment and such cleanups must meet MTCA standards. The standards include requirements for alternative selection, cleanup standards, monitored natural attenuation, and restoration time frame.
Location-specific ARARs	***Shoreline, Wetlands, and Other Critical Areas***		
	Washington Shoreline Management Act (RCW 90.58; WAC 173-14) Tacoma Municipal Code Chapter 13.10—Shoreline Management	The Washington Shoreline Management Act, authorized under the federal Coastal Zone management Act, establishes requirements for substantial development occurring within the waters of Washington State or within 200 feet of a shoreline.	Not applicable, the Facility is more than 200 feet from the shoreline.
	Tacoma Municipal Code Chapter 13.11—Critical Areas Preservation	Critical areas include critical aquifer recharge areas, fish and wildlife habitat conservation areas, flood hazard areas, geologically hazardous areas, stream corridors, wetlands, and any buffer zones. The criteria and standards provided in this chapter are intended to secure the public health, safety, and welfare by: • protecting members of the public and public resources form damage or injury due to slope failures, erosion, landslides, and seismic or volcanic hazards, • maintaining a healthy functioning ecosystem, • preventing impacts to streams, fish and wildlife habitats, and water quality, • providing open space and aesthetic value, • providing migratory pathways for fish and birds, and • giving special consideration to conservation efforts.	Substantive requirements may be applicable based on specific actions and locations. MTCA remedial actions are exempt from the procedural requirements of this law, but must comply with the substantive requirements.
	Executive Order 11990, Protection of Wetlands (40 CFR 6, Appendix A)	Executive Order 11990 Section 7 requires measures to minimize the destruction, loss, or degradation of wetlands. Requires no net loss of remaining wetlands.	Only applicable if alternatives impact wetlands.
	Flood Plain Management 40 CFR 6, Appendix A: 10 CFR 1022	In 100-year flood plains, actions must be taken to reduce the risk of flood loss, minimize the impact of floods on human safety, and restore and preserve the natural beneficial values of flood plains.	Substantive requirements may be applicable based on specific actions and locations. MTCA remedial actions are exempt from the procedural requirements of this law, but must comply with the substantive requirements.
	Washington Floodplain Management Plan RCW 68.16; WAC 173-158	An advisory standard pertaining to wetlands management that suggests local governments, with technical assistance from Ecology, institute a program that can identify and map critical wetland areas located within base floodplains.	
	Tribal and Cultural Protections		
	Native American Graves Protection and Repatriation Act (25 USC 3001 through 3113; 43 CFR Part 10) and Washington's Indian Graves and Records Law (RCW 27.44)	These statutes prohibit the destruction or removal of Native American cultural items and require written notification of inadvertent discovery to the appropriate agencies and Native American tribe. These programs are applicable to the remedial action if cultural items are found. The activities must cease in the area of the discovery, a reasonable effort must be made to protect the items discovered, and notice must be provided.	Because of the Facility's industrial history, Native American protections are likely not an issue; however, the National Historic Preservation Act is applicable.

Table 1: ARARs (cont.)

	Standard, Requirement, or Limitation	Description	Applicability
Location-Specific ARARs (cont'd)	***Tribal and Cultural Protections (cont'd)***		
	Archaeological Resources protection Act (16 USC 470aa et seq.; 43 CFR part 7)	This program sets forth requirements that are triggered when archaeological resources are discovered. These requirements only apply if archaeological items are discovered during implementation of the selected remedy.	Because of the Facility's industrial history, Native American protections are likely not an issue; however, the National Historic Preservation Act is applicable.
	National Historic Preservation Act (16 USC 470 et seq.; 36 CFR parts 60, 63, and 800)	This program sets forth a national policy of historic preservation and provides a process that must be followed to ensure that impacts of actions on archaeological, historic, and other cultural resources are protected.	
Action-specific ARARs	***Evaluate Environmental Impacts***		
	State Environmental Policy Act (SEPA) RCW 43.21C; WAC 197-11	Establishes the state's policy for protection and preservation of the natural environment.	Applicable. SEPA and MTCA are integrated processes per WAC 197-11-250 through 197-11-268
	Disposal of Excavated Material		
	Resource Conservation and Recovery Act (RCRA) (42 USC 6921-6949a; 40 CFR Part 268, Subtitles C and D)	Establishes requirements for the identification, handling, and disposal of hazardous and non-hazardous waste.	Facility is a RCRA Facility (permitted under the state Hazardous Waste Management Act). Facility is regulated under MTCA and must meet MTCA standards.
	Dangerous Waste Regulations (RCW 70.105; WAC 173-303)	Establishes regulations that are the state equivalent of RCRA requirements (and largely stand in lieu of RCRA) for determining whether a solid waste is a state dangerous waste. This regulation also provides requirements for the management of dangerous wastes.	Only applicable if waste is generated from selected alternative.
	Solid Waste Disposal Act (42 USC Sec. 325103259, 6901-6991; 40 CFR 257,258) Federal Land Disposal Requirements (40 CFR part 268)	Protects health and the environment and promotes conservation of valuable material and energy resources.	
	Minimum Functional Standards for Solid Waste Handling (WAC 173-304)	Sets minimum functional standards for the proper handling of all solid waste materials originating from residences, commercial, agricultural, and industrial operations and other sources.	
	Solid Waste Handling Standards (WAC 173-350)	Regulates upland beneficial reuse of sediments.	Only applicable if sediments are reused in uplands areas, on- or off-site.
	Wastewater/Stormwater Discharge		
	Washington Water Pollution Control Law RCW 90.48; WAC 173-216, WAC 173-220	Washington State has been delegated authority to issue NPDES permits. CWA Sections 301, 302, and 303 require states to adopt water quality standards and implement an NPDES permitting process. The Washington Water Pollution Control Law and regulations address this requirement.	State version of CWA NPDES. Any construction or regrading activity will require compliance with NPDES.
	National Pollutant Discharge Elimination System (NPDES) (CWA Part 402)	Regulates discharges to off-site activities for pretreatment standards.	Any discharges from the Facility to a POTW or other water body (Blair Waterway) will be required to comply with pretreatment standards and permitted through the public utility.
	Tacoma Wastewater Treatment Requirements (Tacoma City Ordinance Chapter 12.08) and Shoreline Management (Chapter 13.10.130 for discharges to surface water in Port Industrial Area)	Provides requirements for discharge to the POTW.	Applicable through NPDES permit.

Table 1: ARARs (cont.)

	Standard, Requirement, or Limitation	Description	Applicability
Action-specific ARARs (cont'd)	***Worker Safety***		
	Health and Safety for Hazardous Waste Operations and Emergency Response (WAC 296-62; and Health and Safety 29 CAR 1901.120	The Health and Safety for Hazardous Waste Operations and Emergency Management (HAZWOPER) regulate health and safety operations for hazardous waste sites. The health and safety regulations describe federal requirements for health and safety training for workers at hazardous waste sites.	Any cleanup work will require compliance with OSHA and WISHA.
	Occupational Safety and Health Act (OSHA), 29 USC 653, 655, 657; Occupational Safety and Health Standards 29 CFR 1910	Employee health and safety regulations for construction activities and general construction standards as well as regulations for fire protection, materials handling, hazardous materials, personal protective equipment, and general environmental controls. Hazardous waste site work requires employees to be trained prior to participation in site activities, medical monitoring, monitoring to protect employees from excessive exposure to hazardous substances and decontamination of personnel and equipment.	Any cleanup work will require compliance with OSHA and WISHA.
	Washington Industrial Safety and Health Act (WISHA) RCW 49.17 Washington Industrial Safety and Health Regulations WAC 296-62; WAC 296-155	Adopts the OSHA standards that govern the conditions of employment in all work places. The regulations encourage efforts to reduce safety and health hazards in the work place and set standards for safe work practices for dangerous areas such as trenches, excavations, and hazardous waste sites.	Any cleanup work will require compliance with OSHA and WISHA.
	Air Quality Controls		
	Federal, State, and Local Air Quality Protection Programs State Implementation of ambient air quality standards NWAPA ambient and emission standards Regional Standards for fugitive dust emissions, and toxic air pollutants.	Regulations promulgated under the federal Clean Air Act (42 USC 7401) and the Washington State Clean Air Act (RCW 70.94) governs the release of airborne contaminants from point and non-point sources. Local air pollution control authorities such as the Puget Sound Clean Air Authority (PSCAA) have also set forth regulations for implementing these air quality requirements. These requirements may be applicable to the Facility for the purposes of dust control should the selected remedial alternatives require excavation activities. Both PSCAA (under Regulation III) and WAC 173-460 establish ambient source impact levels for arsenic.	The selected alternative will require compliance with air quality regulations and best management practices for dust control.
	Miscellaneous		
	Noise Control Act of 1974 (RCW 70.107; WAC 173-60)	Establishes maximum noise levels.	The selective alternative will need to comply with local and state noise pollution requirements. Construction and other activities will need to be limited to normal working hours.
	Grading Activities under Tacoma Municipal Code (Chapters 13.11 and 13.12)	Establishes restrictions of upland grading activities.	Substantive compliance required to minimize stormwater and other related impacts. MTCA remedial actions are exempt from the procedural requirements of this law, but must comply with the substantive requirements.

ARAR	Applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System
CWA	Clean Water Act
MTCA	Model Toxics Control Act
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NWAPA	Northwest Air Pollution Authority
OSHA	Occupational Safety and Health Act
POTW	Publicly-owned Treatment Works
PSCAA	Puget Sound Clean Air Authority
RCRA	Resource Conservation and Recovery Act
SEPA	State Environmental Policy Act
WISHA	Washington Industrial Safety and Health Act

3.2.1 Chemicals of Concern (COCs)

Chemicals of concern (COCs) are those "hazardous substances" that pose the greatest risk to human-health and the environment. During the FFS, the COC list was filtered to reflect current site conditions. Soil COCs were refined by reviewing analytical results for soil that has yet to be excavated and removed, i.e. existing or current site soils. For both soil and ground water, known breakdown products (e.g. PCP to 2,4,5-trichlorophenol) were kept as COCs for purposes of this CAP, regardless of detection frequency or concentration. For ground water, analytical data from Mar-03 to Feb-08 was used to refine the COC list. The following criteria were used to eliminate COCs:

Soil:

- If the COC was detected in less than 10 percent of the total number of samples and the value when detected was less than one-tenth of the cleanup level,
- The maximum level of detection was less than one-hundredth of the cleanup level, or
- The substance was a metal other than molybdenum.

For this CAP, the refined soil COC list now includes these 10 substances:

- 2-Chlorophenol,
- 2,3,4,6-Tetrachlorophenol,
- 2,4-Dichlorophenol,
- 2,4,5-Trichlorophenol,
- 2,4,6-Trichlorophenol,
- Pentachlorophenol,
- Tetrachloroethene,
- Trichloroethene,
- Molybdenum, and
- Aroclor 1248.

Ground Water

For ground water, several chemicals were eliminated as COCs for various reasons (Sections 4.21, 4.2.2, FFS Tables 4.4, and 4.5). Hazardous substances that did not exceed surface water criteria between 2003 and 2008 were eliminated as COCs. COCs that were retained for one aquifer were retained for both aquifers.

The refined ground water COC list now includes these 8 substances:

- 2-Chlorophenol,
- 2,3,4,6-Tetrachlorophenol,
- 2,4-Dichlorophenol,
- 2,4,6-Trichlorophenol,
- Pentachlorophenol,
- Tetrachloroethene,
- Trichloroethene, and
- Vinyl chloride

3.2.2 Cleanup Level Development

Site Groundwater

Site groundwater is non-potable (WAC 173-340-720(2)). Therefore, surface water cleanup levels were used for ground water that discharges to off-site ditches and the Blair Waterway. A conditional off-property point of compliance (POC) was also used. This conditional POC is where shallow and submarine ground water discharges to the Blair Waterway surface water (WAC 173-340-720(8)(d)(ii)). As part of the FFS, site ground water "remediation levels" (RELs) were derived. These REL values are established in this CAP as RELs for the cleanup action. These RELs protect the nearby ditches (North ditch, South ditch, and Lincoln Avenue ditch) and the Blair Waterway. Details on how the site ground water RELs were derived are as follows:

1. **Evaluate exposure pathways and receptors (WAC 173-340-708):** site ground water is migrating either radially to the off-property ditches (shallow aquifer) or west to the Blair Waterway (intermediate aquifer). This ground water discharge may impact sediments and aquatic life. Terrestrial ecological receptors were not evaluated because this site qualifies for the terrestrial ecological risk exclusion provision (WAC 173-340-7491). Human exposure to surface water and COCs may occur with fish consumption (commercial fishing), incidental ingestion (e.g. swimming) or by construction activity (e.g. the former off-site graving dock). However, the Blair Waterway is an industrial/commercial shipping channel and is restricted from recreational swimming.

2. **Derive surface water cleanup levels that are protective of potential human and ecological receptors:** the most stringent cleanup criteria for human, ecological receptors, MTCA Method B surface water criteria and "ARARs" (applicable state or federal law) was used (WAC 173-340-730, see also Table 1, p. 19).

3. **Calculate ground water source area "remediation levels":** an EPA ground water fate and transport model (BIOSCREEN) was used to assess ground water concentrations that are protective of surface water. For this cleanup action, these concentrations are referred to as "remediation levels[4]" (RELs). Specifically, the BIOSCREEN model was used to evaluate the fate and transport of remnant dissolved-phase PCP, and all other PCOCs, as ground water flows west to the Blair Waterway and the off-property ditches. This modeling process resulted in the derivation of ground water "RELs". A ground water REL is a "source area" (e.g. property) concentration that will not exceed surface water standards at the point of discharge to the surface water (600 ft. west of the property at the Blair Waterway or at the perimeter ditches). In other words, site ground water RELs account for the natural attenuation that occurs between the property and the Blair Waterway. Ground water RELs are provided in Table 4, p. 35. A detailed discussion of the BIOSCREEN modeling process is included in Section 4.0 and Appendix A of the FFS.

Soil

For vadose zone soil (soil above the water table), cleanup levels were determined for direct human contact (soil ingestion), leaching to groundwater, and potential ecological exposure. Because the site meets the criteria of an industrial site (WAC 173-340-745), MTCA Method C soil ingestion (direct contact) cleanup levels are established in this CAP. For the soil-leaching-to-ground water pathway, the 3-phase partitioning "model" was used (MTCA Eq. 747-1). The lowest cleanup level of the two exposure pathways (leaching to ground water and soil ingestion) is established as the cleanup level.

Site soil cleanup levels are also established through this CAP as updated "treatment levels" for soil within the on-site engineered soil treatment cells. Soil cleanup levels are presented in Table 2, p. 26. The current and proposed soil treatment cell levels are further discussed in Section 6.0.

[4] "Remediation level (REL)" is a "target" soil, sediment, ground water or air hazardous substance concentration that is used for designating when different cleanup actions will be used (e.g., active treatment versus natural attenuation). If you exceed a REL, then you typically must implement a different cleanup action. MTCA cleanup actions are commonly based on RELs.

Table 2: Surface Water Cleanup Levels and Ground Water Remediation Levels (RELs).

CAS Number	Hazardous Substance	2008 FFS Surface Water Cleanup Level µg/L	Ground Water Remediation Levels (RELs) Shallow µg/L	Intermediate (1) µg/L
Volatile Organic Compounds				
75-34-3	1,1-Dichloroethane	8.6E+04	2.6E+04	2.6E+04
67-64-1	Acetone	3.1E+06	1.7E+06	1.7E+06
71-43-2	Benzene	2.3E+01	1.8E+03	9.2E+04
100-41-4	Ethylbenzene	2.1E+03	5.0E+04	5.0E+04
75-09-2	Methylene Chloride	5.9E+02	9.0E+02	4.2E+03
127-18-4	**Tetrachloroethene**	**3.9E-01**	**7.0E+02**	**1.5E+05**
108-88-3	Toluene	1.5E+04	4.0E+05	4.0E+05
156-60-5	Trans-1,2-dichloroethene	1.0E+04	3.4E+04	4.8E+04
79-01-6	**Trichloroethene**	**1.5E+00**	**1.0E+02**	**2.4E+04**
75-01-4	**Vinyl Chloride**	**2.4E+00**	**2.7E+02**	**1.9E+04**
Semivolatile Organic Compounds				
95-57-8	**2-Chlorophenol**	**9.7E+01**	**1.2E+04**	**2.0E+04**
91-57-6	2-Methylnaphthalene	2.1E+01	2.0E+04	2.0E+04
95-48-7	2-Methylphenol	7.2E+03	5.0E+05	5.0E+05
58-90-2	**2,3,4,6-Tetrachlorophenol**	**5.5E+01**	**2.8E+03**	**2.0E+04**
120-83-2	**2,4-Dichlorophenol**	**1.9E+02**	**2.10E+03**	**2.0E+04**
88-06-2	**2,4,6-Trichlorophenol**	**2.4E+00**	**1.3E+04**	**2.0E+04**
106-44-5	4-Methylphenol	7.6E+02	1.2E+02	1.2E+02
83-32-9	Acenaphthene	6.4E+02	4.0E+02	4.0E+02
65-85-0	Benzoic Acid	6.5E+05	6.5E+05	6.5E+05
117-81-7	Bis(2-ethylhexyl)phthalate	2.2E+00	3.4E+02	3.4E+02
91-20-3	Naphthalene	4.9E+03	4.0E+03	4.0E+03
87-86-5	**Pentachlorophenol**	**3.0E+00**	**2.0E+04**	**2.0E+04**
108-95-2	Phenol	1.1E+06	1.5E+05	1.5E+05
Miscellaneous Compounds				
-	Cyanide (distilled) (2)	7.9E+02	7.9E+02	7.9E+02
-	Cyanide (total) (2)	7.9E+02	7.9E+02	7.9E+02
50-00-0	Formaldehyde	3.5E+05	1.0E+05	1.0E+05
7439-98-7	Molybdenum	1.5E+04	1.5E+04	1.5E+04

Notes: **bold** indicates a groundwater COC. (1) Ground water remediation levels are based the projected 200 ft. cutback for the Blair Waterway. This will reduce the distance from the site property boundary to the Blair from ~ 800 to 600 ft. (2) Ecological benchmark screening level for fish-consuming avian species (FFS, Section 4.1.1.1.).

Table 3: Soil Cleanup Levels.

Hazardous Substance	2008 FFS Soil Cleanup Level (mg/kg) (1)
Volatile Organic Compounds (VOCs)	
1,1,1-Trichloroethane	3.2E+06
2-Butanone	2.1E+06
Acetone	6.9E+03
Benzene	1.7E+01
Benzyl Alcohol	1.1E+06
Carbon Disulfide	3.5E+05
Chlorobenzene	7.0E+04
Chloroform	2.2E+04
Cis-1,3-dichloropropene (2)	7.5E+01
Ethylbenzene	1.0E+03
Methylene Chloride	4.5E+00
Styrene	7.0E+05
Tetrachloroethene	1.9E+01
Toluene	6.3E+03
Trans-1,2-dichloroethene	2.6E+02
Trichloroethene	1.2E+00
Vinyl Chloride	2.2E+00
Xylene (total)	7.0E+05
Semivolatile Organic Compounds (SVOCs)	
1,2,4-Trichlorobenzene	3.5E+04
2-Chlorophenol	4.1E+02
2-Methylnaphthalene	5.2E+03
2-Methylphenol	5.6E+03
2,3,4,5-Tetrachlorophenol (3)	
2,3,4,6-Tetrachlorophenol) (3)	7.4E+01
2,3,5,6-Tetrachlorophenol (3)	
2,4-Dichlorophenol	3.4E+01
2,4,5-Trichlorophenol	3.5E+05
2,4,6-Trichlorophenol	4.5E+02
4-Methylphenol	3.3E+00
Acenaphthene	2.1E+05
Anthracene	1.1E+06
Benzo(a)anthracene	1.8E+02
Benzo(a)pyrene	1.8E+01
Benzo(b)fluoranthene	1.8E+02
Benzo(k)fluoranthene	1.8E+03
Benzoic Acid	1.4E+07
Bis(2-ethylhexyl)phthalate	3.0E+03
Butyl benzyl phthalate	7.0E+05

Table 3: Soil Cleanup Levels. (cont).

Hazardous Substance	2008 FFS Soil Cleanup Level (mg/kg) (1)
Dibenzo(a,h)anthracene	1.8E+01
Dibenzofuran	7.0E+03
Diethylphthalate	2.8E+06
Di-n-butylphthalate	3.5E+05
Di-n-octylphthalate	7.0E+04
Fluoranthene	1.4E+05
Fluorene	1.4E+05
Hexachlorobenzene	8.2E+01
Hexachlorobutadiene	1.7E+03
Hexachloroethane	9.4E+03
Indeno(1,2,3-cd)pyrene	1.8E+02
Naphthalene	4.0E+02
Pentachlorophenol	1.0E+03
Phenol	9.5E+02
Pyrene	1.1E+05
Metals (4)	
Aluminum	1.0E+06
Antimony	1.4E+03
Arsenic	8.8E+01
Barium	7.0E+05
Beryllium	7.0E+03
Chromium	6.0E+03
Cobalt	4.0E+04
Copper	1.3E+05
Iron	6.0E+05
Manganese	4.9E+05
Molybdenum	5.9E+03
Nickel	4.0E+04
Silver	1.8E+04
Vanadium	2.5E+04
Zinc	1.1E+06
Polychlorinated Biphenyls, Miscellaneous Compounds	
4,4'-DDT	3.9E+02
Aroclor 1242	6.6E+01
Aroclor 1248	6.6E+01
Aroclor 1260	6.6E+01
BHC-Beta	7.3E+01

Notes: bold indicates soil COC. (1) Soil cleanup level is based on the lower of two exposure pathways: a) soil ingestion (industrial land use or MTCA Method C) and b) leaching-to-ground water. (2) MTCA Method B value used in 2006 FRI and carried through FFS. (3) Not addressed as a potential substance of concern (2006 FRI). (4) Except for molybdenum, all soil metals cleanup levels are based on natural background concentrations.

3.2.3 Ground Water Off-Property Conditional Point of Compliance

For ground water, an off-property conditional point of compliance (WAC 173-340-720(8)(d)(ii)) is established for this cleanup action. Site ground water is non-potable and this site is "near" but does not abut surface water. This cleanup action will include a site deed restriction that prohibits all future use of site ground water. Additionally, SSA and other intervening property owners between the site and the Blair Waterway (e.g. Puyallup Tribe) have agreed in writing to the use of the off-property conditional point of compliance (Attachment A – Point of Compliance Letter). Additional details on the ground water conditional point of compliance are provided in Section 4.3. If future ground water monitoring results indicate that groundwater concentrations throughout the site have declined to less than cleanup levels (surface water criteria), then the off-property conditional point of compliance may be removed (see also Section 7.0).

3.2.4 Review of Applicable or Relevant and Appropriate (ARAR) requirements

An "ARAR" review was performed to ensure compliance with all local, state and federal laws (Table 1, p. 19):

- RCRA Land Disposal Regulations (LDRs): some site soil contains FO21 listed hazardous waste (1988 RCRA permit that was in force prior to the DWM Permit). Therefore, the site soil is subject to RCRA Land Disposal Regulations (LDRs). Soil cleanup actions were screened to comply with RCRA LDR was well as RCRA ARARs, TSCA regulations, and "CAMU" restrictions.

- NPDES permit: discharge, monitoring, and other requirements were evaluated.

- USEPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements: although the site is located within the USEPA Commencement Bay Nearshore/Tideflats Superfund site, it has been "deferred" to the RCRA/HWMA corrective action process for cleanup. Because CERCLA remains applicable, however, the cleanup must be sufficiently protective in order to not require any further action under CERCLA.

4.0 Groundwater Remedial Actions

4 GROUND WATER REMEDIAL ACTION

4.1 Overview

The ground water remedial action selected through this CAP is monitored natural attenuation (MNA[5]). A site ground water "pump and treat" system (hydraulic control) has been operating for some time. Over the last 20 years, ground water dissolved-phase concentrations (PCP) have significantly declined (Figure 6, p. 32). This is particularly true of off-property, downgradient areas (west to the Blair Waterway). As of 2007, source area (PCP plant) ground water PCP concentrations were ~ 3 mg/L (ppm). However, the weight of evidence suggests that as ground water flows west to the Blair Waterway, PCP (and other COCs) are naturally attenuated.

MNA is a common "mainstream" remedy for "legacy" ground water pump and treat systems. Once source control measures are taken and concentrations have declined, it is common to discontinue operation of pump and treat systems. In this case, ground water concentrations have declined and remnant source area soil PCP will be removed.

The groundwater remedial action is designed to prevent COCs from reaching the Blair Waterway and the site ditch system. The groundwater remedial action consists of four elements:

- Discontinuation of hydraulic control and ground water pump and treat,
- Off-property conditional point of compliance (Blair Waterway),
- MNA, and
- Ground water compliance monitoring.

Details on each of these are provided in the following subsections.

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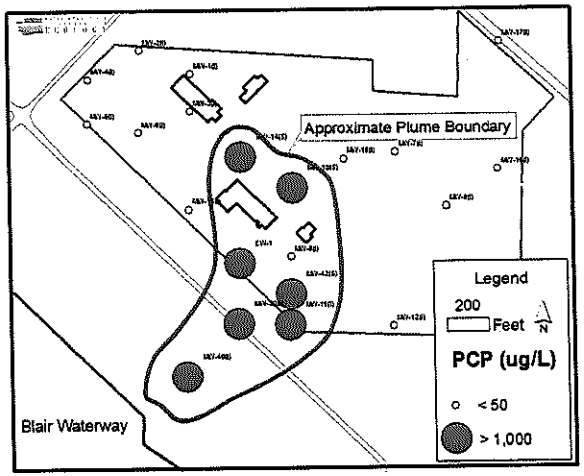
[5] The term "MNA" refers to natural processes that reduce contaminant concentrations to "acceptable" levels. MNA involves physical, chemical, and biological processes that act to reduce the mass, toxicity, and mobility of subsurface contamination. Physical, chemical, and biological processes involved in MNA include biodegradation, chemical stabilization, dispersion, sorption, and volatilization (Source: USEPA Brownfields).

4.1.2 Ground Water Compliance Monitoring

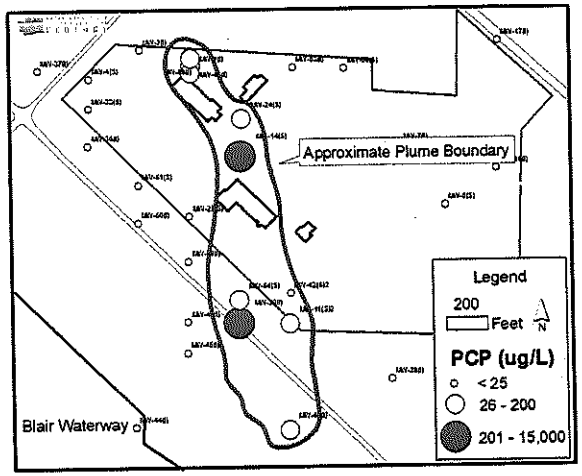
The shallow water table groundwater flow pattern is toward site perimeter ditches. Consequently, monitoring wells that are located along North and Lincoln Avenue ditches as well as the southwestern property boundary will be used (Figure 7, p. 34). Monitoring wells that are located along the southern and downgradient site perimeter will be used for the intermediate aquifer compliance-monitoring network. These intermediate aquifer monitoring wells will be located near the PPA and BPA, and in the off property areas downgradient of the former CDA (west to the Blair Waterway). Details on compliance monitoring and well locations are provided in the Attachment B – Compliance Monitoring Contingency Plan (CMCP), p. 62.

Figure 6: Ground Water Dissolved-Phase PCP Concentrations Over Time.

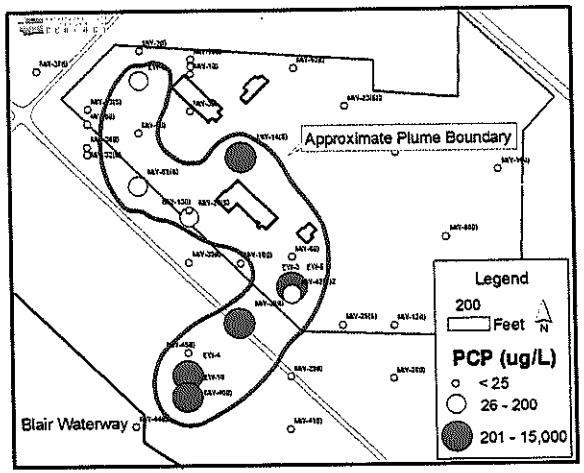
1987



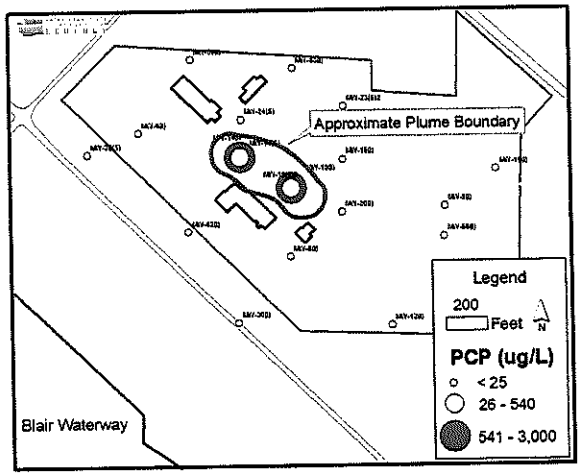
1999



1993



2007



4.1.3 Ground Water Contingency Action

If site ground water concentrations (e.g. of PCP) increase when the pump and treat (hydraulic control) system is discontinued, then there needs to be a "backup" or "contingency" plan. Details on compliance monitoring and well locations are provided in Attachment B – Compliance Monitoring Contingency Plan (CMCP), p. 62. The nature of any contingency action will initially depend on whether or not the ground water treatment system has been decommissioned. If ground water compliance monitoring standards are not being met while the treatment system is operational, then the contingency plan calls for additional monitoring. The "presumptive" contingency action would consist of restarting all or portions of the existing ground water treatment system. Additional actions, (e.g. additional site characterization) may also be implemented.

Figure 7: Compliance Monitoring Well Locations.

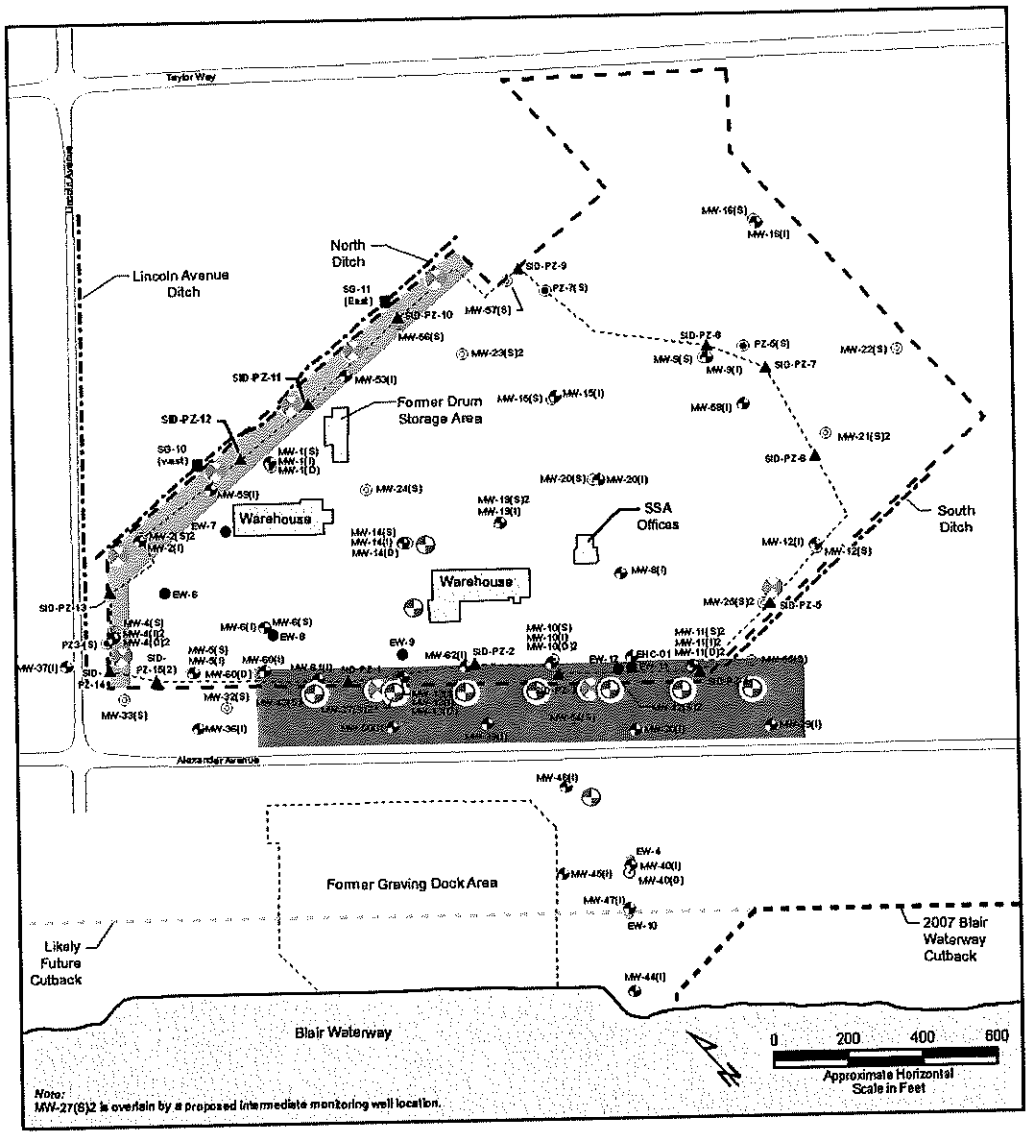


Figure 7

Shallow Aquifer Monitoring Well Network Zone
Intermediate Aquifer Monitoring Well Network Zone
Monitoring Well, Shallow Aquifer (Location Approximate)
Monitoring Well, Intermediate Aquifer (Location Approximate)
Monitoring Well, Shallow Aquifer
Monitoring Well, Intermediate Aquifer
Monitoring Well, Deep Aquifer
Piezometers
Shallow Intercept Drain (SID) Piezometers
Staff Gauges
Extraction Well
Inactive Extraction Well
Property Boundary
SID Location
Ditch Location
2007 Blair Waterway Cutback (Approximate)
Likely Future Cutback (Approximate)

Cleanup Action Plan
Reichhold/SSA Containers Facility
Tacoma, Washington

Table 4: Ground Water Cleanup / Remediation Levels.

Hazardous Substance (1)	2008 FFS Surface Water Cleanup Levels (2)	Remediation Levels (3)		
		On-Site Ground Water		Off-Site Ground Water
		Shallow Aquifer	Intermediate Aquifer	Intermediate Aquifer
	µg/L	µg/L	µg/L	µg/L
Volatile Organic Compounds (VOCs)				
Tetrachloroethene	3.9E-01	7.0E+02	1.5E+05	4.0E+02
Trichloroethene	1.5E+00	1.0E+02	2.4E+04	2.0E+02
Vinyl Chloride	2.4E+00	2.7E+02	1.9E+04	6.5E+03
Semivolatile Organic Compounds (SVOCs)				
2-Chlorophenol	9.7E+01	1.2E+04	2.0E+04	6.8E+03
2,3,4,6-Tetrachlorophenol	5.5E+01	2.8E+03	2.0E+04	1.9E+03
2,4-Dichlorophenol	1.9E+02	2.1E+03	2.0E+04	2.3E+03
2,4,6-Trichlorophenol	2.4E+00	1.3E+04	2.0E+04	5.0E+03
Pentachlorophenol	3.0E+00	2.0E+04	2.0E+04	5.6E+03

Notes: (1) This list reflects 2008 updates and revisions (FFS-Floyd|Snider Team 2008). (2) Cleanup levels applicable at the off-property points of compliance. Applies to shallow and submarine ground water discharges to surface water. (3) Calculated via the USEPA "BIOSCREEN" model.

4.2 GROUNDWATER REMEDIAL ACTION ALTERNATIVES

Remedial technologies that may be used to accomplish remedial action objectives ("RAOs") were identified in the FFS. This process resulted in evaluation of two different cleanup actions or "remedial alternatives":

- MNA with monitoring
- Continued hydraulic control and groundwater treatment

The FFS contains details on the advantages and disadvantages of these two different remedial alternatives. This evaluation resulted in selection of the remedial alternative listed in Section 4.1 (MNA).

4.3 JUSTIFICATION FOR SELECTING THE GROUNDWATER REMEDIAL ACTIONS

This site has undergone significant investigation, monitoring, and remediation, including hydraulic control and ground water treatment. Groundwater COCs, their fate and transport, exposure pathways, and receptors are well understood. Years of monitoring indicate that both the shallow and intermediate aquifers are now in compliance with remediation levels. Ecology does not believe that dissolved-phase groundwater contaminants (e.g. PCP) pose significant risks to "receptors" (i.e. the Blair Waterway, sediments and aquatic life).

However, the MNA cleanup action leaves groundwater contaminated above cleanup levels (surface water criteria) at the site, with continued monitoring and institutional controls required. Based on these considerations, the MNA action is not a "permanent cleanup action" as defined under WAC 173-340-200, since it requires further action at the site. Furthermore, based on the determination that it is not practicable to clean up groundwater to cleanup levels (surface water criteria) throughout the site within a reasonable restoration timeframe (see WAC 173-340-720(8)(c); WAC 173-340-720(8)(d)(d)(ii), referencing WAC 173-340-720(8)(d)((i)), the MNA cleanup action includes an off-property conditional point of compliance at the Blair Waterway. In order for a groundwater remedy to be considered "permanent" under MTCA, it must achieve cleanup levels at the standard point of compliance (i.e., throughout the site) (WAC 173-340-360(c)(i)).

Since the MNA cleanup action is not "permanent" as defined under MTCA, it must be compared against the FFS alternative that provides the greatest degree of permanence. You must do this to determine whether the MNA "action" is "permanent to the maximum extent practicable" (WAC 173-340-360(3)). This is accomplished through a disproportionate cost analysis (DCA) (WAC 173-340-360(3)(e)). If the costs of the most permanent cleanup action are disproportionate to its benefits, then alternative remedies that provide permanent solutions to the maximum extent practicable (i.e., MNA) may be selected. Consequently, a DCA was performed to compare a permanent alternative using a standard point of compliance against the MNA alternative using an off-site point of compliance. The DCA concluded that:

1) A permanent alternative is not practicable, and

2) The preferred alternative (ground water MNA) is "permanent" to the maximum "extent practicable".

In addition, in order to utilize a conditional point of compliance, it must be demonstrated that it is not practicable to achieve cleanup levels (surface water criteria) throughout the site within a reasonable

restoration timeframe and that all practicable methods of treatment are being used in site cleanup (WAC 173-340-720(8)(c)). The DCA analysis makes both of these demonstrations with respect to the MNA alternative.

4.3.1 Description of the "Permanent" Alternative

Continued hydraulic control (i.e. pump and treat) is the "permanent" alternative to which the MNA alternative has been compared. The continued hydraulic control alternative includes a standard point of compliance. This alternative includes:

- Ground water pump and treat (shallow and intermediate aquifers) until cleanup levels (surface water criteria) are met at all points "throughout the site".
- Remediation of ground water in the shallow and intermediate aquifers through treatment and natural attenuation
- Implementation of a monitoring program throughout the site to confirm hydraulic control and determine when cleanup levels are met throughout the site.

The following ground water pump and treat (hydraulic control) systems would then remain operational until cleanup levels (surface water criteria) are achieved throughout the site:

- Shallow Interceptor Drain ("SID"): this "SID" system is located around the perimeter of the manufacturing portion of the site. It is used to intercept and collect shallow aquifer groundwater.
- The six on-site and active intermediate aquifer extraction wells.
- The water treatment system that treats organic compounds (enhanced oxidation). This system treats water captured by the SID and the groundwater extraction wells.
- The discharge of treated (NPDES permit) water to the Blair Waterway.

If a "permanent" cleanup alternative with the "standard" point of compliance is used, then cleanup standards (surface water criteria) are achieved "throughout" the site. It is likely that the "permanent" alternative (hydraulic control or pump and treat) will result in additional mass removal (i.e. extraction of ground water contaminants). It is also highly likely that the permanent alternative (pump and treat) will result in attainment of groundwater cleanup levels throughout the site, likely in a shorter timeframe than would be achieved with MNA.

Specifically, for ground water MNA, the estimated "restoration timeframe" (time required to reach ground water cleanup levels throughout the site) is approximately 24-50 years (FFS, Appendix E). However, as stated, active ground water pump and treat may result in a shorter "restoration timeframe". For this cleanup action evaluation and DCA, it was assumed that the restoration timeframe for active pump and treat would be approximately 18-37 years. This timeframe (18-37 yrs) is 75% of the MNA restoration timeframe.

It should be noted that the 75% figure is based on best professional judgment. The actual time to cleanup levels is hard to predict. It is acknowledged and understood that actual ground water systems are highly variable and complex. However, for comparison purposes and the DCA, an effort to quantify costs and benefits must be attempted.

4.3.2 Evaluation of Ground Water Remedial Alternatives Using MTCA Criteria

The continued hydraulic control and ground water treatment alternative and the MNA alternative were compared to the WAC 173-340-360 requirements. WAC 173-340-360(2) specifies four threshold criteria that all cleanup actions must satisfy, and WAC 173-340-360(3) specifies three other criteria that alternatives that meet the threshold requirements must also achieve.

4.3.2.1 MTCA Threshold Criteria

Protection of Human Health and the Environment - Both remedial alternatives prevent migration of contamination into surface water receptors. Institutional controls restricting ground water withdrawal and use will limit exposure via ingestion and dermal contact.

Compliance with Cleanup Standards – Continued ground water treatment (hydraulic control) would prevent off-property migration of contamination. For the MNA alternative, ground water dissolved-phase concentrations (PCP) will naturally attenuate as ground water flows west and discharges to the Blair Waterway. For both alternatives, Cleanup standards will be met at the ground water/surface water interface.

Compliance with Applicable State and Federal Laws – both cleanup actions comply with applicable state and federal laws as shown previously in Section 3.2.4.

Compliance Monitoring – Both alternatives would include compliance monitoring. For the MNA alternative, ground water compliance monitoring will be conducted, per the site Compliance Monitoring and Contingency Plan (CMCP). Continued monitoring will ensure that natural attenuation is occurring and that ground water concentrations will continue to decline over time.

4.3.2.2 Additional MTCA Criteria

This groundwater remedial alternative must also meet the three additional requirements specified in WAC 173-340-360(2):

1. Use permanent solutions to the maximum extent practicable.
2. Provide for a reasonable restoration time frame.
3. Consider public concerns and comments on the CAP.

The restoration timeframe for continuation of ground water pump and treat (hydraulic control) would be approximately 18- 37 years. Public comment will be addressed following issuance and review of the DCAP.

4.3.3 Evaluation of Alternatives and the Maximum Extent Practicable

In accordance with WAC 173-340-360(2), the preferred alternative must use permanent solutions to the maximum extent practicable. A disproportionate cost analysis is used to compare alternatives to determine the alternative which is permanent to the maximum extent practicable.

4.3.3.1 Disproportionate Cost Analysis (DCA)

A MTCA "DCA" was used to compare the costs of continued pump and treat (hydraulic control) vs. natural attenuation. If the costs of any given cleanup action (pump and treat) are disproportionate to its benefits, then alternative remedies (MNA) may be selected (WAC 173-340-360(3)(e)). In the FFS analysis of the ground water remedy, the costs and benefits of operating (long-term) the site ground water treatment system were compared to monitored natural attenuation (MNA). The following were used (WAC 173-340-360(3)(f)):

- Protectiveness
- Permanence
- Cost
- Effectiveness over the long term
- Management of short-term risks
- Technical and administrative implementability
- Consideration of public concerns

Protectiveness

For site ground water, both long-term pump and treat and MNA protect the highest beneficial use of ground water (the surface water in the site ditches and the Blair Waterway). Both would rely on institutional controls to prohibit the withdrawal of ground water for use as drinking water. Thus, in terms of protectiveness, both remedies (MNA and pump and treat) are nearly the same.

Permanence

Permanence measures the degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances. Most of the remnant site ground water contamination has been successfully treated. If site ground water treatment continues into the future, it would likely result in only a small removal of contaminant mass. Specifically, it is anticipated that removal of remnant soil contamination is likely to have more impact on ground water. Consequently, both pump and treat and MNA are thought to be nearly equal in terms of permanence.

Cost

The cost of operating the site ground water treatment, including the cost of construction and the net present value of any long-term costs for the next 24-50 yrs is estimated at approximately $10,900,000 to $20,400,000. Conversely, the cost of the preferred alternative (MNA) for the next 18-37 yrs is estimated at approximately $600,000. In other words, if operation of the site ground water treatment continued

until cleanup levels are met "throughout the site", then it would cost approximately 20-30 times more than MNA.

Effectiveness over the Long-term

Both the permanent and preferred alternatives are effective at removing the source of the contamination and preventing migration of the contaminants over the long-term.

Management of Short-term Risks

Risks of continued site ground water pump and treat include exposure of site maintenance workers to contaminated ground water. The wastes from the treatment process are considered hazardous. Additionally, risks to personnel from system operation including leaks, spills, slips, and falls are associated with this alternative.

Conversely, for MNA, there is very little exposure to site ground water. There will be some exposure while field personnel are conducting monitoring and collecting ground water samples; however, this exposure is thought to be relatively nominal.

Technical and Administrative Implementability

The site is scheduled for future development as a marine cargo terminal. The permanent alternative is not compatible with this intended future use and would require significant modifications to the current plans for the site.

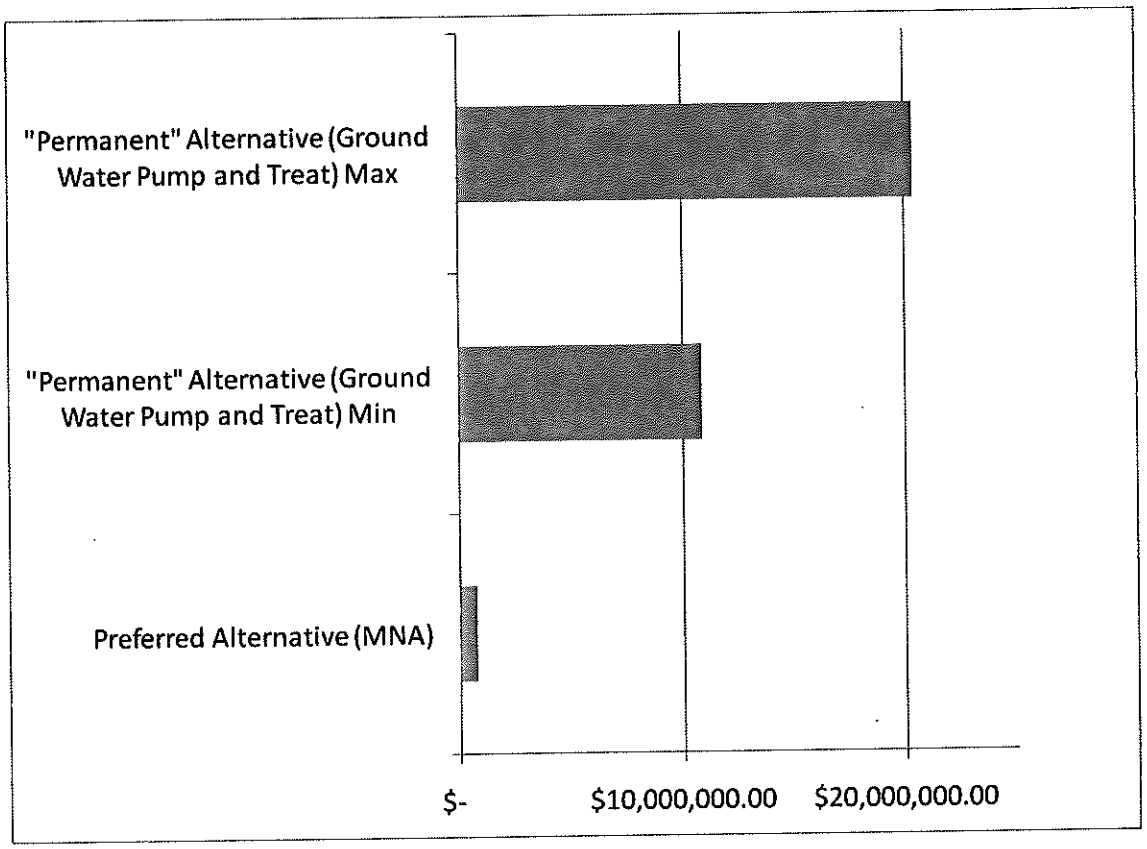
Consideration of Public Concerns

All public questions on this cleanup action will be addressed during public comment.

4.3.3.2 Disproportionate Cost Analysis (DCA)

Based on the DCA, the selected ground water alternative is monitored natural attenuation (MNA). This remedy includes an off-property conditional point of compliance and compliance monitoring. This alternative uses permanent solutions to the maximum extent practicable and provides the same environmental benefit as the permanent alternative without the additional costs. The incremental cost of the "permanent" alternative (continued pump and treat) does not justify the negligible environmental benefits that would be obtained.

Figure 8: Ground Water Remedial Alternatives Costs.



5.0 Soil Remedial Actions

5.1 SOIL REMEDIAL ACTIONS

This section provides details on the remedial actions selected under this CAP for four (4) site areas with remnant soil contamination:

- Hydrochloric (HCL) acid pond,
- Pentachlorophenol (PCP) plant,
- Butylphenol process, and
- SDA-9.

Each cleanup action is based on COCs, site constraints (e.g. utility lines, etc.) and future land use. The proposed remedial action for each area was evaluated based on the WAC 173-340-360 requirements. Based on the selection process identified in the FFS, the following remedial technologies are selected as the remedial actions for the identified soil areas and are described further in the sections below:

- SWMU 10—Hydrochloric Acid Pond: excavation with ex-situ treatment through aeration within the CAMU. Treatment would occur in either a temporary treatment area or the treatment cells. After treatment, the soil would be placed in the CAMU. Alternatively, a contingency action would be excavation and off-site disposal.
- SWMU 24—Pentachlorophenol Plant area: excavation and off-site disposal.
- SWMU 25—Butylphenol process area: excavation and off-site disposal.
- SDA-9 Area: excavation and off-site disposal.

5.1.1 SWMU 10—Hydrochloric Acid (HCL) Pond Area

Analytical data from the preclosure and focused soil investigation, indicate that the HCL Pond Area has concentrations of tetrachloroethene, and trichloroethene that exceed cleanup levels. The HCL pond soil excavation will consist of removing soil above and below the water table. For soil above the water table (vadose zone), the approximate excavation depth shall coincide with the lowest groundwater elevation measured over the last 5 years in two wells (MW-15(S) and MW-23(S)2). At these locations, the vadose zone extends from the surface to an elevation of approximately 5.7 to 5.9 feet, which is approximately 4.3 and 8.3 feet below ground surface (below ground surface). Analytical results indicate that there is essentially a "clean" horizon of soil from 0-3 ft. depth. This horizon can be used as clean fill or placed somewhere else on-site within the CAMU.

For the HCL pond, most of the contamination is located between 3 and 4.5 feet below ground surface. For example, the results of soil sample # HCL-101 indicate that the soil at 6.5 and 8 feet below ground surface is less than cleanup levels. Therefore, the vertical extent of the soil excavation will be 4.5 - 6.5 feet, which results in an estimated soil volume of 50 to 150 cubic yards.

Because the HCL pond area has soil VOCs that tend to rapidly volatilize when exposed to ambient air, the plan is to excavate soil for ex-situ treatment. A vadose zone confirmation-sampling plan will be developed in conjunction with Ecology as part of the remedial action work plans. The confirmation sampling will ensure that once the soil excavation is completed, there will be no remnant soil COCs that exceed cleanup levels. The anticipated limits of excavation are shown on Figure 4, p. 15.

Contaminated soil from the HCL pond area will be re-located to a treatment area within the site "CAMU". Once in the treatment area, it will be frequently aerated and tilled. Stormwater erosion control measures will be implemented to ensure that contaminated does not "leach" or migrate from treatment areas. Once the soil achieves cleanup levels, it will be used on-site as clean fill within the CAMU. Confirmational sampling will be conducted to ensure that treated soil complies with cleanup standards.

5.1.1.1 HCL Pond Area Ex-situ Treatment

In order to promote volatilization and spread the contaminated soil evenly, the soil will be mixed on a routine basis. The mixing will be accomplished by a tiller or backhoe. Best management practices will be implemented to ensure that the contaminated soil is not transported to other site locations.

In order to verify the effectiveness of the removal and ex-situ treatment, samples will be collected during the treatment. The sampling requirements will be defined in the remedial action work plans. This plan will likely include the collection of 4 sets of samples, as described in these 4 steps:

1. Collect the first set of samples from the excavator bucket soil. These samples represent the "baseline" condition. Soil sample analytical results from the Dec-02 sampling event (HCL-101 @ 3-4.5 feet depth) will also be used for the "baseline" condition.

2. Collect a second set of samples from soil that is "laid down" on the liner or in the treatment cells. This set of samples will be used to calculate the VOC mass that is lost solely by excavation, transport, and atmospheric exposure.

3. Collect a third set of samples from soil after it has been exposed to the atmosphere for some pre-determined period. These samples would represent the final conditions of the soil after ex-situ treatment was complete.

4. Collect a fourth set of samples from the excavation bottom and sidewalls to confirm that soil COCs do not remain at concentrations than cleanup levels.

If this "ex-situ" treatment is deemed effective, then it will be used. Conversely, if the treatment is found to be ineffective or if treatment timeframes are not compatible with future site development, then the soil will be disposed of off-site. The HCL pond area soil is not a listed F021 hazardous waste and will not be subject to land disposal requirements (LDRs).

5.1.2 SWMU 24—Pentachlorophenol Plant Area (PPA)

Soil samples PCP-22, PP1108.0A and PP1109.0A were collected from the PPA. These samples contain pentachlorophenol, 2,4-dichlorophenol, 2-chlorophenol, and/or Aroclor 1248 at concentrations that exceed cleanup levels. Sample locations, PP1108.0A and PP1109.0A are co-located near the 2002 PPA

excavation. Additionally, several samples from the Nov-07 PCP plant area sampling event (supplemental soil investigation) contain concentrations of 2,3,4,6-tetrachlorophenol, pentachlorophenol, 2,4-dichlorophenol, trichloroethene, and/or Aroclor 1248 that exceed cleanup levels. PCP plant sample locations are shown on Figure 4, p. 15.

PPA soil cleanup levels (except for Aroclor 1248) are based on the soil-leaching-to-groundwater pathway. Remnant COC concentrations do exceed cleanup levels for the leaching pathway. The remnant Aroclor 1248 soil concentrations also exceed the cleanup level for the human soil ingestion (direct contact) exposure pathway. Consequently, the vadose zone soil needs to be either removed or stabilized.

The PPA has been identified for a source removal action in October 2002; however, during the source removal, noxious odors created an unsafe condition, which in turn prevented the excavation from being completed. Consequently, the excavation "pit" was backfilled prior to soil removal. During the removal action, it was originally estimated that approximately 40-100 cubic yards of contaminated soil was left in place within the excavation. Due to the strong odors, soil treatment was identified as a potential cleanup option.

Based on the results of the 2007 supplemental soil investigation, the volume of contaminated soil that remains in place was re-calculated. It is now estimated that approximately 1,900 - 2,800 cubic yards of contaminated soil remains in place. Consequently, the decision has been made to excavate this remaining soil and disposed of it off-site.

The PPA "vadose zone" (soil above the water table) is based on the lowest ground water elevation over the last 5 years, as measured in two nearby monitoring wells (MW-14(S) and MW-24(S)). For the PPA, the vadose zone extends from the land surface to an elevation of approximately 7 ft., which is approximately 3.5-5.2 feet below ground surface. The majority of the overlying soil is clean fill from the 2002 removal action. Analytical results confirm that soil from 0-4 ft. is "clean" (less than cleanup levels). Consequently, this soil can be excavated and used as clean fill or placed somewhere else within the site CAMU.

For the PPA, the contaminated soil "horizon" is 4-12 feet below land surface, which is at or below the shallow water table. In some locations, contaminated soil extends downward to the top of the underlying aquitard, which is located approximately 6-10 feet below land surface. On the surface of this aquitard is a layer of peat 3 to 6 inches thick. It is assumed that this peat layer is, in theory, acting as a "sponge" and "collecting" contamination (organic chemicals tend to adsorb to organic carbon, e.g. peat). The PPA soil excavation will extend vertically to the top of the upper aquitard and the peat layer will be removed. Efforts will be made to do this as carefully as possible to avoid aquifer "cross-contamination" by breaching the aquitard and allowing contaminants to cross between the shallow and intermediate aquifers. Based on the PPA analytical results, the excavation is expected to extend to approximately 6 - 12 feet below ground surface. The estimated volume of contaminated soil to be excavated is expected to be approximately 1,900 - 2,800 cubic yards. The anticipated limits of the excavation are shown on Figure 4, p. 15.

Due to concerns about noxious odors and air quality concerns, the PPA excavation "pit" will remain open for only a short period. Other "odor control" measures, including foam vapor retardants and careful scheduling and sequencing of the work may also be used. Prior to the excavation, Ecology will define "how deep and how far" the excavation will go. All contaminated PPA soil will be removed to the

extent practicable. As a last step, a PPA confirmational soil-sampling plan will be developed as part of the remedial action work plan to ensure that all contaminated soil has been removed. Ecology will aid in the development of this plan and it will be implemented once the soil excavation has been completed.

Contaminated PPA soil is likely to be a listed F021 hazardous waste. Therefore, it will be disposed of at a permitted hazardous waste facility as CAMU-eligible waste. The closest landfill that meets these requirements is the Waste Management facility in Arlington, Oregon. The contaminated soil will be disposed of in accordance with WAC 173-303-646920 and it will be subject to the acceptance and sampling requirements. Additionally, some of the excavated soil may also be designated as Toxic Substances Control Act (TSCA) waste and will be subject to TSCA[6] regulations. This soil will also be disposed of at the Waste Management site in Arlington, Oregon and will be subject to the acceptance and sampling requirements. Lastly, the excavated soil will be segregated based on its chemical characteristics and disposed of appropriately.

5.1.3 SWMU 25—Butylphenol Process Area (BPA)

The BPA has soil with 2,4,6-trichlorophenol and 2,4-dichlorophenol that exceeds cleanup levels. Within the BPA, 3 sample locations exceeded cleanup levels: RC-BP-1, BPA-101, and BPA-102. Additionally, several BPA samples (e.g. SB-06, SB-08, and SB-36) from the Nov-07 supplemental soil investigation had concentrations of 2,4,6-trichlorophenol and/or 2,4-dichlorophenol that exceed cleanup levels. Contaminated soil has been detected from approximately 3-10.3 feet below ground surface. BPA sample locations are shown on Figure 4, p. 15.

The 2007 supplemental soil investigation results were used to clarify and refine the nature and extent of the BPA area contamination. Full characterization of this area has been constrained due to the presence of several large footings and remnant concrete site structures. These remnant structures will be removed prior to soil excavation. This will allow for additional site investigation (if deemed necessary).

When the BPA soils are excavated, there is the potential to encounter noxious odors from remnant soil contamination. The BPA is close to the PPA and similar conditions are likely at both areas. The excavation will consist of removing contaminated vadose zone soil as well as "hot spot" removal of saturated zone soil.

The extent of the BPA vadose zone s based on the lowest ground water elevation over the last 5 years, as measured in one nearby well (MW-19(S)). Within the BPA, the vadose zone extends from land surface to an elevation of approximately 6 feet. This is approximately 5.3 feet below ground surface. Analytical results from soil samples collected from within the BPA confirm that there is a horizon of

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[6] The Toxic Substances Control Act of 1976 (15 U.S.C. §2601 et seq. (1976) -- otherwise known as TSCA (pronounced TAHS-ka) -- was enacted by Congress to give EPA the ability to track the 75,000 industrial chemicals currently produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

"clean" soil from land surface to a depth of approximately 3 ft. This soil may be excavated and used as clean fill or placed somewhere else on-site within the CAMU.

For the BPA, the contaminated soil horizon or "target" layer for removal is located approximately 3- 10.3 feet below ground surface. This layer of contaminated soil will be excavated and removed. Confirmation samples will then be collected to ensure that all contaminated soil has been removed to the extent practicable.

In some locations, contaminated soil extends downward to the top of the underlying aquitard, which is located approximately 6-10 feet below land surface. On the surface of this aquitard is a layer of peat 3 to 6 inches thick. It is assumed that this peat layer is, in theory, acting as a "sponge" and "collecting" contamination (organic chemicals tend to adsorb to organic carbon, e.g. peat). The BPA soil excavation will extend vertically to the top of the upper aquitard and the peat layer will be removed. As with the PPA excavation, efforts will be made to do this as carefully as possible to avoid aquifer "cross-contamination".

Based on previous soil analytical results, the excavation is expected to extend vertically to approximately 6- 11 feet below ground surface. The contaminated soil volume is estimated at approximately 1,500 - 1,800 cubic yards. The anticipated limits of the BPA excavation are shown on Figure 4, p. 15.

Due to concerns about noxious odors and air quality concerns, the BPA excavation "pit" will remain open for only a short period. Other "odor control" measures, including foam vapor retardants and careful scheduling and sequencing of the work may also be used. Prior to the excavation, Ecology will define "how deep and how far" to extend the excavation. All contaminated BPA soil will be removed to the extent practicable. Lastly, a BPA confirmational soil-sampling plan will be developed to ensure that all contaminated soil has been removed. Ecology will aid in the development of this plan and it will be implemented once the soil excavation has been completed.

The contaminated BPA soil may be a listed F021 hazardous waste and will therefore be disposed of as CAMU-eligible waste at a permitted hazardous waste facility. The closest landfill that meets these requirements is the Waste Management facility in Arlington, Oregon. The soil will be disposed of in accordance with WAC 173-303-646920 and will be subject to the acceptance and sampling requirements.

5.1.4 SDA-9 Area

Two sampling locations within the SDA-9 exceed cleanup levels for Aroclor 1248. An excavation for this area had been planned in the 1990s, but was not conducted due to presumed utility conflicts. It has now been determined that the existing utility lines in this area will not impact cleanup efforts. As a result, the SD-9 area is now "on the table" for assessment. The area to be addressed has been focused to a limited area, identified as the SDA-9 "area of concern" (Figure 3, p. 13).

For the SDA-9 area, two samples contained concentrations of Aroclor 1248 that exceed cleanup levels. Both of these samples were collected from 0-3 ft. depth. Since the limits have been previously defined

and the area is relatively small, the remedy for this area is excavation and off-site disposal[7]. On site or "ex-situ" treatment alternatives are not appropriate for Aroclor 1248.

The SD-9 area excavation will consist of removing contaminated vadose zone soils (or that soil above the water table). Like the BPA and PPA areas, the SDA-9 vadose zone is defined as the lowest ground water elevation over the last 5 years, as measured in one nearby well (MW-10(S)). In the fourth quarter 2006, MW-10S was dry. What this means is that vadose zone extends from land surface to the upper aquitard, or an elevation of approximately 2.1 feet or 10 feet below ground surface (FFS Table 6.1).

Based on previous analytical results, the "target" soil layer for the SDA-9 area is from approximately 0- 3 feet below ground surface. This layer of contaminated soil will be excavated and removed. The estimated volume of contaminated soil is approximately 80-140 cubic yards. The anticipated limits of the excavation are shown on Figure 4, p. 15.

The excavation would be followed by confirmation sampling to verify that all the contaminated soil was removed. Contaminated soil will be taken off-site and transported to an approved landfill. This soil is not a listed F021 hazardous waste and will not be subject to the associated land disposal requirements. However, it is likely that the soil will be designated as "TSCA" waste and will be subject to TSCA regulations. This contaminated soil will be disposed of at the Waste Management facility in Arlington, Oregon and will be subject to the acceptance and sampling requirements.

5.2 SOIL REMEDIAL ACTION ALERNATIVES

Remedial technologies that may be used to accomplish remedial action objectives or "RAOs" were identified in the FFS. Advantages and disadvantages of each remedial technology were evaluated and compared to the 173-340-350(8)(b)criteria. Any remedial technology that did not meet the regulatory "criteria" was deemed "unsuitable" and removed from further analysis. Likewise, those alternatives that "met" the regulatory criteria were deemed "acceptable" and were therefore further evaluated. This process resulted in selection and evaluation of six different cleanup actions or "remedial alternatives":

- No action
- Excavation
- Disposal
- In-situ Treatment
- Ex-situ Treatment
- Engineered Cap and Institutional Controls

The FFS contains details on the advantages and disadvantages of these six different remedial alternatives. This evaluation resulted in the remedial alternatives listed in Section 5.1. In summary, the selected remedial alternative is excavation and removal for off-site disposal for four site areas (PPA, BPA, HCL pond and SDA-9 area).

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[7] Figure 3.2 of Construction Package No. 13, Agreed Order No. 1578.

5.3 JUSTIFICATION FOR SELECTING THE SOIL REMEDIAL ACTIONS

As required by WAC 173-340-350 (8)(c)(i)(G), the FFS evaluated soil alternatives criteria set forth in WAC 173-340-360. WAC 173-340-360(2) specifies four threshold criteria that all cleanup actions must satisfy and WAC 173-340-360(3) specifies three other criteria that alternatives that meet the threshold requirements must also achieve. Descriptions of how these selected alternatives meet these criteria are described below.

5.3.1 MTCA Threshold Requirements

The soil remedial alternative as described above meets the four MTCA threshold criteria:

- Protect human health and the environment.
- Comply with cleanup standards.
- Comply with applicable state and federal laws.
- Provide for compliance monitoring.

Site cleanup levels were calculated based on two exposure pathways: soil ingestion (direct contact) and the protection of surface water (site perimeter ditches and the Blair Waterway). For soil, compliance monitoring will include confirmation sampling of all excavated areas. If deemed necessary, additional removal would be performed following confirmational sampling to ensure that all contaminated soil has been removed. The proposed remedy (excavation and removal of all contaminated soil) is a "permanent" solution. Therefore, long-term monitoring of the soil is not necessary. The proposed soil remedy also complies with applicable state and federal laws ("ARARs", Section 5.3.4).

5.3.2 Other MTCA Requirements

The proposed soil cleanup action (excavation and off-site disposal) complies with three additional requirements (WAC 173-340-360(3)):

1. Use permanent solutions to the maximum extent practicable.
2. Provide for a reasonable restoration time frame.
3. Consider public concerns and comments on the CAP.

Excavating contaminated site soil meets and complies with the first two criteria. The third criterion will be satisfied during the public comment period.

5.3.3 MTCA Disproportionate Cost Analysis (DCA)

For soil, a MTCA disproportionate costs analysis "DCA" (WAC 173-340-360 (3)(e)) is not necessary. Excavating and removing contaminated soil is considered protective of human health and the environment. It is a permanent solution and it can be done in a "reasonable" restoration timeframe.

5.3.4 Compliance with Applicable or Relevant and Appropriate Requirements

In addition to MTCA requirements, the proposed soil remedy complies with ARARs (Section 3.4.1 of the FFS and Table 1, p. 19).

6.0 Soil Treatment Cell Remedial Actions

6.1 REMEDIAL ACTION FOR SOIL TREATMENT CELLS

One cleanup action is appropriate for the soil treatment cell area. As selected through this CAP, this action is composed of three components. These three components are listed below and are described in further detail in the following sections.

- Continued treatment with CAMU placement.
- Off-site disposal of soil remaining in the treatment cells at time of site development.
- Off-site disposal as a contingency for soil that is unable to be treated using the biological treatment technology.

6.1.1 Treatment with CAMU Placement

Biological treatment of contaminated soil within the site "CAMU" area has been very successful. Treatment typically consists of 1-2 year timeframes for soil horizons that are approximately 18-24 inches thick. It is anticipated that continued biological treatment of CAMU area soil will not impact future site development. Soil treatment will continue into the future. Once treated, it will be removed from the treatment cells and placed in an Ecology-approved area of the CAMU. Once there, it will subject to verification sampling to ensure that the soil complies with treatment levels. Under this CAP, the soil treatment levels are adjusted to the levels specified in (Table 5, p. 50).

The treatment technology is continually being optimized to achieve effective treatment in the most efficient time frame. One approach being developed is the attempt to minimize leachate production while concurrently progressing the date of Daramend™ application to as early as possible.

Currently, the soil treatment cells remain uncovered during the wet season and stormwater infiltrates the soil. Biological treatment activities are generally dormant during the winter months; however, the soil within the treatment cells is also saturated by winter rainfall. As a result, the soil treatment cells remain "wet" until late May. In addition, treated soil cannot be removed until it is dry enough for access by machinery. Consequently, the soil treatment cells may be covered with a tarp during the winter months. This would make it easier to apply the Daramend™ treatment each spring and would reduce leachate generation.

Table 5: Soil Cell "Treatment" Levels.

Hazardous Substance	2008 FFS Soil Cell Treatment Levels (mg/kg) (1)
Volatile Organic Compounds	
1,1,1-Trichloroethane	3.2E+06
2-Butanone	2.1E+06
Acetone	6.9E+03
Benzyl alcohol	1.1E+06
Carbon disulfide	3.5E+05
Chlorobenzene	7.0E+04
Methylene chloride	4.5E+00
Styrene	7.0E+05
Tetrachloroethene	1.9E+01
Toluene	6.3E+03
Trichloroethene	1.2E+00
Semivolatile Organic Compounds	
2-Benzyl 4-chlorophenol	-
2-Chlorophenol	4.1E+02
2-Methylnaphthalene	5.2E+03
2,4-Dichlorophenol	3.4E+01
2,4,5-Trichlorophenol	3.5E+05
2,4,6-trichlorophenol	4.5E+02
4-Methylphenol	3.3E+00
Acenaphthene	2.1E+05
Anthracene	1.1E+06
Benzo(a)anthracene	1.8E+02
Benzo(b)fluoranthene	1.8E+02
Benzo(k)fluoranthene	1.8E+03
Bis(2)ethylhexyl phthalate	3.0E+03
Butyl benzyl phthalate	7.0E+05
Chrysene	1.8E+04
Diethyl phthalate	2.8E+06
Di-n-butyl phthalate	3.5E+05
Di-n-octyl phthalate	7.0E+04
Fluoranthene	1.4E+05
Fluorene	1.4E+05

Table 5 (cont.)

Hazardous Substance	2008 FFS Soil Cell "Treatment" Levels (2) (mg/kg)
Hexachlorobenzene	8.2E+01
Naphthalene	4.0E+02
Parabenzoquinone	-
Pentachlorophenol	1.0E+03
Phenanthrene	-
Phenol	9.5E+02
Pyrene	1.1E+05
Polychlorinated Biphenyls	
Aroclor 1248	6.6E+01
Metals	
Lead (3)	--
Molybdenum	5.9E+03

Notes: (1) This list is based is based on previous verification sampling efforts (CH2M Hill, 2004). (2) Soil cell "treatment" levels are equivalent to cleanup levels. (3) Not identified as a COC.

6.1.2 Off-Site Disposal

Off-site disposal of remaining soil and soil treatment cell infrastructure material (liners, leachate collection system materials) will be conducted once soil treatment cells are decommissioned. The timeframe for treatment cell decommissioning is dependent upon on future site development. Lastly, there will be some remnant soil contamination that must be removed when the treatment system is decommissioned. The actual amount (or volume) of soil to be removed depends on the effectiveness of the treatment system.

It is likely that the residual treatment cell contaminated soil will be classified as a listed F021 hazardous waste. Thus, this contaminated soil will be subject to RCRA LDRs. This contaminated soil will be disposed of as CAMU-eligible waste at a permitted hazardous waste facility located outside of Washington State. All contaminated soil will be disposed of in accordance with WAC 173-303-646920 and will be subject to receiving facility acceptance and sampling requirements.

Public comment on this planned off-site disposal will be conducted.

6.1.3 Off-Site Disposal Contingency

The biological amendment Daramend™ is specifically targeted to certain types of chemicals, particularly SVOCs. However, the Daramend™ treatment may not be effective for soil contaminated with Aroclor 1248. Therefore, contaminated soil that cannot be effectively treated (e.g. soil with Aroclor 1248 above site cleanup levels) will be disposed off-site[8].

If the treatment cell contaminated soil meets RCRA LDRs and all applicable permit requirements, then it will not be classified as F021 listed hazardous waste. Proper measures will be implemented to ensure that the treatment cell soil is properly disposed of, per state and federal regulations (i.e. RCRA, ARARs, TSCA, CAMU restrictions, etc.).

6.2 SOIL TREATMENT CELL REMEDIAL ALTERNATIVES CONSIDERED

For the treatment cell contaminated soil, two remedial alternatives were considered: 1) continued treatment, and 2) excavation and off-site disposal. The current soil treatment technology (Daramend™ biological treatment) has proven to be very effective. It is now estimated that within the next 3 years (approximately 2010-11), all treatment cell contaminated soil will be reduced to "acceptable" or "treatment" levels.

Conversely, if the treatment cell soil cannot be successfully treated within the next few years, then it will need to be excavated and removed for off-site disposal. As discussed, it is anticipated that the Daramend™ treatment will not be effective for Aroclor 1248. If this is the case, then targeted volumes of

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[8] Off-site disposal would only be implemented if baseline and/or verification sampling identified "zones" or "horizons" of contaminated soil that exceed treatment levels for contaminants that are unable to be biologically treated. If this occurs, then the baseline / verification analytical results would be used to identify hazardous substance types. This information would then be used to select a proper disposal site.

treatment cell contaminated soil would need to be excavated and for off-site disposal. Lastly, the treatment cell liners and leachate collection bedding material would also be analyzed and disposed of properly.

Untreated treatment cell soil may be classified as a listed F021 hazardous waste. Off-site disposal of contaminated treatment cell soil would be subject to RCRA LDRs. These LDR regulations require that the soil be hauled to an appropriately permitted landfill. This landfill must be able to provide appropriate pre-treatment prior to disposal. This contaminated soil will be disposed of as CAMU-eligible waste at a permitted hazardous waste facility. The closest landfill that meets these requirements is the Waste Management facility in Arlington, Oregon. The material will be disposed of in accordance with WAC 173-303-646920 and will be subject to the acceptance and sampling requirements.

Additionally, some of the material may also be designated as TSCA waste and will be subject to TSCA regulations. This material will also be disposed of at the Waste Management facility in Arlington, Oregon and will be subject to the acceptance and sampling requirements. The excavated material will be segregated based on its chemical characteristics and disposed of appropriately.

Lastly, if future site development impedes or inhibits treatment cell operations, then the contaminated soil will need to be removed for off-site disposal.

6.3 JUSTIFICATION FOR SELECTING THE SOIL TREATMENT CELL REMEDIAL ACTIONS

This section provides details on the soil treatment cell remedial alternatives, as required by WAC 173-340-360. All cleanup actions must meet the four threshold criteria specified in WAC 173-340-360(2). All cleanup actions must comply with three additional criteria specified in WAC 173-340-360(3).

6.3.1 MTCA Threshold Criteria

The soil treatment cell remedial alternative meets the four criteria specified in WAC 173-340-360(2):

1. Protect human health and the environment.
2. Comply with cleanup standards.
3. Comply with applicable state and federal laws.
4. Provide for compliance monitoring.

Treatment of contaminated soil meets the above four criteria. In addition, soil that does not meet treatment levels will be removed and disposed of off-site. if necessary per the future site development schedule. This plan is also compatible with the above 4 criteria. Soil treatment levels were derived in accordance with MTCA guidance. These treatment levels are considered protective of human health and the environment for two exposure pathways: direct human contact (soil ingestion) and the protection of surface water (i.e. nearby ditches and the Blair Waterway). Therefore, when treated soil is re-located to the CAMU, it will be "safe" for both human health and the environment. Baseline and verification sampling will ensure that this soil complies with both cleanup standards and state / federal laws.

All off-site disposal of contaminated soil will comply with RCRA ARARs, TSCA regulations, and CAMU requirements. Lastly, treatment cell sampling will be conducted per the established Treatment Cell Sampling Protocols (Soil Cells Sampling and Analysis Plan, Attachment #7 to RCRA Corrective Action Management Unit Summary, March 2004) to ensure that all residual soil contamination has been removed.

6.3.2 Additional MTCA Criteria

All cleanup actions must comply with three additional criteria specified in WAC 173-340-360(3):

1. Use permanent solutions to the maximum extent practicable.
2. Provide for a reasonable restoration timeframe.
3. Consider public concerns comments on the CAP.

The soil treatment cell remedial alternative meets these three additional requirements:

- Permanent solution: this cleanup action eliminates human exposure to contaminated soil and significantly reduces "leaching" of contaminants from soil to ground water. Therefore, it is permanent to the extent practicable.
- "Restoration" timeframe: it is anticipated that the contaminated treatment cell soil will be reduced to "acceptable" (treatment) levels within the next 3 years (by 2011). This is considered a "reasonable" timeframe. In addition, there is a contingency plan for complete removal of all contaminated soil, if deemed necessary.
- All public comments on this Cleanup Action Plan (CAP) will be reviewed and considered.

6.3.3 Soil Treatment Cell Remedial Alternative and Other Applicable or Relevant and Appropriate Requirements

In addition to MTCA requirements, the proposed soil treatment cell remedial alternative complies with other ARARs, based on a comprehensive review of federal, state, and local regulations (Table 1, p. 19).

7.0 Cleanup Action Plan Schedule

7.1 OVERVIEW

It is anticipated that in October of 2008, a draft Consent Decree[9] and associated documents (CAP, CMCP, FFS, and FRI) will be released for public comment. This public comment also satisfies the public comment requirements for off-site disposal of CAMU-eligible wastes (WAC 173-303-646920). Following completion of the public comment process (fall of 2008), it is anticipated SSA will proceed with implementation of the final remedial (cleanup) actions. Final remedial actions will be conducted prior to anticipated site development, which is estimated to occur in 2010-2011.

7.1.1 Scope of Work and Schedule

The Scope of Work (SOW) addresses the design, construction and monitoring of the corrective actions detailed in the CAP. The SOW also requires SSA to submit to Ecology a remedial action work plan, a Compliance Well Installation Work Plan, an Operation and Maintenance (O&M) plan for shutdown of the ground water treatment system, a decommissioning plan and remedial action / closure reports.

Groundwater Remedial Action Tasks

1. Install additional shallow and intermediate aquifer ground water monitoring wells. This work is to be done as part of the ground water remedy (MNA). A work plan for this task will be submitted to Ecology for approval. This plan must provide details on the number and location of the new wells and the logic for all well locations (e.g. the interior of the site, in and around soil remedial action areas). Details on sample collection, analytical methods, target analytes, etc. must also be provided, consistent with the Attachment B – Compliance Monitoring Contingency Plan (CMCP). This work plan must account for future property development issues. Lastly, this plan must account for any variability in ground water flow directions caused by decommissioning of the site ground water treatment system. The monitoring wells will be installed after Ecology approval of the work plan.

2. Implement the compliance monitoring contingency plan (CMCP) (Attachment B). Conduct compliance monitoring and reporting. Verify that monitored natural attenuation (MNA) is occurring.

3. Discontinue all future groundwater treatment, including groundwater extraction from the SID and intermediate aquifer extraction wells. Prepare an operation and maintenance (O&M) plan and submit to Ecology for approval. This plan must provide details on the decommissioning of the site ground water extraction and treatment system. The O&M plan must meet the

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[9] A consent decree is a formal legal agreement filed in court. The work requirements in the decree and the terms under which it must be done are negotiated and agreed to by the potentially liable person, Ecology and the state Attorney General's office. Before consent decrees can become final, they must undergo a public review and comment period. Among other things, consent decrees protect the potentially liable person from being sued for "contribution" by other persons that incur cleanup expenses at the site while facilitating any contribution claims against the other persons when they are responsible for part of the cleanup costs. Sites cleaned up under a consent decree are also exempt from having to obtain certain state and local permits that could delay the cleanup.

applicable requirements of WAC 173-340-400(c) (e.g. provide details on maintenance of pumps and seals, flush pipes, inspect tanks, etc.). This O&M plan must also provide details on how to collect, store and dispose of soil treatment cell leachate.

4. Decommission "old" site monitoring wells as deemed appropriate given potential use for MNA monitoring. Submit a monitoring well decommissioning work plan for Ecology approval. Provide details on how the monitoring wells will be decommissioned (i.e. in accordance with Chapter 173-160 WAC).

Soil Remedial Action Tasks

5. Prepare a soil removal remedial action work plan for Ecology approval. This work plan must provide details on the excavation and soil removal for four site areas: hydrochloric (HCL) acid pond, pentachlorophenol (PCP) plant, the butylphenol process area, and SDA-9. This plan must also include confirmation and verification soil sampling plans (developed in collaboration with Ecology) to ensure that all contaminated soil has been removed.
6. Develop bid documents and secure a contractor to perform remedial actions.
7. Secure necessary permits for remedial actions.
8. Select appropriate facilities (e.g. Waste Management, Arlington, OR) for transport and disposal of contaminated soil. Coordinate with the Oregon Department of Environmental Quality (ODEQ). Check and make sure that the "receiving facility" (e.g. Waste Management) can accept CAMU-eligible waste, per WAC 173-303-646920.
9. Perform remedial actions in accordance with the remedial action work plan, including confirmational sampling and backfill of excavations.
10. Document remedial actions and performance in a "closure report" and submit for Ecology's approval.

Soil Treatment Cells Remedial Action Tasks

11. Continue to treat soil (treatment cells) with biological amendment. Soil treatment is anticipated to continue into the future until it is no longer feasible, per the pending future site development.
12. Install treatment cell cover (tarp) to reduce leachate accumulation. Describe this task in the O&M plan.
13. Prepare a draft treatment cell closure work plan for Ecology review and approval. This plan must provide details on how the treatment cells will be decommissioned. This plan must also include a soil verification / confirmational sampling plan. This verification soil-sampling plan will be used to ensure that all treatment cell contaminated soil has been removed.
14. Dispose of residual treatment cell soil off-site, as deemed necessary. Select appropriate facilities (e.g. Waste Management, Arlington, OR) for transport and disposal. Coordinate with the Oregon Department of Environmental Quality (ODEQ). Check and make sure that the "receiving facility" (e.g. Waste Management) can accept CAMU-eligible waste, per WAC 173-303-646920.

15. Implement the CAMU closure work plan.
16. Document decommissioning and performance in closure report and submit to Ecology for approval.

Overall site

17. Develop a CAMU closure plan, per the WAC 173-303-646(5)(b)(iv) requirements. Submit this plan for Ecology review and approval.
18. Apply appropriate industrial land use deed restriction and restrictive covenants.

Schedule of Work and Deliverables

19. Complete all tasks and review all deliverables (Table 6, p. 58) within 30 days (Ecology).

Table 6: Deliverables and Schedule.

Task	Description and Timeframe
1. Soil Treatment Cells—Continued Treatment	On-going until property development or completion of treatment
2. Draft Compliance Monitoring Well Installation Work Plan	Within 30 days of the effective date of the consent decree, or enforcement mechanism under RCW 70.105D.050
3. Final Compliance Monitoring Well Installation Work Plan	Within 15 days of Receipt of Ecology's comments on the draft work plan
4. Draft O&M Plan for shutdown of the ground water extraction and treatment system	Within 30 days of the effective date of the consent decree, or enforcement mechanism under RCW 70.105D.050
5. Final O&M Plan for shutdown of the ground water extraction and treatment system	Within 15 days of Receipt of Ecology's comments on the draft O&M Plan
6. Shutdown of the ground water extraction and treatment system	Immediately after Ecology approval of the Final O&M Plan
7. Implementation of the CMCP	Within 30 days following ground water extraction shutdown
8. Draft Remedial Action Work Plan for soil	Within 6 months of the effective date of the consent decree, or enforcement mechanism under RCW 70.105D.050
9. Final Remedial Action Work Plan for soil	Within 30 days of Receipt of Ecology's comments on the draft Remedial Action Work Plan
10. Final Remedial Actions for In-Situ Soil	Within 90 days of Ecology's approval of final Remedial Action Work Plan, or on the approved schedule in the Remedial Action Work Plan that addresses seasonal construction constraints
11. Construction Completion Report for Final Remedial Actions for In-Situ Soil	Within 60 days of receipt of validated data related to the completion of in-situ soil remedial actions.
12. Construction Completion Report for Final Remedial Actions for Soil Treatment Cells	Within 60 days of final decommissioning of the soil treatment cells.
13. Draft CAMU Closure Work Plan	Within 2 years of the effective date of the consent decree, or enforcement mechanism under RCW 70.105D.050
14. Final CAMU Closure Work Plan	Within 30 days of Receipt of Ecology's comments on the Draft CAMU Closure Work Plan
15. CAMU Closure	Within 60 days of Ecology's approval of a CAMU closure work plan, or on the approved schedule in the CAMU closure work plan that addresses completion of operations at the soil treatment cells
16. Draft Ground Water Extraction and Treatment System Decommissioning Work Plan	Within 2 years of the effective date of the consent decree, or enforcement mechanism under RCW 70.105D.050

Task	Description and Timeframe
17. Implement decommissioning Water Extraction and Treatment System	Within 30 days of Ecology's approval of the Final Ground Water Extraction and Treatment System Decommissioning Work Plan, or on the approved schedule in the Decommissioning Work Plan that addresses completion of operations at the soil treatment cells, and schedule for property development.
18. Site development (phased as necessary relative to remediation system decommissioning). (1)	Anticipated timeframe is 2010-2011 and is contingent upon development permits, etc.

(1) Not a cleanup action task. For informational purposes only.

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Attachment A – Point of Compliance Letter

Note: reserved for letter from intervening property owners (off- site ground water conditional point of compliance).

Puyallup Tribe of Indians

Mr. Skip Sahlin
SSA Containers, Inc.
1131 S.W. Klickitat Way
Seattle, WA 98134

October 14, 2008

Dear Mr. Sahlin,

I am writing on behalf of the Puyallup Tribe of Indians (the Tribe). The Tribe is the owner of certain real properties abutting the Blair Waterway that are shown on Exhibit A, attached hereto.

To the east of our Blair Waterway properties is the parcel owned by SSA Containers, Inc. at 3320 Lincoln Avenue in Tacoma, Washington, commonly called the Reichhold/SSA Property. The Reichhold/SSA Property has been the subject of significant remedial activities. The Tribe is aware of those activities and has reviewed sampling data, including data generated from monitoring wells on the Tribe's property, concerning groundwater contamination originating from the Reichhold/SSA Property.

In connection with its proposed remedial actions, SSA has asked the Tribe to approve the establishment of a conditional point of compliance for groundwater on the Tribe's Property. Pursuant to WAC 173-340-720(d)(ii), the Tribe consents to the use of a conditional point of compliance on the Tribe's Property for groundwater for SSA's Cleanup Action Plan.

Our understanding and expectation is that compliance monitoring will be performed at the SSA Containers downgradient property line near Alexander Avenue, to confirm that groundwater concentrations coming off of the SSA site remain below Source Area Target Concentrations protective of cleanup levels at the point of compliance. The use of a conditional point of compliance of the Tribe's Property is consistent with the deed restriction that is already in place on out properties in the area prohibiting groundwater withdrawal for drinking water.

By agreeing to the establishment of a conditional point of compliance for groundwater on the Tribe's property the Tribe does not waive, and expressly reserves, all claims and causes of action it may have concerning any contamination originating from the Reichhold/SSA property.

Very truly yours,

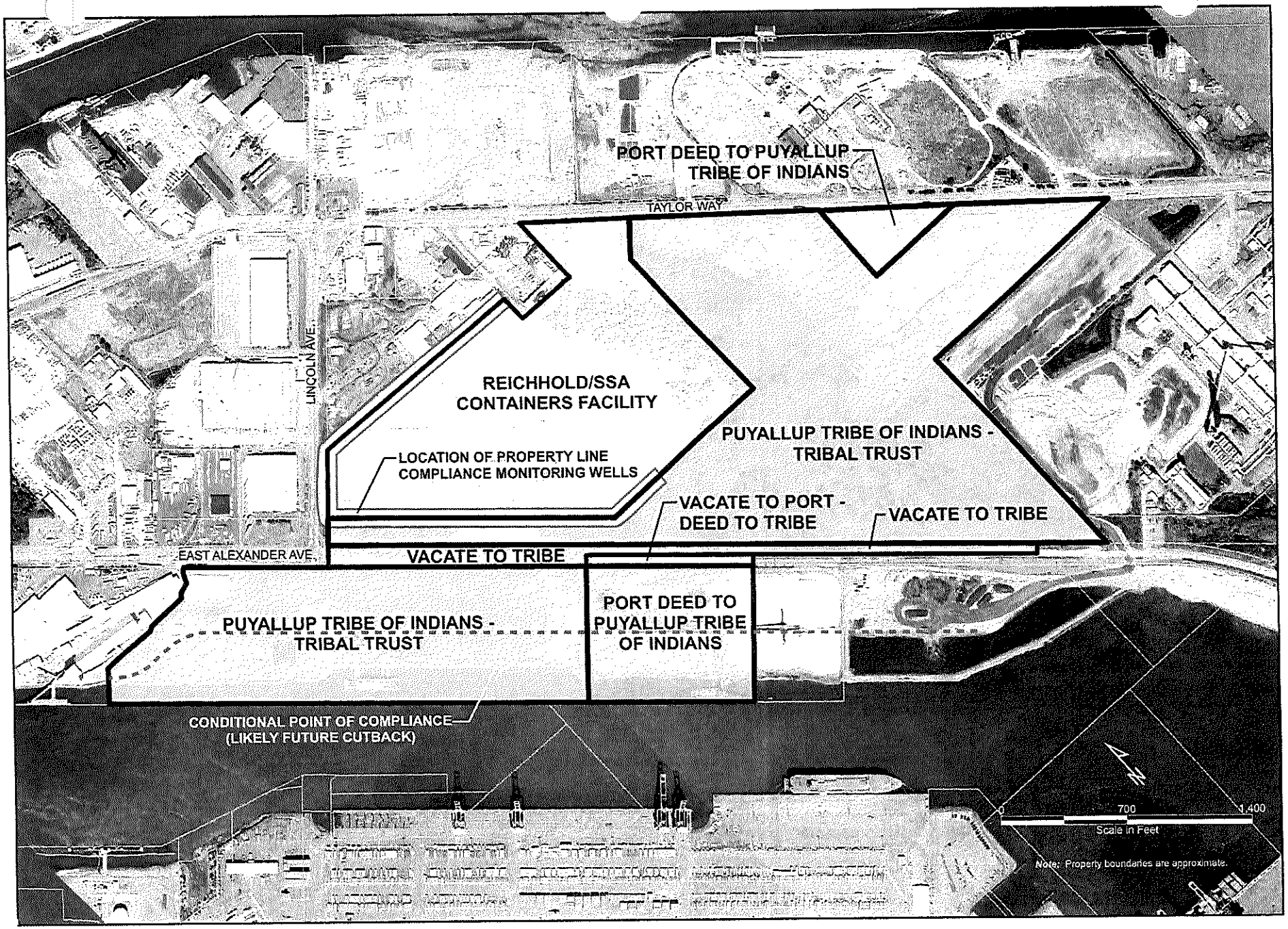
Puyallup Tribe of Indians

Bill Sullivan

Bill Sullivan, Environmental Director

c: Stan Leja, Washington State Department of Ecology

Al Jeroue, SSA Containers, Inc.



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Date: 10/28/2008

Exhibit A

Attachment B – Compliance Monitoring Contingency Plan (CMCP)

Reichhold/SSA Containers Facility
Tacoma, Washington

Compliance Monitoring and Contingency Plan

Prepared for

SSAContainers.
A Carrix Enterprise

Prepared by

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December 2008

FINAL

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List of Abbreviations and Acronyms

Acronym/Abbreviation	Definition
CAP	Cleanup Action Plan
CDA	Construction Debris Area
CMCP	Compliance Monitoring and Contingency Plan
COC	Constituent of concern
EIM	Environmental Information Management
FFS	Focused Feasibility Study
MNA	Monitored natural attenuation
MTCA	Model Toxics Control Act
ORP	Oxidation-reduction potential
PPA	Pentachlorophenol Plant Area
QAPP	Quality Assurance Project Plan
QC	Quality control
RAO	Remedial action objective
RBC	Risk-based calculation
SAP	Sampling and Analysis Plan
SID	Shallow Interceptor Drain
SVOC	Semivolatile organic compound
USEPA	U.S. Environmental Protection Agency
WAC	Washington Administrative Code

1.0 Introduction

This Compliance Monitoring and Contingency Plan (CMCP) for the Reichhold/SSA Containers Facility (the Facility), located at 3320 Lincoln Avenue in Tacoma, Washington (Figure 1.1) accompanies the Cleanup Action Plan (CAP), which describes the final remedial actions to be implemented at the Facility. The CAP was developed based on the preferred remedial alternatives selected in the Focused Feasibility Study (FFS; Floyd|Snider Team 2008). This CMCP has been prepared in accordance with the Model Toxics Control Act (MTCA) requirements for compliance monitoring contained in WAC 173-340-410.

This CMCP presents compliance monitoring requirements and contingency plans that address the soil-to-groundwater leaching and the groundwater transport exposure pathways at the Facility. Following implementation of the remedial actions as defined in the CAP, soil on-site will meet requirements for direct contact and will not require monitoring. The groundwater monitoring activities outlined in this CMCP are designed to ensure that the proposed soil and groundwater remedial actions are protective of the adjacent surface water bodies. Discharge to surface water is the highest beneficial use of groundwater at the Facility. The monitoring activities in this CMCP are intended to address the performance of the remedial actions, confirm continued natural recovery, and confirm the long-term effectiveness of the remedy following the completion of remedial activities and the operation of the site as a container terminal.

This CMCP also sets forth a clear process by which monitoring may trigger contingency responses, and establishes a framework for implementing contingency actions.

1.1 SUMMARY OF GROUNDWATER REMEDIAL ACTION

In this section, an overview of the groundwater remedial action is provided. The groundwater remedial action is intended to confirm that off-site migration of groundwater constituents of concern (COCs) is not occurring at concentrations greater than source area target concentrations. Source area target concentrations are back calculated from the nearest receptor to the Facility property boundary to be protective of Washington State Department of Ecology (Ecology) MTCA surface water cleanup levels.

Groundwater data from the most recent 4 years of monitoring indicate that the Shallow Aquifer is in compliance with these source area target concentrations due to the effectiveness of the corrective actions implemented to date. All available groundwater data from the Intermediate Aquifer indicates compliance with source area target concentrations. The final groundwater remedial action will ensure that the groundwater remains in compliance as the Facility is developed into a marine cargo terminal.

As defined in the CAP, the following steps comprise the final groundwater remedial action:

- Discontinuation of hydraulic control through shutdown of the Shallow Interceptor Drain (SID) and Intermediate Aquifer extraction well pumps
- Implementation of the proposed compliance monitoring program for both Shallow and Intermediate Aquifers

- Demonstration of natural attenuation through monitoring in the Shallow and Intermediate Aquifers
- Implementation of a contingency plan to address potential concerns if identified through compliance monitoring

Additional details on the groundwater remedial action, including its relationship to the site-wide comprehensive remedial actions, are provided in the CAP.

1.1.1 Discontinuation of Hydraulic Control

Active pumping for both the SID and Intermediate Aquifer extraction wells will be discontinued following installation of the compliance monitoring well network, which is planned for 2008, as described in Section 4.0. Groundwater in both aquifers will be allowed to resume its normal flow pattern. The SID, Intermediate Aquifer extraction wells, and water treatment system will remain in place and will be maintained as potential contingency measures until the property is developed, estimated to be in 2010-2011. In late 2010 or early 2011, depending on other remedial objectives and site development progress, it is anticipated that the water treatment system will be permanently decommissioned. Potential contingency actions following decommissioning of the water treatment system are described in Section 8.0.

1.1.2 Monitored Natural Attenuation and Compliance Monitoring

monitored natural attenuation (MNA) will be used to evaluate the effects of natural attenuation processes that have been demonstrated to be biodegrading the groundwater COCs and reducing their concentrations over time, primarily through anaerobic processes. MNA will also serve to validate the predictions from attenuation modeling, which was used to develop source area target concentrations. To demonstrate continued natural attenuation, the remedial action will include groundwater sampling designed to provide data to track the concentration trends of primary contaminants (pentachlorophenol and tetrachloroethene) and their biodegradation daughter products (tetra-, tri-, di- and monochlorinated phenols, trichloroethene, and vinyl chloride). These data will also provide demonstrations that natural attenuation processes result in continued declining concentrations and contaminant mass reduction. Natural attenuation monitoring will also include measurement of oxidation-reduction potential (ORP) to confirm that groundwater redox conditions remain conducive to reductive dechlorination. Additional details on MNA monitoring are provided in Section 3.1.4.

Compliance monitoring, which will include MNA monitoring, will be a central component of the remedial action for both the Shallow and Intermediate Aquifers. The compliance monitoring network, described in Section 4.0, will be installed prior to the discontinuation of hydraulic controls as noted in Section 1.1.1. The compliance monitoring network and program will be designed to confirm that groundwater concentrations leaving the property are protective of an off-property conditional point of compliance at the point of discharge to the Blair Waterway and to the associated ditches that drain to the Blair Waterway, in accordance with WAC 173-340-720(8)(d)(ii)).

Continued compliance with groundwater quality objectives will be confirmed by the compliance monitoring program. While the conditional point of compliance is in place, compliance

monitoring will confirm that groundwater concentrations leaving the source area (the Facility boundary, or property owned by SSA Containers, Inc. [SSA]) are less than source area target concentrations, and that COC concentrations in groundwater reaching the point of discharge, Blair Waterway for the Intermediate Aquifer or associated ditches for the Shallow Aquifer, are less than surface water criteria.

If the compliance monitoring indicates non-compliance with the groundwater quality objectives, the contingency plan will be implemented as described in Section 8.0.

2.0 Facility Description

In this section, relevant Facility conditions are presented to provide context and rationale for compliance monitoring and the contingency plan.

2.1 OVERVIEW OF FACILITY CONDITIONS

The hydrogeologic conditions relevant to compliance monitoring and contingency planning are briefly summarized here. Additional information on Facility conditions, land use, and geologic setting are summarized in the FFS (Floyd|Snider Team 2008).

2.1.1 Summary of Hydrogeologic Units and Groundwater Flow Directions

The Facility is underlain by three near-surface aquifers and two near-surface aquitards, or confining layers. The three aquifers, which are brackish and non-potable, are referred to as the Shallow, Intermediate, and Deep Aquifers. The two aquitards are referred to as the upper and lower aquitards.

The Facility is located within the Tacoma tideflats, which is a regional groundwater discharge area. Groundwater flows from recharge areas at higher elevations toward discharge areas along Commencement Bay and its adjacent waterways, such as the Blair Waterway to the southwest of the Facility. Because of this situation, the vertical groundwater gradient direction is typically upward from the Deep Aquifer to the Intermediate Aquifer.

- The Shallow Aquifer consists of fine to medium sand and silty sand that is primarily dredge spoils from the Hylebos and Blair Waterways, which were hydraulically emplaced in the 1950s. The Shallow Aquifer is unconfined and seasonally ranges in saturated thickness from 0 to approximately 10 feet. Groundwater flow direction is generally radial from the interior of the Facility toward the perimeter drainage ditches and SID that currently surrounds the former process area of the Facility. The Shallow Aquifer is not tidally-influenced.
- The upper aquitard is the uppermost native formation, considered to represent the former ground surface of the salt marsh that existed prior to filling. The unit ranges from approximately 1 to 20 feet thick and consists primarily of silt, organic silt, and clayey silt, with zones of peat.
- The Intermediate Aquifer consists primarily of fine to medium sand and silty sand, with zones of interbedded sand, silty sand, and silt. The Intermediate Aquifer ranges in thickness from approximately 4 to 31.5 feet. Groundwater elevation data indicate that groundwater in the Intermediate Aquifer generally flows from east to west across the eastern portion of the Facility, toward the Blair Waterway. The Intermediate Aquifer is tidally-influenced and experiences transient reversals in the groundwater flow direction in areas near the Blair Waterway. However, the net groundwater flow direction is toward the waterway and the transient reversals in the groundwater flow direction do not prevent groundwater discharge to the waterway. The groundwater flow patterns for the remainder of the Facility are currently dominated by the influence of the groundwater extraction system. Prior to installation and startup of the

extraction system, the general groundwater flow pattern across the Facility was east to west toward the Blair Waterway, becoming more southwesterly in the off-site area, closer to the Blair Waterway.

- The lower aquitard separates the Intermediate and Deep Aquifers at the Facility. This unit consists of silt, organic silt, and clayey silt, with occasional very fine sandy silt and peat interbeds and zones of organic material. The lower aquitard ranges in thickness from approximately 5.5 to 18 feet.
- The Deep Aquifer consists primarily of alternating fine to medium sand and silty sand, with occasional silt interbeds. The total thickness of the Deep Aquifer is not known; regional studies indicate that the sand might reach a thickness of 80 feet or more in the vicinity of the Facility (Walters and Kimmel 1968). Groundwater flow in the Deep Aquifer occurs under confined conditions, with the potentiometric surface approximately 20 to 30 feet above the top of the unit. Groundwater flow in the Deep Aquifer is generally to the southwest toward the Blair Waterway. The Deep Aquifer is tidally-influenced like the Intermediate Aquifer and also experiences transient, localized reversals in the groundwater flow direction, however, the net groundwater flow direction in the Deep Aquifer is westward, toward the Blair Waterway.

Underlying the three uppermost aquifers is up to 400 feet of generally fine-grained marine sediments. These fine-grained sediments provide a low-permeability base that separates the three uppermost aquifers beneath the Facility from the underlying deep regional aquifer, a glacially derived unit of alternating layers of fine- and coarse-grained materials (Walters and Kimmel 1968).

2.1.2 Surface Water Features

The surface water features in the immediate vicinity of the Facility are the Blair Waterway, the Lincoln Avenue Ditch, the North Ditch, and the South Ditch (Figure 2.1). The Facility is currently located approximately 800 feet northeast of the Blair Waterway, which was excavated from the sediment of the Puyallup River Delta at the head of Commencement Bay. According to Attachment 2 to Agreed Order No. 1577, the North Ditch is a man-made industrial drainage ditch that runs along the northern SSA property boundary and carries stormwater runoff from SSA and other adjacent properties to the Lincoln Avenue Ditch, which runs along the northwestern property boundary. The Lincoln Avenue Ditch, which receives runoff from several industrial and urban properties northeast of the Facility, enters a concrete culvert adjacent to the Facility that conveys runoff to the Blair Waterway. The South Ditch is located along a portion of the southern property boundary. The North and South Ditches flow only when precipitation runoff or high groundwater levels discharge into them, and typically either go dry or cease to flow and become stagnant during dry summer conditions.

In 2007, a portion of the Blair Waterway was widened by the Port of Tacoma in the vicinity of the Facility. It is expected that during future terminal development along the waterway this cutback will be continued farther to the northwest. This planned future cutback will decrease the distance from the Facility to the Blair Waterway by approximately 200 feet. This new distance of 600 feet was used in the FFS to update the source area target concentrations for the Facility and is shown on Figure 2.1.

3.0 Compliance Criteria and Monitoring Requirements

This section briefly summarizes the development of compliance criteria and defines the proposed methods of compliance monitoring in the context of MTCA requirements (WAC 173-340-410). The approved groundwater COCs and groundwater compliance criteria described in the FFS are summarized for clarity. In addition, MNA monitoring is described, the process for evaluating compliance is outlined, and other monitoring requirements are presented.

3.1 COMPLIANCE CRITERIA DEVELOPMENT AND ROLE OF GROUNDWATER MONITORING

Groundwater COCs and the source area target concentrations for groundwater were defined in the FFS to ensure that the cleanup goals used at the Facility are protective of human health and remain protective of surface water in the nearby ditches and the Blair Waterway. Similarly, in-situ soil COCs and soil cleanup levels were defined in the FFS to be protective of these nearby surface water bodies and human health by addressing the leaching pathway and the groundwater transport pathway. As a result, monitoring of the groundwater pathway is an effective approach to overall compliance monitoring at the Facility.

3.1.1 Source Area Target Concentrations

Source area target concentrations are concentrations in groundwater that are protective of the nearest surface water receptors based on modeled attenuation rates, groundwater flow velocities, and relevant surface water criteria. Because groundwater at the Facility is non-potable, the risk of exposure to constituents in groundwater is limited to discharge into surface water within the perimeter ditches and the Blair Waterway. Therefore, as the groundwater enters the surface water, it must meet relevant surface water criteria.

The cleanup standards for groundwater are the surface water criteria, to be met at the off-property conditional points of compliance—those locations where groundwater enters adjacent surface water. The groundwater cleanup levels, equivalent to surface water criteria, were used as attenuation endpoints in the development of source area target concentrations as part of the FFS. Using the Ecology-approved BIOSCREEN model, these endpoints were back-calculated to determine a maximum concentration in groundwater at the Facility's boundary that will naturally attenuate to be in compliance with surface water criteria as groundwater enters the respective surface water receptors. Source area target concentrations calculated using the distance to the property boundary are appropriate for assessing compliance in on-site monitoring wells. For off-site groundwater monitoring wells between the Facility boundary and the Blair Waterway, location-specific target concentrations have been calculated relative to the specific distance from the well to the Blair Waterway.

3.1.2 Soil Cleanup Levels

Soil cleanup levels were developed by using the lower, more protective of either the risk-based concentrations (RBCs) protective of human and ecological exposure pathways (calculated according to WAC 173-340-745, 7491-7494) or the soil leaching-to-groundwater pathway by the

MTCA Three-phase Leaching Model (WAC 173-340-747; CH2M HILL 2006). Soil cleanup levels are modeled to not exceed the source area target concentration in groundwater through the soil to groundwater leaching pathway.

In-situ vadose zone soil with COC concentrations that exceed cleanup levels is planned to be excavated as part of the remedial action, which will result in compliance for all in-situ soil at the Facility. Therefore, no direct soil compliance monitoring is necessary following implementation of the remedial action. Additionally, soil within the saturated zone containing soil COCs with concentrations exceeding the cleanup level will be excavated to limits determined in conjunction with Ecology. Compliance monitoring for groundwater will evaluate the effectiveness of soil cleanup actions indirectly, by focusing on confirming that groundwater concentrations continue to naturally recover and remain less than levels of concern.

3.1.3 List of Groundwater Constituents of Concern

The following constituents are included in the final COC list for groundwater, as defined in the FFS (Floyd|Snider Team 2008):

- 2-Chlorophenol
- 2,3,4,6-Tetrachlorophenol
- 2,4-Dichlorophenol
- 2,4,6-Trichlorophenol
- Pentachlorophenol
- Tetrachloroethene
- Trichloroethene
- Vinyl chloride

3.1.4 MNA Monitoring Indicators

Relevant guidance documents that describe the objectives of MNA groundwater monitoring (e.g., DOE 2001, USEPA 2004) draw on eight goals from the 1999 USEPA OSWER Directive 9200.4-17P (USEPA 1999a). Monitoring conducted to support MNA should:

- demonstrate that natural attenuation is occurring according to expectations,
- detect changes in environmental conditions (e.g., hydrogeologic, geochemical, microbiological, or other changes) that may reduce the efficacy of any of the natural attenuation processes,
- identify any potentially toxic and/or mobile transformation products,
- verify that groundwater contamination is not expanding downgradient, laterally, or vertically,
- verify no unacceptable impact to downgradient receptors,

- detect new releases of contaminants to the environment that could impact the effectiveness of the natural attenuation remedy,
- demonstrate the efficacy of institutional controls that were put in place to protect potential receptors, and
- verify attainment of remediation objectives.

According to U.S. Environmental Protection Agency (USEPA) guidance documents, these objectives are commonly met by implementing a performance monitoring program that measures contaminant concentrations, geochemical parameters, and hydrologic parameters (USEPA 2004). The nature of the monitoring program depends on the site-specific monitoring objectives for MNA, which are derived from site-specific remedial action objectives (RAOs) and other remediation goals. Site-specific monitoring objectives are used to develop site-specific MNA performance indicators for assessing MNA effectiveness.

As described in the FFS (Floyd|Snider Team 2008) and CAP, groundwater RAOs for the Facility are to prevent COCs in Shallow Aquifer and Intermediate Aquifer groundwater from reaching the Blair Waterway and surface water in the ditch system that drains to the Blair Waterway at concentrations greater than or equal to surface water criteria. The groundwater remedial action will accomplish this through a compliance and MNA monitoring program, by ensuring that groundwater concentrations leaving the source area remain less than source area target concentrations.

In conjunction with the compliance monitoring objective of ensuring that groundwater remains in compliance with source area target concentrations following the discontinuation of hydraulic control, the site-specific monitoring objective for MNA is to confirm that natural attenuation processes continue to occur in groundwater as demonstrated by decreasing COC concentrations over time, the presence of daughter products, and geochemical conditions.

Three key site-specific MNA performance indicators will be:

1. Measured decreasing trends in compliance monitoring wells of COC concentrations based on annual running averages (averages of two consecutive semiannual monitoring events, during semiannual performance monitoring, or annual results during annual confirmational monitoring). Exceptions to this indicator will be made for biodegradation daughter product COCs (lesser chlorinated phenols, trichloroethene, and vinyl chloride) if the absence of a decreasing trend is the result of degradation of primary contaminants (pentachlorophenol and tetrachloroethene).
2. Demonstration of a decreasing trend in chlorinated semivolatile organic compound (SVOC) concentrations with respect to distance from the Pentachlorophenol Plant Area (PPA), as measured based on annual running averages (averages of two consecutive semiannual monitoring events during semiannual performance monitoring) in the line of three monitoring wells proposed for this demonstration. Refer to Figure 2.1. The highest concentrations of the three should be measured at the well closest to the PPA, MW-14(I) (or Location A, a new informational monitoring well in this vicinity). The next highest concentrations of the three should be measured at Location B, a new informational monitoring well between the PPA and the Facility boundary. The lowest concentration of the three should be measured at the farthest

distance from the PPA, MW-13I (or Location C, a new compliance well in this vicinity).

3. Consistency with geochemical conditions suitable for anaerobic degradation, as indicated by negative ORP measurements in areas with groundwater impacted by chlorinated phenols.

To demonstrate continued natural attenuation and validate the results of BIOSCREEN modeling, the proposed remedy will involve collecting data to track the concentration trends of primary contaminants (pentachlorophenol and tetrachloroethene) and their biodegradation daughter products (lesser-chlorinated phenols, trichloroethene, and vinyl chloride). These measurements will provide confirmation of the natural attenuation process, continuing declining concentrations, and contaminant mass reduction. Natural attenuation monitoring will also include measurement of ORP to confirm that groundwater redox conditions remain conducive to reductive dechlorination. These data will be used to evaluate MNA with respect to the groundwater RAOs and evaluate the dynamic behavior of the contaminant concentrations in groundwater over time.

This CMCP sets forth site-specific indicators for MNA. These indicators and the associated compliance monitoring program together meet the objectives for MNA monitoring, to demonstrate the effectiveness of MNA with respect to remedial objectives, as described below. According to USEPA guidance, the design of a specific MNA monitoring program depends on site conditions and the site-specific limits on decision errors. The ways in which the site-specific MNA indicators meet the objectives provided in the guidance documents are described below, listed in the same order:

- The monitoring program will demonstrate that natural attenuation is occurring according to expectations. Evaluation of temporal trends in contaminant concentrations, measurement of biodegradation daughter products, and confirmation of redox conditions will be used to verify the occurrence of natural attenuation. Because the degradation of chlorinated volatile organic compounds and SVOCs is influenced by redox conditions, assessment of ambient redox conditions is an important component of any MNA monitoring program for these contaminants. The appropriate level of monitoring can only be determined on a site-by-site basis. Measurement of ORP in Facility groundwater is deemed a sufficient parameter to monitor redox conditions. According to USEPA, the production of daughter products from parent contaminants is considered primary evidence of biotransformation processes that may be used to evaluate progress toward achieving contamination reduction objectives.
- The monitoring program will support detection of changes in environmental conditions that may reduce the efficacy of any of the natural attenuation processes. The monitoring program will detect changes in hydrogeological conditions, in particular:
    * the expected changes in groundwater flow direction and flow velocity following the discontinuation of hydraulic control,
    * changes associated with other remedial actions, namely the source control activities planned for the PPA, and

  - changes in the redox conditions that would indicate that anaerobic degradation may no longer be an effective process.

- The monitoring program will identify any potentially toxic and/or mobile transformation products. As indicated above, the biodegradation daughter products of both pentachlorophenol and tetrachloroethene are included as COCs that will be monitored at the same frequency as the primary contaminants.
- The monitoring program will verify that the extent of groundwater contamination is not expanding downgradient, laterally, or vertically. The compliance monitoring well network, described in Section 4.0, is designed in accordance with USEPA guidance (USEPA 2004) to detect such an expansion of contamination extents, by locating wells along the transport pathway from the PPA, along transects at the Facility boundaries adjacent to Shallow Aquifer groundwater ditch receptor points, and in the downgradient off-site area between the Facility and the Intermediate Aquifer groundwater receptor point at the Blair Waterway.
- The monitoring program will verify that negative impacts are not occurring to downgradient receptors by monitoring at the property boundary and off-site to confirm that concentrations are less than levels of concern and continue to decline.
- The monitoring program will detect potential new releases of contaminants by detecting increases in contaminant concentrations at monitoring points located within and immediately downgradient of source areas.
- The remedy will include assurances to demonstrate the efficacy of institutional controls. Other than deed restrictions preventing withdrawal of Facility groundwater for drinking water or other beneficial uses, institutional controls are not required for the remedial action. The monitoring program will verify the attainment of remedial objectives by monitoring the concentrations of COCs in groundwater until the RAOs have been met. Facility groundwater is currently in compliance with the applicable cleanup criteria, the source area target concentrations (and target concentrations for the off-site monitoring well), for both the Shallow and Intermediate Aquifers. The RAOs are based on confirming that these cleanup objectives are sufficient to protect adjacent surface water bodies, and that natural attenuation continues as predicted. According to the USEPA guidance the demonstration of attainment of cleanup objectives should include sufficient monitoring, approximately 3 to 5 years, once the standards have been met to evaluate the effects of natural variations in site conditions, based on statistical analyses of the data (USEPA 2004). The monitoring program provides for 8 years of monitoring to evaluate the effects of discontinuing hydraulic controls and natural variations. In addition, the monitoring program applies the recommended statistical methods of temporal trend analysis of contaminant concentrations and comparisons with specified compliance standards.

3.2 COMPLIANCE CRITERIA: CONSTITUENT OF CONCERN CONCENTRATIONS

The source area target concentrations and groundwater COC list defined in the FFS and CAP are presented in Table 3.1 for monitoring wells located in the source area (within Facility property boundaries) and a single monitoring well located downgradient of the source area.

These values will be used to assess compliance in groundwater sampling of these monitoring wells as described in this CMCP. Additional details are given below.

3.2.1 Shallow Aquifer

Shallow Aquifer monitoring wells are all planned to be located at the Facility perimeter (refer to Section 4.0). As a result, the source area target concentrations listed in Table 3.1, which were calculated based on the minimum distance of 40 feet from the Facility property boundary to the North Ditch, South Ditch, and Lincoln Ave Ditch are suitable as compliance criteria for assessing compliance and protecting these water bodies.

3.2.2 Intermediate Aquifer

Intermediate Aquifer source area target concentrations for on-site monitoring wells are based on the location of the projected Blair Waterway cutback, which reduces the distance from the Facility property boundary to the Blair Waterway from 800 feet to 600 feet. The planned locations for the majority of Intermediate Aquifer compliance wells are along the southwestern perimeter of the Facility, at a distance of 600 feet. The source area target concentrations for the Intermediate Aquifer presented in Table 3.1 are based on this 600-foot distance and are therefore suitable as compliance criteria for compliance monitoring and protection of the quality of the Blair Waterway (Section 4.0).

One off-site compliance monitoring well is additionally proposed and will be located approximately equidistant between the Facility perimeter and the projected Blair Waterway cutback, near the location of existing Well MW-46(I). The approximate distance to the projected Blair Waterway cutback from this location is 300 feet. The target concentrations presented in Table 3.1 for this off-site compliance monitoring well have been calculated for groundwater COCs using this approximate distance to the Blair Waterway.

Compliance monitoring wells will be installed as close as possible to the identified locations, while ensuring that they are in appropriate locations relative to the proposed container terminal development. If compliance monitoring wells are significantly relocated, the target concentrations for the off-site compliance monitoring well will be recalculated according to the procedures described in the FFS to calculate source area target concentrations for on-site monitoring wells. These new concentrations would replace the target concentrations in Table 3.1 and be used as the compliance criteria.

3.2.3 Deep Aquifer

No Deep Aquifer compliance monitoring is proposed. This is based on the results of the sampling history for the Deep Aquifer wells, and the consistent upward gradients from the Deep Aquifer to the Intermediate Aquifer that are associated with the Facility location in a regional discharge area.

In 2007, SSA performed quarterly sampling in six Deep Aquifer wells following an Ecology-approved monitoring program designed to confirm the status of Deep Aquifer groundwater quality. These six Deep Aquifer wells have been sampled for four consecutive quarters for site-specific COCs, and this monitoring program has been successfully completed to the satisfaction

of Ecology. Concentrations of COCs in the Deep Aquifer wells have all been less than surface water criteria. Four other Deep Aquifer wells, MW-7(D), MW-22(D), MW-49(D), and MW-53(D), have already been decommissioned, as approved by Ecology. The remaining Deep Aquifer wells will be decommissioned and will not be part of the compliance monitoring network (Snider 2007).

3.3 COMPLIANCE CRITERIA: PROCESS FOR ASSESSING COMPLIANCE

For monitoring wells in the Shallow or Intermediate Aquifer compliance networks, the following process will be used to assess compliance and continued natural attenuation. Unless otherwise noted, this process will be used during the entire compliance monitoring period.

Compliance monitoring wells will be considered in compliance if the concentrations of COCs in groundwater are less than the compliance criteria—equivalent to the applicable source area target concentration.

If a COC concentration measured in groundwater is equal to or greater than its compliance criteria, it will be considered an exceedance. The compliance well will be re-sampled for confirmation within 4 weeks of receipt of laboratory results and the new sample will be tested for the analyte that exceeded compliance criteria. If the new sample result is not an exceedance, the well will be considered in compliance and regularly-scheduled monitoring will continue at the well (refer to Section 8.1.1).

If the new sample result exceeds the compliance criteria, the contingency plan will be implemented, as described in Section 8.0. The contingency plan may also be triggered by an increasing trend in a compliance well with elevated concentrations, as defined in Section 8.1.2. Triggering the contingency plan without a confirmed exceedance will not constitute a lack of compliance.

In addition, monitoring results will be compared to the three MNA indicators listed in Section 3.1.4. Because compliance criteria include provisions to address increasing concentrations of COCs, meeting the three MNA indicators is not necessary for compliance. Failure to meet any one of the three MNA indicators, however, will result in a review of available groundwater quality and elevation data to evaluate natural attenuation conditions. The requirement for this evaluation, described in Section 8.2.1 as part of contingency monitoring, will not trigger the contingency plan or the other requirements associated with contingency monitoring. Based on the results of this evaluation, SSA may elect to increase sampling frequency or add constituents for wells not meeting MNA indicators to provide data necessary for additional MNA evaluations.

3.4 MONITORING TYPES AND OBJECTIVES

In this section, the proposed methods of compliance and MNA monitoring described in this plan are defined and placed in the context of the MTCA requirements for compliance monitoring (WAC 173-340-410). MTCA requirements for compliance monitoring consist of evaluation monitoring, protection monitoring, performance monitoring, and confirmational monitoring. Evaluation monitoring will not be conducted at the Facility. Because the Facility has been the subject of decades of groundwater monitoring, the data needs commonly filled by evaluation monitoring have been thoroughly addressed. The groundwater COCs have been identified and

an existing monitoring well network and baseline chemical and hydrogeologic conditions have been well established.

3.4.1 Protection Monitoring

According to the MTCA requirements for compliance monitoring, the goal of protection monitoring is to confirm that human health and the environment are adequately protected during construction and the operation and maintenance period of a remedial action. Remedial actions include removal of in-situ soil at concentrations greater than cleanup levels, cessation of groundwater extraction and treatment, and groundwater monitoring to confirm continued compliance and predicted natural attenuation. The groundwater remedial action, however, will not require construction activities beyond the installation of additional monitoring wells, and will require limited operation and maintenance in the traditional sense beyond performance monitoring activities.

The requirements for protection monitoring, therefore, will be met through performance monitoring activities and procedures established in the sampling and analysis plans and health and safety plans associated with implementation of the groundwater remedial action, such as monitoring well installation, groundwater sampling activities, and disposal of investigation-derived waste.

3.4.2 Performance Monitoring

According to MTCA requirements, performance monitoring should confirm that the cleanup action has attained cleanup standards or other performance standards. Source area target concentrations at the Facility's boundary and target concentrations for monitoring in the off-site area have been calculated to be protective of the nearby surface water bodies. Because groundwater at the Facility is already in compliance with these approved target concentrations, performance monitoring will be utilized to ensure continued natural attenuation and compliance with source area and other target concentrations in the first 3 years of monitoring following the discontinuation of hydraulic controls.

In addition to this purpose, performance monitoring will be used to track changes in the groundwater flow regime associated with shutting down the extraction wells and SID pumps. This groundwater cleanup action and the site development that will follow are expected to result in significant changes in the groundwater flow regimes in both the Shallow and Intermediate Aquifers, as groundwater flow patterns return to conditions uninfluenced by the extraction wells and SID systems.

Performance monitoring will be conducted and reported semiannually during the 3-year performance monitoring phase and is discussed in further detail in Section 5.0.

3.4.3 Confirmational Monitoring

According to MTCA requirements, the purpose of confirmational monitoring is to confirm the long-term effectiveness of the action once cleanup standards or other performance standards have been met. Groundwater at the Facility is already in compliance with source area target concentrations. Prior to the initiation of confirmational monitoring, 3 years of performance

monitoring is expected to confirm that natural attenuation continued to occur and that the discontinuation of hydraulic control has not adversely affected the ability to meet the Facility source area target concentrations. In this context, confirmational monitoring at the Facility will address the long-term effectiveness of the remedy by continuing to evaluate natural attenuation and compliance for 5 years following successful completion of performance monitoring.

Because 3 years of semiannual monitoring data will be available to assess changes in groundwater quality and flow regime associated with discontinuation of hydraulic control and/or development of the Facility, confirmational monitoring will be conducted on an annual basis.

Confirmational monitoring is discussed in further detail in Section 6.0.

4.0 Compliance Monitoring Well Network

Monitoring wells and piezometers that are not included in the Compliance Monitoring Well Network will be decommissioned with Ecology approval. However, because the SID and Intermediate Aquifer extraction wells are part of the contingency plan, they will be left in place and will be maintained in working order for as long as practical, given site development requirements. New monitoring wells will be added for long-term compliance groundwater monitoring as described in the following sections.

4.1 EXISTING NETWORK AND WELL DECOMMISSIONING

As of June 2008, 97 monitoring wells, extraction wells and piezometers are located throughout the Facility. The Shallow Aquifer contains 30 monitoring wells and 18 piezometers for 48 Shallow Aquifer locations. The Intermediate Aquifer contains 34 monitoring wells[1] and 8 extraction wells for 42 Intermediate Aquifer locations. The Deep Aquifer contains 8 monitoring wells. Figure 2.1 shows the existing monitoring well network at the Facility. Of the remaining 97 wells, extraction wells, and piezometers on-site, 8 Shallow Aquifer wells, 14 Intermediate Aquifer wells, and 6 Deep Aquifer wells are proposed for decommissioning in Phase II of the decommissioning program scheduled to occur in 2008.

4.3 NEW COMPLIANCE MONITORING WELL NETWORK

Depending on the specific redevelopment plans, the Compliance Monitoring Well Network may include some existing monitoring wells or may be entirely composed of new monitoring wells. Final proposed locations of monitoring wells will be determined based on compatibility with the proposed redevelopment plan. Wells will be located in areas that are expected to allow consistent access for monitoring and protection of the wells within the layout of the marine cargo handling facility development, as described below.

Although existing monitoring wells will be used when locations are appropriate, the installation of new monitoring wells will be necessary for the Compliance Monitoring Well Network for the Shallow and Intermediate Aquifers at the Facility. The future container terminal will provide temporary storage for large shipping containers that cannot be easily moved to gain access for groundwater sampling. In order to ensure access to wells sampled during monitoring events, the locations of monitoring wells in the Compliance Monitoring Well Network will be coordinated with the redevelopment design.

Because the location of containers on the property will change, the following priority will be considered in determining locations of wells in the Compliance Monitoring Well Network. The most desirable locations are next to light poles, fire hydrants or other non-moveable structures where containers cannot be stacked. Secondary locations are in the aisles between stacks of containers. Any new wells that are added to the network will be installed with aboveground monuments set in concrete. The Compliance Monitoring Well Network wells may later be modified to flush monuments when the final grade of the Facility is constructed, if appropriate.

[1] This total includes EHC-1, installed for pilot study activities.

Refer to Figure 4.1 for a generalized Shallow Aquifer well construction diagram and Figure 4.2 for a generalized Intermediate Aquifer well construction diagram.

4.3.1 Shallow Aquifer

The Shallow Aquifer groundwater flow pattern is generally radial and currently from the center of the Facility toward the SID system. Prior to installation of the SID, the groundwater flow pattern was similar but directed toward perimeter ditches. Because the natural Shallow Aquifer groundwater flow pattern is toward perimeter ditches, the Shallow Aquifer Compliance Monitoring Well Network will be primarily composed of perimeter wells along the North Ditch and Lincoln Avenue Ditch. Refer to Figure 2.1, which illustrates the proposed Shallow Aquifer Monitoring Well Network Zone.

Six monitoring wells are proposed to be located in the primary monitoring zone (along the North Ditch and the Lincoln Avenue Ditch) for the Shallow Aquifer Compliance Monitoring Well Network and may include existing wells as appropriate (e.g., MW-56(S), MW-2(S)2, MW-4(S)). The remaining wells in the network will be newly installed at locations determined to provide effective groundwater monitoring and to provide year-round access and protection given the planned site development. The monitoring well network along the North Ditch will include at least two of the monitoring wells to be installed between the SID and the North Ditch, as requested by Ecology. Final proposed locations of monitoring wells will be determined based on groundwater flow directions and compatibility with the proposed redevelopment plan. Wells will be located in areas that can enable consistent access for monitoring within the layout of the container terminal.

In addition to the primary monitoring zone, the proposed Shallow Aquifer Compliance Monitoring Well Network includes three monitoring wells along the southern and southwestern sections of the property perimeter. SSA anticipates that property redevelopment activities will eliminate the South Ditch between the Facility and Tribal properties to the south, and install a tight-lined stormwater conveyance system in its place, such that shallow groundwater will no longer flow to the South Ditch. Proposed monitoring wells will then be evaluated relative to potential Shallow Aquifer flow towards the Blair Waterway. It may be possible to use existing Wells MW-27(S)2, MW-42(S)2, and MW-25(S)2 for this purpose if they are in locations that will be consistently accessible and protected relative to the site development plan, otherwise new monitoring wells will be installed.

Shallow Aquifer groundwater monitoring is not proposed for the eastern section of the Facility because without the SID in operation, there are no ditches or other features to induce groundwater flow from the Facility interior toward that direction and pre-SID groundwater flow patterns indicate that groundwater did not flow in that direction under natural conditions. The lack of ditches in the eastern section of the Facility provides no pathway for Shallow Aquifer groundwater to reach the Blair Waterway or other receptors.

4.3.2 Intermediate Aquifer

Groundwater flow in the Intermediate Aquifer is generally toward the south to the Blair Waterway, even under current conditions with the influence of an active extraction well system. Following shutdown of the extraction well system, groundwater flow is expected to continue

toward the Blair Waterway. The Intermediate Aquifer Compliance Monitoring Well Network is therefore proposed to be located on the southwestern, downgradient perimeter of the property and in the off-site area downgradient of the former Construction Debris Area (CDA). Refer to Figure 2.1, which illustrates the proposed Intermediate Aquifer Compliance Monitoring Well Network.

The proposed Intermediate Aquifer Compliance Monitoring Well Network will extend from approximately MW-60(I) in the west to MW-29(I) in the east and will include seven evenly-spaced monitoring wells along the property line with approximately 200 feet between wells, and one additional well in the off-site area downgradient of the former CDA. Existing off-site well MW-46(I) might be used for this purpose or a new well might be installed depending on site development plans.

In addition, Ecology requested two monitoring wells downgradient of the PPA, between the property boundary and the PPA. These two monitoring wells (Locations A and B), along with a third monitoring well located at the property line (Location C), are intended to provide data to evaluate groundwater quality downgradient of the PPA for several quarters following planned excavation activities. These monitoring wells interior to the property are not compliance wells, but are informational wells to assist with demonstration of natural attenuation. The excavation work proposed for the PPA is designed to remove source material. Existing Well MW-14(I), or a new well in its vicinity, and one additional well between the PPA and the property line will be used for downgradient water quality evaluation.

To confirm that the two informational monitoring wells downgradient of the PPA at Locations A and B are in locations appropriate for assessing natural attenution, additional investigation of COC concentrations in the Intermediate Aquifer in the vicinity of MW-14(I) and MW-19(I) will be conducted. This additional investigation will be performed using direct-push groundwater screening samples to evaluate the extent of chlorinated SVOCs in the Intermediate Aquifer in the vicinity of the PPA. This additional investigation will take place directly following the soil removal actions in this area, to be able to take into account observations from the soil removal in the design of the investigation program. This is expected to occur in fall 2009, after the compliance monitoring program has been initiated. If it is deemed necessary for MNA monitoring, based on the results of the additional investigation, the locations of the interior informational monitoring wells will be adjusted by installing additional monitoring wells and decommissioning the old monitoring wells.

4.4 SCHEDULE FOR INSTALLATION OF THE COMPLIANCE MONITORING NETWORK

New monitoring wells will be installed in 2008. Installation of new wells in the Shallow and Intermediate Aquifer Compliance Monitoring Well Network will be complete prior to the shutdown of the SID and extraction wells.

4.5 COMPLIANCE MONITORING SCHEDULE

The compliance monitoring schedule is intended to provide more frequent sampling in the initial 3 years following cessation of hydraulic controls (SID and extraction wells) during performance monitoring, followed by an annual sampling interval for 5 additional years during confirmational

monitoring to ensure evaluation of the continued effectiveness of the remedy and protection of surface water receptors.

Compliance monitoring is designed to provide data that allow determination of whether COC concentrations exceed compliance criteria or demonstrate an increasing trend in compliance wells that have elevated COC concentrations. If either of these conditions occurs, they would trigger a contingency process designed to bring Facility groundwater back into compliance. Refer to Section 3.3 for a description of the compliance evaluation process and Section 8.1 for a discussion of how compliance monitoring results may trigger the contingency plan.

Compliance monitoring for the Shallow Aquifer and the Intermediate Aquifer Monitoring Well Networks is described in the following sections.

4.5.1 Shallow Aquifer

SSA will sample Shallow Aquifer wells semiannually for the first 3 years of compliance monitoring following cessation of groundwater pumping in the SID. Following this initial period, and with favorable analytical results, compliance monitoring will then be extended to an annual sampling schedule for the next 5 years. Analytical data will be evaluated throughout this 8-year compliance monitoring period to determine if compliance criteria have been exceeded or the contingency plan has been triggered by increasing trends in monitoring wells with elevated concentrations. Refer to Sections 3.3 and 8.1.

A comprehensive evaluation of the analytical monitoring data from the 8-year compliance monitoring period will be performed. If those data demonstrate that Shallow Aquifer groundwater has remained in compliance throughout the monitoring events, that natural attenuation continues to occur based on a review of results with respect to MNA indicators, and contingency monitoring has not otherwise been triggered, Shallow Aquifer groundwater monitoring will be discontinued.

4.5.2 Intermediate Aquifer

SSA will sample Intermediate Aquifer wells semiannually for the first 3 years of compliance monitoring following cessation of groundwater pumping in Intermediate Aquifer extraction wells. Following this initial period, and with favorable analytical results, compliance monitoring will then be extended to an annual sampling schedule for the next 5 years. Analytical data will be evaluated throughout this 8-year monitoring period to determine if compliance criteria have been exceeded or the contingency plan has been triggered by increasing trends in monitoring wells with elevated concentrations. Refer to Sections 3.3 and 8.1.

A comprehensive evaluation of the analytical monitoring data from the 8-year compliance monitoring period will be performed. If those data demonstrate that Intermediate Aquifer groundwater has remained in compliance throughout the monitoring events, that natural attenuation has continued to occur based on a review of results with respect to MNA indicators, and contingency monitoring has not otherwise been triggered, Intermediate Aquifer groundwater monitoring will be discontinued.

4.6 MONITORING WELL INSPECTION, MAINTENANCE PROCEDURES, AND SCHEDULE

All Compliance Monitoring Well Network wells will be inspected and maintained on an annual schedule as defined in Appendix A. If, during the annual well inspection, it is determined that more than one foot of sediment has accumulated in a well, the well will be redeveloped.

SID sumps and pumps, as well as Intermediate Aquifer extraction wells and associated operating systems, will be maintained in operating condition and inspected annually, at a minimum, until the water treatment system is decommissioned. This will maintain the viability of the groundwater extraction system for use as a potential contingency action for as long as reasonably possible given site development (refer to Section 8.2.1).

5.0 Performance Monitoring

As described in Section 4.0, the Compliance Monitoring Well Network will be designed and installed for long-term (at least 8 years) Shallow and Intermediate Aquifer groundwater quality monitoring at the Facility. Performance monitoring data will determine if, following the shutdown of the SID and Intermediate Aquifer extraction wells, Shallow and Intermediate Aquifer groundwater samples from compliance monitoring wells at the Facility boundaries and in the off-site area maintain groundwater COC concentrations at levels less than source area and off-site target concentrations. Results will also indicate whether natural attenuation processes continue to occur in groundwater. In the event that concentrations greater than compliance criteria are detected or an increasing trend is apparent in a compliance well with an elevated COC concentration, the contingency plan will be triggered, as described in Section 8.0.

Refer to the Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) in Appendix B for sample collection details.

5.1 PERFORMANCE MONITORING PLAN COMPONENTS

Semiannual performance monitoring of the Shallow and Intermediate Aquifer compliance monitoring wells will consist of measuring groundwater levels, sampling for groundwater COCs, measuring ORP in groundwater as part of field parameter measurements during normal low-flow sampling procedures, and evaluating the laboratory analytical data and field ORP measurements with respect to compliance criteria, MNA indicators, and other criteria for triggering the contingency plan in semiannual reports.

5.1.1 Water Level Measurements

Water levels will be measured in all Shallow and Intermediate Aquifer wells at the Facility to provide an indication of groundwater flow directions following cessation of hydraulic control. Semiannual water levels will be measured no more than 7 calendar days prior to beginning each sampling event. Water levels in all tidally-influenced wells (Intermediate Aquifer) will be measured within 60 minutes of low tide (beginning 30 minutes before and ending no later than 30 minutes after low tide). Water level measurements will begin with the off-site well closest to the Blair Waterway and will proceed inland. Shallow Aquifer wells are not tidally-influenced and will be measured the same day as the Intermediate Aquifer wells.

Specific water level measurement and equipment decontamination procedures are presented in the SAP/QAPP in Appendix B.

5.1.2 Sampling Methods

Following water level measurement, monitoring wells will be purged according to procedures in USEPA's Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures until field parameter equilibrium is demonstrated (Puls and Barcelona 1996). The volume purged will be determined in the field based on stabilization of field parameters for specific conductance, temperature, and pH. The parameters ORP and dissolved oxygen will also be measured during

purging but because of their inherent sensitivity, their use as stabilization parameters will be optional. Groundwater samples will be taken after the stabilization criteria are met. Refer to the SAP/QAPP in Appendix B for specific stabilization criteria.

5.1.3 Sampling Parameters

Groundwater from each well will be sampled for the eight groundwater COCs, which include three chlorinated volatile organic compounds (tetrachloroethene, trichloroethene, and vinyl chloride), and five chlorinated semivolatile organic compounds (2-chlorophenol, 2,3,4,6-tetrachlorophenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol, and pentachlorophenol). Refer to Section 3.1.3. As noted above, ORP will be measured as part of normal low-flow sampling procedures. A summary of specific compounds and analytical testing methodology is included in the SAP/QAPP presented in Appendix B.

5.2 PERFORMANCE MONITORING SCHEDULE

Performance monitoring will be conducted semiannually for 3 years following cessation of pumping in the Shallow and Intermediate Aquifer groundwater extraction systems. The semiannual monitoring schedule is intended to quickly identify any potential issues that might result in the need to add wells to the monitoring network or restart portions of the extraction system. If no compliance criteria are exceeded, natural attenuation has continued to occur based on a review of results with respect to MNA indicators, and contingency monitoring has not otherwise been triggered during the first 3 years of monitoring groundwater, the sampling frequency will be reduced to an annual schedule for 5 additional years of confirmational monitoring, as described in Section 6.0.

If COC concentrations exceed compliance criteria or otherwise trigger the contingency plan at any time during the 3-year performance monitoring period, contingency monitoring will be implemented, as described in Section 8.0. In the event that contingency monitoring is halted because COC concentrations or concentrations trends stabilize and satisfy contingency monitoring requirements without a contingency action, regularly scheduled semiannual performance monitoring for the analyte at the affected well(s) will resume. In the event that a contingency action is implemented, performance monitoring will resume in the area affected with a revised schedule to be negotiated between SSA and Ecology.

5.3 PERFORMANCE MONITORING REPORTING REQUIREMENTS

During the first 3 years of performance monitoring, groundwater monitoring reports will be submitted to Ecology on a semiannual basis. Each semiannual report will contain groundwater elevation measurement results, laboratory data reports validated at Level 1 (refer to Section 7.0), and a summary evaluation of groundwater monitoring results compared to compliance criteria, MNA indicators, and other contingency plan triggers. Data will also be submitted to Ecology's Environmental Information Management (EIM) database in the appropriate EIM format.

At the end of the third year of monitoring, a single performance monitoring report will be prepared and submitted to Ecology. This final performance monitoring report will summarize the

results of the semiannual monitoring events for the entire 3 years. The performance monitoring report will include the following components:

- A summary of performance monitoring laboratory results (with comparisons to compliance criteria, MNA indicators, and other contingency plan triggers) and discussion of significant findings and conclusions, including a comparison of COC data before and after shutdown of the SID and extraction wells.
- A summary of groundwater elevation data, including water level elevation contour maps and a discussion of any notable changes in groundwater flow velocity or direction.

6.0 Confirmational Monitoring

Following the successful completion of performance monitoring, the Compliance Monitoring Well Network will be sampled during the confirmational monitoring phase. The objective of the confirmational monitoring is to demonstrate the long-term effectiveness of the cleanup action once all the compliance and MNA indicators and other contingency triggers have been met for the 3-year performance monitoring period following cessation of hydraulic control.

6.1 CONFIRMATIONAL MONITORING PLAN COMPONENTS

As with performance monitoring at the Facility, confirmational monitoring will consist of measuring groundwater levels, sampling for groundwater COCs in the groundwater, measuring ORP in groundwater as a field parameter during normal low-flow sampling procedures, and evaluating the laboratory analytical data and field ORP measurements with respect to compliance criteria, MNA indicators, and other criteria for triggering the contingency plan to confirm continued compliance and attainment of RAOs. Confirmational monitoring reports will be submitted annually as described in Section 6.3.

6.1.1 Water Level Measurements

Groundwater level measurements will be performed as described in Section 5.1.1 of performance monitoring.

6.1.2 Sampling Methods

Groundwater sampling will be performed following the methods described in Section 5.1.2 of performance monitoring.

6.1.3 Sampling Parameters

Sampling parameters will continue as described in Section 5.1.3 of performance monitoring.

6.2 CONFIRMATIONAL MONITORING SCHEDULE

The confirmational monitoring sampling frequency will be annually for five years after successful completion of 3 years of performance monitoring for a total of 8 years of monitoring following the shutdown of the SID and Intermediate Aquifer extraction wells.

If COC concentrations exceed compliance criteria or otherwise trigger the contingency plan at any time during the 5-year confirmational monitoring period, contingency monitoring will be implemented as described in Section 8.0. In the event that contingency monitoring is halted because COC concentrations or concentrations trends stabilize and satisfy contingency monitoring requirements without a contingency action, regularly-scheduled annual confirmational monitoring sampling for the analyte at the affected well(s) will resume. In the event that a contingency action is implemented, confirmational monitoring will resume in the area affected with a revised schedule to be negotiated between SSA and Ecology.

6.3 CONFIRMATIONAL MONITORING REPORTING REQUIREMENTS

During the 5 years of confirmational monitoring, groundwater monitoring reports will be submitted to Ecology on an annual basis. Each annual report will contain groundwater elevation contour maps and a summary table, laboratory data reports validated at Level 2 (refer to Section 7.0), and a summary evaluation of groundwater monitoring results relative to compliance criteria, MNA indicators, and other contingency plan triggers. Results will be submitted to Ecology's EIM database.

If, after 5 years of annual confirmational monitoring with no COCs detected at concentrations greater than compliance criteria, attenuation has continued to occur based on a review of results with respect to MNA indicators, and contingency monitoring has not otherwise been triggered, annual confirmational monitoring will be discontinued at the Facility. The fifth annual report will contain a summary of all 8 years of compliance and MNA monitoring data, a summary of groundwater elevation data, and conclusions regarding discontinuing monitoring.

7.0 Data Evaluation and Management

7.1 DATA VALIDATION

Performance and confirmational monitoring analytical reports from the laboratory will be accompanied by sufficient backup data and quality control (QC) results to enable reviewers to perform a comprehensive Level 2 verification and review in accordance with the USEPA functional guidelines for data validation, if necessary, to determine data quality (USEPA 1999b). At a minimum, the Floyd|Snider Team will review the laboratory reports for internal consistency, transmittal errors, laboratory protocols, and for adherence to the QC elements specified in the SAP/QAPP (Appendix B) at a Level 1 (basic) review. The Level 1 data validation will include the following actions:

- Review of sample holding times
- Verification of laboratory sample identification, chain of custody records, and proper analytical methods
- Verification of attainment of specified reporting limits
- Verification of the frequency of analysis of field duplicate, matrix spikes/matrix spike duplicates, and lab control samples
- Verification of surrogate compound analyses performance and attainment of QC criteria
- Verification that laboratory blanks are free of contaminants

The results of the Level 1 data validation will be submitted with the regular performance monitoring reports. Items of concern will be noted. If jointly decided upon by Ecology and SSA, data that appear to have significant deficiencies will be validated using the more comprehensive Level 2 Data Validation and review. Following this review, data qualifiers assigned by the laboratory may be amended, as necessary.

Confirmational monitoring results will automatically be subjected to a third-party data validation using the more comprehensive Level 2 verification and review, as described in Section 7.2.

7.2 DATA MANAGEMENT AND EVALUATION

At least six sampling events will be conducted during the 3-year performance monitoring period, and at least five sampling events will be conducted during the 5-year confirmational monitoring period. All performance and confirmational monitoring groundwater quality results will be managed in an electronic database and submitted to Ecology's EIM database.

Analytical data from performance monitoring activities will be subjected to the Level 1 internal data validation review described above. The results will be reported for each event with regular monitoring reports. Data for each COC will be compared with previous results, compliance criteria, and MNA indicators described in Section 3.0, and contingency plan triggers described in Section 8.0.

Analytical data from confirmational monitoring activities will be subjected to Level 2 verification and review in accordance with the USEPA functional guidelines for data validation (USEPA 1999b). The goal of the more intensive data validation procedure is to provide more defensible monitoring results to support the planned cessation of compliance and MNA monitoring at the end of confirmational monitoring. The results will be reported for each event with regular monitoring reports. Each analyte will be compared with previous compliance criteria and MNA indicators described in Section 3.0, and contingency plan triggers described in Section 8.0.

8.0 Contingency Plan

In this section, the processes by which the contingency plan is engaged (or "triggered") and implemented are explained. Compliance monitoring results are evaluated relative to criteria that determine whether implementation of the contingency plan is warranted. The contingency plan, once triggered, begins with a period of quarterly contingency monitoring to assess the stability and implications of the COC concentration(s) in the affected groundwater, accompanied by an evaluation of the available water quality and water elevation data to identify potential causal factors. Failure to meet any of the three primary MNA indicators will also result in a requirement for a similar evaluation, but will not trigger the contingency plan.

If a contingency action is needed prior to decommissioning of the treatment system, existing hydraulic controls could be restarted as a contingency if appropriate to the concern. Contingency actions following treatment system shutdown will entail additional investigation, evaluation of approach, and focused remedial action in consultation with Ecology.

8.1 CONTINGENCY PLAN TRIGGERS

As described in Section 3.0, compliance monitoring results for both the Shallow and Intermediate Aquifer will be evaluated relative to compliance criteria that are protective of surface water, and MNA indicators to confirm the continued effectiveness of natural attenuation processes. For the off-site groundwater monitoring well between the Facility boundary and the Blair Waterway, well-specific compliance criteria concentrations have been calculated relative to the specific distance from the well to the Blair Waterway.

The process for triggering the contingency plan and evaluating contingency monitoring is presented in Figure 8.1. To evaluate the need for the contingency plan, compliance monitoring results will be evaluated relative to the following criteria. As described in greater detail below, the following indicators will trigger the contingency plan at the Facility based on compliance monitoring results:

- Confirmed COC in exceedance of the compliance criteria in a compliance monitoring well
- Increasing elevated COC concentration in a compliance monitoring well as described in Section 8.1.2

These criteria provide a system for identifying the potential for COCs at concentrations greater than surface water criteria to enter the nearby surface water bodies, and ensure appropriate measures are taken to prevent further migration.

8.1.1 Exceedance in a Compliance Monitoring Well

As described in Section 3.0, the contingency plan will be implemented in the event that a COC is measured at a concentration equal to or greater than its compliance criteria and this exceedance is confirmed by a re-sampling event for which the compliance well will be re-sampled within 4 weeks of laboratory confirmation and the sample tested for the analyte concentration.

8.1.2 Increasing Elevated Constituent of Concern Concentration in a Compliance Monitoring Well

To provide greater protectiveness, the contingency plan may also be triggered without exceeding compliance criteria. A contingency plan will also be triggered in the event that COC concentrations in a compliance well consecutively increase 10 percent or more over three consecutive events and the COC concentrations are greater than 75 percent of the applicable compliance criteria.

Limiting this criterion to compliance wells with generally elevated concentrations (operationally defined here as greater than 75 percent of the source area target concentration) is appropriate because COC concentrations that are not approaching the compliance criteria do not pose a potential risk to surface water receptors and this will account for increases in concentrations of breakdown products. In this way, the contingency plan is reserved for preventing migration of COCs in groundwater at concentrations greater than the compliance criteria, which would pose a potential risk to surface water receptors. Increasing COC concentrations in wells without elevated concentrations will be noted and future results evaluated for additional changes.

It should be noted that, although contingency monitoring can be triggered without exceeding compliance criteria, contingency action will not be implemented unless there are two consecutive quarters in which there are exceedances of compliance criteria.

8.2 CONTINGENCY PLAN

The intent of this section is to establish a framework for action in the event that the contingency plan is triggered based on the results of performance monitoring or confirmational monitoring. The contingency plan will begin with contingency monitoring—a more intensive monitoring schedule intended to assess the stability of the COC concentration(s) in the affected groundwater.

The nature of the contingency action that may follow contingency monitoring will depend on the timing with respect to the status of the treatment system. During the initial few years of compliance monitoring, while the Facility water treatment system is operational, contingency actions may involve restarting all or portions of the existing hydraulic controls (SID and Intermediate Aquifer extraction well system) and treatment of the captured groundwater. After the water treatment system is shut down, contingency actions, if necessary, would involve a process of additional investigation to identify and delineate the problem, evaluate potentially applicable technologies, consult with Ecology, implement the contingency action, and continue monitoring.

8.2.1 Contingency Monitoring

Triggering of the contingency plan will result in contingency monitoring of the affected compliance well (Figure 8.1). Quarterly monitoring of the compliance well, and nearby compliance wells if appropriate, will begin with the goal of evaluating the stability and implications of the COC concentration. Specific criteria for determining whether a contingency action is warranted are described in the following subsections.

As part of contingency monitoring, the potential cause of the COC exceedance or increasing trend in COC concentration will be evaluated using the available water quality and water elevation data and additional data collection, if necessary. Potential causes may include a change in the groundwater flow direction, disruptions to the subsurface resulting from construction activities, leaching from residual contaminated soil, or production of chemical breakdown products from the degradation of chemicals in the groundwater.

The water quality and water elevation data set will be reviewed for changes in the site water balance, or other patterns that may suggest a potential source. In the event that contingency monitoring results in the need for a contingency action in the period following the shutdown of the water treatment system, this review will be used to develop a contingency investigation plan, as described in Section 8.2.3.

8.2.1.1 Criteria for Contingency Monitoring Triggered by Exceedance

If contingency monitoring was triggered by an exceedance of the compliance criteria, contingency monitoring may be halted when the COC concentration is less than the compliance criteria for 4 consecutive quarters. At this point, the COC concentration will be considered stable and regularly-scheduled sampling (performance monitoring or confirmational monitoring) for the analyte at that well will resume.

In the event that the COC concentration exceeds the compliance criteria for 2 consecutive quarters of contingency monitoring, a contingency action shall be implemented, as described in the following sections.

8.2.1.2 Criteria for Contingency Monitoring Triggered by Increasing Elevated Constituent of Concern Concentration

In the event that contingency monitoring is triggered by an increasing elevated COC concentration, contingency monitoring may be halted when the COC concentration has remained steady or declined for 4 consecutive quarters, or if the COC concentration decreases to less than 75 percent of the compliance criteria during any quarter (i.e., is no longer "elevated" according to the terminology in this CMCP). At this point, regularly-scheduled sampling (performance monitoring or confirmational monitoring) for the COC at that well will resume.

Contingency monitoring will continue until the elevated COC concentration remains less than compliance criteria for 4 consecutive quarters without an increasing trend. At this point, the COC concentration will be considered stable and regularly-scheduled sampling (performance monitoring or confirmational monitoring) for the analyte at that well will resume.

In the event that the COC concentration exceeds the compliance criteria for 2 consecutive quarters, a contingency action shall be implemented, as described in the following sections.

8.2.2 Contingency Actions Prior to Water Treatment System Shutdown

The SID and Intermediate Aquifer extraction well system are expected to remain in place approximately until property development, expected in 2010–2011. The Facility water treatment system is expected to remain operational and capable of treating SID or Intermediate Aquifer

extraction well groundwater during this time. As a result, during the period when contingency action is most likely to occur, the initial months following the discontinuation of hydraulic controls, the ideal contingency action of resuming these controls will be available, if necessary. Restarting the SID or Intermediate Aquifer extraction well system would quickly begin to capture groundwater containing COC concentrations greater than compliance criteria to prevent off-site migration.

8.2.3 Contingency Actions Following Water Treatment System Shutdown

By the time the water treatment system is decomissioned, groundwater at the Facility will have had approximately 2 years to reach a new equilibrium following the discontinuation of hydraulic controls. As a result, it is not expected that contingency actions would be required beyond this point, given the many years of corrective actions—most importantly source removal—and monitoring that have taken place at the Facility.

In the event that a contingency action is necessary following shutdown of the water treatment system, the process will begin with an additional investigation. Based on the review of water quality and water elevation data conducted during contingency monitoring, a contingency investigation plan will be prepared and submitted to Ecology.

The goals of the contingency investigation plan will be to assess potential causes of the COC exceedances or increasing concentration trend, and to determine the source and scope of the problem, including whether it originates on- or off-site, unless this information is already established. The contingency investigation may include additional or more frequent water elevation or sampling at existing wells, the installation and sampling of new wells, a limited number of test pits, borings, discrete-depth groundwater samples, or other standard investigative methods depending on the nature of the groundwater exceedance or trend. The findings of the initial contingency investigation may lead to additional investigations to assess contaminant sources and migration.

Once the source and scope are sufficiently defined, a summary report will be prepared and submitted to Ecology explaining the results of the investigation, evaluating approaches for addressing the exceedance or trend, and providing the rationale for the selected action. Based on the COC, hydrogeologic setting, and results of additional characterization, a number of remedial technologies are potentially applicable. The aims of a contingency action may include removing a source area, containing an area of contaminated groundwater, treating groundwater in-situ, or extracting groundwater for ex-situ treatment.

After consultation with and approval from Ecology, the contingency action will be implemented and compliance monitoring resumed with a revised schedule to be negotiated.

9.0 References

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Reichhold/SSA Containers Facility
Tacoma, Washington

Compliance Monitoring and Contingency Plan

Tables

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Table 3.1
Target Concentrations for Constituents of Concern

Constituent[1]	Surface Water Criteria[2] 2008 FFS Surface Water Criteria	Target Concentrations[3]		
		2008 FFS Source Area Target Concentrations for On-site Monitoring Wells		Target Concentrations for Off-site Monitoring Well
		Shallow	Intermediate[4]	Intermediate[5]
	µg/L	µg/L	µg/L	µg/L
Volatile Organic Compounds				
Tetrachlorethene	3.9E-01	7.0E+02	1.5E+05	4.0E+02
Trichloroethene	1.5E+00	1.0E+02	2.4E+04	2.0E+02
Vinyl Chloride	2.4E+00	2.7E+02	1.9E+04	6.5E+03
Semivolatile Organic Compounds				
2-Chlorophenol	9.7E+01	1.2E+04	2.0E+04	6.8E+03
2,3,4,6-Tetrachlorophenol	5.5E+01	2.8E+03	2.0E+04	1.9E+03
2,4-Dichlorophenol	1.9E+02	2.1E+03	2.0E+04	2.3E+03
2,4,6-Trichlorophenol	2.4E+00	1.3E+04	2.0E+04	5.0E+03
Pentachlorophenol	3.0E+00	2.0E+04	2.0E+04	5.6E+03

Notes:

1 The list of groundwater constituents of concern used for compliance monitoring was revised in 2008 as described in the FFS (Floyd|Snider Team 2008).

2 These values, updated as described in the FFS, apply to groundwater only at the point of discharge to surface water. Surface water criteria are provided in this table for reference, and will not be used to assess compliance for the Facility.

3 These values, calculated using BIOSCREEN based on updated surface water criteria as described in the FFS, will be used to assess compliance in groundwater monitoring wells that make up the Facility Compliance Monitoring Well Network.

4 The 2008 FFS Intermediate Aquifer source area target concentrations for property line monitoring wells are based on the location of the projected Blair Waterway cutback, which reduces the distance from the property boundary to the Blair Waterway from 800 feet to 600 feet.

5 One off-site Intermediate Aquifer compliance monitoring well is proposed, to be located approximately equidistant between the Facility perimeter and the projected Blair Waterway cutback, near the location of existing Well MW-46(I). The approximate distance to the projected Blair Waterway cutback from this location is 300 feet. There are no off-site compliance monitoring wells proposed for the Shallow Aquifer, which generally discharges to ditches near the perimeter of the Facility.

FFS Focused Feasibility Study

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Compliance Monitoring and Contingency Plan

Figures

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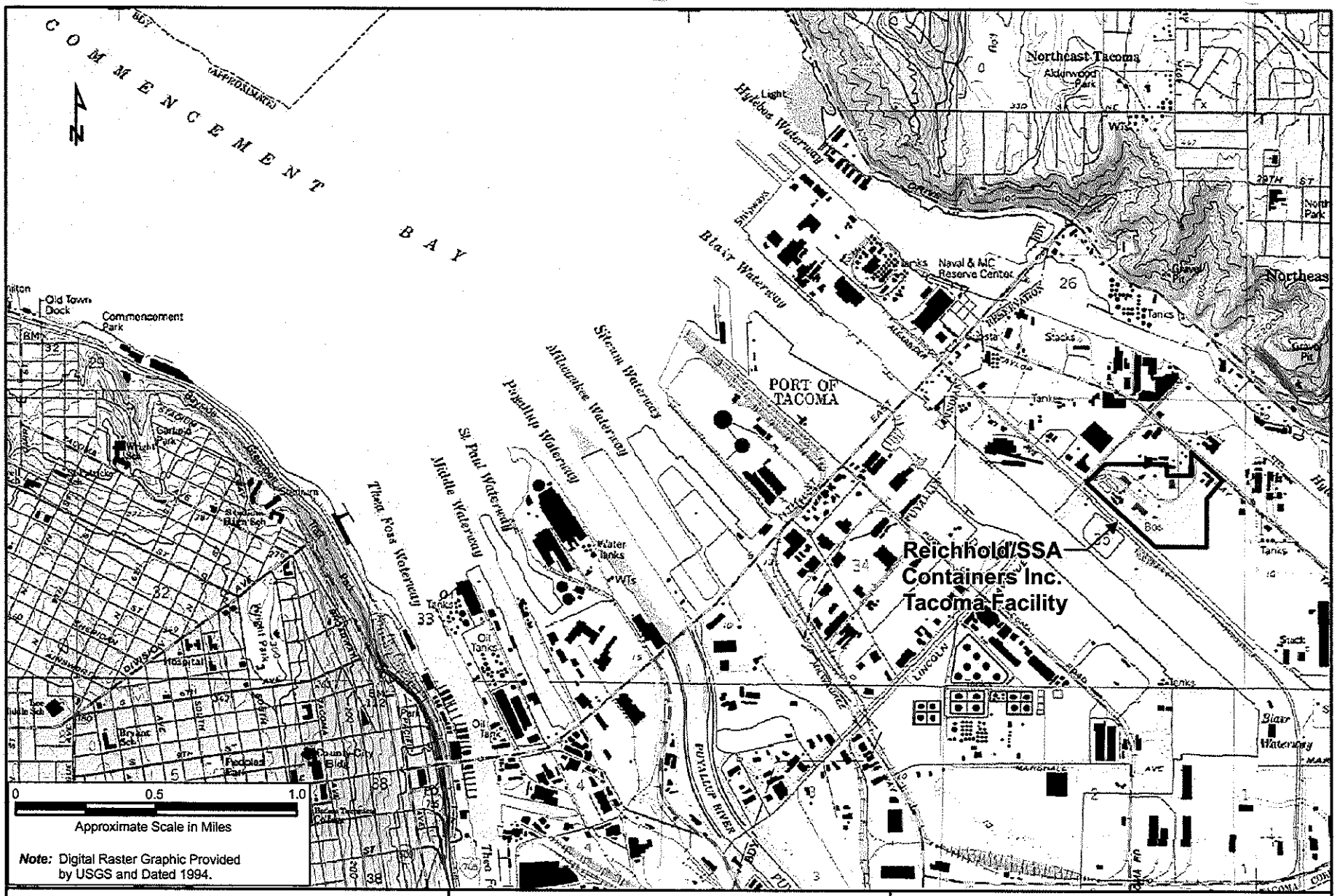

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Tacoma, Washington

Figure 1.1
Vicinity Map

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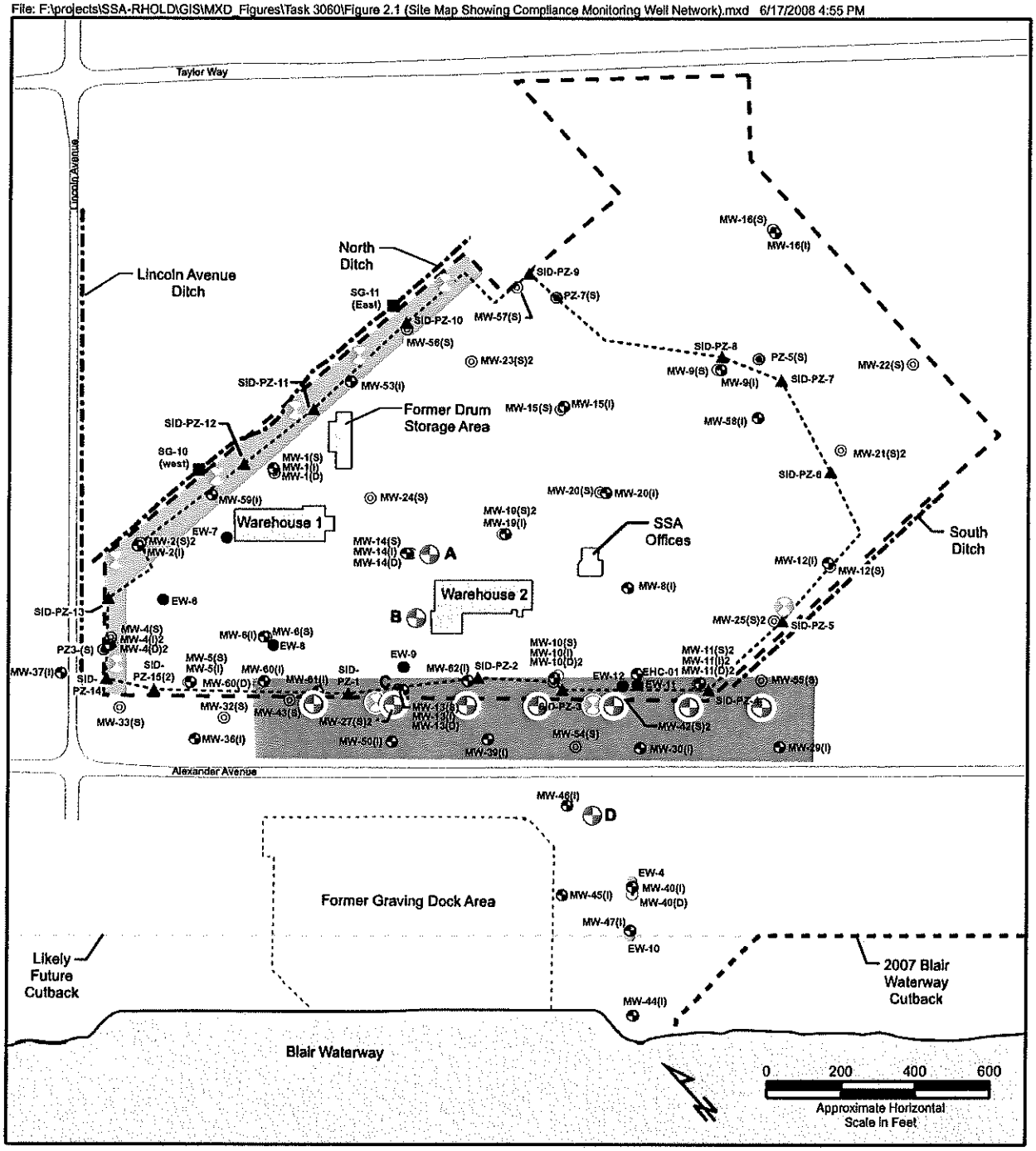
Date: 12/11/2008

December 2008

File: F:\projects\SSA-RHOLD\GIS\MXD_Figures\Task 3060\Figure 2.1 (Site Map Showing Compliance Monitoring Well Network).mxd 6/17/2008 4:55 PM



Notes:

- MW-27(S)2 is overlain by a proposed intermediate monitoring well location.
- Locations A and B are informational wells for monitoring natural attenuation and are not compliance wells.

- Shallow Aquifer Monitoring Well Network Zone
- Intermediate Aquifer Monitoring Well Network Zone
- Proposed Monitoring Well, Shallow Aquifer (Location Approximate)
- Proposed Monitoring Well, Intermediate Aquifer (Location Approximate)
- Monitoring Well, Shallow Aquifer
- Monitoring Well, Intermediate Aquifer
- Monitoring Well, Deep Aquifer
- Piezometers
- Shallow Intercept Drain (SID) Piezometers
- Staff Gauges
- Extraction Well
- Inactive Extraction Well
- Property Boundary
- SID Location
- Ditch Location
- 2007 Blair Waterway Cutback (Approximate)
- Likely Future Cutback (Approximate)

Figure 2.1
Site Map Showing Compliance Monitoring Well Network

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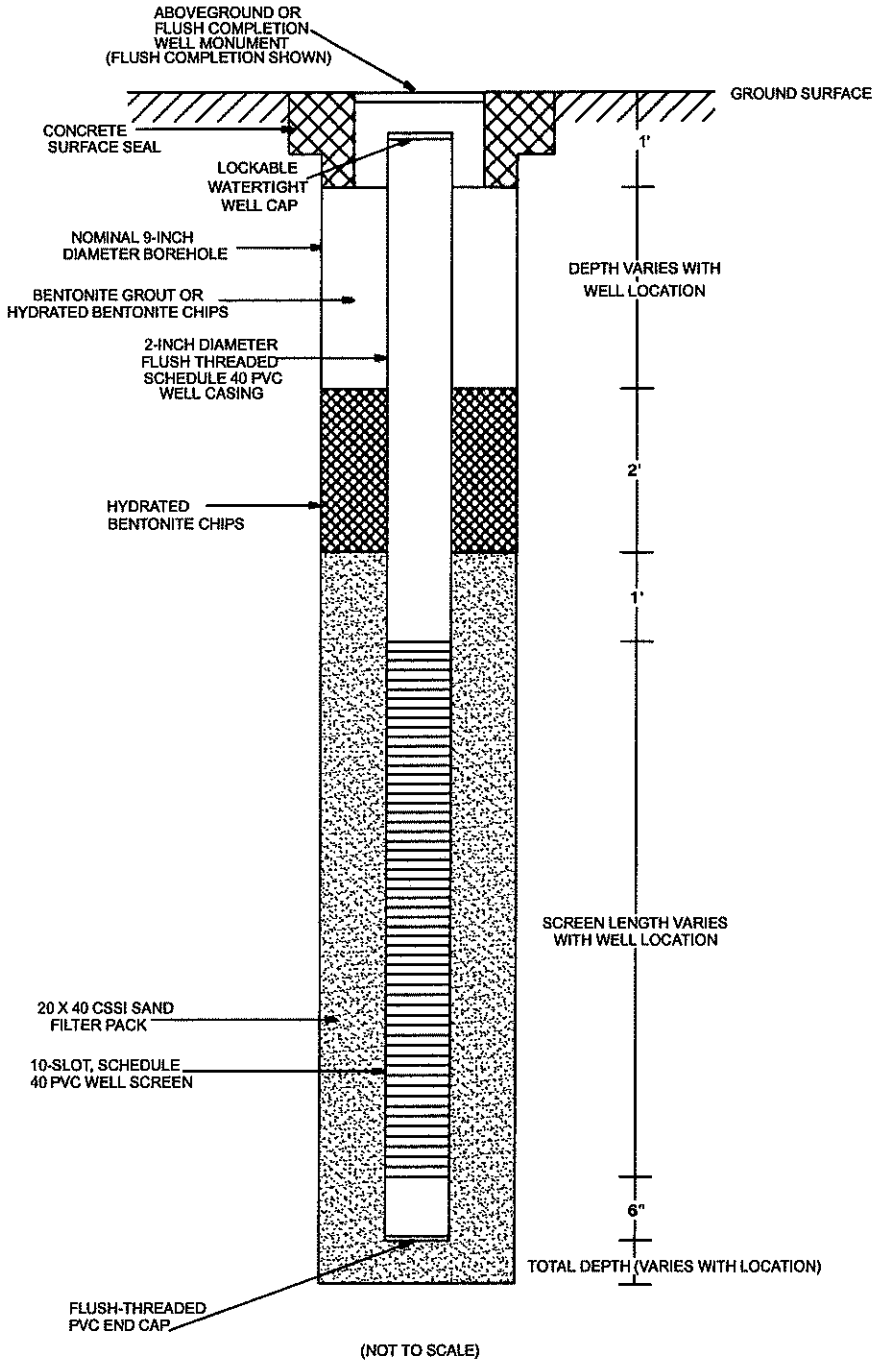

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Issaquah, Washington 98027

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Figure 4.1
Generalized Shallow Aquifer
Monitoring Well
Construction Drawing

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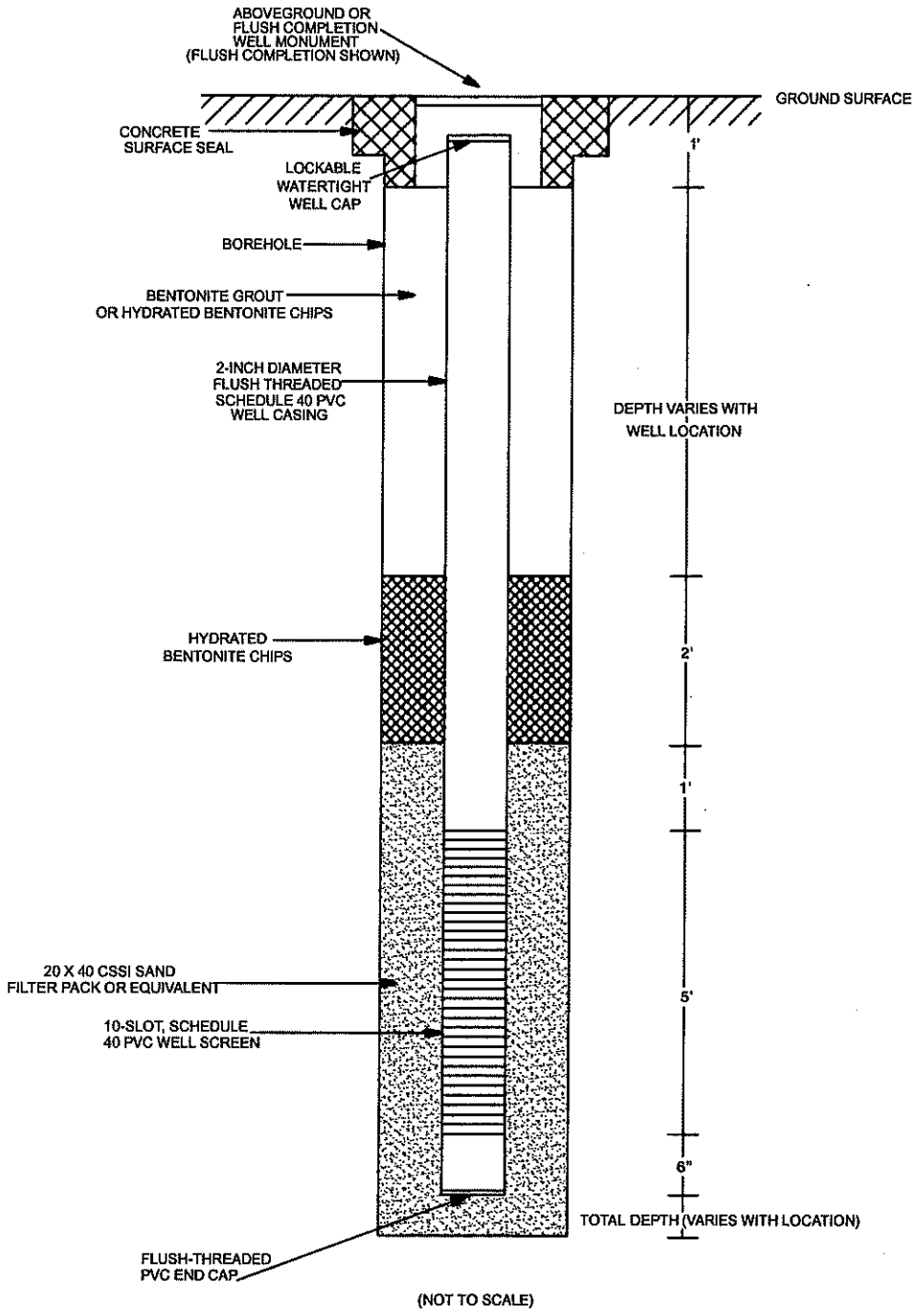

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Reichhold/SSA Containers Facility
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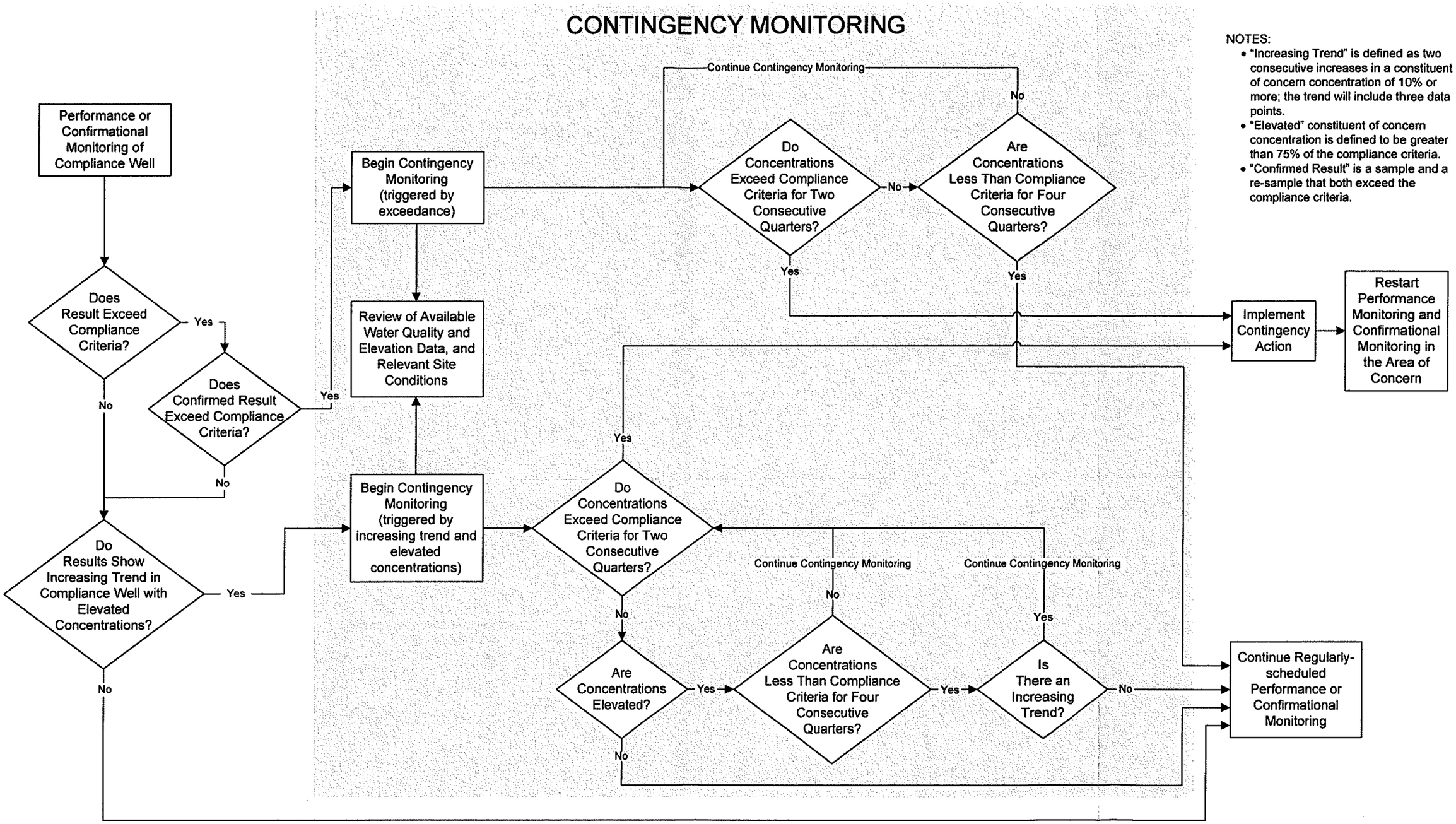
Figure 4.2
Generalized Intermediate Aquifer
Monitoring Well
Construction Drawing

CONTINGENCY MONITORING



NOTES:

- "Increasing Trend" is defined as two consecutive increases in a constituent of concern concentration of 10% or more; the trend will include three data points.
- "Elevated" constituent of concern concentration is defined to be greater than 75% of the compliance criteria.
- "Confirmed Result" is a sample and a re-sample that both exceed the compliance criteria.

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Figure 8.1
Summary of Contingency Plan Triggers
and Contingency Monitoring for Compliance Wells

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December 2008

Reichhold/SSA Containers Facility
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Compliance Monitoring and Contingency Plan

Appendix A
Well Maintenance Procedures

FINAL

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WELL REDEVELOPMENT CRITERION A-1
WELL INSPECTION AND MAINTENANCE A-1

Annual Well Sounding and Inspection

Monitoring well sounding, inspection, and routine maintenance will be performed annually at the Reichhold/SSA Containers Facility (the Facility). The inspection and maintenance procedures summarized below will be performed to maintain the monitoring well network in good operating condition and limit the potential for biased groundwater data resulting from poor well maintenance.

WELL REDEVELOPMENT CRITERION

A best management practice for monitoring well construction is that any well should be redeveloped when it is determined to have accumulated silt or sediment in excess of 1 foot of depth. This well redevelopment criterion will be implemented at the Facility throughout the term of the compliance monitoring program.

Measured well total depths will be compared annually to as-built total depths measured at the time of well construction. If the well is determined to have greater than 1 foot of silt or sediment, the well will be redeveloped by surging and pumping, or equivalent well development method, to remove sediment in the well and in the sand filter pack surrounding the screened interval.

WELL INSPECTION AND MAINTENANCE

Inspection steps and routine maintenance items that will be performed annually at each of the monitoring wells at the Facility are listed below:

- Limited brush clearing to access wells, if applicable
- Inspect protective casing
- Inspect surface seal
- Inspect bollards if present
- Inspect well identification tags (required by Washington State Department of Ecology [Ecology]), replace as needed
- Inspect padlock, lubricate with graphite or replace as needed
- Inspect well cap, clean, or replace as needed
- Remove and inspect dedicated pump and tubing, if applicable
- Measure static water level
- Measure total well depth
- Lubricate hinges on protective casing using vegetable oil, if applicable
- Paint protective well casing, well cover, and bollards as needed.
- Re-mark measuring points as needed
- Re-mark well identification number as needed

Routine maintenance items, such as the installation of new well caps and locks, and re-marking well identification numbers will be resolved in the field during the well inspection.

If a well is damaged, the well protection measures and casing will be repaired to meet requirements of WAC 173-160-400. Significant repairs or repairs or modifications to the well seals will be performed by a driller licensed in Washington State as required by WAC 173-160-420 (10)(a) and WAC 173-160-450.

If a well is damaged beyond repair, Ecology will be consulted. If Ecology determines that it is appropriate to decommission the well it will be decommissioned in accordance with WAC 173-160-460. A replacement well will be installed at an appropriate location and with Ecology approval. Replacement wells will be drilled and constructed to meet the requirements of WAC 173-160-400.

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Compliance Monitoring and Contingency Plan

Appendix B
Sampling and Analysis Plan/ Quality Assurance Project Plan

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Figure B.1 Project Management Organization

1.0 Introduction

This Sampling and Analysis Plan and Quality Assurance Project Plan (SAP/QAPP) has been prepared for the Reichhold/SSA Containers Facility (Facility), a former chemical manufacturing plant located at 3320 Lincoln Avenue East in Tacoma, Washington (the Facility). This SAP/QAPP is presented as Appendix B of the Compliance Monitoring and Contingency Plan (CMCP) and has been prepared in accordance with Model Toxics Control Act (MTCA) compliance monitoring requirements (WAC 173-340-410). The SAP/QAPP reflects future site conditions and proposed monitoring well networks that are scheduled to be installed at the Facility.

A general vicinity map of the Facility is presented in Figure 1.1 of the CMCP. The proposed monitoring well sampling locations along with site features are shown in Figure 2.1 of the CMCP.

The compliance monitoring fieldwork consists of protection monitoring, performance monitoring, and confirmational monitoring, as specified in Section 5.0 of the CMCP. As described in the CMCP, the requirements for protection monitoring, will be met through the performance monitoring activities and procedures established in this SAP and health and safety plans (HASPs) associated with implementation of the groundwater remedial action.

The procedures for performance monitoring and confirmational monitoring are identical, as described in the CMCP, and the procedures defined in this SAP/QAPP will be used for both periods. The SAP/QAPP has been organized for use as a reference for field personnel to conduct compliance monitoring.

1.1 SAMPLING PURPOSE AND OBJECTIVES

This document is intended to provide guidance on achieving the specific objectives of the CMCP, which are presented below:

- Address the performance of the remedial actions to be performed at the Facility
- Confirm continued natural recovery
- Confirm the long-term effectiveness of the remedy following the completion of remedial activities and the future operation of the site as a container terminal

In order to accomplish these objectives, the CMCP will evaluate groundwater quality at the Facility following discontinuation of hydraulic control through shutdown of the Shallow Interceptor Drain (SID) and Intermediate Aquifer extraction well pumps by conducting compliance monitoring of groundwater semi-annually for 3 years under the performance monitoring program and annually for 5 additional years under the confirmational monitoring program. In the event that compliance monitoring results exceed site-specific criteria (constituent of concern source area target concentrations, concentration trends, etc.) contingency action may be taken, if appropriate. Compliance criteria are defined in Section 3.0 of the CMCP and contingency actions are further defined in Section 8.0 of the CMCP.

Groundwater samples will be analyzed for the volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) and compared to the source area target concentrations identified in Table B.1.

This SAP/QAPP presents the field sampling and analytical methods and associated Quality Assurance/Quality Control (QA/QC) procedures selected to meet the Data Quality Objectives (DQOs) defined in Section 3.0.

1.2 SAMPLING SCHEDULE

CMCP sampling will commence after the shutdown of the SID and the extraction wells and the installation of any new compliance monitoring wells, if necessary. This is anticipated to be in the third quarter of 2008.

Groundwater samples will initially be collected from compliance monitoring wells semi-annually for 3 years under the performance monitoring program and annually 5 years thereafter under the confirmational monitoring program. If constituents of concern (COCs) are not detected at concentrations greater than source area target concentrations and trigger criteria are not exceeded at the end of the 5-year confirmational monitoring period, groundwater monitoring will be discontinued at the Facility. In the event that compliance monitoring wells exceed source area target concentrations or exhibit increasing trends, the contingency plan and monitoring will be implemented, as described in Section 8.0 of the CMCP.

2.0 Project Organization and Responsibilities

SSA Containers, Inc. (SSA) has overall responsibility for the implementation of the CMCP. Project management, quality assurance, laboratory, and field responsibilities of essential project personnel are defined below. Project management organization defining the roles is depicted on Figure B.1.

2.1 SUMMARY OF PROJECT PARTICIPANTS AND RESPONSIBILITIES

Mr. Stan Leja is the Project Manager for the Washington State Department of Ecology (Ecology), and is responsible for review and approval of this SAP/QAPP and all other related documents. Mr. Skip Sahlin is the SSA Project Coordinator. Mr. Alan Jeroue, P.E., of SSA is responsible for management of all Facility and compliance activities. Floyd|Snider is SSA's technical consultant responsible for technical analysis, authorship, and Ecology coordination to produce the CMCP in a manner consistent with the Ecology Agreed Orders. Ms. Kate Snider, P.E., is the Floyd|Snider Principal in Charge. Mr. Stephen Bentsen, P.E., is Floyd|Snider's Project Manager. Environmental Partners, Inc. (EPI) provides subcontracted assistance to Floyd|Snider for hydrogeology and related document preparation. The lead contact for EPI is Mr. Doug Kunkel, L.H.G.

Analytical Resources, Incorporated (ARI) of Tukwila, Washington has been selected to perform all laboratory analyses. Ms. Susan Dunnihoo is ARI's Project Manager for this project. Mr. David Mitchell is the laboratory Quality Assurance Officer.

The following sections describe individual responsibilities for key team members.

- The CMCP Principal in Charge (Ms. Kate Snider, Floyd|Snider) provides technical oversight of project activities and senior review of project submittals. The Floyd|Snider Principal in Charge serves as liaison between agencies, the client, the laboratory, and contract personnel.
- The CMCP Project Manager (Mr. Stephen Bentsen, Floyd|Snider) provides technical oversight of project activities and review of project submittals and serves as liaison between agencies, the client, the laboratory, and contract personnel.
- The EPI Project Manager (Mr. Doug Kunkel, EPI) provides technical oversight of project activities and review of project submittals. Additionally, EPI, as a subcontractor to Floyd|Snider, is responsible for overseeing project performance to ensure contract compliance and for implementing all necessary actions and adjustments to accomplish program objectives. The EPI team lead may also serve as liaison between agencies, the client, the laboratory, and contract personnel.
- The CMCP Health and Safety Manager (Mr. Josh Bernthal, EPI) is responsible for evaluating risks associated with the CMCP and preparing a site-specific HASP compliant to applicable laws and regulations related to health and safety. CMCP Managers and Health and Safety Manager are responsible for implementing the HASP.

- The Project QA Officer (TBD) is responsible for overall implementation of the QAPP. Duties include overseeing all contractor activities to ensure compliance with the QAPP, including field and laboratory activities, and project work products. The QA Officer will work closely with the other QA Managers, will be immediately notified if problems occur, and will approve changes to the CMCP if such changes are warranted. In the event that changes are needed, the QA Officer will immediately notify the Floyd|Snider Project Manager, who will discuss the proposed changes with the SSA Containers Project Manager prior to implementing those changes.
- The Project Chemist (Project QA Officer or qualified representative, TBD) will remain independent of direct project involvement and day-to-day operations, is responsible for coordinating with the laboratory to obtain required analyses, sample tracking, and chain-of-custody. The Project Chemist is also responsible for review and validation of laboratory analysis reports and resolving any analytical data quality issues.
- The Site Manager (Mr. Josh Bernthal, EPI) will support the CMCP Project Manager and is responsible for day to day coordination with the CMCP Project Manager on technical issues, coordinating and managing field staff, implementing QC procedures for field measurements, for monitoring and documenting all work performed by EPI for this project.
- The Laboratory Project Manager (Ms. Susan Dunnihoo, ARI) is the primary ARI contact for EPI, and is responsible for sample tracking and analysis at the analytical laboratory.
- The Laboratory QA Officer (Mr. David Mitchell, ARI) is responsible for monitoring and documenting the quality of all work produced by the laboratory for this project, and for implementing corrective action should the need arise.

2.2 PERSONNEL TRAINING REQUIREMENTS AND CERTIFICATIONS

All field personnel must be OSHA-HAZWOPER trained. As described above, a site-specific HASP will be developed prior to implementing compliance monitoring.

3.0 Data Quality Objectives

The overall objective of the DQOs is to ensure that data are of known and defensible quality. This SAP/QAPP provides procedures to implement field sampling, chain-of-custody, laboratory analysis, and reporting that provides results that meet these objectives. The DQOs of the CMCP are to:

- collect high quality and verifiable data,
- use resources cost-effectively, and
- collect data that are suitable for their intended use by SSA and Ecology.

3.1 DATA QUALITY

Data must be of sufficient quality to meet the DQOs noted above. Two levels of data quality and analysis are applicable for this project:

- Screening Level Data
- Definitive Data

3.1.1 Screening Level Data

Field screening measurements are performed using portable instruments. Field screening measurement results are used to evaluate groundwater conditions. Field screening methods are summarized in Section 5.3.

3.1.2 Definitive Data

Fixed laboratory data meet a higher level of stringency and are used to monitor groundwater performance and confirmational monitoring samples. To generate data of sufficient quality, the following approach for analytical laboratory data for groundwater samples is followed:

- The laboratory is accredited by Ecology
- Applicable analytical test methods (e.g., SW846 methods) will be used
- Quality control samples and procedures are used by the laboratory for analysis
- Data summary packages will be generated and documentation provided are sufficient to perform a Level I data quality review
- Data quality review will be performed on the analytical data according to the procedures specified in Section 10

Groundwater samples will be analyzed using the following methods:

- VOCs by SW-846 8260B
- SVOCs by SW-846 8270D

Laboratory QA will be implemented and maintained as described in this plan and according to the ARI's Laboratory Quality Assurance Plan and standard operating procedures (SOPs). Field quality control samples are described in Section 5.4. Laboratory quality control samples are described in Section 8.2.

The methods selected are sufficient to meet the project DQOs. While a best effort will be made to achieve the project DQOs, there may be cases in which it is not possible to meet the specified goals. Any limitation in data quality due to analytical problems (e.g., elevated detection limits due to matrix effect) will be identified within 48 hours and brought to the attention of the Floyd|Snider Project Manager. If necessary, corrective measures will be determined and implemented. ARI will document the problem, the correction, and the results. In addition, this information will be discussed in the data validation report.

3.2 DATA QUALITY INDICATORS

To achieve the CMCP objectives, data quality indicators (DQIs) of precision, accuracy (bias), comparability, completeness, representativeness, and sensitivity are used to assess DQOs. Data quality indicators and associated types of samples are shown in Table B.2. Definitions for each of these indicators are provided below.

3.2.1 Precision

Precision is a measure of the reproducibility of an analytical result (i.e., to obtain the same or similar results on replicate measurements of the same sample or of duplicate samples). Reproducibility is affected by matrix variations, the extraction procedure, and the analytical method used. For duplicate samples, precision is expressed as the relative percent difference (RPD). Precision will be evaluated for two components:

- Analytical method precision will be evaluated using matrix spike duplicates or laboratory duplicates, depending on the analytical method requirements
- Analytical and field sampling precision will be evaluated using field duplicates

The RPD (field or laboratory duplicates) will be reviewed during data quality review, and deviations from the specified limits will be noted and the effect on reported data commented upon by the data reviewer. Precision goals are presented in Table B.3.

3.2.2 Accuracy

Accuracy is assessed by determining how close a measured value lies to its true value. Field accuracy is obtained through evaluation of trip blanks, proper sample handling, preservation, and compliance with holding times. Primary indicators of laboratory accuracy are with blank, matrix spike, or laboratory control samples. A sample is spiked with an analyte of known concentration and the average percent recovery (%R) value is calculated. This can be a surrogate compound in organics methods, a blank, or matrix spike. Accuracy goals are presented in Table B.3.

Percent recovery values will be reviewed during data quality review, and deviations from the specified limits will be noted and the effect on reported data commented upon by the data reviewer.

3.2.3 Representativeness

Representativeness is a measure of how closely analytical results reflect the actual concentration or distribution of chemical compounds in a sampled media. Monitoring well locations for sampling are placed to evaluate compliance. The number, location, and frequency of samples influence representativeness; these factors are addressed in the CMCP. Standard procedures for sample collection and handling have been developed to provide data that are representative of each sampling event.

3.2.4 Comparability

Data comparability expresses the confidence with which each sampling event can be compared to another. Comparability will be maintained by use of consistent sampling procedures, approved analytical methods, consistent detection limits, and consistent units.

3.2.5 Completeness

Completeness for usable data is defined as the percentage of usable data out of the total amount of data generated. Specifically, the basis is the total number of scoped samples collected relative to the total number of valid results generated. To avoid potential conditions where monitoring wells may not be accessible due to staging of shipping containers within the planned site development, the client will be given ample notice of scheduled monitoring events. When feasible, the amount of sample collected will be sufficient for reanalysis, should the initial results not meet QC requirements. Less than 100 percent completeness could result if sufficient chemical contamination exists to require sample dilutions, resulting in an increase in the project-required detection/quantitation limits for some parameters. Highly contaminated environments can also be sufficiently heterogeneous to prevent the achievement of specified precision and accuracy criteria. The target goal for completeness will be 90 percent for laboratory analytical methods as shown in Table B.3.

3.2.6 Sensitivity

The sensitivity of the analytical methods (i.e., method reporting limits) identified for this project are sufficient to allow comparison of project results to decision criteria. Project decision criteria and analytical method quantitation limits for the project COCs are listed in Table B.4. Analytical method detection and reporting limits for all requested analytes are listed in Table B.4. It should be noted that ARI periodically updates the method limits; however, this project has specific method reporting criteria. Updated limits will be reviewed to ensure that project DQOs are achieved. Method detection limits (MDLs), and reporting limits (MRLs) are defined below.

3.2.6.1 Method Detection Limit

The MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte (Appendix B of 40 CFR 136). Method detection limit studies have been performed by the laboratory and are acceptable for this project. MDLs are listed in Table B.4.

3.2.6.2 Method Reporting Limit

The MRL is the lowest quantitative value. Any sample result less than the MRL is routinely reported by the laboratory as not detected. It may be based on project-specific concentrations of concern, regulatory action levels, or sensitivity capability of methods and instrument. The MRLs are adjusted based on the sample matrix and any necessary sample dilutions. Dilutions will only be performed after method-required cleanup procedures and where target analyte concentrations exceed the highest calibration standard. Project-specific laboratory MRLs for target analytes are listed in Table B.4.

4.0 Groundwater Level Monitoring

Water levels will be measured in all Shallow and Intermediate Aquifer wells at the Facility to provide an indication of groundwater flow directions following cessation of hydraulic control.

Water levels will be measured no more than 7 calendar days prior to beginning each sampling event. Water levels in all tidally-influenced wells (Intermediate Aquifer) will be measured within 60 minutes of low tide (beginning 30 minutes before and ending no later than 30 minutes after low tide). Water level measurements will begin with the off-site well closest to the Blair Waterway and will proceed inland. Shallow Aquifer wells are not tidally-influenced and will be measured the same day as the Intermediate Aquifer wells.

4.1 GROUNDWATER LEVEL MONITORING PROCEDURES

A Little Dipper (or equivalent) electronic water level indicator will be used to measure the depth to water (DTW) to the nearest 0.01 foot. The water level indicator will be decontaminated prior to use by washing the probe and the first 20 to 30 feet of cable in a solution of Liquinox™ (or equivalent) and potable water, then rinsing with distilled water. The water level indicator will be decontaminated between wells by spray rinsing the probe and any portion of the tape that was submerged in the groundwater with distilled water.

Nitrile gloves (or equivalent) should be worn when unlocking the protective well casing. A clean, unused pair of nitrile gloves must be donned prior to measuring the water level in order to avoid contaminating the well or water level indicator. The DTW is measured from a marked measuring point on the north side of the casing to the static water level inside the well casing. Sufficient time will be allowed for the water level to equilibrate prior to taking the measurement.

The DTW measurement will be recorded to the nearest 0.01 foot along with the time to the nearest minute in the field logbook. Any notable well maintenance issues will also be recorded in the field logbook so that these issues can be evaluated by the Floyd|Snider Project Manager and addressed as warranted.

At all measurement locations, the water level indicator probe and the portion of the cable that entered the well will be thoroughly decontaminated by using a spray rinse of distilled water after the DTW measurement is performed. After completing the measurement and recording the DTW in the field logbook, the well cap will be re-locked, and used gloves will be discarded before proceeding to the next well.

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5.0 Groundwater Sampling

Groundwater samples will be collected from Shallow and Intermediate Aquifer Compliance Monitoring Well Network monitoring wells at the Facility to fulfill monitoring requirements under the CMCP.

5.1 COMPLIANCE MONITORING WELL NETWORK

The approximate locations of the Shallow and Intermediate Aquifer Compliance Monitoring Network wells and informational wells are shown in Figure 8.1 of the CMCP; actual well locations will be adjusted as necessary in areas that will be accessible after planned site development. Existing monitoring wells may be incorporated into the Compliance Monitoring Well Network if they are appropriately located and constructed for compliance monitoring.

Although existing monitoring wells will be used when locations are appropriate, the installation of new monitoring wells will be necessary for the Shallow Aquifer and Intermediate Aquifer Compliance Monitoring Well Networks at the Facility. The future container terminal will provide temporary storage for large shipping containers that cannot be easily moved to gain access for groundwater sampling. In order to ensure access to wells sampled during monitoring events, the locations of monitoring wells in the Compliance Monitoring Well Network will be coordinated with the redevelopment design.

Because the location of containers on the property will change, the most desireable locations of the wells in the Compliance Monitoring Well Network will be next to light poles, fire hydrants or other non-moveable structures where containers cannot be stacked. Secondary locations would be in the aisles between stacks of containers. Any new wells added to the network will be installed with aboveground monuments set in concrete. The Compliance Monitoring Well Network wells may later be modified to flush monuments, if necessary, when the final grade of the container terminal is constructed.

5.1.1 Shallow Aquifer Monitoring Wells

Six monitoring wells are proposed to be located in the primary monitoring zone (along the North Ditch and the Lincoln Avenue Ditch) for the Shallow Aquifer Compliance Monitoring Well Network and may include existing wells as appropriate (e.g., MW-56(S), MW-2(S)2, MW-4(S)). The remaining wells in the network will be newly installed at locations determined to provide effective groundwater monitoring and to provide year-round access and protection, given the planned site development. The monitoring well network along the North Ditch will include at least two of the monitoring wells to be installed between the SID and the North Ditch, as requested by Ecology. Final proposed locations of monitoring wells will be determined based on groundwater flow directions and compatibility with the proposed redevelopment plan. Wells will be located in areas that can enable consistent access for monitoring within the layout of the container terminal.

In addition to the primary monitoring zone, the proposed Shallow Aquifer Compliance Monitoring Well Network includes three monitoring wells along the southern and southwestern sections of the property perimeter. SSA anticipates that property redevelopment activities will eliminate the

South Ditch between the Facility and Tribal properties to the south. A tight-lined stormwater conveyance system will likely be installed so that shallow groundwater will no longer flow to the South Ditch. Proposed monitoring wells will then be evaluated relative to potential Shallow Aquifer flow towards the Blair Waterway. It may be possible to use existing Wells MW-27(S)2, MW-42(S)2, and MW-25(S)2 for this purpose if they are in locations that will be consistently accessible and protected relative to the site development plan, otherwise new monitoring wells will be installed.

5.1.2 Intermediate Aquifer Monitoring Wells

The proposed Intermediate Aquifer Compliance Monitoring Well Network will extend from approximately MW-60(I) in the west to MW-29(I) in the east and will include seven evenly-spaced monitoring wells along the property line with approximately 200 feet between wells, and one additional well in the off-site area downgradient of the former Construction Debris Area. Existing off-site Well MW-46(I) might be used for this purpose or a new well might be installed depending on site development plans.

In addition, Ecology requested two monitoring wells downgradient of the Pentachlorophenol Plant Area (PPA), between the property boundary and the PPA. These two monitoring wells (Locations A and B), along with a third monitoring well located at the property line (Location C), are intended to provide data to evaluate groundwater quality downgradient of the PPA for several quarters following planned excavation activities. These monitoring wells interior to the property are not compliance wells, but are informational wells to assist with demonstration of natural attenuation. The excavation work proposed for the PPA in 2009 is designed to remove source material. Existing Well MW-14(I), or a new well in its vicinity, and one additional well between the PPA and the property line will be used for downgradient water quality evaluation.

5.1.3 Deep Aquifer Monitoring Wells

No Deep Aquifer compliance monitoring is proposed. This is based on the results of the sampling history for Deep Aquifer wells, and the consistent upward gradients from the Deep Aquifer to the Intermediate Aquifer that are associated with the Facility location in a regional discharge area.

5.1.4 Monitoring Well Construction

New monitoring wells will be drilled and installed to meet resource protection well construction standards found in WAC 173-160-420, Minimum Standards for Construction and Maintenance of Wells.

Monitoring wells will be constructed of 2-inch-diameter, flush-threaded, Schedule 40 PVC well casing and screen in conformance with WAC 173-160-430. Well screen assemblies will consist of 0.010-inch (10 slot), flush-threaded, machine-slotted, Schedule 40 PVC set in a 20x40 CSSI, 2/12 Monterey, or equivalent silica sand filter pack. The well design includes a 0.5 foot-long flush-threaded, Schedule 40 PVC sump with a flush-threaded end cap, or equivalent. Flush-threaded, Schedule 40 PVC well casing extends from the top of the screened interval to approximately 6 inches below ground surface. A 2-inch-diameter, locking, watertight PVC well cap will be installed to secure the well casing.

The sand filter pack will extend from below the screened interval to 1 foot above the top of the screened interval. A minimum 2-foot-thick seal of hydrated bentonite chips will be installed in the annular space immediately above the sand filter pack. The remainder of the annular space will be sealed with hydrated bentonite chips or bentonite grout to within approximately 1 foot of the ground surface.

A generalized construction diagram for Shallow Aquifer wells is presented in Figure 4.1 of the CMCP and a generalized well construction diagram for Intermediate Aquifer wells is presented in Figure 4.2 of the CMCP.

5.2 COMPLIANCE MONITORING SCHEDULE

Compliance monitoring for groundwater will begin following the discontinuation of hydraulic control at the Facility. Compliance monitoring consists of semi-annual performance monitoring for 3 years followed by annual confirmational monitoring for an additional 5 years.

The compliance monitoring results for wells along the property boundary will be evaluated relative to source area target concentrations. The results from the off-site well between the Facility boundary and the Blair Waterway will be evaluated relative to the target concentration calculated specifically for that well. The target concentrations for these wells are shown in Table 3.1 of the CMCP. Analytical results for the interior informational wells will be used to demonstrate natural attenuation, but will not be used to determine compliance.

The compliance monitoring results will be evaluated relative to specific criteria (COC concentrations, concentration trends, etc.) that would trigger contingency action at the Facility in the event that compliance monitoring wells exceed these thresholds. The criteria that serve as triggers for contingency actions are defined in Section 8.0 of the CMCP.

If the results of compliance monitoring indicate exceedances of target concentrations or increasing trends, additional contingency monitoring will be implemented as shown in Figure 8.1 of the CMCP.

5.3 GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling consists of field instrument calibration, static water level measurement, well purging, field parameter measurements, sample collection, sample identification and handling, and sample shipping. Procedures for each of these groundwater sampling steps are presented in the following sections.

5.3.1 Field Instrument Calibration

Instruments are used during purging to measure field parameters that will determine when a well is ready for sampling. The field parameters, pH, temperature, conductivity, dissolved oxygen, and oxidation-reduction potential (ORP), are measured and compared to stabilization criteria, as noted in Section 5.3.5. A Yellow Springs Instrument Model 556 multiparameter meter, or equivalent, will be used to obtain field parameter measurements.

Field instruments must be calibrated prior to use, and any time that measurements appear to be anomalous, or if readings drift excessively. Instruments will be calibrated according to manufacturer's instructions.

5.3.2 Water Level Measurement

The DTW of each well will be measured prior to sampling to provide a static DTW measurement, which will be used as a baseline measurement for evaluating and adjusting pumping rates during low-flow purging. The DTW also provides the data necessary to calculate one casing volume, which is the minimum volume of water to be purged from the well before collecting a groundwater sample. The procedures for measuring DTW are described in Section 4.0, Groundwater Level Monitoring.

5.3.3 Purge Volume Calculation

The DTW and total well depth of each well will be used to compute one wetted casing volume, which is the minimum volume of water to be purged prior to sampling. The minimum volume of water purged from each well (assuming the casing diameter is 2 inches) prior to sampling will be calculated using the following equation.

Wetted Casing Volume = (TD – DTW) x 0.16 gal/ft.

Where:

TD = total depth of well in feet (measured in field)
DTW = depth to water in feet (measured in field)
0.16 = gallons of water per foot of wetted casing in a 2-inch diameter well

5.3.4 Purging Procedures

After completing the static water level measurement, monitoring wells will be purged following procedures in U.S. Environmental Protection Agency's (USEPA's) Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures (USEPA 1996) until field parameter equilibrium is demonstrated. The well will be purged at a pumping rate that will not cause excessive drawdown. The pumping rate should be controlled as needed using the pump's variable speed flow controller. DTW will be measured in the well during purging to evaluate if the well is being drawn down excessively. Excessive drawdown is defined as greater than 0.3 feet of drawdown relative to the pre-purging static water level. Ideally, the pumping rate should cause less than 0.3 feet of water level drawdown and should stabilize over time. Water level measurements to monitor drawdown should be taken periodically during purging, generally at the same time as field parameter measurements.

If needed, pumping rates should be reduced to avoid pumping the well dry and ensure stabilization of the indicator parameters as noted in the following section.

The following purging procedures will be followed during sampling:

1. Check static water level and calculate purge volumes, as discussed above.

2. Purge water will be removed from each well using a dedicated bladder pump, submersible pump, or equivalent.
3. Purge water will be checked for the presence of immiscible (floating or sinking) contaminants during well purging. Observation of floating or sinking contaminants will be documented in the field logbook, including any other observable features such as color or odor—without intentionally sniffing the sample.
4. Purge water will be measured in graduated 5-gallon buckets. Purge water will then be transferred from the buckets to a waste tank that can be emptied at the Facility decontamination pad for treatment at the on-site water treatment plant. Purge water disposal methods will be modified following shutdown of the on-site water treatment plant.

5.3.5 Field Parameter Measurements

Purge water will be discharged through a flow cell for field parameter measurements and will be contained in graduated 5-gallon buckets or equivalent. Temperature, pH, conductivity, dissolved oxygen, and ORP will be measured approximately every 3 to 5 minutes. If at least one wetted casing volume has been purged and field parameters have stabilized for three consecutive measurements, the well is considered to contain representative formation water, and no further purging is required. Stabilization criteria are:

- pH ± 0.1 pH units
- Specific conductance ± 3%
- Temperature ± 0.1 °C
- ORP ± 10 millivolts (optional)
- Dissolved oxygen ± 0.3 mg/L (optional)

Dissolved oxygen and ORP are very sensitive parameters and are affected by exposure to air. Attaining stabilization for dissolved oxygen and ORP may not be possible in low-yield wells and therefore meeting stabilization criteria for these two parameters is optional. When the above stabilization criteria have been met the water in the well casing is stabilized and sample collection can begin. The total volume of water purged from each well will be recorded in the field logbook.

If the field parameters do not meet the above stabilization criteria, purging and measurement of parameters will continue until stabilization is obtained. Refer to the procedures in Section 5.3.6 for purging low-yield wells.

5.3.6 Purging Procedures for Low-yield Wells

Because low well yields are common for Shallow Aquifer monitoring wells, it may not be possible to meet stabilization criteria before evacuating the well to dryness. To the extent possible, wells will not be purged to dryness. When purging monitor wells of this type, the following procedures will be used.

If the purge process results in a dry well, the well will be evacuated to dryness only once (one well casing volume) prior to sampling. Any water entering the well after purging to dryness is representative formation water and may be sampled within 24 hours without further purging. Samples may be collected at that well upon sufficient recovery, which is defined as water level recovery to at least 80 percent of the original static water level prior to purging. If the purging process does not result in a dry well after one casing volume, an attempt to achieve field parameter stabilization will be performed, as described above.

At no time should the well be purged to dryness if the recharge rate causes formation water to cascade vigorously down the sides of the well screen. Cascading is likely to occur if the well is purged to dryness and the water level fully recovers within several minutes. If this happens, the purging rate will be decreased and field parameters wil be monitored until stabilization criteria are met.

Wells in which the static water level is at or below the bottom of the well screen will be considered as dry and will not be purged and sampled.

5.3.7 Sample Collection

Samples will be collected from each well immediately after purging is completed, except as previously described for low-yield wells. The time of sample collection should be recorded and marked on the sample label. If two or more bottles from the same well are filled consecutively and without interruption, the bottles may be labeled with the same sampling time. Additional samples will be collected for field and laboratory QA/QC, as designated on the sample matrix.

Groundwater samples will be collected into laboratory-cleaned, pre-labeled sample bottles. Sample bottles should be filled starting with the most sensitive aliquot and ending with the least sensitive aliquot.

Sample aliquots will be collected in the order of volatilization sensitivity as follows:

- Volatile organic compounds
- Semivolatile organic compounds

5.3.8 Sample Containers, Preservation, and Handling

Samples will be collected at each monitoring well location, as indicated on the sample matrix in Table B.5. The sample matrix specifies analyses, sample containers, preservation methods, and holding times. Sample bottles are to be placed in iced coolers containing bagged ice, or equivalent, immediately after sample collection.

Some sample types require preservation to retard biological action, retard hydrolysis, and reduce sorption effects. Preservation methods include pH control through chemical addition, cooling, and protection from light. The laboratory will provide bottles with appropriate preservatives already added. Preserved bottles will be pre-labeled and identified as "preserved" by the laboratory in order to distinguish them from non-preserved bottles. Safety glasses and nitrile or equivalent gloves should be worn whenever handling sample bottles, especially those containing preservatives.

The laboratory might pre-treat bottles used for VOC samples with hydrochloric acid (HCl) to extend the holding time for this aliquot. The sample bottles should be filled slowly to minimize volatilization due to agitation. VOC sample containers should be filled so that no headspace (air bubbles) remains in the container. Avoid overfilling the VOC bottles (overfilling will dilute the HCl preservative). Each VOC container must be checked for the presence of air bubbles using the following procedure:

1. Turn the container upside down so the bottom of the container is slightly tilted.
2. Flick the side of the inverted container with a finger or strike container on an open palm and observe for air bubbles.
3. If air bubbles appear, turn the container with the right side up and flick or strike the container again to move air bubbles back to the top.
4. Remove the cap and add water from the sampling pump to the container or cap and carefully place cap back on container.
5. Observe container again in the same manner for air bubbles. Repeat procedure as necessary until no air bubbles appear.

Bottles used for SVOC samples will contain no preservatives. Bottles should be filled to the shoulder.

5.3.9 Sample Collection Procedures for Low-yield Wells

For wells with slow recovery rates, samples should be collected as soon as sufficient water level recovery is achieved (at least 80 percent of the static water level prior to purging). The well should be allowed to recover until a sufficient volume of water is available to collect all VOC sample containers. Completely collected aliquots will be shipped to ARI on the day of collection.

Aliquots for SVOC analyses may be collected on subsequent visits to the well and may be partially filled on each visit. More than 1 day may be required to collect the full SVOC sample in a well with very low yields. To achieve SVOC project-specific reporting limits, ARI needs a minimum volume of 500 ml. No further purging will be necessary if the well is sampled within 24 hours of purging or pumping to dryness during sampling.

5.4 FIELD QUALITY CONTROL SAMPLES

QC measurements will be collected to evaluate laboratory precision, potential matrix interferences, and potential contamination from ambient air.

Field duplicate samples, trip blank samples, and matrix spike/matrix spike duplicate (MS/MSD) samples will be the only types of QC samples collected as part of the field QC program. Table B.6 summarizes the number of samples that will be analyzed to evaluate data quality. Equipment blank samples will not be obtained because groundwater sampling equipment will be either dedicated or disposable single-use devices.

A sample matrix will be prepared prior to each sampling event to inform the sampling personnel of the specific wells, analyses, and sample container types as well as locations to collect QA/QC

samples. Duplicate samples will be collected at 10 percent of the wells. Trip blank samples originating at ARI will accompany one cooler of samples during each day of the sampling event.

5.4.1 Trip Blank Samples

The potential for contamination from ambient air and air in sample coolers or on-site sample refrigerators will be evaluated using trip blank samples. One set of trip blanks is required for each day of sample collection during the sampling event. The trip blank will originate at the contract laboratory and be re-labeled prior to submittal at the analytical laboratory following the sample identification procedures noted in Section 5.5. Trip blanks will accompany the sampling team into the field and will be handled along with field samples. The trip blank samples will be analyzed for VOCs only.

5.4.2 Field Duplicate Samples

Laboratory and field sampling precision will be evaluated by collecting blind field duplicate samples. Field duplicate samples will be collected at a rate of 10 percent of the total number of samples per sampling event, exclusive of other QC samples. Field duplicate samples will be collected under conditions as identical as reasonably possible to the original sample and will be analyzed for all COCs. Field duplicate samples will be labeled as noted in Section 5.5.

5.4.3 Matrix Spike/Matrix Spike Duplicate Samples

Triplicate volumes of sample will be collected at a rate of 5 percent of the total number of samples per sampling event, exclusive of other QC samples. The additional volume of sample will be used by the laboratory for MS/MSDs for all COCs. MS/MSD samples will be labeled like original samples, as noted in Section 5.5.

5.5 SAMPLE IDENTIFICATION

Samples will be given unique identifiers using the following system for designation.

SSA-GW - ##S - mm/yy

Where:

SSA	Identifies the sample as originating from the SSA.
GW	Identifies the sample as groundwater.
##S	Identifies the monitoring well number (e.g., 13S or 13I). Upper case letters without parentheses will be used for aquifer designation (e.g., S or I).
mm/yy	Indicates month and year sample was collected (e.g., 06/09 for June 2009).

In addition to the sample identification, spaces will also be provided on the sample identification label to record the following information at the time of actual sample collection:

- Initials of personnel collecting samples
- Date and time of sample collection to the nearest minute (record the initial sample start time if all aliquots are collected consecutively)

- Requested analyses

A fictitious identification number and sample will be assigned to the two types of QA/QC samples (field duplicate, and trip blank samples), using the following sample number ranges. Consecutive numbers will be required beginning with the lower limit of the range for each QA/QC sample type.

QA/QC Sample Type	Sample Number Range
Field duplicate	160-169
Trip blank	180-189

Laboratory MS/MSD samples will be labeled in the same manner as the aliquots collected for standard analyses. The additional aliquots for MS/MSD samples will be documented in the field logbook and on the sample chain-of-custody form.

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6.0 Sample Documentation and Delivery

6.1 SAMPLE DOCUMENTATION

Information for each sampling location that will be documented in the groundwater sampling field logbook includes:

- Sampling personnel
- Equipment calibration (at least once per day and as needed)
- Equipment decontamination steps (if not dedicated or single use)
- Weather conditions
- Static water level
- Purging data
- Field parameter measurements
- Purge volume
- Sample times, bottle types, preservation
- Physical appearance and odor (if any) of the sample
- Presence of free product

Additional information that may be recorded in groundwater sampling field logbook on a case-by-case basis includes:

- Well condition (if noteworthy)
- Repairs made to well or sampling equipment
- Health and safety monitoring data (if required)
- Visitors to the site including arrival and departure times

6.2 SAMPLE CHAIN OF CUSTODY

The management of samples collected in the field must follow specific procedures to ensure sample integrity. The possession of samples must be traceable from the time they are collected through the time they are analyzed by the contract laboratory.

Chain-of-custody of a sample is defined by the following criteria:

- The sample is in a person's possession or in his/her view after being in his/her possession.
- The sample was in a person's possession and was locked up or transferred to a designated secure area by him/her.

Samples will be logged onto a chain-of-custody form after they are collected and before leaving the Facility. Each time the samples change hands, both the sender and the receiver will sign and date the chain-of-custody form. When a sample shipment is delivered to ARI, the samples must be relinquished to a representative of ARI. The top signature copy of the signed chain-of-custody form will be retained by ARI. The second copy of the chain-of-custody form will be retained by the sampling personnel and will be delivered to the Floyd|Snider Project Manager for inclusion in the project files. A chain-of-custody form will be completed for each sample shipment and the information on the record must be consistent with the sample matrix.

The following information is included in the chain-of custody form:

- Project number
- Sample number
- Signature of sampler
- Date and time of collection
- Place of collection
- Type of sample
- Number of containers
- Date and time when sample possession was relinquished
- Signature of person relinquishing samples
- Signature of receiver at laboratory

Additionally, field personnel are to include on the chain-of-custody form within the Comments/Special Instructions portion of the form: *"SEE ARI PM—REQUEST SSA PROJECT DQOs"* to ensure that project objectives are consistently met.

6.3 SAMPLE PACKAGING

Before packaging samples, clean and dry the exterior of the sample container and make certain that the sample label is correct, complete, and legible.

The sample packaging and shipping containers will be constructed and packed to meet the following requirements:

- There will be no release of materials to people or the environment.
- Inner containers that are breakable must be packaged to prevent breakage and leakage. The cushioning material must not be reactive with the sample contents.

Only waterproof ice chests or coolers will be considered acceptable shipping containers. Coolers will be provided by the contracted laboratory.

Samples that will be hand-delivered to the analytical laboratory will be handled as follows:

- Seal drain plug in cooler and place bubble-wrap or equivalent in bottom of cooler

- Place bottles inside Ziploc®-type plastic bags
- Place bagged, sample bottles in cooler
- Add double-bagged ice and packing material such as bubble wrap or equivalent to coolers

Samples that will be shipped to the analytical laboratory will be handled as follows:

- Seal drain plug in cooler and place bubble-wrap or equivalent in bottom of cooler.
- Wrap glass bottles with bubble wrap or equivalent.
- Place wrapped bottles inside Ziploc®-type plastic bags.
- Place wrapped, bagged, sample bottles in cooler.
- Add double-bagged ice and packing material such as bubble wrap to coolers.
- Place shipping list chain-of-custody form in plastic bag attached to inside of cooler lid.
- If shipping via courier attach two custody seals (front and back of container) so that the seals must be broken if the cooler is opened. Tape over custody seals with fiber tape.
- Place name and address of receiving laboratory in a position clearly visible on the outside of the cooler.
- Secure the cooler lid with fiber tape.
- Typically samples for this project are hand delivered to the laboratory. If samples are shipped via courier notify the laboratory, provide an airbill tracking number for each cooler shipped, and an estimated time of arrival.

Samples will be delivered to ARI for analysis after each day of sampling. ARI's address and contact person information is given below:

Analytical Resources, Inc.
4611 South 134th Place, Suite 100
Tukwila, WA 98168
Contact: Susan Dunihoo (206) 695-6207

6.4 SAMPLE DOCUMENTATION

All original field record and laboratory data reports will be stored in a project file at EPI's, Issaquah, Washington office. EPI will file and maintain records, reports, field logbooks, subcontractor reports and at minimum, records will include:

- Field logbooks
- Drawings
- Photographs
- Calculations

- Sampling Records
- Chain of custody
- Laboratory data
- Data validation reports
- Data assessment reports
- Interim project reports, progress reports, QA reports, etc.

6.5 DATA MANAGEMENT

CMCP data generation includes groundwater elevation measurement data and analytical data. Additionally project-related information such as (corrective action reports, field records etc) will be stored per data management procedures specified by Floyd|Snider. Data management will consist of database generation, data receipt and input of field and analytical data, and other data generated during the CMCP, and finally data presentation. ARI will provide an electronic data deliverable in the format specified by Floyd|Snider.

7.0 Sampling Equipment Decontamination

Sampling equipment generally used at the Facility will be dedicated or single-use disposable equipment. However, it may become necessary to decontaminate dedicated equipment should it become dirty or accidentally contaminated by improper handling. If groundwater sampling equipment requires decontamination, use the following procedures:

- Set up a decontamination station on the Facility decontamination pad or equivalent area.
- Disassemble the equipment as thoroughly as practical.
- Wash in a solution of tap water and Liquinox™ or equivalent detergent. Use a brush to wash the outside surfaces of the sampling device.
- Rinse thoroughly with tap water.
- Rinse with distilled water.
- Spray-rinse with reagent grade isopropyl alcohol.
- Spray-rinse with n-hexane and allow to evaporate.
- Spray-rinse with deionized water or ASTM Type II water.
- Place sampling device back into service or wrap in aluminum foil until placed back into service.

Upon completion of decontamination, pour rinsate into the Facility decontamination pad drain for treatment in the on-site water treatment plant. Rinsate disposal methods will be modified following shutdown of the on-site water treatment plant.

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8.0 Instrument Calibration and Maintenance

Analytical instrument calibration and maintenance is conducted in accordance with the QC requirements identified in each laboratory SOP and QA plan, and the manufacturer's instructions. General requirements are discussed below.

8.1 FIELD MEASUREMENT INSTRUMENT CALIBRATION PROCEDURES

Field instruments must be calibrated prior to use, and any time that measurements appear to be anomalous, or if readings drift excessively. Instruments will be calibrated according to manufacturer's instructions.

8.2 LABORATORY INSTRUMENT CALIBRATION PROCEDURES

As stated in SW846 and applicable laboratory SOPs, calibration of all analytical instrumentation is required to ensure that the analytical system is operating correctly and functioning at the sensitivity required to meet project-specific DQOs. Each instrument will be calibrated with standard solutions appropriate to the instrument and analytical method, in accordance with the methodology specified and at the QC frequency specified in the project laboratory SOPs.

All laboratory instruments will be calibrated according to manufacturers' instructions, as specified in ARI's Quality Assurance Plan dated January 4, 2008.

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9.0 Internal Quality Control Samples

This section describes field and laboratory QC checks.

9.1 FIELD QUALITY CONTROL CHECK

Assessment of field sampling precision and bias will be made by collecting field duplicates for laboratory analysis. Collection of these samples will be in accordance with the applicable procedures and frequency described in Section 5.4 of this SAP/QAPP.

9.2 LABORATORY QUALITY CONTROL CHECKS

Laboratory QC checks are accomplished through analyzing initial and continuing calibration samples, method blanks, surrogate spikes, laboratory control samples (LCS), and laboratory duplicate samples. Method-specific QC samples are described in the laboratory SOPs and summarized in Table B.7.

9.2.1 Initial and Continuing Calibration

Laboratory instrument calibration and maintenance requirements are discussed in Section 8.2.

9.2.2 Method Blanks

Method blanks are used to check for laboratory contamination and instrument bias. Laboratory method blanks will be analyzed at a minimum frequency of 5 percent or one per analytical batch for all chemical parameter groups.

Quality control criteria require that no contaminants be detected in the blank(s) at concentrations greater than or equal to the method reporting level. If a chemical is detected, the action taken will follow the laboratory SOPs as modified with project-specific procedures. Blank samples will be analyzed for the same parameters as the associated field samples.

9.2.3 Surrogate Spikes

Accuracy of an analytical measurement is evaluated by using surrogate spikes. Surrogate compounds are compounds not expected to be found in environmental samples; however, they are chemically similar to several compounds analyzed in the methods and behave similarly in extracting solvents. Samples for organics analysis will be spiked with surrogate compounds consistent with the requirements described in the laboratory SOPs.

Percent recovery values of surrogates are calculated concurrently with the analytes of interest. Since sample characteristics will affect the percent recovery, the percent recovery value is a measure of accuracy of the overall analytical method on each individual sample.

9.2.4 Laboratory Control Samples

LCS are used to monitor the laboratory's day-to-day performance of routine analytical methods, independent of matrix effects. The LCS is prepared by spiking reagent water with standard solutions prepared independently of those used in establishing instrument calibration. The LCS are extracted and analyzed with each batch of samples. Results are compared on a per-batch basis to established control limits and are used to evaluate laboratory performance for precision and accuracy. Laboratory control samples may also be used to identify any background contamination of the analytical system that may lead to the reporting of elevated concentration levels or false-positive measurements.

9.2.5 Laboratory Duplicate Samples

Precision of the analytical system is evaluated by using laboratory duplicates. Laboratory duplicates are two portions of a single homogeneous sample analyzed for the same parameter. Laboratory duplicates are prepared and analyzed with project samples.

10.0 Data Reduction, Validation, and Reporting Methods

The process of data reduction, review, and reporting is applicable to all aspects of the project (field activities, laboratory analyses, and analytical data review) and is required for both technical and managerial data. All data generated through field activities, or by the laboratory operation shall be reduced and validated prior to reporting. The following sections describe the process of handling data in terms of data generation, checking, and formatted reports for both field sampling and laboratory analysis data.

10.1 DATA REDUCTION

Data, both field and laboratory generated, are reduced either manually on calculation sheets or by computer on formatted printouts. Responsibilities for the data reduction process are delegated as follows:

- Technical personnel will document and review their own work and are responsible for the correctness of the work.
- Major calculations will receive a method and calculation check by a secondary reviewer prior to reporting (peer review).
- The Laboratory QA Officer will be responsible for ensuring that data reduction is performed according to protocols discussed in this SAP/QAPP.

10.2 IN-LABORATORY DATA REDUCTION AND VERIFICATION

All data generated by the laboratory will be reviewed prior to data release. ARI Laboratory Quality Assurance Program indicates that 100 percent of the data generated by ARI undergo four levels of review. The levels of review consist of analyst, peer, supervisory, and administrative review. Additionally Quality Assurance Personnel review 10 percent or more of the completed packages for accuracy, overall compliance, and completeness.

10.3 LABORATORY DATA REPORTING

Data deliverables will be submitted to Floyd Snider for verification and validation, as appropriate. A summary laboratory data package along with data available electronically will be submitted to Floyd Snider for each analytical batch. Data deliverables will include:

- Cover letter/case narrative which identifies the laboratory analytical batch number; matrix and number of samples included, analyses performed, and analytical methods used. Cover letter will also summarize any anomalies or discrepancies with the analytical data.
- Holding time (dates sampled, received, extracted, and analyzed) will be clearly specified.
- Tabulated sample analytical results with units, data qualifiers, sample volume, dilution factor, laboratory batch and sample number, and sample identification.
- Compound quantitation and reported detection limits.

- Blank summary results.
- MS/MSD result summaries with calculated percent recovery and relative percent difference values.
- LCS results when performed, with calculated percent recovery value.
- Duplicate analyses (laboratory duplicates).
- Data qualifiers assigned by the laboratory.

ARI will provide an electronic data deliverable in the format specified by Floyd|Snider.

10.4 DATA REVIEW

The QA Officer or designated representative will perform a Level I data review on all analytical data reports. A Level I data review process includes a review of sample analysis using USEPA's Functional Guidelines for Organic Data Review (USEPA 1999 and 2007) as guidance, specific method criteria, and professional judgment to assess that data quality objectives are met.

Technical review requires comparison of quality control (QC) to the required control limits. The following QC elements will be reviewed (as appropriate):

- Compliance with the SAP/QAPP
- Proper sample collection and handling procedures
- Holding times and sample receipt conditions
- Reviewing the laboratory data package for transcription errors, misidentifications, or miscalculations
- Cover letter
- Chain-of-custody and cooler receipt forms.
- Compound quantitation and reported detection limits.
- Blank summary results (e.g., method or trip)
- Surrogate percent recovery values
- Duplicate analyses (laboratory duplicates and MS/MSDs)
- Matrix spike and matrix spike duplicate
- Field QC results
- Assessing the reliability of data based on quality control sample results.
- Data qualifiers assigned by the laboratory
- Data completeness and format
- Overall assessment of data for the project.

The data quality review process for this project will follow the procedures in USEPA's Functional Guidelines (USEPA 1999 and 2007), as appropriate, but applicable to SW846, this QAPP, method SOPs, and professional judgment.

Qualifiers applied to the data as a result of the independent review will be limited to:

U The analyte was analyzed for but was not detected above the sample-specific reporting limit.

J The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample.

UJ The analyte was not detected above the sample reporting limit. However, the reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

10.5 DATA REVIEW REPORTING

Results of the QA review and/or validation will be included in a data quality review report, which will provide a basis for meaningful interpretation of the data quality and evaluate the need for corrective actions and/or comprehensive data validation. This report will be used to generate the quality control summary report. The QA review reports will be submitted to the Floyd|Snider Project Manager 30 days after receipt of all laboratory data.

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11.0 Performance and System Audits

Performance and systems audits may be conducted to determine that sampling and analysis are performed in accordance with SAP/QAPP-specified requirements. The project QA/QC Officer is responsible for initiating audits and overseeing audit implementation and, if necessary, corrective actions.

11.1 DATA QUALITY AUDITS (INDEPENDENT DATA VALIDATION)

Data generated by the laboratory undergoes a Level I verification by the QA Officer, designated staff, or consultant. Laboratory data will be evaluated for compliance with data quality objectives, and with procedural requirements contained in this QAPP. The detailed scope of this validation is presented in Section 10.0, Data Reduction, Validation, and Reporting Methods.

11.2 LABORATORY AUDITS

ARI Laboratory is certified by Ecology and the State of Washington Department of Health to perform the methods listed in this QAPP. ARI also participates in the USEPA Contract Laboratory Program (CLP), and multiple performance evaluation programs and is subject to the quality control requirements and audits of these programs. For this reason, no laboratory audit is currently planned. If a problem is identified, a systems or performance audit of the laboratory will be conducted, if warranted, in order to identify and correct specific problems.

11.3 FIELD AUDITS

Field audits will be conducted if the Project QA Officer identifies the need.

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12.0 Preventative Maintenance

Field and laboratory instrumentation are examined and tested prior to being put into service and are to be maintained according to the manufacturer's instructions. Sampling personnel will maintain a supply of typical maintenance replacement items available in the field to help prevent downtime because of equipment malfunctions. Examples of typical equipment maintenance items may include but not be limited to batteries, filters, tubing, fittings, sample containers, and calibration standards.

12.1 FIELD INSTRUMENTS

All instruments will be maintained according to manufacturer's instructions.

12.2 LABORATORY INSTRUMENTS

All laboratory instruments will be maintained according to manufacturers' instructions as specified in ARI's Quality Assurance Plan dated January 4, 2008.

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13.0 Corrective Actions

The Floyd|Snider and EPI Project Managers are responsible for maintaining quality throughout the compliance monitoring. The day-to-day responsibility for assuring the quality of field and laboratory data rests with the Field Investigation Manager, project QA/QC Officer, and the Laboratory Quality Assurance Officer.

Any nonconformances with the established QC procedures will be expeditiously identified and controlled. Where procedures are not in compliance with the established protocol, corrective actions will be taken immediately. Subsequent work which depends on the nonconforming activity will not be performed until the identified nonconformance is corrected.

Analytical and equipment problems may occur during sampling and sample handling, sample preparation, laboratory analysis, and data review. For noncompliance problems, a formal corrective action program is determined and implemented at the time the problem is identified. Corrective actions will be implemented and documented accordingly.

13.1 FIELD CORRECTIONS

The initial responsibility for monitoring the quality of field measurements lies with the field personnel. Each technical staff member is responsible for verifying that all QC procedures are followed. The technical staff member assesses the correctness of the field methods and the ability to meet QA objectives. If a problem occurs that might jeopardize the integrity of the project or cause some quality assurance objective not to be met, the technical staff member will notify the QA Officer. The QA Officer will notify the Project Manager or the analytical laboratory QA Officer, as appropriate. Corrective measures will be determined and implemented. The technical staff member will document the problem, the correction, and the results.

13.2 LABORATORY CORRECTIONS

The need for correction(s) in the analytical laboratory may come from several sources: equipment malfunction, failure of internal QA/QC checks, method blank contamination, or failure of performance or system audits; and/or noncompliance with QA requirements. When measurement equipment or analytical methods fail QA/QC checks, the problem should be immediately brought to the attention of the appropriate Laboratory QA Officer and other persons in the laboratory in accordance with the laboratory's SOP. Any limitation in data quality due to analytical problems will be identified within 48 hours and brought to the attention of the EPI or Floyd|Snider Project Manager. The laboratory will demonstrate that they tried corrective actions, as recommended in the applicable methods, to deal with non-conformance. Corrective actions will be discussed in the cover letter and data validation report.

13.3 RECONCILIATION WITH USER REQUIREMENTS

The project QC Officer and EPI or Floyd|Snider Project Manager review the field and laboratory data generated for this project to ensure that all project quality assurance objectives are met. If any nonconformances are found in the field procedures, sample collection procedures, field

documentation procedures, laboratory analytical and documentation procedures, and data evaluation and quality review procedures, the impact of those nonconformances on the overall project QA objectives will be assessed. Appropriate actions, including resampling and reanalysis, may be recommended to the Floyd|Snider, EPI, SSA, and Ecology Project Managers so that the project objectives can be accomplished.

14.0 Quality Control Reports

After the field work and the final analyses have been completed and reviewed, a final quality control summary report is prepared by the project QA Officer. The report summarizes the QA and audit information, indicating any corrective actions taken and the overall results of SAP/QAPP compliance. Analytical data quality review involves checking the laboratory data package against criteria established in the SAP/QAPP as described in Section 10.0. The quality control summary report is to be included in the central project file and incorporated as part of the semi-annual or final report.

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15.0 References

U.S. Environmental Protection Agency (USEPA). 1999. *USEPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review*. EPA-540/R-99/008. October.

U.S. Environmental Protection Agency (USEPA). 2003. National Environmental Laboratory Accredidation Conference (NELAC) Standard. EPA/600/R-04/003. 1 July.

U.S. Environmental Protection Agency (USEPA). 2007. *USEPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review*. EPA-540/R-07/003. July.

Tables

Table B.1
Screening Levels for Volatile Organic Compounds and Semivolatile Organic Compounds in Groundwater

Constituent	CAS Number	Method	Shallow Aquifer Monitoring Well Target Concentrations[1] (µg/L)	Intermediate Aquifer Target Concentrations for On-site Monitoring Wells[1] (µg/L)	Intermediate Aquifer Target Concentrations for Off-site Monitoring Well[1] (µg/L)
Volatile Organic Compounds					
Tetrachloroethene	127-18-4	USEPA 8260B	7.0E+02	1.5E+05	4.0E+02
Trichloroethene	79-01-6		1.0E+02	2.4E+04	2.0E+02
Vinyl Chloride	75-01-4		2.7E+02	1.9E+04	6.5E+03
Semivolatile Organic Compounds					
2-Chlorophenol	95-57-8	USEPA 8270D	1.2E+04	2.0E+04	6.8E+03
2,3,4,6-Tetrachlorophenol	58-90-2		2.8E+03	2.0E+04	1.9E+03
2,4-Dichlorophenol	120-83-2		2.1E+03	2.0E+04	2.3E+03
2,4,6-Trichlorophenol	88-06-2		1.3E+04	2.0E+04	5.0E+03
Pentachlorophenol	87-86-5		2.0E+04	2.0E+04	5.6E+03

Notes:
1 Refer to Compliance Monitoring and Contingency Plan for further information on target concentrations.
MTCA Model Toxics Control Act

Table B.2
Sample Types Used to Evaluate Data Quality

Data Quality Indicator	Field and Laboratory Quality Assurance Sample Type
Precision	Field Duplicate
	Laboratory Duplicate
	Matrix Spike Duplicate
Accuracy	Matrix Spike
	Surrogate Spike
	Laboratory Control Sample
	Trip Blank
	Method Blank
Representativeness	Trip Blank
	Method Blank
	Chain of Custody
	Holding Times
Comparability	Method Detection Limits
	Method Reporting Limits
	Sample Collection Methods
	Laboratory Analytical Methods
Completeness	Data Qualifiers
	Laboratory Deliverables
	Requested / Reported Results

Table B.3
Accuracy, Precision, and Completeness Guide

Constituent	Method	Laboratory Control Sample Accuracy[1,2] (% Recovery)	Matrix Spike Sample Accuracy[3] (% Recovery)	Precision (Duplicate or MS/MSD)	Completeness
Volatile Organic Compounds[1]					
Tetrachloroethene	USEPA 8260B	80-124	80-124	30%	90%
Trichloroethene		80-117	80-117	30%	90%
Vinyl Chloride		53-132	53-132	30%	90%
Semivolatile Organic Compounds[1]					
2-Chlorophenol	USEPA 8270D	54-102	54-102	30%	90%
2,3,4,6-Tetrachlorophenol		30-160	30-160	30%	90%
2,4-Dichlorophenol		50-112	50-112	30%	90%
2,4,6-Trichlorophenol		44-116	44-116	30%	90%
Pentachlorophenol		34-126	34-126	30%	90%

Notes:

Accuracy data for VOCs and SVOCs obtained from ARI website, March 2008. ARI uses default limits of 30-160% recovery and 30% RPD for all organic non-Contract Laboratory Program analyses. Accuracy data (i.e., LCS, surrogates) are subject to periodic updates.

1 VOC LCS data collected between 8/1/07 and 11/15/07. SVOC LCS data (liquid-liquid extract) collected between 1/1/07 and 12/1/07 . VOC and SVOC LCS control limits were effective 1/3/08 and 1/24/08 respectively and are subject to periodic updates.

2 Marginal exceedances as defined in the NELAC Standard (USEPA 2003) where percent recovery values are outside LCS control limits but within marginal exceedance limits (3 or 4 standard deviations around the mean). Three marginal exceedances are considered acceptable.

3 Use LCS data for evaluating matrix spike percent recovery values. The LCS criteria should be used as advisory control limits.

ARI Analytical Resources, Inc.

LCS Laboratory control sample

MS/MSD Matrix spike/matrix spike duplicate

NELAC National Environmental Laboratory Accreditation Conference

RPD Relative percent difference

SVOC Semivolatile organic compound

USEPA U.S. Environmental Protection Agency

VOC Volatile organic compound

Table B.4
Method Detection Limits and Method Reporting Limits

Constituent	Method	Method Detection Limit[1] (µg/L)	Method Reporting Limit[1] (µg/L)
Volatile Organic Compounds			
Tetrachloroethene	USEPA 8260B	0.053	0.2
Trichloroethene		0.043	0.2
Vinyl Chloride		0.119	0.2
Semivolatile Organic Compounds			
2-Chlorophenol	USEPA 8270D	0.324	1
2,3,4,6-Tetrachlorophenol		NA	5
2,4-Dichlorophenol		1.661	5
2,4,6-Trichlorophenol		1.65	5
Pentachlorophenol		0.497	3

Notes:

1 Detection limit data for analytical parameters obtained from ARI website, June 2008. MDLs and MRLs are updated periodically. MDL studies are performed in accordaince with 40 CFR Part 136, Appendix B, using seven degrees of freedom.

ARI Analytical Resources, Inc.

MDL Method detection limit

MRL Method reporting limit

NA Not analyzed

USEPA U.S. Environmental Protection Agency

Table B.5
Container, Preservation, and Holding Time Requirements

Parameter	Matrix	Method	Container	Preservation	Maximum Holding Time
Field Screening					
pH	Water	Refer to Section 5.3	Field analysis	None	Analyze immediately
Temperature				None	
Specific Conductance				None	
Dissolved Oxygen				Avoid contact with air	
Oxidation-reduction Potential				Avoid contact with air	
Fixed Laboratory Analysis					
Volailte organic compounds	Water	USEPA 8260B	(3) 40-ml VOA vials with Teflon-lined septa without headspace	Cool to 4°C, HCl to pH < 2	14 days with pH ≤ 2[1]
Semivolatile organic compounds		USEPA 8270D	(2) 500-ml amber glass jars	Cool to 4°C	7 days to extraction, 40 days to analyze extract

Notes:

1 7 days without preservative.
HCl Hydrochloric acid
USEPA U.S. Environmental Protection Agency
VOA Volatile organic analysis

Table B.6
Estimated Number of Groundwater Samples per Sampling Event

Parameter	Method	Shallow Aquifer Primary Samples	Intermediate Aquifer Primary Samples	Field Duplicate (10%)	MS/MSD (5%)	Trip Blank (5%)[1]	Estimated Total
Volatile organic compounds	USEPA 8260B	12	10	2	1	2 to 3	27 to 28
Semivolatile organic compounds	USEPA 8270D	12	10	2	1	0	25

Notes:

1 One set of trip blanks is required for each day of sampling during the sampling event. Estimated sampling event duration is 2 to 3 days.

MS/MSD Matrix spike/matrix spike duplicate

USEPA U.S. Environmental Protection Agency

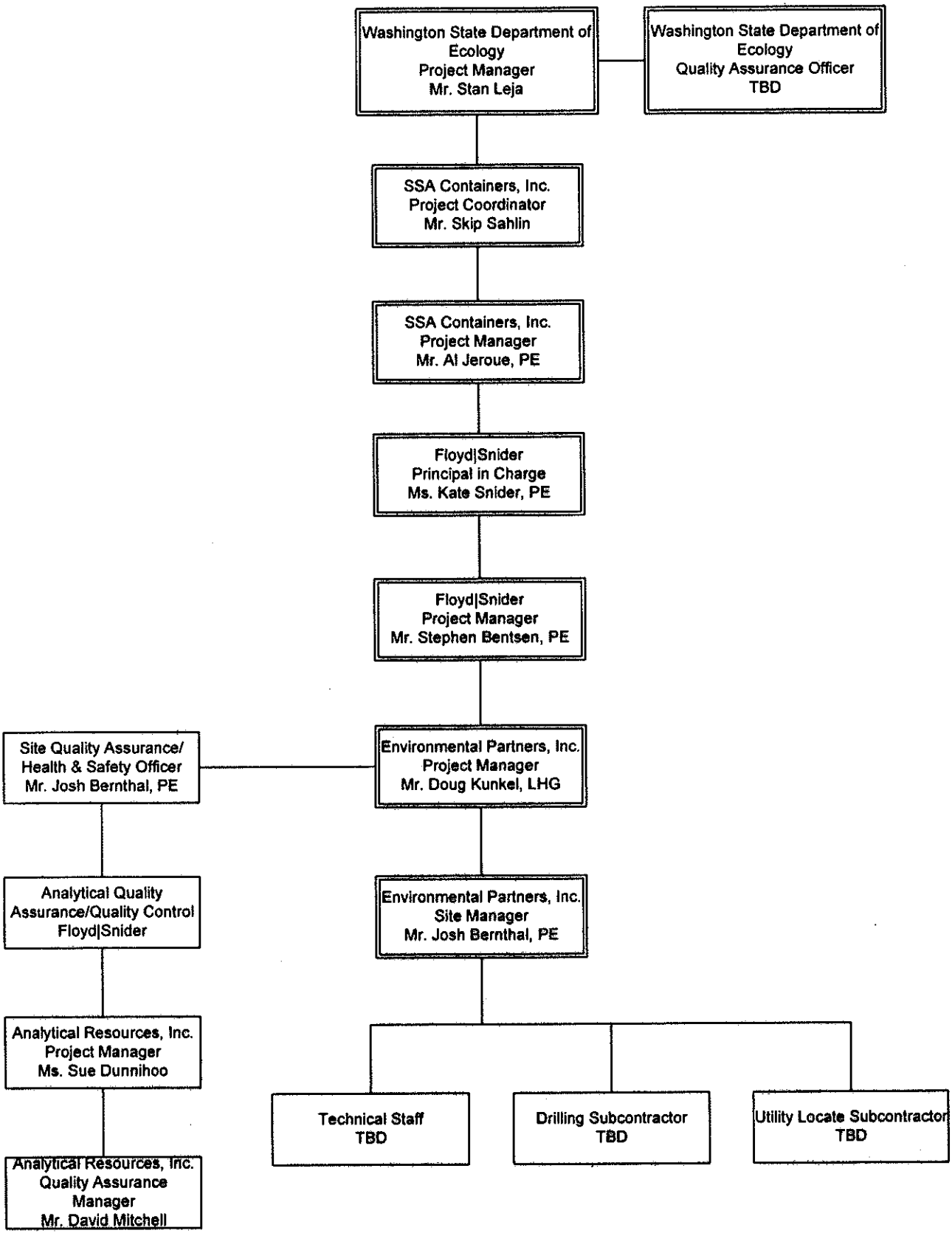
Table B.7
Laboratory Quality Assurance/Quality Control Sample Summary

Parameter	Method	Method Blanks	MS/MSD	LCS	Surrogate
Volatile organic compounds	USEPA 8260B	1/batch	5%	1/batch	All samples
Semivolatile organic compounds	USEPA 8270D	1/batch	5%	1/batch	All samples

Notes:

1 Blank spike may substitute for matrix spike data.
LCS Laboratory control sample
MS/MSD Matrix spike/matrix spike duplicate
USEPA U.S. Environmental Protection Agency

Figures



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Compliance Monitoring and Contingency Plan
Reichhold/SSA Containers Facility
Tacoma, Washington

Figure B.1
Organizational Chart

Reichhold/SSA Containers Facility
Tacoma, Washington

Consent Decree

Exhibit C
Environmental Covenant

Environmental Covenant

After Recording Return to:
Stan Leja
Department of Ecology – Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Environmental Covenant

Grantor: SSA Tacoma, Inc.
Grantee: State of Washington, Department of Ecology
Legal: Lots 1 and 2 of Short Plat 8308190230, Pierce County, Washington
Tax Parcel Nos.: 0321355005, 0321355006
Cross Reference: None

Grantor, SSA Tacoma, Inc., hereby binds Grantor, its successors and assigns to the land use restrictions identified herein and grants such other rights under this environmental covenant (hereafter "Covenant") made this __ day of _____, _____ in favor of the State of Washington Department of Ecology and its successors and assigns (Ecology). Ecology will have full right of enforcement of the rights conveyed under this Covenant pursuant to the Model Toxics Control Act, RCW 70.105D.030(1)(g), and the Uniform Environmental Covenants Act, 2007 Wash. Laws ch. 104, sec. 12.

This Declaration of Covenant is made pursuant to RCW 70.105D.030(1)(f) and (g) and WAC 173-340-440 by SSA Containers, Inc., its successors and assigns, and Ecology.

A remedial action (hereafter "Remedial Action") occurred at the property that is the subject of this Covenant. The Remedial Action conducted at the property is described in the Cleanup Action Plan for the Reichhold/ SSA Containers Facility dated December 16, 2008 and its attachments. These documents are on file at Ecology's Southwest Regional Office.

This Restrictive Covenant is required to ensure that groundwater is not used for drinking water and future use of the Property is limited to industrial use.

The undersigned, SSA Tacoma, Inc., is the fee owner of real property (hereafter "Property") in the County of Pierce, State of Washington, that is subject to this Covenant. The

Property is legally described in Attachment A of this Covenant and made a part hereto by reference.

SSA Tacoma, Inc. makes the following declaration as to limitations, restrictions, and uses to which the Property may be put and specifies that such declarations will constitute covenants to run with the land, as provided by law and will be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Property (hereafter "Owner").

Section 1.

1. The Property will be used only for traditional industrial uses, as described in RCW 70.105D.020(23) and defined in and allowed under the County of Pierce's zoning regulations codified in the Pierce County Development Regulations - Zoning as of the date of this Restrictive Covenant.

2. No groundwater may be taken for drinking water purposes from the Property.

Section 2. The Owner must restrict leases to uses and activities consistent with the Covenant and notify all lessees of the restrictions on the use of the Property.

Section 3. The Owner must notify and obtain approval from Ecology prior to any use of the Property that is inconsistent with the terms of this Covenant. Ecology may approve any inconsistent use only after public notice and comment.

Section 4. The Owner will allow authorized representatives of Ecology the right to enter the Property at reasonable times for the purpose of evaluating the Remedial Action; to take samples, to inspect remedial actions conducted at the property, to determine compliance with this Covenant, and to inspect records that are related to the Remedial Action.

Section 5. The Owner of the Property reserves the right under WAC 173-340-440 to record an instrument that provides that this Covenant will no longer limit use of the Property or be of any further force or effect. However, such an instrument may be recorded only if Ecology, after public notice and opportunity for comment, concurs.

SSA TACOMA, INC.

_____
Edward DeNike
President

Dated: _____

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

_____
[Name of Person Acknowledging Receipt]
[Title]

Dated: _____

STATE OF _____
COUNTY OF _____

On this _____ day of _____, 20__, I certify that _____ personally appeared before me, acknowledged that **he/she** is the _____ of the corporation that executed the within and foregoing instrument, and signed said instrument by free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that **he/she** was authorized to execute said instrument for said corporation.

_____
Notary Public in and for the State of Washington, residing at

_____.
My appointment expires_____.

Exhibit A
Legal Description

Lots 1 and 2 of Pierce County Short Plat, as recorded August 19, 1983 under Recording No. 8308190230, records of Pierce County Auditor;

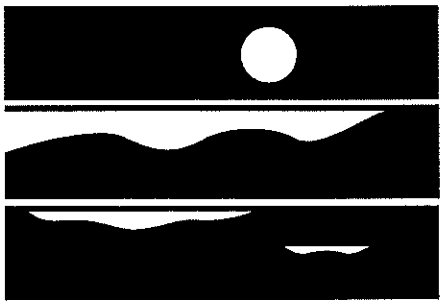
Situate in the City of Tacoma, County of Pierce, State of Washington.

Reichhold/SSA Containers Facility
Tacoma, Washington

Consent Decree

Exhibit D
Public Participation Plan

EXHIBIT D



WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Reichhold/SSA Containers Facility

PUBLIC PARTICIPATION PLAN
FOR
CONSENT DECREE AND CLEANUP ACTION PLAN

September 2008

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1.0 INTRODUCTION AND OVERVIEW OF THE PUBLIC PARTICIPATION PLAN

1.1 Public Participation at Hazardous Waste Sites

Public participation is an integral element of the Model Toxics Control Act (MTCA), Chapter 70.105D Revised Code of Washington (RCW). The citizen-mandated hazardous waste cleanup law went into effect in March 1989. The implementing regulation, found in Chapter 173-340 of the Washington Administrative Code (WAC), prescribes the process and standards to identify, investigate, and clean up facilities where hazardous substances may be located. The law and associated regulations for implementation include requirements and guidelines for involving the public in the investigation and cleanup of hazardous waste sites.

Under WAC 173-340-600 (9) of the regulations, a Public Participation Plan (PPP) is required for sites undergoing investigation and cleanup of hazardous substances that are conducted under the Washington Department of Ecology (Ecology) or its oversight. The plan must be updated for each new phase of work at the site.

The PPP is a document designed to provide a process for meaningful public participation during the technical studies and cleanup of a site. While certain aspects of the plan are prescribed by regulation, PPPs are developed to meet the needs of a specific community and to encourage participation by members of the community. This PPP addresses public participation in the cleanup of the Reichhold/SSA Containers Facility (Facility).

The property owned by SSA Containers, Inc. (SSA) is composed of approximately 52 acres in the Commencement Bay industrial area located at 3320 Lincoln Avenue in Tacoma, Washington, between the Hylebos and Blair Waterways. The property is targeted for future use as a marine cargo facility in the Port of Tacoma's Master Plan for the East Blair Terminal. SSA plans to redevelop the property into a paved industrial facility related to marine cargo handling consistent with neighboring uses and designated zoning. Significant cleanup has been conducted at the site over the past 10 years by Reichhold Chemical (Reichhold) and SSA. SSA will complete cleanup requirements prior to development of the site.

1.2 Goal of this Public Participation Plan

The goal of this plan is to promote public understanding of the cleanup regulations and process and to encourage the public's meaningful participation in achieving a cleanup that is protective of human health and the environment. The actions in this plan will provide a channel for the public to be notified of, comment on, and assist in the cleanup process for the Facility.

The main objectives of this plan are to:

a) promote public understanding of the cleanup and meaningful participation in the cleanup process,

b) ensure that the public will be appropriately informed of the status of cleanup activities for the existing site conditions and of cleanup actions that would be a component of future development at the Facility,
c) solicit and respond to community concerns, questions, and comments during cleanup actions scheduled to take place.

1.3 Public Participation for the Selection of Cleanup Actions

This PPP has been prepared by Ecology, with assistance from SSA Containers and their environmental consultant, Floyd|Snider. The PPP is an exhibit to a Consent Decree that sets forth the legal agreements that SSA and Ecology will follow during the cleanup of the Facility. The Consent Decree contains several exhibits, as summarized below.

Documents that are presented for public comment are listed below and defined in detail in the paragraphs that follow.

- Consent Decree
- Cleanup Action Plan
- Public Participation Plan
- Compliance Monitoring and Contingency Plan
- State Environmental Policy Act (SEPA) Determination of Non-significance and associated SEPA Checklist
- Focused Feasibility Study
- Focused Remedial Investigation

These documents must be available for public comment for 30 days. *(Refer to Section 4.0 of this PPP for the methods for obtaining public comment on these documents.)*

The **Consent Decree** is a legal contract signed by Ecology and the Potentially Liable Party (PLP) that contain the agreements to perform the cleanup actions.

A **Cleanup Action Plan (CAP)** is a document prepared under WAC 173-340-360 that specifies cleanup standards, cleanup actions and other cleanup requirements. The CAP sets the cleanup standards and selects a cleanup action that meets those cleanup standards for the Facility.

The Facility will be developed for marine industrial use as a portion of the planned Puyallup Tribal Terminal. SSA and the Puyallup Tribe of Indians reached an agreement that following completion of the cleanup actions and property development, the property will be transferred into long-term Tribal ownership. Property development will be coordinated with implementation of final cleanup actions and will allow for long-term environmental monitoring. The CAP presents the selected final cleanup actions and associated monitoring that are protective of human health and the environment, and compatible with future site use.

Cleanup actions address soil and groundwater, direct contact exposure to humans, and administrative reporting and monitoring requirements.

The CAP includes a scope of work and schedule which describes the specific activities required by the CAP that will be completed and their schedules for completion. The scope of work and schedule for the Facility includes cleanup activities for existing site conditions and the process for coordinating SSA and Ecology reviews and approvals associated with cleanup action components for the future site development and use.

The **Public Participation Plan (PPP)** is mandated by law and is prepared to encourage coordinated, effective, and meaningful public involvement. The PPP is customized to meet the needs of the "potentially affected vicinity" or the public who are impacted by the contamination at a site and the cleanup of that contamination. The plan describes the activities that Ecology and/or the PLP will conduct to make sure that the concerns of any public entities are addressed and that citizens are able to be informed and to meaningfully participate in the cleanup activities. In these customized plans, public involvement activities are selected to effectively address the concerns of the public.

The **Compliance Monitoring and Contingency Plan (CMCP)** describes long-term groundwater monitoring requirements and contingency plans to ensure that on-site groundwater continues to remain at concentrations that do not pose a risk to the nearby surface water bodies.

A **SEPA Determination of Non-significance** has been issued based on a SEPA checklist prepared for the CAP. SEPA determinations are required on all proposed cleanup actions. Ecology is the lead SEPA agency for these proposed cleanup actions and has evaluated potential adverse impacts to the environment from these actions. The determination at this time is that there are no significant potential adverse impacts to the environment due to the proposed cleanup actions.

The **Focused Feasibility Study (FFS)** presents information on the nature and extent of contamination and outlines the feasible alternatives for cleaning up the Facility for the current existing conditions. The rationale for the choice of cleanup actions outlined in the cleanup action plan is contained in this document. The FFS updates cleanup levels, evaluates remedial alternatives, and identifies preferred alternatives for cleanup of soil and groundwater at the Facility. The comprehensive preferred alternative for final cleanup action is put forward in this document.

The **Focused Remedial Investigation (FRI)** was conducted to investigate releases and evaluate compliance with applicable regulatory standards. In July 2006, Ecology approved the FRI report for the Facility. The FRI defined the cleanup levels for surface water, groundwater, and soil, and compares existing concentrations to those cleanup levels to determine compliance. The results of these tasks were re-evaluated in the FFS to reflect the most current soil cleanup levels, groundwater source area target concentrations, and surface water criteria.

2.0 SITE BACKGROUND

Reichhold operated a manufacturing facility on the property that produced chemical and chemical-related products including pentachlorophenol, urea-formaldehyde resins, calcium chloride solution, treated fiber products, and a formaldehyde catalyst between 1956 and 1990. Reichhold worked with Ecology and the U.S. Environmental Protection Agency (USEPA) Region 10 beginning in 1986 to investigate, begin remediation, and permit the Facility for further cleanup action. As noted in the Resource Conservation and Recovery Act (RCRA) Permit, Reichhold has conducted numerous investigations since that time, including a RCRA Facility Assessment and RCRA Facility Investigation. Attachment 1 to Agreed Order No. 1578 includes a description of the manufacturing facility, its historic manufacturing operations, and the cleanup activities completed to date under the RCRA Corrective Action Program.

Effective July 30, 2004, the regulatory guidelines for implementing corrective action activities at the Facility include Dangerous Waste Management Permit for Corrective Action No. WAD009252891 (the DWM Permit) granted by Ecology to Reichhold, and Agreed Order Nos. 1577 and 1578 between Ecology and Reichhold. The DWM Permit and associated Agreed Orders replaced the RCRA Storage and Corrective Action Permit issued by the USEPA Region 10 that had been in effect since December 4, 1988. The USEPA delegated authority for final RCRA corrective actions to Washington State in 1997.

To satisfy corrective action under WAC 173-303-646 and in accordance with Agreed Order No. 1577, a FRI and FFS are required. The final FRI was completed by Reichhold in April 2006 and approved by Ecology on July 26, 2006. The FFS Work Plan was completed by SSA in March 2007 and was approved by Ecology on June 21, 2007.

Through the DWM Permit, Ecology and SSA have also entered into Agreed Order No. 1578. Under the requirements of this order a Corrective Action Management Unit (CAMU) was established at the Facility through an interim action to facilitate final remedial action. A CAMU is an area designated by Ecology pursuant to WAC 173-303-646(4), (5), and (6) for the purpose of implementing the corrective action requirements of WAC 173-303-646(2). A CAMU may be used only for the management of remediation wastes pursuant to implementing such corrective action requirements at the Facility. SSA operates the CAMU as approved by Ecology and in accordance with the requirements of WAC 173-340.

By facilitating a final cleanup under MTCA, Chapter 17.105D RCW, the CAMU helps to satisfy the corrective action requirements under WAC 173-303-646. In accordance with the requirements of WAC 173-340-430(3)(b), the creation of the CAMU can be incorporated into a final remedial action at the Facility and does not foreclose reasonable alternatives for any additional corrective action at the Facility.

In the 1988 RCRA Storage and Corrective Action Permit issued to Reichhold by USEPA, interim actions provided for source area cleanup, and containment and treatment of groundwater. Source area removal actions include the following:

- Excavation of impacted soil from the former Pentachlorophenol Plant Area (PPA) in 1996.
- Excavation of impacted soil from the North Extension Area in 1996.
- Excavation of impacted soil from the Off-site Drum Storage Area and the Septic Tank and Leach Field.
- Excavation of over 23,000 cubic yards of impacted soil from the Construction Debris Area (CDA) in 2002.
- Excavation of impacted soil from the PPA in 2002.

The excavated soil was either placed in the soil treatment cells for biological treatment on-site or disposed of off-site at an approved facility.

The interim actions implemented by Reichhold achieved a significant reduction in the constituents of concern in all media. SSA continues to operate the interim hydraulic containment system for shallow and intermediate groundwater and meet regulatory requirements.

Treated water is discharged to the Blair Waterway under the conditions of National Pollutant Discharge Elimination System Waste Discharge Permit No. WA0040771 (NPDES Permit), issued to Reichhold on May 11, 2004 and effective July 1, 2004. The NPDES Permit was modified to reflect SSA's ownership of the property on July 12, 2006 and expires June 30, 2009. In addition to governing discharge of treated groundwater through Outfall RC-1, the NPDES Permit also governs discharge of stormwater to Lincoln Avenue Ditch through Outfall RC-2.

The Facility will be developed for marine industrial use as a portion of the planned Puyallup Tribal Terminal. In early 2008, SSA and the Puyallup Tribe of Indians reached agreement that following completion of cleanup actions and property development, the property will be transferred into long-term Tribal ownership.

The completed draft CAP and related documents, including this Public Participation Plan, are being issued for public comment.

3.0 COMMUNITY BACKGROUND

The Facility is located in the middle of the Blair Penninsula, within the Port of Tacoma (Port) industrial area between the Blair and Hylebos waterways. The current zoning classification of the property is Port Maritime and Industrial (PMI) and the comprehensive plan designation of the site is as a high intensity Manufacturing/Industrial Center. Land Use on the peninsula is completely industrial and is composed of Port facilities, manufacturing, industrial and warehouse uses.

There are several properties in the area undergoing cleanup through Ecology and USEPA programs. In the late 1980s, the Port conveyed adjacent properties to the Puyallup Tribe of Indians, for purpose of development into marine industrial uses. The local community affected by actions on the Facility is completely industrial, not residential.

Previous cleanup actions at the Reichhold/SSA Containers Facility have included public participation processes. For those actions, community members from neighboring residential communities have not expressed concern, as the property is located in a fully industrial area.

The public participation process will include a public notice that will be distributed to all businesses and residents within a ¼-mile radius of the Facility. Additionally, as further described in Section 4.0, a public notice will be placed in the newspaper and a notification of the project and the public comment period will be placed on the radio.

4.0 PUBLIC PARTICIPATION ACTIVITIES

4.1 Introduction

The following items are to provide the public with the opportunity to access information during the cleanup of the Facility and have meaningful participation for cleanup activities related to existing conditions. The activities listed here are required by law, offered by the City of Tacoma, or requested by the citizens.

4.2 Public Contacts

Department of Ecology

- Stan Leja, Site Manager/Citizen Technical Advisor
  300 Desmond Drive SE
  Lacey, WA 98503
  (360) 407-6345
  slej461@ecy.wa.gov

- Nancy Farman, Public Involvement Coordinator
  300 Desmond Drive SE
  Lacey, WA 98503
  (360) 407-0272
  nfar461@ecy.wa.gov

SSA Containers, Inc.

- Al Jeroue, Site Manager
  3320 Lincoln Avenue
  Tacoma, WA 98421
  (253) 627-0406
  al.jeroue@ssamarine.com

- Skip Sahlin, Assistant Vice President
  1131 S.W. Klickitat Way
  Seattle, WA 98134
  (206) 654-3510
  skip.sahlin@ssamarine.com

4.3 Ecology Activities and Responsibilities

4.3.1 Public Comment Period

The public comment period of 30 days will take place from October 13, 2008 to November 12, 2008. Comment will be taken on the following documents:

- Consent Decree

- Cleanup Action Plan
- Public Participation Plan
- Compliance Monitoring and Contingency Plan
- SEPA Determination of Non-significance and associated SEPA Checklist
- Focused Feasibility Study
- Focused Remedial Investigation

4.3.2 Public Notice of the Comment Periods

Public notice of the comment periods will be given, using the following methods:

- A **fact sheet** describing the activity and how the public may comment. The fact sheet will be mailed to all addressees on the Ecology mailing list. The list contains residents and property owners of the area and other interested community members.
- A **public notice** will be placed in the Tacoma News Tribune.
- A **public notice** will be published in Ecology's Site Register.
- A **public notice** will be published in Ecology's SEPA Register.
- A radio advertisement describing the project will be aired.

4.3.3 Information Repositories

Relevant documents will be located at the following locations for community access:

- **Department of Ecology Southwest Regional Office**
  300 Desmond Drive SE
  Lacey, WA 98503
  (360) 407-6300
  - ❖ All major documents and complete project records
  - ❖ Weekdays 8 a.m. to 5 p.m.

4.3.4 Responsiveness Summary

A responsiveness summary will be prepared following the public comment period that addresses the comments. The responsiveness summary will be available at the information repositories listed above.

4.4 Ecology Activities and Responsibilities

4.4.1 Website

Ecology currently has an existing website http://www.ecy.wa.gov/programs/hwtr/foia/index.html. The website will include a section on the site conditions and cleanup activities and related documents.