STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

June 20, 2012

Keith Lund
Director of Permitting
Burlington Environmental, LLC
1701 E. Alexander Avenue
Tacoma, WA-98421

RE: Kent Final Permit (WAD 991281767)

Dear Mr. Lund:

I am enclosing the final dangerous waste management facility permit being issued to Burlington Environmental, LLC (PSC) Kent facility, located at 20245 77th Avenue South in Kent, WA 98032. This permit will go into effect on June 25, 2012.

Washington State Department of Ecology (Ecology) gave public notice of their tentative decision to issue this dangerous waste permit for public comments from April 5 through May 21, 2012. Burlington Environmental, LLC submitted comments on the draft permit and requested minor edits. Ecology incorporated the edits as requested.

Also, Section 1.10.2, Notification of the Tribe on page 10 of the draft permit (Standard Conditions) for the Burlington Environmental facility in Kent was edited to include the Muckleshoot Indian Tribe Fisheries Division.

I appreciate the hard work and cooperation from you and your coworkers while developing the application for this permit. If you have any questions, please contact Pallavi Mukerjee at (360) 407-7018 Pallavi.Mukerjee@ecy.wa.gov; or Lisa Perle @ (360) 407-7553 or Lisa.Perle@ecy.wa.gov.

Sincerely,

Dennis Johnson
Northwest Regional Office
Hazardous Waste & Toxics Reduction Program
Washington State Department of Ecology

Enclosure

cc: Keith Lund, Philip Services Corps
Laura Castrilli, Environmental Protection Agency
Dave Misko, Ecology
Michelle Underwood, Ecology
Pallavi Mukerjee, Ecology
Lisa Perle, Ecology
Nancy Farman, Ecology
Kimberly Goetz, Ecology
Robin Harrover, Ecology

PERMIT
FOR THE STORAGE AND TREATMENT OF DANGEROUS WASTE

Department of Ecology
PO Box 47600
Olympia, Washington 98504-7600
Telephone: (360) 407-6700

Issued in accordance with the applicable provisions of the Hazardous Waste Management Act, Chapter 70.105 Revised Code of Washington (RCW), and the regulations promulgated there under in Chapter 173-303 Washington Administrative Code (WAC).

ISSUED TO: Burlington Environmental, LLC.
20245 77th Avenue South
Kent, Washington 98032

WAD 991281767

This Permit is effective **June 25, 2012** and will remain in effect until **June 25, 2022**, unless revoked and reissued, or terminated under WAC 173-303-830 or continued in accordance with WAC 173-303-806(7) or as provided at condition 1.2.3 of this Permit.

ISSUED BY: WASHINGTON DEPARTMENT OF ECOLOGY

Northwest Regional Office Section Manager
Hazardous Waste & Toxics Reduction Program
Washington Department of Ecology

6/18/12
Date

TABLE OF CONTENTS

PAGE

Signature Page 1
Introduction 3
List of Attachments 4
Definitions 4
Part 1 Standard Conditions 5
Part 2 Corrective Action 12

INTRODUCTION

Permittee: Burlington Environmental, LLC.

EPA/state identification number: WAD 991281767

Pursuant to:

Chapter 70.105 Revised Code of Washington (RCW), the Hazardous Waste Management Act of 1976, as amended, and regulations codified in Chapter 173-303 Washington Administrative Code (WAC); and the Solid Waste Disposal Act (SWDA), as amended

A Permit is issued to Burlington Environmental, LLC (hereinafter called the Permittee), to operate a dangerous waste storage and treatment facility located at 20245 77th Avenue South, Kent, Washington, 98032, latitude 47 degrees, 24 minutes, and 45 seconds North and longitude 122 degrees, 14 minutes, and 08 seconds West. Pursuant to RCW 70.105D.030(1)(d), the Washington State Department of Ecology (Ecology) is designated by the Washington State Legislature to carry out all State programs authorized by the United States Environmental Protection Agency (EPA) pursuant to the federal Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et. seq., as amended. Pursuant to Section 3006 of RCRA, 42 U.S.C. Section 6926, the hazardous waste program in the State of Washington and revisions to that program were authorized as specified by EPA. Ecology has authority to issue this Permit in accordance with the authorized program and with RCW 70.105.130 and is responsible for enforcement of all conditions of this Permit.

The Permittee must comply with all terms and conditions set forth in this Permit, including all of the "ATTACHMENTS INCORPORATED BY REFERENCE."

Chapter 173-303 WAC state regulations specified in the Permit are those state regulations in effect on the date of permit issuance

The Permittee must also comply with requirements identified at WAC 173-303-810(8)(a)(i) through (iv) that are not included in the Permit, including but not limited to, self implementing statutory and regulatory requirements.

This Permit is based upon the administrative record, as required by WAC 173-303-840. The Permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts or the Permittee's misrepresentation of any relevant facts at any time are grounds for the termination, revocation and reissuance, or modification of this Permit and/or initiation of an enforcement action, including criminal proceedings.

The Department will enforce all conditions of this Permit. Any challenge of a permit condition must be appealed to the Pollution Control Hearings Board in accordance with WAC 173-303-845.

The Agency has the authority to enforce any condition in this Permit that is based on federal regulations for which the State of Washington's dangerous waste management program is authorized.

ATTACHMENTS INCORPORATED BY REFERENCE

The following documents are incorporated by reference into this Permit. Except for Chapter 173-303 WAC and the Public Participation Plan, these documents are from Burlington Environmental, LLC, Dangerous Waste Permit Application (most recently amended 12.01.2011). These incorporated documents are enforceable conditions of this Permit.

Part A of Permit Application - Dangerous Waste Permit Forms, including topographic map, figures, photographs, and Facility Location Map.

Section C of Permit Application - Waste Analysis Plan, including tables and figures and Appendices C 1 through C 6.

Section D of Permit Application - Process Information, including tables and figures and Appendices D-1 through D-13.

Section F of Permit Application - Inspection Plan, including tables and figures and Appendices F-1 and F-2.

Section G of Permit Application – Contingency Plan, including tables and figures and Appendix G1 through G3.

Section H of Permit Application - Training Plan, including tables and figures and Appendix H1 and H 2.

Section I of Permit Application - Closure Plan, including tables and figures, and Appendix I1 through I 4.

Chapter 173-303 WAC (June 30, 2009).

Public Participation Plan

DEFINITIONS

All definitions in WAC 173-303-040 are incorporated by reference into this Permit. If any definition in WAC 173-303-040 differs from the following definition in this Permit, the Permit's definition prevails. Any term used in this Permit which has not been defined in the Permit or in WAC 173-303-040 shall have the same meaning as set forth in Title 40 CFR Parts 260, 264, 270, and 124. All other terms shall have their standard, technical meaning.

Some terms are specifically defined in Part 2, Corrective Action, for the purposes of that section of the Permit only.

For this Permit, except where a specific definition applies under Part 2, Corrective Action, the following definitions apply:

"**Agency**" means the United States Environmental Protection Agency, Region 10.

"**Days**" means calendar days unless otherwise defined for a condition or section of this Permit.

"**Tribe**" means the Puyallup Tribe of Indians or a designated representative.

1. STANDARD CONDITIONS

1.1. EFFECT OF PERMIT

1.1.1. The Permittee is authorized to store and treat dangerous waste in accordance with the conditions of this Permit which include applicable requirements of Chapter 173-303 WAC specified in the Permit, and any self-implementing regulations in Chapter 173-303 WAC, and self-implementing statutory provisions and related regulations which are automatically applicable to the Permittee's dangerous waste management activities according to the Hazardous Waste Management Act, as amended, or other laws.

1.1.2. Any storage, treatment, or disposal of dangerous waste that requires a permit under Chapter 173-303 WAC is prohibited at this facility unless that activity is authorized by this Permit, including any temporary authorization by the Department under WAC 173-303-830(4)(e).

1.1.3. Conducting an activity at the facility that requires a permit under Chapter 173-303 WAC and is not authorized by this Permit or a temporary authorization under WAC 173-303-830(4)(e) is subject to enforcement of all applicable state and federal laws and regulations.

1.1.4. The Permittee is authorized to continue to manage newly regulated dangerous wastes or to continue to use newly regulated dangerous waste management units subject to all limits, conditions and procedures in WAC 173-303-830(4)(g)(i)(A) through (E). For this condition to apply, the unit must have been in existence as a dangerous waste facility with respect to the newly listed or identified waste or newly regulated waste management unit on the effective date of the final rule listing or identifying the wastes, or regulating the unit according to WAC 173-303-830(4)(g)(i)(A).

1.1.5. Pursuant to WAC 173-303-810(8), compliance with this Permit during its term constitutes compliance for the purpose of enforcement with Chapter 173-303 WAC for waste management activities covered under this Permit except as provided for in WAC 173-303-810(8)(a)(i) through (iv). Compliance with this Permit does not constitute a defense to any order issued or any action brought under other state or federal laws or regulations.

1.1.6. The Permittee is subject to requirements in Chapter 173-303 for any activity not authorized by this Permit or for activities not subject to a permit under Chapter 173-303 WAC, including but not limited to generator and transporter requirements at WAC 173-303-170 through -270.

1.1.7. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege.

1.1.8. Issuance of this Permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations.

1.2. PERMIT ACTIONS

1.2.1. Permit Modification, Revocation, Re-issuance, and Termination

1.2.1.1. The Department may modify, revoke and reissue, or terminate this Permit if there is cause as specified in WAC 173-303-830(3) and (5).

1.2.1.1.1. When a permit is modified only the conditions subject to modification are reopened. All other aspects of the existing permit remain in effect for the duration of the permit.

1.2.1.1.2. If a permit is revoked and reissued the entire permit is reopened and subject to revision and the permit is reissued as a new permit. The Permittee must comply with all conditions of the existing permit until a new final permit is reissued.

1.2.1.1.3. If the Department tentatively decides to terminate the permit it will issue a notice of intent to terminate and follow procedures in WAC 173-303-840(2).

1.2.1.2. Permit modifications at the request of the Permittee must comply with procedures and other requirements of the three-tiered modification system specified in WAC 173-303-830(4).

1.2.1.3. The filing of a request by the Permittee for a permit modification, revocation and re-issuance, termination, notification of planned changes, or anticipated noncompliance does not stay any permit condition.

1.2.2. Transfer of Permit

1.2.2.1. In accordance with WAC 173-303-810(14)(c), this Permit is not transferable to any person except after notice to the Department.

1.2.2.2. This Permit may be transferred to a new owner or operator only if it has been modified or revoked and reissued in accordance with WAC 173-303-830(2)(a) and (b) or WAC 173-303-830(3) to identify the new permittee and incorporate such other requirements as may be necessary.

1.2.2.3. Before transferring ownership or operation of the Facility, the Permittee must notify the new owner or operator in writing of the requirements of this Permit and Chapter 173-303 WAC in accordance with WAC 173-303-290(2).

1.2.2.4. In accordance with WAC 173-303-830(2), the Permittee must maintain financial assurance conforming to the requirements of WAC 173-303-620 until the Department notifies the Permittee that the new owner or operator has demonstrated compliance with the financial requirements.

1.2.3. Duty to Reapply and Permit Continuation

1.2.3.1. If the Permittee wishes to continue an activity regulated by this Permit after its expiration date, the Permittee must apply for and obtain a new permit. In addition, the Permittee must apply for and obtain a new permit if corrective action or closure required by this Permit has not or will not be completed by this Permit's expiration date. Department review of any application for a permit re-issuance will consider improvements in the state of control and measurement technology, as well as changes in applicable regulations.

1.2.3.1.1. To continue an activity allowed by this Permit after the Permit's expiration date or to complete closure or corrective action, the Permittee must submit to the Department a new permit application at least 180 days before this Permit's expiration date, unless the Department grants a later date provided that such date will never be later than the expiration date of the effective permit.

1.2.3.1.2. In accordance with WAC 173-303-806(7), if the Permittee submits a timely, complete application and the Department has not made a final permit determination as set forth in WAC 173-303-840, this Permit will remain in effect beyond this Permit's expiration date until the Department does make a final permit determination (issuing or denying a new permit).

1.2.3.2. If the Permittee fails to submit a timely, complete application as required under Permit Condition 1.2.3.1, then those permit terms and conditions necessary to conduct and complete closure and corrective action will remain in effect beyond this Permit's expiration date until the Department terminates the terms and/or conditions or the permit is revoked and reissued.

1.3. DUTIES AND REQUIREMENTS

1.3.1. Duty to Comply

The Permittee must comply with all conditions of this Permit except to the extent, and for the duration, such noncompliance is authorized by an Emergency Permit issued under WAC 173-303-804. Other than as authorized by an Emergency Permit, any permit noncompliance constitutes a violation of Chapter 173-303 WAC and/or Chapter 70.105 RCW and is grounds for: a) enforcement action; b) termination of permit; c) revocation and re-issuance of permit; d) modification of permit; or e) denial of a permit renewal application.

1.3.2. Need to Halt or Reduce Activity Not a Defense

If any enforcement action is taken because of Permittee's noncompliance with this Permit, the necessity to halt or reduce the permitted activity to maintain compliance with the conditions of this Permit is not a defense for the Permittee.

1.3.3. Duty to Mitigate

The Permittee must take all steps required by the Department to minimize or correct any adverse impact on the environment resulting from noncompliance with this Permit. That the Permittee took such mitigation is not a defense to enforcement for noncompliance with this Permit.

1.3.4. Proper Operation and Maintenance

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures (this includes quality assurance and quality control). This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit.

1.3.5. Duty to Provide Information

The Permittee must furnish to the Department, within a reasonable time, any information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit or for determining compliance with this Permit. The Permittee must also furnish to the Department, upon request, copies of records required to be kept by this Permit.

1.3.6. Inspection and Entry

1.3.6.1. Pursuant to WAC 173-303-810(10), the Permittee must allow authorized representatives of the Department upon the presentation of credentials to:

1.3.6.1.1. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;

1.3.6.1.2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

1.3.6.1.3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

1.3.6.1.4. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by Chapter 173-303 WAC any substances or parameters at any location.

1.3.7. Reporting Planned Changes

1.3.7.1. In accordance with WAC 173-303-810(14)(a), the Permittee must give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Such physical alterations or additions must be in compliance with this Permit. The Permittee must not manage dangerous waste in the new or physically changed portions of the facility until:

1.3.7.1.1. The Permit has been modified or the Permittee has obtained a temporary authorization for the physical change and for any change in the way waste is managed.

1.3.7.1.2. The Permittee has submitted to the Department by certified mail or hand delivery a letter signed by the Permittee and a registered professional engineer stating the facility has been constructed or modified in compliance with the Permit, and either

1.3.7.1.3. The Department has inspected the modified or newly constructed facility and finds it in compliance with the Permit, or

1.3.7.1.4. Within fifteen days of the date of the submission of the certified mail or hand delivered letter specified in Permit Condition 1.3.7.1.2, the Permittee has not received notice from the Department of its intent to inspect.

1.3.8. Reporting Noncompliance with the Permit and Reporting Emergencies

1.3.8.1. The Permittee must meet requirements for immediate reporting and written submissions in WAC 173-303-810(14)(f) for noncompliance which may endanger health or the environment.

1.3.8.2. In accordance with WAC 173-303-810(14)(g), the Permittee must report instances of noncompliance not reported under WAC 173-303-810(14)(d), (e), and (f) (as specified in permit conditions 1.3.11.1, 1.3.10, and 1.3.8.1) at the time of the next monitoring report or within six months of the date of noncompliance, whichever is sooner.

1.3.8.3. The Permittee must give advance notice to the Department as soon as possible of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements. Such changes require a permit modification pursuant to WAC 173-303-830 before they can be implemented.

1.3.8.4. In the event of spills, releases and other emergencies, the Permittee must meet requirements for reporting and written submissions in Section G of the Permit Application.

1.3.9. Reporting Relevant Facts and Incorrect Information

Pursuant to WAC 173-303-810(14)(h), if the Permittee becomes aware that he/she failed to submit any relevant facts in the permit application, or submitted incorrect information in the permit application or in any report to the Department, the Permittee must promptly submit the relevant and correct information.

1.3.10. Reporting Compliance Schedules

Reports of permit compliance or noncompliance or any progress reports on interim and final permit requirement contained in any compliance schedules must be submitted no later than 14 days following each scheduled compliance date.

1.3.11. Other Reporting

1.3.11.1. Monitoring Reports: Monitoring results must be reported at intervals specified elsewhere in this Permit.

1.3.11.2. The following reports are required:

a. Manifest discrepancy report as specified at WAC 173-303-370(4).
b. Unmanifested waste report as specified at WAC 173-303-390(1).
c. Annual report as specified at WAC 173-303-390(2).
d. Additional reports as specified at WAC 173-303-390(3).

1.3.12. Information Repository

The Permittee must establish and maintain an information repository at any time the Department requires based on the factors set forth in WAC 173-303-281(6)(b). The information repository will be governed by the provisions in WAC 173-303-281(6)(c) through (f).

1.4. MONITORING AND RECORDS

1.4.1. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.

1.4.2. As provided at WAC 1730-303-810(11)(c) , the Permittee must retain records of all monitoring information for a minimum of three years from the date of the sample, measurement, report or application. The record retention period may be extended by request of the Department at any time.

1.4.2.1. The Permittee must maintain specific monitoring records for longer than three years when that is specified in other parts of this Permit.

1.4.2.2. The Permittee must maintain records from all ground water monitoring wells and associated ground water surface elevations for the active life and post closure period of the facility.

1.4.3. Pursuant to WAC 173-303-810(11)(d), records of monitoring information must include all of the following:

a. The dates, exact place, and times of sampling or measurements.
b. The individuals who performed the sampling or measurements.
c. The dates analyses were performed.
d. The individuals who performed the analyses.
e. The analytical techniques or methods used.
f. The results of such analyses.

1.4.4. In addition, the Permittee must meet specific monitoring and record keeping requirements when those are specified in other parts of this Permit.

1.5. SIGNATURE AND CERTIFICATION REQUIRMENTS

1.5.1. All applications, reports, or information submitted to the Department must be signed in accordance with WAC 173-303-810 (12) and must be certified according to WAC 173-303-810 (13).

1.5.2. Except as otherwise specified in this Permit, all applications, reports, notifications or other submissions that are required by this Permit to be submitted to the Department must be sent by certified mail to the following address or other address as specified by the Department:

Supervisor/Section Manager, Hazardous Waste and Toxics Reduction Section
Department of Ecology
Northwest Regional Office
3190 - 160th Ave. SE
Bellevue, WA 98008-5452

Or hand delivered to the following address or other address as specified by the Department:

Supervisor/Section Manager, Hazardous Waste and Toxics Reduction Section
Department of Ecology
Northwest Regional Office
3190 - 160th Ave. SE
Bellevue, WA 98008-5452

A change in this address does not require a permit modification under WAC 173-303-830.

1.6. CONFIDENTIAL INFORMATION

1.6.1. Information submitted by the Permittee to the Department identified as confidential by the Permittee will be treated in accordance with applicable provisions of WAC 173-303-810(15), Chapter 42.17 RCW, and RCW 43.21A.160.

1.7. WASTE MINIMIZATION

1.7.1. In accordance with WAC 173-303-380(1)(q), the Permittee must place a certification in the operating record on an annual basis that:

1.7.1.1. A program is in place to reduce the volume and toxicity of hazardous waste generated to the degree determined by the Permittee to be economically practicable.

1.7.1.2. Proposed methods of treatment, storage or disposal are those practicable methods currently available to the Permittee which minimize the present and future threat to human health and the environment.

1.7.2. The Permittee must report waste minimization efforts in their annual report as required by Permit Condition 1.3.11.2.

1.8. PERFORMANCE STANDARDS

The Permittee shall design, construct, operate and maintain the facility to the maximum extent practicable given the limits of technology in a manner to ensure performance standards in WAC 173-303-283 are met.

1.9. DOCUMENTS AND RECORDS TO BE MAINTAINED AT THE FACILITY SITE

1.9.1. The following documents must be maintained at the facility:

a. This Permit, including all of its attachments and addendums and all amendments, revisions, and modifications to these documents.

b. Records required by this Permit (commonly called the operating record).

c. Other permits and approvals that authorize actions which affect safety and environmental protection (including, but not limited to, Air Quality Program registrations, Toxic Substance Control Act (TSCA) authorizations, State Environmental Policy Act (SEPA) decision documents).

1.10. NOTIFICATION OF THE TRIBE

1.10.1. The Permittee must notify the Tribe, in addition to the Department, for the following permit conditions: 1.2.1.2, 1.2.2.1, 1.3.7.1, 1.3.8, 1.3.9, 0, 2.3.12.3, and 2.6.15.1.

1.10.2. Notification to the Tribe must be sent or hand delivered to the following address:

Glen St. Amant
Habitat Program Manager
Muckleshoot Indian Tribe Fisheries Division
39015 172nd Ave SE
Auburn, WA 98092

1.11 PSC will provide financial assurance in accordance with WAC 173-303-620.

2. CORRECTIVE ACTION

2.1 The Department is the lead for corrective action at the Burlington Environmental Inc., LLC, Kent Facility, herein referred to as "the Permittee, or "the Facility." The Facility is generally located at 20245 77th Avenue South, Kent, Washington 98032-1362. The Facility is described in the Facility Diagram (Attachment A). Subsequent to the Agency's authorization of the Department's corrective action program, all corrective action requirements of this Part (Part 2, Corrective Action) of the RCRA Permit ("Permit") are now state requirements and are enforceable by the Department.

The state corrective action statutes and regulation authorized by the Department include Chapter 70.106 RCW (Hazardous Waste Management Act); Chapter 173-303 WAC (Dangerous Waste Regulations); Chapter 70.105D RCW (Model Toxics Control Act); and Chapter 173-340 WAC (The Model Toxics Control Act Cleanup Regulations). These statutes and regulations meet the requirements of Section 3004(u) of RCRA (Section 206 of HSWA), 42 USC Section 6924(u), and regulations codified at 40 CFR 264.101.

2.2. LIST OF ATTACHMENTS

The following listed documents are hereby incorporated, in their entirety, by reference into this Permit.

Attachment A	Diagram of the Facility showing Solid Waste Management Units (SWMUs), and Areas of Concern (AOC)
Attachment B	List of SWMUs and AOC
Attachment C	Well Construction, Maintenance, and Replacement

2.3. DEFINITIONS

Unless otherwise specified, the definitions set forth in Chapter 70.105 RCW, Chapter 173-303 WAC (Dangerous Waste Regulations), Chapter 70.105D RCW, and Chapter 173-340 WAC (Model Toxics Control Act), shall control the meanings of the terms used in Part 2 of the Permit. Additional or modified definitions for this Part are as follows:

2.3.1. **Agreed Order or Order**: Means any Order and each of the exhibits to any Order incorporated by reference into this Permit. All exhibits are integral and enforceable parts of this Order. The terms "Agreed Order" or "Order" shall include all exhibits to the Order.

2.3.2. **Area of Concern (AOC):** Means any area of the Facility where a release of dangerous constituents (including dangerous waste and hazardous substances) has occurred, is occurring, is suspected to have occurred, or threatens to occur.

2.3.3. **Cleanup Action Plan (CAP):** Means the document issued by the Department under WAC 173-340-360, which selects Facility-specific corrective measures and specifies cleanup standards (cleanup levels, points of compliance, and other requirements for the

corrective measures).

2.3.4. **Cleanup Standards:** Means the standards promulgated under RCW 70.105D.030(2)(e) and include: (1) hazardous substance concentrations (cleanup levels) that protect human health and the environment; (2) the location at the Facility where cleanup levels must be attained (points of compliance); and (3) additional regulatory requirements that apply to a corrective action because of the type of action and/or the location of the Facility.

2.3.5. **Consent Decree:** Means any Decree and each of the exhibits to any Decree incorporated by reference into this Permit. All exhibits are integral and enforceable parts of this Decree. The terms "Consent Decree" or "Decree" shall include all exhibits to the Decree.

2.3.6. **Corrective Action:** Means any activities including investigations, studies, characterizations, and corrective measures, including actions taken pursuant to Chapter 70.105D RCW and Chapter 173-340 WAC, undertaken in whole or in part to fulfill the requirements of WAC 173-303-64620.

2.3.7. **Corrective Measure:** Means any measure or action to control, prevent, or mitigate releases and/or potential releases of dangerous constituents (including dangerous waste and hazardous substances) reviewed and approved by the Department for the Facility and set forth in a Facility-specific CAP prepared in compliance with the requirements of Chapter 173-340 WAC, including WAC 173-340-360. Corrective measures may include interim actions as defined by Chapter 173-340 WAC. Interim actions will not necessarily be set forth in a Facility-specific CAP.

2.3.8. **Dangerous Constituent or Dangerous Waste Constituent:** Means any constituent identified in WAC 173-303-9905 or 40 CFR Part 264 Appendix IX, any constituent which caused a waste to be listed or designated as dangerous under the provisions of Chapter 173-303 WAC, and any constituent defined as a hazardous substance at RCW 70.105D.020(10).

2.3.9. **Dangerous Waste:** Means any solid waste designated in WAC 173-303-070 through -100 as dangerous or extremely hazardous or mixed waste. Dangerous wastes are considered hazardous substances under RCW 70.105D.020(10).

2.3.10. **Dangerous Waste Management Unit (DWMU):** Means a contiguous area of land on or in which dangerous waste is placed, or the largest area in which there is a significant likelihood of mixing dangerous waste constituents in the same area, as defined in WAC 173-303-040, e.g., a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area.

2.3.11. **Day:** Means calendar day, unless otherwise noted.

2.3.12. **Facility:** Under this Permit and any Agreed Order or Consent Decree incorporated by reference into this Permit, for the purposes of implementing corrective action under WAC 173-303-64620 or WAC 173-303-64630, "Facility" means all contiguous property under control of the Permittee under the provisions of Chapter 70.105 RCW or Chapter 173-303 WAC. "Facility" also includes the definition of facility found in RCW 70.105D.020(5).

2.3.13. **Feasibility Study (FS):** Means the investigation and evaluation of potential corrective

measures performed in accordance with the FS requirements of WAC 173-340-350, which includes the substantive requirements of a RCRA corrective measures study, undertaken in whole or in part to fulfill the corrective action requirements of WAC 173-303-64620.

2.3.14. **Interim Action:** Means a remedial action conducted under WAC 173-340-430.

2.3.15. **Parties:** Means the Department and the Permittee.

2.3.16. **Permit or Permitting Requirement:** Means the requirements of Chapter 173-303 WAC for applying for, obtaining, maintaining, modifying, and terminating Dangerous Waste Management Facility permits.

2.3.17. **RCRA:** Means the Resource Conservation and Recovery Act, 42 U.S.C. § 6901 et seq.

2.3.18. **RCRA Facility Assessment (RFA):** Means the investigation conducted by the Agency of releases and potential releases at the Facility and the information contained in the report entitled SAIC Technology Services Co., for U.S. EPA, Region 10, Seattle, Washington, January, 1996; *RCRA Facility Assessment, Preliminary Review/VSI Report, Burlington Environmental Inc., Kent, Washington; EPA ID No. WAD 991281767.*

2.3.19. **Release:** Means any intentional or unintentional spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous substances, including dangerous waste and dangerous constituents into the environment. It also includes the abandonment or discarding of barrels, containers, and other receptacles containing dangerous waste or dangerous constituents and includes the definition of release at RCW 70.105D.020(25).

2.3.20. **Remedial Action or Remedy:** Means any action or expenditure consistent with the purposes of Chapter 70.105D RCW to identify, eliminate, or minimize any threat or potential threat posed by hazardous substances to human health or the environment including any investigative and monitoring activities with respect to any release or threatened release of a hazardous substance and any health assessments or health effects studies conducted in order to determine the risk or potential risk to human health.

2.3.21. **Remedial Investigation (RI):** Means a facility-wide investigation and characterization performed in accordance with the requirements of Chapter 173-340 WAC, which includes the substantive requirements for a RCRA facility investigation, undertaken in whole or in part to fulfill the corrective action requirements of WAC 173-303-64620.

2.3.22. **Site:** Under this Permit and any Agreed Order or Consent Decree incorporated by reference into this Permit, means the Burlington Environmental Inc., LLC, Kent Facility according to the definition of "Facility" above. For the purposes of implementing corrective action under WAC 173-303-64620 or 173-303-64630, Site also means all contiguous property under the control of Burlington and includes the definition of Facility at RCW 70.105D.020(5)

2.3.23. **Solid Waste Management Unit (SWMU):** Means any discernible location at the Dangerous Waste Management Facility where solid wastes have been placed at any time, irrespective of whether the location was intended for the management of solid or dangerous waste. Such locations include any area at the Dangerous Waste Management

Facility at which solid wastes, including spills, have been routinely and systematically released and include regulated units as defined by Chapter 173-303 WAC.

2.4 OBJECTIVES

2.4.1. The Permittee shall complete a Remedial Investigation (RI) and a Feasibility Study (FS) to be approved by the Department in accordance with the requirements of WAC 173-340-350 (State Remedial Investigation and Feasibility Study). The purpose of the RI and the FS is to concurrently satisfy the State corrective action requirements for a RCRA facility investigation (RFI), and a RCRA corrective measures study (CMS), WAC 173-303-646 (Corrective Action).

The RCRA Facility Assessment (RFA)[1] and the RI Report[2] identified SWMUs and AOCs to be included in the RI. The SWMUs and AOCs are identified in Part 2, Attachment A and Attachment B. The SWMUs in Attachment B have been divided into five (5) AOCs. By cleaning up the dangerous waste constituents identified in the soils, sediment, surface water and groundwater of each AOC, the Permittee will also have addressed the spills and releases from the SWMUs listed in Attachment B. The tanks that managed dangerous waste and that have completed closure of their aboveground structures and secondary containment are T1, T2, T3A, T6A, T6B, T8, T9A, T9B, T10 and T5603. The soils beneath these tanks must complete closure at the time that the tank farm above them is no longer in active use for either dangerous waste or solid waste. The tanks are identified with both their tank number and SWMU number in Attachment B.

The Permittee completed the RI Report in December of 2007.[3] The Department, during its review of the RI Report, found data gaps and requested that the Permittee address the need for additional information. The Permittee completed a Revised Data Gaps Work Plan in September of 2009[4] which the Department approved in December of 2009.[5] The Permittee completed groundwater sampling and analysis following the approved Revised Data Gaps Work Plan, and submitted the results along with a summary of historical soil and groundwater data in the Feasibility Study (FS) Work Plan, which was submitted in July of 2010.[6] The Department has not yet approved the FS Work Plan.

---

[1] *RCRA Facility Assessment, Preliminary Review/VSI Report, Burlington Environmental, Inc., Kent Washington*; SAIC (Science Applications International Corporation), prepared for EPA Region X, January 1996.

[2] *Final Remedial Investigation Report, PSC Kent Facility, Kent, Washington*; Prepared for Philip Services Corporation by Geomatrix Consultants, Inc; December 2007.

[3] *Final Remedial Investigation Report, PSC Kent Facility, Kent, Washington*; Prepared for Philip Services Corporation by Geomatrix Consultants, Inc; December 2007.

[4] *Revised 2009 Data Gaps Work Plan, PSC Kent Facility, Kent, Washington*; Prepared for Burlington Environmental, LLC, by AMEC Geomatrix, Inc; September 2009.

[5] *Comment and Approval of the Amendment to the 2009 Data Gaps Work Plan, and the Revised 2009 Data Gaps Work Plan, PSC Kent Facility, Burlington environmental, LLC WAD991281767*; Ecology Letter to Mr. William Beck; December 17, 2009.

[6] *Feasibility Study Work Plan, PSC Kent Faciliity, Kent Washington*; Prepared for Burlington Environmental, LLC, by AMEC Geomatrix, Inc; July 2010.

Future work for completion of the RI and the FS is outlined in Permit Condition 2.5, "Work to be Performed." The Department will approve the RI Report and the FS Report after public notice and public comment, prior to development of the draft CAP.

2.4.2. After completion and Department approval of the RI and FS, the Department will require that the Permittee draft a Cleanup Action Plan ("CAP") to satisfy the requirements of WAC 173-340-400 (Cleanup Actions) and to concurrently satisfy the corrective action requirements of WAC 173-303-646.

2.4.3. After public review and comment, the draft CAP will be finalized and the Permittee will be required to design, construct, operate, and monitor the selected cleanup or corrective actions via a consent decree, agreed order, or Class 2 or 3 permit modification, as agreed to by the Department and the Permittee, or an enforcement order, if determined to be necessary by the Department.

2.4.4. The Permittee shall devise and implement an Interim Action to the Department's satisfaction if the Department or Permittee determines that there is an imminent and substantial threat to human health and the environment from: (1) any release, suspected release, or potential release of hazardous substances, including dangerous waste and dangerous constituents, at or from the facility are creating or have the potential to create an imminent and substantial threat to human health and/or the environment and/or 2) actions are necessary to reduce a threat to human health and/or the environment by eliminating or substantially reducing one or more pathways for exposure to hazardous substances at or from the facility.

2.5 WORK TO BE PERFORMED

Based on the foregoing Objectives, it is hereby required that the Permittee take the following actions and that these actions be conducted in accordance with Chapter 173-340 WAC (MTCA Cleanup Regulation) and applicable provisions of Chapter 173-303 WAC (Dangerous Waste Regulations), unless otherwise specifically provided for herein.

2.5.1. PROGRESS REPORTS

2.5.1.1. Progress reports shall continue to be submitted by the Permittee on a semi-annual basis, unless another time interval is agreed upon by the Permittee and the Department. The semi-annual reporting periods shall be January – June, and July – December. Progress reports shall be submitted in both hard copy and electronic format by the 15th of the month following the end of the reporting period. The next progress report shall be submitted in July 2012. The semi-annual progress reports shall include, at a minimum:

a. Corrective action activities completed during the current reporting period;
b. Corrective action activities planned for the next reporting period;
c. Occurrence of any problems, how problems were resolved, deviations from any work plans in effect, and a justification for all deviations;
d. Summary of significant findings,
e. Changes in personnel, and significant contacts with all federal, state, local, community and public interest groups

f. All laboratory analyses (in a mutually agreed upon electronic format and as hard copies of the original laboratory data) in tabulated data format for which quality assurance procedures were completed during the current reporting period
g. All field measurements
h. Tabulated groundwater data showing specific groundwater monitoring well, sample collection date, constituent concentrations, screening levels and MTCA cleanup levels.
i. A summary table and discussion of constituent concentrations which exceed the screening levels and MTCA Cleanup Levels for the site.
j. Groundwater level contour maps for each zone of the aquifer being monitored.
k. Tables and graphs for the presentation of analytical data for groundwater monitoring wells;
l. Hydrographs for each groundwater monitoring well showing date of measurement and groundwater elevation;
m. Graphs of precipitation data from the facility or from the closest rain gauge monitoring station;
n. Evaluation of the seasonal effect on the groundwater data, contaminant plume characteristics, constituents that are migrating off site from the facility, and an estimate of the rate of transport and any revisions to the conceptual model;

2.5.1.2. If both the Permittee and the Department agree that such a change is necessary, the frequency of the progress report submittals may be revised.

2.5.2. GROUNDWATER MONITORING

2.5.2.1. The Permittee shall collect and analyze periodic groundwater samples from existing and future groundwater monitoring wells. The frequency of groundwater sampling and the list of parameters shall be jointly determined by the project managers. The current groundwater monitoring wells, groundwater monitoring parameters, and frequency of groundwater sampling is described in the Groundwater Monitoring Plan, Appendix E-1 to Section E of the Permit Application which is incorporated by reference into this permit. Groundwater sampling and analysis shall also be conducted in accordance with Permit Condition 2.6.16 (Quality Assurance, Sampling, Data Submittal, and Availability).

2.5.2.2. The frequency of water level elevation measurements shall be jointly determined by the project managers. Currently, water level elevations are taken semi-annually at the time of groundwater sampling and analysis. A groundwater elevation contour diagram for each of the zones in the shallow aquifer is required and will be submitted with each semi-annual sampling and analysis event.

2.5.2.3. Any monitoring jointly agreed to in Permit Conditions 2.5.3.1 and 2.5.3.2. above shall continue until altered by a permit modification under WAC 173-303-830 (Permit Changes).

2.5.3. FINAL REMEDIAL INVESTIGATION REPORT

The Department will approve the RI Report at the time that the Department also approves the FS Report. Based on the Department's evaluation of the Data Gaps Work Plan results, which are included in the FS Work Plan, see 2.4.1, the Department could require additional remedial investigation work as part of developing the Feasibility Study Work Plan and Feasibility Study Report. Because of potential revisions to the December 2007 RI Report, Ecology does not yet consider the 2007 RI Report "Final." Upon the Department's approval of the current or the revised December 2007 RI Report, it will be considered "Final." The Final RI Report becomes incorporated by reference into this permit and is an enforceable part of the permit.

2.5.4. FINAL FEASIBILITY STUDY WORK PLAN

2.5.4.1. The Department has received the 2010 FS Work Plan.[7] Within sixty (60) days of receiving the Department's comments on the 2010 FS Work Plan, the Permittee must submit a revised FS Work Plan for the Facility to the Department for review and comment. The work plan will be consistent with requirements in Permit Condition 2.6.16, WAC 173-340-350 and WAC 173-340-360, and include a schedule for implementation. If sampling and analysis is included as part of the revised FS Work Plan, then, the revised FS Work Plan shall include a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP).

2.5.4.2. Within thirty (30) days of receipt of the Department's comments on the revised FS Work Plan, the Permittee must submit for review, comment and approval a Final FS Work Plan incorporating the Department's comments.

2.5.5. FEASIBILITY STUDY

Following the Department's approval of the Final FS Work Plan, the Permittee must complete the FS according to the schedule in the approved work plan.

2.5.6. DRAFT FEASIBILITY STUDY REPORT

2.5.6.1. Within sixty (60) days of completion of field work or receipt of all laboratory data, whichever comes first, the Permittee must submit the Draft FS Report to the Department in accordance with WAC 173-350 (State Remedial Investigation and Feasibility Study), WAC 173-340-840 (General Submittal Requirements), and the schedule set forth in the Department-approved Final FS Work Plan.

2.5.6.2. The Draft FS Report shall include an analysis of potential remedial alternatives and recommendations regarding a preferred remedial action to be implemented.

2.5.7. FINAL FEASIBILITY STUDY REPORT

2.5.7.1. Within (30) days after receipt of the Department's written comments on the Draft FS Report, the Permittee must submit for review, comment, and approval a Draft Final FS Report incorporating the Department's comments.

2.5.7.2 The Department will then publish notice of the RI and FS Reports and allow (30) days for public comment. The Department will send a request for incorporation

[7] *Feasibility Study Work Plan, PSC Kent Facilitiy, Kent Washington*; Prepared for Burlington Environmental, LLC, by AMEC Geomatrix, Inc; July 2010.

of any necessary changes from the public comment period or from the Agency to the RI and/or FS Reports to the Permittee.

2.5.7.3. Within (30) days of receipt of the Department's request for incorporation of any necessary changes to the RI and FS Reports, the Permittee will incorporate those changes and submit the Final RI Report and Final FS Report to the Department. Within (15) days of receipt of the Final RI Report and Final FS Report, the Department will strive to approve the final reports. .Upon the Department's approval of the RI Report and FS Report, they will be considered "Final." The Final RI Report and FS Report become incorporated by reference into this permit and are an enforceable part of the permit.

2.5.8. DRAFT CLEANUP ACTION PLAN

2.5.8.1. Within ninety (90) days after the Final FS Report is issued, the Permittee must prepare and submit in paper and electronic format a draft cleanup action plan (Draft CAP). The Draft CAP must be prepared in accordance with WAC 173-340-380 that details the proposed cleanup action for addressing the contamination present on the Facility, and addresses the requirements for developing a cleanup action in WAC 173-340-350 through -390, including the Department's expectations for cleanup alternatives in WAC 173-340-370. The Draft CAP shall also meet the requirements of WAC 173-340-360 (Selection of Cleanup Actions), WAC 173-340-400 (1) through (7) (Cleanup Actions), WAC 173-340-410 (Compliance Monitoring Requirements), and WAC 173-303-646 (Corrective Action).

2.5.8.2. The scope of the Draft CAP required by the Department shall be subject to the Additional Work provisions of Permit Condition 2.6.11.

2.5.8.3. The Permittee is encouraged to seek and include in the Draft CAP any feasible pollution prevention opportunities that do not interfere with the final cleanup objectives of the facility.

2.5.8.4. The Department will modify the Draft CAP, as necessary, and then hold a sixty (60) day public comment period for the proposed Draft CAP, the permit modification language, and the legal mechanism (Agreed Order or Consent Decree) to incorporate the Final CAP into the Permit. Such public comment period shall be combined with public notice, including, but not limited to, mailed fact sheets, notice in the site register, and notice in the appropriate local newspaper.

2.5.8.5. The Department will also review the Permittee's SEPA checklist and make a threshold determination of significance or non-significance.

2.5.9. FINAL CLEANUP ACTION PLAN

After review and consideration of the comments received during the public comment period, the Department shall issue the Final Cleanup Action Plan (Final CAP), and the Permit modification and Agreed Order incorporating the Final CAP into the Permit; and shall publish their availability in the Site Register.

2.5.10. INTERIM ACTION

2.5.10.1. During the corrective action process, the Permittee shall continuously consider and evaluate information regarding releases, suspected releases, or potential releases of hazardous substances, including dangerous waste and dangerous constituents, at the facility. If the Permittee identifies an imminent and substantial threat to human health and/or the environment, or a threat to human health and/or the environment that requires action to reduce the threat, the Permittee shall immediately (as soon as is safely possible to do so) notify the Department by telephone. The Permittee shall also notify the Department in writing within seven (7) days, summarizing the immediacy and magnitude of such identified threat.

2.5.10.2. If the Department determines that any release, suspected release, or potential release of hazardous substances, including dangerous wastes and dangerous constituents at or from the Facility, presents a threat as identified in Permit Condition 2.5.1.1 above, the Permittee shall devise and perform an Interim Action to mitigate the threat. This determination shall be based on the Permittee's evaluation and/or an independent evaluation by the Department of current and historical investigation and data reports. To the maximum extent practicable, any Interim Action shall be consistent with and capable of being integrated into the overall corrective action process at the facility.

2.5.10.3. Within thirty (30) days of notification by the Department, or by such earlier or later date as may be required by the Department, the Permittee shall prepare and submit a Draft Interim Action Work Plan addressing the threat. The Draft Interim Action Work Plan shall be prepared in accordance with the requirements of WAC 173-340-430 (Interim actions). A schedule for completion of all tasks shall be included. In addition, the Permittee shall submit with the work plan copies of all past RI reports of SWMUs associated with the identified threat.

2.5.10.4. After receiving the Department's comments on the Draft Interim Action Work Plan, the Permittee shall, within thirty (30) days, or by such earlier or later date as may be required by the Department, incorporate the Department's comments and submit a Draft Final Interim Action Work Plan for approval.

2.5.10.5. Following public review and comment on the Draft Final Interim Action Work Plan, the Permittee must complete the interim action according to the schedule in the approved work plan. Within sixty (60) days of completion of the interim action field work or receipt of all laboratory data, whichever comes first, the Permittee must submit a Draft Interim Action Report to the Department for review and comment.

2.5.10.6. Within thirty (30) days of receipt of the Department's written comments on the Draft Interim Action Report, and before the public comment period, the Permittee must submit a Final Interim Action Report incorporating the Department's comments.

2.5.11. SCHEDULE OF DELIVERABLES

Deliverable	Schedule
Progress Report	On the 15th day of the month following the end of the reporting period
Revised Draft FS Work Plan, including (if sampling and analysis is proposed) a sampling and analysis plan (SAP) and Quality Assurance Project Plan (QAPP)	Within 60 days of receipt of the Department's comments on the Draft 2010 FS Work Plan
Final FS Work Plan	Within 30 days of receipt of the Department's written comments on the revised draft FS Work Plan
Complete field work under FS work plan	According to the schedule shown in the Final FS Work Plan
Draft FS Report	Within 60 days of completion of field work or receipt of all laboratory data, whichever comes first
Draft Final FS Report	Within 30 days of receipt of the Department's written comments on the Draft FS Report
Final FS Report	Within 30 days of the Department's request for incorporation of changes based on Agency and public comment
Draft CAP (paper and electronic format)	Within 90 days after the Final FS Report is issued
Draft Interim Action Work Plan	Within 30 days after notification by the Department that one is required
Final Interim Action Work Plan	Within 30 days after receipt of the Department's written comments on the draft interim action work plan
Complete interim remedial action	According to the schedule shown in the Final Interim Action Work Plan
Draft Interim Action Report	Within 60 days of completion of field work or receipt of all laboratory data
Final Interim Action Report incorporating the Department's comments	Within 30 days of receipt of the Department's written comments, and after public comment, on the Draft Interim Action Report
Public Participation Plan	Within 60 days of issuance of this Permit

2.5.12. SEPA

For any proposal under Part 2 of this Permit that includes activities requiring preparation of a State Environmental Policy Act (SEPA) checklist, the Permittee must prepare a SEPA checklist, per Chapter 197-11 WAC (SEPA Rules). Such activities may include demolishing or constructing structures, excavation or filling, and capping contaminated soils. Changes to procedure usually will not require compliance with SEPA. SEPA compliance must occur before the Department makes its first decision on the proposal.

2.6 TERMS AND CONDITIONS

2.6.1. PUBLIC INVOLVEMENT

2.6.1.1. Public Notices and Participation

The Permittee must comply with the public notice and participation requirements of WAC 173-303-900 and WAC 173-303-830 (Permit Changes). For Part 2 of this Permit, the Permittee must also comply with public notice and participation requirements of WAC 173-340-600. For Part 2 of this Permit, the Department will take responsibility for the facility mailing list, the production and distribution of fact sheets, and the publication of notices in the appropriate local newspaper and the site register.

2.6.1.2. Public Participation Plan

A Public Participation Plan is required for this Facility for activities under Part 2 of this Permit. The Department will review the Public Participation Plan, prepared by the Permittee, to determine its appropriateness and compliance with WAC 173-900 and WAC 173-340-600. The Permittee will submit the Public Participation Plan to the Department's Project Manager within 60 days of issuance of this Permit.

The Department will maintain the responsibility for public participation at the Facility under Part 2 of this Permit. However, the Permittee must cooperate with the Department and must:

2.6.1.2.1. If agreed to by the Department, develop appropriate mailing lists, prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, RI/FS reports, cleanup action plans, and engineering design reports. As appropriate, the Department will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of the Department's presentations and meetings.

2.6.1.2.2. Notify the Department's Project Manager prior to the preparation of all press releases and fact sheets, and before major meetings with the interested public and local governments. Likewise, the Department will notify the Permittee 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 the Permittee that do not receive prior approval from the Department, the Permittee must clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by the Department.

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

2.6.1.2.4. When requested by the Department under Part 2 of the Permit, arrange and/or continue information repositories to be located at the following locations:

Kent Public Library
212 2nd Avenue N.
Kent, WA 98032
Phone: 253-859-3330

Department of Ecology
Northwest Regional Office
3160 160th Avenue SE
Bellevue, WA 98008-5452
Phone: 425-649-7239

The Permittee must promptly place in these repositories, at a minimum, copies of all public notices, fact sheets, and press releases; all quality-assured monitoring data; remedial action plans and reports; supplemental remedial planning documents; and all other similar documents relating to performance of the remedial action required by this Permit.

2.6.2. REMEDIAL ACTION COSTS

The Permittee must adhere to the independent agreement, Payment Agreement #8R16, between the Department and the Permittee, dated June 1, 2001 for recovery of the Department's costs reasonably attributable to corrective action activities at a facility per WAC 173-340-550 and WAC 173-303-64630. Permit termination or satisfaction of all corrective action requirements is necessary to terminate the agreement.

In addition to other available relief, pursuant to RCW 19.16.500, the Department may utilize a collection agency and/or, pursuant to RCW 17.105D.055, file a lien against real property subject to the remedial action to recover unreimbursed remedial action costs.

2.6.3. IMPLEMENTATION OF CORRECTIVE ACTION

In the event that the corrective actions performed pursuant to this Permit fail to meet the requirements of Chapter 173-303 WAC or of Chapter 173-340 WAC, the Department reserves the right to require the Permittee to submit a permit modification to ensure that the Facility continues to comply with the corrective action requirements under Chapter 173-303 WAC and Chapter 173-340 WAC. If the permit modification represents a substantial change to the work to be performed, the Department will provide public notice and opportunity to comment in accordance with Permit Condition 2.6.1 (Public Involvement).

If the Department determines that the Permittee has failed without good cause to implement corrective action, in whole or in part, the Department may perform any or all portions of corrective action that remain incomplete. The Department will provide prior written notice of the bases for the Department's determination, unless an emergency prevents such notice.

If the Department performs all or portions of corrective action because of the Permittee's failure to comply with its obligations under this Permit, the Permittee must reimburse the Department for the costs of doing such work.

Except where necessary to abate an emergency situation, the Permittee must not perform any remedial actions outside those remedial actions required by this Permit, unless the Department concurs in writing with such remedial actions.

2.6.4. FINANCIAL ASSURANCE FOR CORRECTIVE ACTION

2.6.4.1. Financial assurance for corrective action is required by WAC 173-303-64620. The Department's Financial Assurance Officer shall determine when the Permittee's actions and submissions meet the requirements of WAC 173-303-64620.

2.6.4.2. The Permittee must submit the original executed or otherwise finalized financial assurance instruments or documents to the Department's Financial Assurance Officer, facsimiles or photocopies are not acceptable to meet this requirement. In addition, the Permittee must also submit copies of financial assurance instruments or documents to the Department's Project Manager.

2.6.4.3. 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 CFR 264.141, 40 CFR 264.142, 40 CFR 264.143, 40 CFR 264.145, 40 CFR 264.148, 40 CFR 264.151, and WAC 173-303-620) will be the definitions and requirements for allowable financial assurance for corrective action under this Permit. It is the intention of the Parties that these definitions and requirements will apply to this corrective action, and the words "corrective action" are hereby substituted for the words "closure," "post closure," "post-closure," or "postclosure" in the above-listed regulations as needed to produce this result.

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

a. The Financial Assurance for Corrective Action Proposed Rule, 51FR 37853 (October 24, 1986);
b. The financial assurance provisions of Corrective Action for Releases from Solid Waste Management Units Advance Notice of Proposed Rulemaking, 61 FR 19432 (May 1, 1996): and
c. The Interim Guidance on Financial Responsibility for Facilities Subject to RCRA Corrective Action (U.S.EPA, September 30, 2003); and/or
d. 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 FR 30798 (July 27, 1990), may be used as secondary guidance at the discretion of the Department. Unless otherwise specified herein, where the language of this Permit conflicts with these rules, proposed rules, notices, and guidance documents, the language of this Permit will prevail.

2.6.4.5. Within thirty (30) days from the effective date of an Agreed Order or Consent Decree incorporated by reference into this Permit, the Permittee must submit to the Department for review and approval a written cost estimate to cover the cost of the Permittee's activities in the Permit. If the Department rejects the Permittee's cost estimate as submitted, the Department shall provide to the Permittee a revised cost estimate amount that will be the approved cost estimate. The Department will, if requested by the permittee in writing, provide a written explanation of the variance between the Permittee's proposed cost estimate and the Department's approved cost estimate. Within thirty (30) days after the Department's final approval of the Permittee's cost estimate amount or the Permittee's receipt of the Department's approved cost estimate amount, the Permittee must establish and maintain continuous coverage of financial assurance in the amount of the approved cost estimate and submit the applicable financial assurance documentation per Permit Condition 2.6.4.2. If the Department does not accept, reject, or revise the Permittee's cost estimate within sixty (60) days after submittal, the Permittee's cost estimate will be deemed approved for purposes of this Permit condition. The Department reserves the right to review and revise the Permittee's cost estimate after the 60-day review period. If the Department revises the Permittee's cost estimate after the 60-day review period, the Permittee must provide an updated financial assurance instrument within (60) days after the revision. If the Permittee disagrees with the Department's cost estimate, they may enter into "Resolution of Disputes" procedures pursuant to Permit Condition 2.6.9.

2.6.4.6 If the Permittee is required to submit an additional work plan(s) under this Permit or the incorporated Agreed Order or Consent Decree; or to conduct activities related to corrective action not previously part of the original cost estimate, the process outlined in Permit Condition 2.6.4.5 will apply in the submission process of an additional work plan(s).

2.6.4.7. If the Permittee believes that the estimated cost of work to complete activities under this Permit or the incorporated Agreed Order or Consent Decree has diminished below the amount covered by existing financial assurance provided under this Permit, the Permittee may submit a written proposal to the Department to reduce the amount of the financial assurance provided under this Permit Condition so that the amount of the financial assurance is equal to the estimated cost of the remaining work to be performed. The written proposal must specify, at a minimum, the cost of the remaining work to be performed and the basis upon which such cost was calculated. If the Department decides to accept such a proposal, the Department will notify the permittee of its decision in writing. After receiving the Department's written decision, the Permittee may reduce the amount of financial assurance only in accordance with and to the extent permitted by such written decision. Within thirty (30) days after receipt of the Department's written decision, the Permittee must submit the applicable financial assurance documentation per Permit Condition 2.6.4.2. No change to the form or terms of any financial assurance provided under Permit Condition 2.6.4, other than a reduction in amount, is authorized under this Permit condition.

2.6.4.8. Within thirty (30) days of written notice that the Department has selected a final remedy, the Permittee must prepare a detailed written notice that the Department has selected a final remedy, the Permittee must prepare a detailed written

estimate of the cost for the remaining amount of work to be completed by the Permittee under this Permit or the incorporated Agreed Order or Consent Decree including, but not limited to, the final remedy, and submit the same to both the Department's Financial Assurance Officer and Project Manager for review and approval. The process outlined in Permit Condition 2.6.4.5 will apply in the submission of cost estimates.

2.6.4.9. 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 the Permittee. On a case-by-case basis, the Department may also determine that a company which 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. The Permittee may also not incorporate a zero cost for wastes that might have economic value.

2.6.4.10. The Permittee must annually adjust all cost estimates for inflation. Adjustments for inflation must be calculated in accordance with the procedure outlined in WAC 173-303-620(3)(c).

2.6.4.11. Acceptable financial assurance mechanisms are trust funds, surety bonds, letters of credit, insurance, the financial test, and the corporate guarantee. The Department may allow other financial assurance mechanisms if they are consistent with the laws of Washington and if the Permittee demonstrates to the satisfaction of the Department that those mechanisms provide adequate financial assurance.

2.6.4.12. If the Permittee is using the financial test or corporate guarantee to meet their financial assurance obligation, the annual inflationary adjustment must occur within ninety (90) days after the close of the Permittee's fiscal year. If the Permittee is using any mechanism other than the financial test or corporate guarantee, this adjustment must occur each year within thirty (30) days after the anniversary of the effective date of this Permit or the incorporated Agreed Order or Consent Decree.

2.6.4.13. If the Permittee seeks to establish financial assurance by using a surety bond for payment or a letter of credit, the Permittee must at the same time establish and thereafter maintain a standby trust fund acceptable to the Department into which funds from the other financial assurance instrument can be deposited, if the financial assurance provider is directed to do so by the Department, pursuant to the terms of this Permit.

2.6.4.14. The Permittee must notify the Department's Project Manager and Financial Assurance Officer by certified mail of the commencement of a voluntary or involuntary bankruptcy proceeding, naming the Permittee 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.

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

a. In the event of bankruptcy of the trustee or issuing institution; or
b. If the authority of the trustee institution to act as trustee has been suspended or revoked; or
c. If the authority of the institution issuing the surety bond, letter or credit, or insurance policy has been suspended or revoked.

2.6.4.14.2. 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, the Permittee must establish a replacement financial assurance mechanism by any means specified in WAC 173-303-620 or other financial instrument as approved by the Department within sixty (60) days after such an event.

2.6.4.15. The Department's Financial Assurance Officer is:

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: kimberly.goetz@ecy.wa.gov

2.6.5 DESIGNATED PROJECT MANAGERS:

The Project Manager for the Department is:

Robin Harrover
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5492
360/407-6359
robin.harrover@ecy.wa.gov

The Project Manager for the Permittee is:

William Beck
PSC Environmental Services, LLC
1800 – 72nd Avenue S, Suite 217
Kent, WA 98032-1035
425/227-6149
w.beck@pscnow.com

The project managers will be responsible for overseeing the implementation of Part 2 of this Permit. To the maximum extent possible, communications between the Department and the Permittee, and all documents, including reports, approvals, and other correspondence concerning activities performed pursuant to the conditions of Part 2 of this Permit, will be directed through the project managers. These phone numbers and addresses may change and such changes will not require a permit modification. Should the Department or the Permittee change project managers, written notification by certified mail or other means establishing proof of delivery will be provided to the

Department or the Permittee at least ten (10) days prior to the change, if possible. A revised page(s) of this Permit must also be prepared. If these provisions are met within reason, a permit modification following the procedures of WAC 173-303-830(3) or (4) and 40 CFR §§ 270.41 and 270.42 will not be required.

2.6.6. PERFORMANCE

2.6.6.1. Once approved in writing by the Department, all submittals to the Department as required by Part 2 of this Permit become enforceable parts of this Permit. During the performance of work under an approved submittal, field modifications may be agreed to verbally by the Department's and the Permittee's project managers. In such a case, the Permittee must submit a description of the modification to the Department's Project Manager in writing within seven (7) days after the verbal agreement. The Department's Project Manager will confirm in writing that the Permittee's description conforms to the agreed-upon modification.

2.6.6.1 The Permittee must provide this Permit and any incorporated Agreed Order or Consent Decree to all agents, contractors, and subcontractors retained to perform work required by Part 2 of this Permit and must ensure that all work undertaken by such agents, contractors, and subcontractors will be in compliance with Part 2 of this Permit.

2.6.6.2 All geologic and hydrogeologic work performed pursuant to Part 2 of this Permit shall 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.

2.6.6.3 All engineering work performed pursuant to Part 2 of this Permit shall 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.

2.6.6.4 All construction work performed pursuant to Part 2 of this Permit shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of professional engineer. The professional engineer must be registered in the State of Washington, except as otherwise provided for by RCW 18.43.130.

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

2.6.6.6 The Permittee must notify the Department in writing of the identity of any engineer(s), geologist(s), contractor(s), and subcontractor(s), and others to be used in carrying out the terms of Part 2 of this Permit, seven (7) days in advance of their involvement at the Facility.

2.6.6.7 The Permittee must provide seven (7) days notice to the Department's Project Manager prior to conducting work activities that the Department identifies at the Facility, including sampling activities and installation(s) of new monitoring wells. The Permittee must provide seven (7) days notice of all excavation activities conducted by the Permittee at the Facility and on neighboring properties. Without limitation of the Department's rights under Permit Condition 2.6.7 (Access), the

Department will attempt to notify the Permittee prior to any sample collection activity at the Facility unless an emergency prevents such notice.

2.6.7 ACCESS

In addition to Permit Condition 1.3.6. (Inspection and Entry), the Permittee must grant the Department or any of the Department's authorized representatives full authority to enter and freely move about the Facility that the Permittee 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 Part 2 of this Permit; reviewing the progress in carrying out the provisions of Part 2 of this Permit; conducting such tests or collecting samples as the Department or the Department's Project Manager may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to Part 2 of this Permit; and verifying the data submitted to the Department by the Permittee. The Permittee shall make all reasonable efforts to secure access rights for those properties within the Facility not owned or controlled by the Permittee where remedial activities or investigations will be performed pursuant to Part 2 of this Permit. This permit condition constitutes reasonable notice of access, and the Permittee must allow access to the Facility at all reasonable times for purposes of overseeing work performed under Part 2 of this Permit.

2.6.8 RETENTION OF RECORDS:

In addition to Permit Condition 1.4 (Monitoring and Records), during the pendency of this Permit and any incorporated Agreed Order or Consent Decree and for ten (10) years from the date of issuance by the Department of written notification that all requirements of Part 2 of this Permit and the incorporated Agreed Order or Consent Decree have been satisfactorily completed, the Permittee must preserve in a readily retrievable fashion, all records, reports, documents, and underlying data in its possession relevant to the implementation of Part 2 of this Permit and the incorporated Agreed Order or Consent Decree. The Permittee must insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of the Department, the Permittee must make all records available to the Department and allow access for review within a reasonable time.

2.6.9 RESOLUTION OF DISPUTES

2.6.9.1 In the event a dispute arises as to an approval, disapproval, proposed change or other formal opinion or action by the Department's Project Manager under Part 2 of this Permit, the Department and the Permittee will utilize the dispute resolution procedure set forth below.

a. Upon receipt of the Department Project Manager's written decision, the Permittee has fourteen (14) days within which to notify in writing the Department's Project Manager of its objection to the decision.

b. The Department's and the Permittee's project managers will then confer in an effort to resolve the dispute. If the project managers cannot resolve the dispute within fourteen (14) days of the Department's receipt of the written objection, the Department's Project Manager will issue a written decision.

c. The Permittee may then request regional management review of the decision. This request must be submitted to the Supervisor of the Hazardous Waste and Toxics Reduction (HWTR) Section at the Department's Northwest Regional

Office within seven (7) days of receipt of the Department Project Manager's written decision.

d. The Section Supervisor will conduct a review of the dispute and endeavor to issue a written decision regarding the dispute within thirty (30) days of the Permittee's request for review. The Section Supervisor's decision will be the Department's final opinion on the disputed matter.

2.6.9.2 The Department and the Permittee 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.

2.6.9.3 Implementation of these dispute resolution procedures must not provide a basis for delay of any activities required in Part 2 of this Permit, unless the Department agrees in writing to a schedule extension.

2.6.10 EXTENSION OF SCHEDULE:

2.6.10.1. The Department may grant an extension of schedule if the Permittee submits a request for an extension 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 must be requested in writing. The request must specify:
a. The deadline that is sought to be extended;
b. The length of the extension sought;
c. The reason(s) for the extension; and
d. Any related deadline or schedule that would be affected if the extension were granted.

2.6.10.2. The burden shall be on the Permittee to demonstrate to the satisfaction of the Department 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:
a. Circumstances beyond the reasonable control and despite the due diligence of the Permittee including delays caused by unrelated third parties or the Department, such as (but not limited to) delays by the Department in reviewing, approving, or modifying documents submitted by the Permittee;
b. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or
c. Endangerment as described in Permit Condition 2.6.12.
However, neither increased costs of performance of the terms of this Permit nor changed economic circumstances will be considered circumstances beyond the reasonable control of the Permittee.

2.6.10.3. The Department will act upon any written request for extension in a timely fashion. The Department will give the Permittee written notification of any extensions granted pursuant to this Permit. A requested extension will not be effective until approved by the Department. Such revisions to the schedules will not require a permit modification, except when required by WAC 173-303-830(4)(i)(N)(5) to incorporate a substantial change requiring public comment under WAC 173-340-600.

2.6.10.4. The Department will grant an extension only for such period of time as the Department determines is reasonable under the circumstances. The Department may grant schedule extensions exceeding ninety (90) days only as a result of:

a. Delays in the issuance of a necessary permit which was applied for in a timely manner;
b. Other circumstances deemed exceptional or extraordinary by the Department; or
c. Endangerment as described in Permit Condition 2.6.12. Copies of all correspondence pursuant to this permit condition must be kept in the Facility's operating record.

2.6.11. ADDITIONAL WORK

The Department may determine or the Permittee may propose that additional work, beyond the scope of the performance requirements of Part 2 of the Permit, is or may be necessary to implement Part2 of the Permit. If the Permittee proposes the additional work, the Department will respond to the proposal in writing within an appropriate time period, no longer than thirty (30) days. If the Department requires the additional work, then the Department will specify in writing the basis for its determination that the additional work is necessary. Within fifteen (15) days after receipt of such written determination, the Permittee shall notify the Department of its willingness to perform the additional work or may request a meeting with the Department to discuss the additional work. If the Permittee is willing to perform the additional work, the Permittee shall submit a work plan incorporating the additional work for review by the Department. The work plan shall be submitted within thirty (30) days (or more, if approved by the Department) after either submitting notice of willingness to perform or of the date of the meeting with the Department, whichever is applicable. The work plan shall be submitted as a Class 1 permit modification request. Upon written approval of the permit modification, the Permittee shall implement the work plan in accordance with the schedule contained therein.

2.6.12. ENDANGERMENT:

2.6.12.1. In the event the Department determines that any activity being performed at the Facility is creating or has the potential to create a danger to human health or the environment, the Department may order the Permittee to stop such activities of Part 2 of this Permit for such period of time as it deems necessary to abate the danger. The Permittee must immediately comply with such directions.

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

2.6.12.3. If the Department concurs with or orders a work stoppage pursuant to Part 2 of this Permit, the Permittee's obligations with respect to the ceased activities will be suspended until the Department 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 Permit Condition 2.6.10 (Extensions of Schedule) for such period of time as the Department determines is reasonable under the circumstances.

2.6.12.4. Nothing in this Permit limits the authority of the Department, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

2.6.13. TRANSFER OF INTEREST IN PROPERTY:

2.6.13.1. The Permittee must not consummate any voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Facility without provision for continued implementation of all requirements of Part 2 of this Permit and implementation of any remedial actions found to be necessary as a result of this Permit.

2.6.13.2. In addition to the requirements of Permit Condition 1.2.2. (Transfer of Permit), prior to transfer of any interest in all or any portion of the Facility, the Permittee must provide a copy of Part 2 of this Permit and any incorporated Agreed Order or Consent Decree to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest. Upon transfer of any interest, the Permittee must restrict uses and activities to those consistent with this Permit and notify all transferees of the restrictions on use of the property.

2.6.13.3. At least thirty (30) days prior to any transfer, the Permittee must notify the Department and the Agency of the said transfer and provide the Department and the Agency with a plan for continued implementation of Part 2 of this Permit. The Permittee must also submit a request for modification of the permit per WAC 173-303-830(2), (3) and (4) and 40 CFR §§ 270.41 and 270.42.

2.6.13.4. If there is a lessee(s) on the Facility at the effective date of this Permit, the Permittee must serve a copy of this Permit and any incorporated Agreed Order or Consent Decree upon any current lessee(s) within fifteen (15) days of the effective date of this Permit. Within thirty (30) days of the effective date of this Permit, the Permittee must amend the current lease(s), if necessary, to ensure that the Department, any authorized representative of the Department, or any party or entity directed or authorized by the Department, has access to all property at the Facility that the Permittee either owns, controls, or has access rights to at all reasonable times for the purpose of investigating and remediating the release of hazardous substances at the Facility, consistent with Permit Condition **Error! Reference source not found.** (Access).

2.6.14. COMPLIANCE WITH OTHER APPLICABLE LAWS:

All actions carried out by the Permittee pursuant to this Permit must be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits.

2.6.15. NEWLY IDENTIFIED RELEASES

2.6.15.1. Notification

The Permittee must continuously consider and evaluate information regarding releases, suspected releases, or potential releases, at the Facility of hazardous substances, including dangerous waste and dangerous constituents as defined by WAC 173-303-64610(4). The Permittee must notify the Department's Project Manager, in writing, of any newly-identified SWMU(s), newly-discovered releases from previously identified or newly identified SWMU(s), and newly-discovered AOC(s) at or from the Facility, no later than fifteen (15) days after discovery. The Permittee must provide information specified in WAC 173-303-806(4)(a)(xxiii) and 806(4)(a)(xxiv)(A).

2.6.15.2. Corrective Action

After receiving notification of any newly identified releases at the Facility, the Department will determine whether the Permittee must fulfill corrective action responsibilities as required by Chapter 173-303 WAC. The Department will specify in writing the basis for its determination that the additional work is necessary. Any such corrective action will be incorporated into this Permit by a permit modification or into any incorporated Agreed Order or Consent Decree by an order amendment. Upon written approval of the permit modification or Agreed Order or Consent Decree amendment, the Permittee must implement the work plan in accordance with the schedule contained therein. The actions taken must meet or exceed all substantive corrective action requirements of Chapter 70.105 RCW and Chapter 173-303 WAC.

To ensure that corrective action will be conducted as necessary to protect human health and the environment, the Permittee must conduct corrective action in a manner that is consistent with the following provisions of Chapter 173-340 WAC:

a. As necessary to select a cleanup action in accordance with WAC 173-340-360, WAC 173-340-350 State Remedial Investigation and Feasibility Study.
b. WAC 173-340-360 Selection of Cleanup Actions.
c. WAC 173-340-400 Cleanup Actions.
d. WAC 173-340-410 Compliance Monitoring Requirements.
e. WAC 173-340-420 Periodic Site Reviews.
f. WAC 173-340-440 Institutional Controls.
g. WAC 173-340-700 through -760 Cleanup Standards.

2.6.16. QUALITY ASSURANCE, SAMPLING, DATA SUBMITTAL, AND AVAILABILITY

2.6.16.1. For all sampling activities and analytical procedures performed pursuant to Part 2 of this Permit, the Permittee must use quality assurance, quality control, and chain-of-custody procedures as identified in relevant Department- or Agency-approved guidance documents. Specifically, the Permittee must follow the provisions specified in WAC 173-340-820 (Sampling and analysis plans), WAC 173-340-830 (Analytical procedures), Guidance on Sampling and Data Analysis Methods (Ecology Publication No. 94-049), Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology Publication No. 04-03-030) and any revisions or amendments thereto), or other guidance approved by the Department.

2.6.16.2. Groundwater monitoring wells must be designed, constructed, maintained, and abandoned in accordance with Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Wells) and the *RCRA Ground-Water Monitoring: Draft Technical Guidance* (EPA/530-R-93-001, PB93-139350, November 1992) and any revisions and amendments thereto. The Department and the Permittee may also use as guidance the publication *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* (EPA/530-R-09-007, March 2009). Groundwater monitoring well design, construction material, installation, and development methods must be documented.

2.6.16.3. In accordance with WAC 173-340-830(2)(a), for all hazardous substances analyses under Part 2 of this Permit, the Permittee must use a laboratory accredited by the Department under Chapter 173-50 WAC for the specific analyses to be conducted, unless otherwise approved by the Department.

2.6.16.4. In preparing any work plan and/or report for this Facility, the Permittee may use information and analytical data from previous investigations at the Facility, with the condition that the previous information and data are in accordance with the above mentioned regulations and Department or Agency guidance documents for sampling and analytical procedures.

2.6.16.5. The Permittee must report all laboratory methods, detection limits, and practical quantitation limits (PQLs) for all constituents included in the analyses pursuant to WAC 173-340-830. With respect to the implementation of Part 2 of this Permit, the Permittee must make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to the Department. Pursuant to WAC 173-340-840(5), all sampling data must be submitted to the Department in both printed and electronic formats in accordance with the Department's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by the Department for data submittal. Additionally, the Department may request raw laboratory data to be submitted. All other provisions specified in WAC 173-340-840 (General submittal requirements) must also be followed.

2.6.16.6. If requested by the Department, the Permittee must allow the Department and/or the Department's authorized representative to take split or duplicate samples of any collected by the Permittee pursuant to implementation of Part 2 of this Permit. The Department may, upon request, allow the Permittee and/or the Permittee's authorized representative to take split or duplicate samples of any samples collected by the Department pursuant to implementation of Part 2 of this Permit, provided that doing so does not interfere with the Department's sampling.

2.6.17. LAND USE RESTRICTION

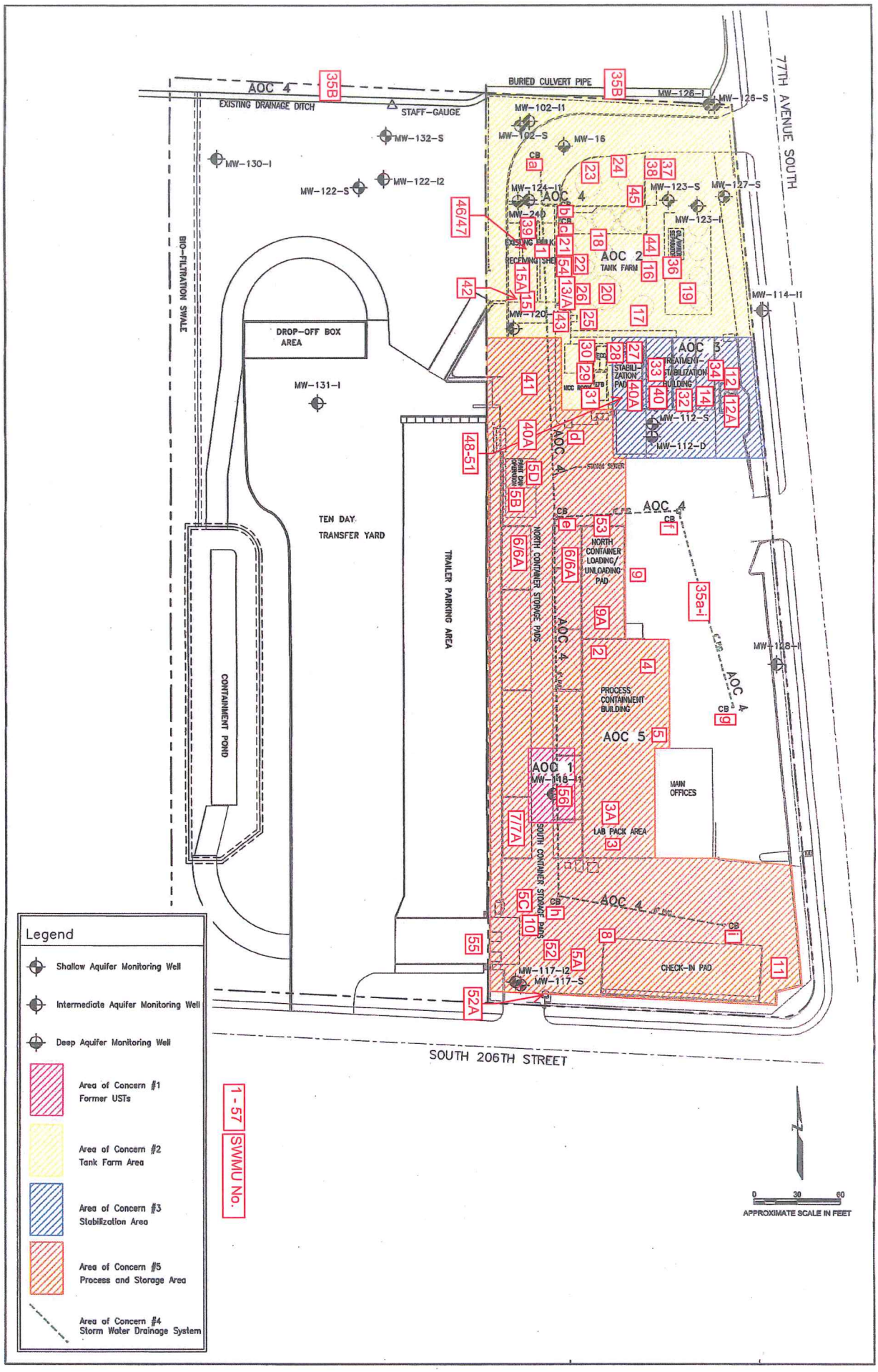
If a restrictive covenant is required under WAC 173-340-440(4), the Permittee must record a restrictive covenant meeting the requirements of WAC 173-340-440(9) with the office of the King County Auditor within ten (10) days of completion of the remedial action. The Permittee must provide the Department with a copy of the recorded Restrictive Covenant within thirty (30) days of the recording date. The Permittee must also comply with the requirements of WAC 173-303-610(9) and -610(10).

2.6.18. PERIODIC REVIEW

After initiation of the cleanup action required by the (Final CAP), and in accordance with WAC 173-340-420(2), the Department will conduct periodic reviews at least every five years. At least ninety (90) days prior to each periodic review, the Permittee must submit a report to the Department that documents whether human health and the environment are being protected based on factors set forth in WAC 173-340-420(4). The Department reserves the right to require the Permittee to conduct further corrective action to comply with the corrective action requirements under Chapter 173-303 WAC. After reviewing information obtained from the Permittee and other sources, if the Department determines that substantial changes in the cleanup action are necessary to protect human health and the environment, the Permittee must submit a revised draft cleanup action plan for Department review and approval. The Department will provide opportunities for public review and comment on the draft cleanup action plan in accordance with WAC 173-340-830 and WAC 173-340-600. Approved corrective action plans will be incorporated into this Permit in accordance with the permit modification procedures under WAC 173-303-830.

ATTACHMENT A

Diagram of the Facility showing Solid Waste Management Units (SWMUs), and Areas of Concern (AOC)


AOC 4
EXISTING DRAINAGE DITCH
STAFF-GAUGE
BURIED CULVERT PIPE
77TH AVENUE SOUTH
BIO-FILTRATION SWALE
DROP-OFF BOX AREA
TEN DAY TRANSFER YARD
TRAILER PARKING AREA
CONTAINMENT POND
NORTH CONTAINER STORAGE PADS
SOUTH CONTAINER STORAGE PADS
NORTH CONTAINER LOADING/ UNLOADING PAD
PROCESS CONTAINMENT BUILDING
AOC 5
AOC 1
MW-118-I
MAIN OFFICES
LAB PACK AREA
CHECK-IN PAD
AOC 2
TANK FARM
AOC 3
TREATMENT STABILIZATION BUILDING
STABILI-ZATION PAD
SOUTH 206TH STREET
MW-102-I1
MW-102-S
MW-16
MW-132-S
MW-130-I
MW-122-I2
MW-122-S
MW-124-I1
MW-240
MW-123-S
MW-123-I
MW-127-S
MW-126-I
MW-126-S
MW-114-I1
MW-120
MW-131-I
MW-112-S
MW-112-D
MW-128-I
MW-117-I2
MW-117-S
Legend
Shallow Aquifer Monitoring Well
Intermediate Aquifer Monitoring Well
Deep Aquifer Monitoring Well
Area of Concern #1 Former USTs
Area of Concern #2 Tank Farm Area
Area of Concern #3 Stabilization Area
Area of Concern #5 Process and Storage Area
Area of Concern #4 Storm Water Drainage System
1 - 57 SWMU No.
0 30 60
APPROXIMATE SCALE IN FEET

ATTACHMENT B

List of SWMUs and AOC

Attachment B
Resolution of SWMUs and AOCs for Corrective Action

Red Highlight – RCRA Facility Assessment High Priority[1]
Orange Highlight – RCRA Facility Assessment Medium Priority[1]
Red Text – Tank certified closed and placed back in service as part of the Wastewater Treatment Plant

SWMUs Incorporated Into AOCs 1-5

Cleanup of soil and groundwater at the AOC to meet the Facility cleanup standards addresses cleanup of the incorporated SWMUs
[Unit may also be included in Facility Closure Plan]

AOC 1 – Former USTs	
SWMUs	STATUS
56 Former USTs (Three tanks removed, one was a 5000 gallon tank. Tanks held diesel, leaded gasoline, and unleaded gasoline)	Tanks and soil removed in 1991, soil sampling, and subsequent groundwater monitoring shows NFA is warranted. Still included in groundwater monitoring.

AOC 2 – Tank Farm	
SWMUs	STATUS
1 Bulk Receiving Area	Active
13 Former Roto Strainer Accumulation Area	Not Active
13A Roto Strainer Screen	Active – part of wastewater treatment (WWT) system
15 Former Solidification Area	Removed. Included in RI investigation.
15A Solidification and Bulk Receiving Area Sump	Active. Included in RI Investigation
16 T5302 (T6B) Sludge Treatment Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.

[1] ***RCRA Facility Assessment, Preliminary Review/VSI Report, Burlington Environmental, Inc., Kent Washington***; SAIC (Science Applications International Corporation), prepared for EPA Region X, January 1996.

[2] These tanks and their secondary containment have been certified closed. At the time of closure the tanks and secondary containment were decontaminated and either removed or placed back in service to treat only non-dangerous waste liquids. These tanks are **not covered by this permit and must treat non-dangerous wastes only.** The investigation and cleanup of contaminated soils underneath the tanks will take place at the time that the units are no longer in active service. The closure will take place according to the closure plan, Section I of the Permit Application incorporated by reference into this permit (see Part 1), and will comply with the regulations for closure, WAC 173-303-806(4)(a)(xiii), -610.

AOC 2 – Tank Farm	
SWMUs	STATUS
17 T-5301 (T6A) Sludge Treatment Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
18 T-5401 (T-2) Wastewater Storage Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
19 T-5402 (T-3A) Wastewater Storage Tank[2]	Hole in tank discovered at closure. The tank was removed. Subsequent sampling of the sub-base material (SBM) below the tank did not find evidence of a release
20 T-5101 (T-1) Primary Separator Treatment/Storage Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
21 T-5102 (T-10) Batch Wastewater Treatment/Storage[2]	This tank was removed and the unit is closed. A hole was discovered during an inspection, and subsequent sampling of the SBM did not find evidence of a release.
22 T-5201 (T-8) Oily Waste Treatment/Storage Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
23 T-5202 (T-9A) Oily Waste Treatment/Storage Tank[2]	This tank was closed and removed.
24 T-5203 (T-9B, moved to location of T-9A) Oily Waste Treatment/Storage Tank[2]	This tank was closed and moved to the former location of T-9A. The SBM was sampled and no evidence of a release was found. This tank is now DW Tank T-9B.
25 F5100 Air Scrubber	Removed
26 H-5100 Roto Strainer Screen	Active – part of wastewater treatment (WWT) system
29 T-5405 (T-5) Electro-Flotation Basin Treatment Tank	Removed
30 T-5407 Coagulation cell Electroclear (ECC) Wastewater Treatment Tank	Removed
31 T-5408 Electro-Flotation Basin Wastewater Treatment/Storage Tank (EFB)	Removed
36 Former T5406 (T-7) Recycled Water Storage Tank	Removed
37 Former TEB Pretreatment Tank (Baker Tank)	Removed
38 Former TWB Pretreatment Tank (Baker Tank)	Removed
39 Former Reactor Tank (T-21)	Formerly located under Bulk Receiving Area west of Tank Farm.

AOC 2 – Tank Farm	
SWMUs	STATUS
	Tank was removed.
42 Former Storage Tank (T-22)	Formerly located west of the former Solidification Area. Tank was removed.
43 Sump	Active. Located in Tank Farm Area
44 Sump	Active. Located in Tank Farm Area
45 Sump	Active. Located in Tank Farm Area
46 Former T504	Formerly under Bulk Receiving Area west of Tank Farm. Tank was removed
47 Former T537	Formerly under Bulk Receiving Area west of Tank Farm. Tank was removed
54 T-5603 Mercury Treatment Tank[2]	This unit was closed and the tank was removed.

AOC 3 – Stabilization Area	
SWMUs	STATUS
12 Centrifuge Drop Box Satellite Accumulation Area	Not Active
12A Former Moderate Risk Waste (MRW) Sump	Not Active. This sump was formerly the containment for a truck scale which was removed and converted to MRW handling including liquid solid waste. This waste process has been moved to Tanks T-5305 and T-5306. This area is being closed.
14 Stabilization Area	Active. The stabilization area includes the MRW Area, the area under cover, and the stabilization pad. It includes Tanks T-5305 (SWMU 32) and T-5306 (SWMU 40), and all related sumps
27 T-5403 (T4A) Wastewater Treatment Tank	Removed
28 T-5404 (T-4B) Electro-Flotation Basin Treatment Tank	Removed
32 T-5305 Stabilization Receiving Treatment Pit	Above-ground portion closed and converted to MRW use
33 C-5301 Centrifuge	Removed
34 C-5301 Centrifuge Conveyor	Removed
40 T-5306 Stabilization Receiving Treatment Pit	Above-ground portion closed and converted to MRW use
40A Former Drum/Truck Washing Area	Not Active.
48-51 Old Centrifuge	Removed. Formerly located by T-22 (SWMU 42) and Solidification Area (15)

AOC 4 – Stormwater Drainage System	
SWMUs	STATUS
35 Stormwater Drainage System	Active. Includes the ditch at the northern property boundary, Oil/Water Separator by MW-16 (35a) and Sumps (35b – i).
35B Stormwater Drainage Ditch	Active. The stormwater drainage system includes the ditch at the northern property boundary.

AOC 5 – Process and Storage Areas		
SWMUs		STATUS
2	Indoor Flammable Waste Storage Area (PCB Facility)	Active
3	Indoor Lab Pack & Household DW Storage Area	Active
3A	Indoor Lab Pack & Household DW Storage Area SUMP	Active
4	Compactor Area	Active
5	Aerosol Can Depressurization Area	Not Active
5A	Former Can crush canopy area in SW Corner of Facility	Not Active
5B	Former Can crush canopy area located between MW-15 and North Container Storage Area	Not Active
5C	Can crusher area in south check-in area	Active
5D	Can crusher area in new North Staging Area	Active
6	North Container Storage Area	Active
6A	North Container Storage Area SUMP	Active
7	South Container Storage Area	Active.
7A	South Container Storage Area SUMP	Active
8	South Staging Area	Active
9	North Staging Area	Active

AOC 5 – Process and Storage Areas		
SWMUs		STATUS
9A	North Staging Area Located North of Warehouse	Active
10	Household hazardous waste dumpster	Active
11	Solid Waste Dumpster	Active
40A	Former Drum/Truck Washing Area	Active
41	Former Container Management Area	Not Active
52	South Container Loading/Unloading Area	Active
52A	South Unloading Area SUMP	Active
53	North Container Loading/Unloading Area	Active
55	Drum Dock, West side of facility	Active

ATTACHMENT C

Well Construction, Maintenance, and Replacement

ATTACHMENT C

WELL CONSTRUCTION, MAINTENANCE, AND REPLACEMENT

New and existing wells operated for the purposes of this Pennit shall meet all applicable state and federal laws. In addition, the Permittee shall specifically meet requirements 1-6 below, or propose equivalent or superior methods for Department approval. For minor deviations from the stated methods deemed necessary by the Permittee due to unforeseen events in the field, the Permittee shall notify the Department by telephone and a notation describing and explaining the deviation must be logged in the facility's Operation Record.

1. Monitoring, observation, and recovery wells shall be inspected quarterly and maintained in good working order. The Permittee shall maintain an adequate supply of replacement parts and repair equipment as necessary to ensure that repairs may be undertaken in a timely manner, and that wells may continue to perform their stated functions.

2. Visual evidence of damage to or deterioration of wells, and all well maintenance activities, must be logged in the facility's Operating Record. The Permittee shall also notify the Department by telephone or in writing of any visual damage to or deterioration of wells.

3. The Permittee shall maintain the borehole integrity at each well. One of the following three methods will be consistently used to maintain that integrity:

   a) Annual comparisons of specific capacity. With this method the Permittee shall redevelop any well to within 5% of the original specific capacity if that well's annual capacity measurement is less than 80% of the original measured capacity;

   b) Annual sounding. With this method the Permittee shall develop any well which has an annually measured build-up of at least one (1) foot of sediment; or,

   c) Biennial comparisons of hydraulic conductivity. With this method the Permittee shall redevelop any well to within 5% of the original hydraulic conductivity if that well's biennial conductivity measurement is less than 80% of the original measured conductivity. Hydraulic conductivity shall be determined through consistently performed slug tests.

4. If any well must be decommissioned and replaced for any reason during the term of this Permit, the Permittee shall, if possible, replace that well prior to the next scheduled sampling event. At least fifteen (15) days prior to decommissioning, the Permittee shall give notice in writing to the Department explaining the rationale for the decision.

   In such a case, the replacement well shall be installed as close as practicable to the well being replaced. The Permittee shall provide information regarding the new well in the facility's Operating Record, and shall submit this information to the Department as stated in Item 6 below.

   The Permittee shall close each well being replaced no later than ninety (90) days after installation of the replacement well. Unless analytical data from the well being closed shows that hazardous constituent concentrations have been below MTCA Method B groundwater cleanup levels or more conservative proposed cleanup levels for at least three (3) consecutive years, closure shall be accomplished by pulling the casing or drilling out the casing and screen, re-drilling the borehole, and backfilling the entire depth of the borehole through a tremie pipe

with a 3% to 5% bentonite/cement grout. In the case where a well to be closed is separated from contaminated zones by what the Department considers to be a continuous, well-defined aquitard, abandonment may proceed by ripping the well casing below the seal, destroying the screen and filter pack. The well may then be pressure grouted from the bottom up.

5. A qualified geologist shall perfom1 inspection of drilling and well construction. The geologist shall prepare and maintain a detailed log of each well, describing the geologic strata encountered during drilling. The logs and descriptions shall include:

   a. Date and time of construction;

   b. Drilling method and any fluid used;

   c. Well location (surveyed to within 0.5');

   d. Borehole and well casing diameter;

   e. Well depth (surveyed to within 0.1');

   f. Field drilling logs and lithologic logs, including a description of soil or rock types, color, weathering, texture, structure, and fractures;

   g. Casing materials;

   h. Screen material, design, length, and slot size;

   i. Casing and screen joint type;

   j. Filter pack material (including size, placement method, and approximate volume);

   k. Composition and approximate volume of sealant material, and method of placement;

   l. surface seal design and construction;

   m. Well development procedures;

   n. Ground surface elevation (to within O.01')

   o. Top of casing elevation (to within 0.01'); and,

   p. Detailed drawing of the well, including dimensions.

6. The Permittee shall submit the logs and descriptions prepared pursuant to Item 5 above, as-built drawings, and location information for any new well(s) to the Department within thirty (30) days after completion of the well(s). Such a submission shall not be considered a modification of the Permit.

A. PART A OF THE RCRA PERMIT APPLICATION

40 CFR 270.10(d), 270.11(a) and (d), 270.13

WAC 173-303-806(2), 810(2), 810(12), 810(13)

A.1. Background Information

A.1.1. REVISIONS INCLUDED IN PART A APPLICATION FOR PART B PERMIT

Burlington Environmental, LLC, is the legal owner of the facility. Burlington Environmental, LLC, a Clean Earth Environmental Solutions, Inc. company is identified as the facility operator and is a wholly-owned subsidiary of PSC Environmental Services, LLC, which is a wholly-owned subsidiary of Clean Earth Environmental Solutions, Inc. For simplicity, Burlington Environmental LLC, a Clean Earth Environmental Solutions, Inc. company will be referred to in this document as the "Kent facility."

The Kent facility's original RCRA Part B permit was issued on August 27, 1998 and was renewed on June 25, 2012. This permit modification addresses the change in operator identification and includes an updated Dangerous Waste Permit Application Part A Form [ECY 030-71 (08/2002)].

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Dangerous Waste Permit Application Part A Form

Date Received			Reviewed by:	Date:
Month	Day	Year	Approved by:	Date:

I. This form is submitted to: (place an "X" in the appropriate box)

X	**Request modification to a final status or Part B permit**
☐	**Establish interim status because of the newly regulated waste(s) (list wastes):** **Wastes newly regulated on:** (Date)
☐	**Request a change under interim status**
☐	**Apply for a final status permit. This includes the application for the first final status permit or for an application to replace an expiring permit.**

II. EPA/State ID Number

WAD991281767

III. Name of Facility

BURLINGTON ENVIRONMENTAL, LLC

IV. Facility Location (Physical address not P.O. Box or Route Number)

A. Street

2024577TH AVENUE SOUTH

Street (continued)

City or Town	State	ZIP Code
KENT	WA	98032-

County Code (if known)	County Name
17	KING

B. Land Type	C. Geographic Location:		D. Facility Existence Date Month Day Year
	LATITUDE (degrees, mins, & secs)	LONGITUDE (degrees, mins, & secs)	
P	47 25 5	-122 14 18	04 01 1981

V. Facility Mailing Address

Street or P.O. Box

SAME

City or Town	State	ZIP Code

Ecology is an equal opportunity employer.

VI. Facility contact (Person to be contacted regarding waste activities at facility)

Name (last)	(first)
SWICK	MEGAN

Job Title	Phone Number (area code and number)
FACILITY MGR	253-872-8030

Facility Contact Address (see instructions)

Street or P.O. Box

2024577TH AVENUE SOUTH

City or Town	State	ZIP Code
KENT	WA	98032

VII. Facility Operator Information (see instructions)

A. Name of Operator

Burlington Environmental, LLC, a Clean Earth Environmental Solutions, Inc. company

Street or P.O. Box

334 S WARMINSTER RD

City or Town	State	ZIP Code
HATBORO	PA	19040

Phone Number (area code and number)	B. Is the name listed in VII also the owner? If yes, skip to Section X.
215-734-1400	Yes ☐ No ☒*

C. Operator Type			D. Change of Operator (Indicator)	Date Changed Month Day Year
P	F = Federal I = Indian M = Municipal P = Private	S = State C = County D = District O = Other	Yes ☒ No ☐	04 06 2020

VIII. Facility Owner Information (see instructions)

A Name of Facility Owner

BURLINGTON ENVIRONMENTAL, LLC

Street or P.O. Box

1701 E ALEXANDER AVENUE

City or Town	State	ZIP Code
TACOMA	WA	98421

Phone Number (area code and number)
253-627-7568

B. Owner Type			C. Change of Owner Indicator	Date Changed Month Day Year
P	F = Federal I = Indian M = Municipal P = Private	S = State C = County D = District O = Other	Yes ☐ No ☒	

IX. NAIC Codes (5/6 digit codes)

A. First	B. Second
562211	562112

C. Third	D. Fourth

X. Other Environmental Permits (see instructions)

A. Permit Type	B. Permit Number	C. Description
E	71590-09	King County Industrial Wastewater Discharge Permit
E	10154	Puget Sound Clean Air Agency Registration
E	PR006389	Seattle/King Co. Moderate Risk Waste Permit
E	WAD991281767	USEPA TSCA Commercial Storage authorization

XI. Nature of Business (provide a brief description that includes both dangerous waste and non-dangerous waste areas and activities areas and activities)

*** Burlington Environmental, LLC (BELLC) is the legal owner of the facility. Burlington Environmental, LLC, a Clean Earth Environmental Solutions, Inc. company is identified as the facility operator and is a wholly-owned subsidiary of PSC Environmental Services, LLC, which is a wholly owned subsidiary of Clean Earth Environmental Solutions, Inc. For simplicity, Burlington Environmental, LLC, a Clean Earth Environmental Solutions, Inc. company will be referred to as the "Kent facility" throughout this permit application. The Kent facility is a storage and treatment facility for dangerous waste. Storage and treatment occurs in containers and tanks. The facility receives a broad variety of waste from off-site generators. The waste received for management may be described by any combination of the dangerous waste numbers shown in Section XIV. The estimated annual quantity of waste is based on historical records and on conservative estimates of future waste receipts at the facility. This estimate is intended to reflect all regulated dangerous waste numbers or treatment processes that apply. Incoming wastes are sorted by the appropriate treatment process. Facility waste management onsite options include:**

Wastewater Treatment and Discharge
Solidification (non-DW)
Tank Consolidation
Container Consolidation

Specific treatment processes utilized in these general options are described in detail in Sections B, C, and D of the Part B Permit renewal application.

The Kent facility is undergoing corrective actions to address soil and groundwater contamination from past practices at the facility. The Corrective Action Objectives, Work to be Performed and Terms and Conditions are covered in Section 2, Corrective Action, of the existing Part B permit. The Corrective Action work is being overseen by Ecology. In 2017, Ecology held a public comment period for the Remedial Investigation (RI) and Feasability Study (FS) for the Kent facility. No public comments were received and Ecology approved the RI and FS on March 20, 2018. A Cleanup Action Plan (CAP) has been accepted by Ecology for public comment which is expected in 2021. The CAP identifies the proposed cleanup for the Kent facility which consists of contaminated soil remedation, maintenance of surface cover over the remaining source soils, and monitored natural attenuation (MNA) to address affected site soil and groundwater.

Moderate Risk Waste (MRW) is a class of solid waste that covers Household Hazardous Waste (HHW) and Small Quantity Generator (SQG) waste that arrives at the facility in approved DOT drums, boxes, and bulk containers. MRW exhibits properties of hazardous waste but is conditionally exempt from dangerous waste regulations. The Kent facility's MRW operations are regulated under a solid waste permit issued by King County in accordance with WAC 173-350.

The Kent facility also manages TSCA and TSCA/RCRA regulated PCB wastes. Operations performed in the TSCA/DW area include container storage, PCB fluid draining, consolidation, flushing, and decontamination.

Section XII. Process Codes and Design Capacities

Line Number	A. Process Codes (enter code)	B. Process Design Capacity		C. Process Total Number of Units
		1. Amount (specify)	2. Unit of Measure (enter code)	
1	S01	9,900	G	1
2	S02	33,100	G	3
3	T01	57,600	U	3
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

Section XIII. Other Process Codes

Line Number	A. Process Codes (enter)	B. Process Design Capacity		C. Process Total Number of Units	D. Process Description
		1. Amount (specify)	2. Unit of Measure (enter code)		

XIV. Description of Dangerous Wastes

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process (1) Process Codes (enter)	D. Process (2) Process Description (If a code is not entered in D (1))
1	D001	2,000	T	S01 S02 T01	see note in Section XI
2	D002			S01 S02 T01	
3	D003			S01 S02 T01	
4	D004			S01 S02 T01	
5	D005			S01 S02 T01	
6	D006			S01 S02 T01	
7	D007			S01 S02 T01	
8	D008			S01 S02 T01	
9	D009			S01 S02 T01	
10	D010			S01 S02 T01	
11	D011			S01 S02 T01	
12	D012			S01 S02 T01	
13	D013			S01 S02 T01	
14	D014			S01 S02 T01	
15	D015			S01 S02 T01	
16	D016			S01 S02 T01	
17	D017			S01 S02 T01	
18	D018			S01 S02 T01	
19	D019			S01 S02 T01	
20	D020			S01 S02 T01	
21	D021			S01 S02 T01	
22	D022			S01 S02 T01	
23	D023			S01 S02 T01	
24	D024			S01 S02 T01	
25	D025			S01 S02 T01	

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
001	D026			S01 S02 T01
002	D027			S01 S02 T01
003	D028			S01 S02 T01
004	D029			S01 S02 T01
005	D030			S01 S02 T01
006	D031			S01 S02 T01
007	D032			S01 S02 T01
008	D033			S01 S02 T01
009	D034			S01 S02 T01
010	D035			S01 S02 T01
011	D036			S01 S02 T01
012	D037			S01 S02 T01
013	D038			S01 S02 T01
014	D039			S01 S02 T01
015	D040			S01 S02 T01
016	D041			S01 S02 T01
017	D042			S01 S02 T01
018	D043			S01 S02 T01
019	F001			S01 S02 T01
020	F002			S01 S02 T01
021	F003			S01 S02 T01
022	F004			S01 S02 T01
023	F005			S01 S02 T01
024	F006			S01 S02 T01
025	F007			S01 S02 T01
026	F008			S01 S02 T01
027	F009			S01 S02 T01
028	F010			S01 S02 T01
029	F011			S01 S02 T01
030	F012			S01 S02 T01
031	F019			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
032	F020			S01 S02 T01
033	F021			S01 S02 T01
034	F022			S01 S02 T01
035	F023			S01 S02 T01
036	F024			S01 S02 T01
037	F025			S01 S02 T01
038	F026			S01 S02 T01
039	F027			S01 S02 T01
040	F028			S01 S02 T01
041	F032			S01 S02 T01
042	F034			S01 S02 T01
043	F035			S01 S02 T01
044				
045	F037			S01 S02 T01
046	F038			S01 S02 T01
047	F039			S01 S02 T01
048	K001			S01 S02 T01
049	K002			S01 S02 T01
050	K003			S01 S02 T01
051	K004			S01 S02 T01
052	K005			S01 S02 T01
053	K006			S01 S02 T01
054	K007			S01 S02 T01
055	K008			S01 S02 T01
056	K009			S01 S02 T01
057	K010			S01 S02 T01
058	K011			S01 S02 T01
059	K013			S01 S02 T01
060	K014			S01 S02 T01
061	K015			S01 S02 T01
062	K016			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
063	K017			S01 S02 T01
064	K018			S01 S02 T01
065	K019			S01 S02 T01
066	K020			S01 S02 T01
067	K021			S01 S02 T01
068	K022			S01 S02 T01
069	K023			S01 S02 T01
070	K024			S01 S02 T01
071	K025			S01 S02 T01
072	K026			S01 S02 T01
073	K027			S01 S02 T01
074	K028			S01 S02 T01
075	K029			S01 S02 T01
076	K030			S01 S02 T01
077	K031			S01 S02 T01
078	K032			S01 S02 T01
079	K033			S01 S02 T01
080	K034			S01 S02 T01
081	K035			S01 S02 T01
082	K036			S01 S02 T01
083	K037			S01 S02 T01
084	K038			S01 S02 T01
085	K039			S01 S02 T01
086	K040			S01 S02 T01
087	K041			S01 S02 T01
088	K042			S01 S02 T01
089	K043			S01 S02 T01
090	K044			S01 S02 T01
091	K045			S01 S02 T01
092	K046			S01 S02 T01
093	K047			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process	
094	K048			S01 S02 T01	
095	K049			S01 S02 T01	
096	K050			S01 S02 T01	
097	K051			S01 S02 T01	
098	K052			S01 S02 T01	
099	K060			S01 S02 T01	
100	K061			S01 S02 T01	
101	K062			S01 S02 T01	
102	K069			S01 S02 T01	
103	K071			S01 S02 T01	
104	K073			S01 S02 T01	
105	K083			S01 S02 T01	
106	K084			S01 S02 T01	
107	K085			S01 S02 T01	
108	K086			S01 S02 T01	
109	K087			S01 S02 T01	
110	K088			S01 S02 T01	
111	K093			S01 S02 T01	
112	K094			S01 S02 T01	
113	K095			S01 S02 T01	
114	K096			S01 S02 T01	
115	K097			S01 S02 T01	
116	K098			S01 S02 T01	
117	K099			S01 S02 T01	
118	K100			S01 S02 T01	
119	K101			S01 S02 T01	
120	K102			S01 S02 T01	
121	K103			S01 S02 T01	
122	K104			S01 S02 T01	
123	K105			S01 S02 T01	
124	K106			S01 S02 T01	

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process	
125	K107			S01 S02 T01	
126	K108			S01 S02 T01	
127	K109			S01 S02 T01	
128	K110			S01 S02 T01	
129	K111			S01 S02 T01	
130	K112			S01 S02 T01	
131	K113			S01 S02 T01	
132	K114			S01 S02 T01	
133	K115			S01 S02 T01	
134	K116			S01 S02 T01	
135	K117			S01 S02 T01	
136	K118			S01 S02 T01	
137	K123			S01 S02 T01	
138	K124			S01 S02 T01	
139	K125			S01 S02 T01	
140	K126			S01 S02 T01	
141	K131			S01 S02 T01	
142	K132			S01 S02 T01	
143	K136			S01 S02 T01	
144	K141			S01 S02 T01	
145	K142			S01 S02 T01	
146	K143			S01 S02 T01	
147	K144			S01 S02 T01	
148	K145			S01 S02 T01	
149	K147			S01 S02 T01	
150	K148			S01 S02 T01	
151	K149			S01 S02 T01	
152	K150			S01 S02 T01	
153	K151			S01 S02 T01	
154	K156			S01 S02 T01	
155	K157			S01 S02 T01	
156	K158			S01 S02 T01	
157	K159			S01 S02 T01	
158	K161			S01 S02 T01	

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
156	K158			S01 S02 T01
157	K159			S01 S02 T01
158	K161			S01 S02 T01
159	K169			S01 S02 T01
160	K170			S01 S02 T01
161	K171			S01 S02 T01
162	K172			S01 S02 T01
163	K174			S01 S02 T01
164	K175			S01 S02 T01
165	K176			S01 S02 T01
166	K177			S01 S02 T01
167	K178			S01 S02 T01
168	P001			S01 S02 T01
169	P002			S01 S02 T01
170	P003			S01 S02 T01
171	P004			S01 S02 T01
172	P005			S01 S02 T01
173	P006			S01 S02 T01
174	P007			S01 S02 T01
175	P008			S01 S02 T01
176	P009			S01 S02 T01
177	P010			S01 S02 T01
178	P011			S01 S02 T01
179	P012			S01 S02 T01
180	P013			S01 S02 T01
181	P014			S01 S02 T01
182	P015			S01 S02 T01
183	P016			S01 S02 T01
184	P017			S01 S02 T01
185	P018			S01 S02 T01
186	P020			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
187	P021			S01 S02 T01
188	P022			S01 S02 T01
189	P023			S01 S02 T01
190	P024			S01 S02 T01
191	P026			S01 S02 T01
192	P027			S01 S02 T01
193	P028			S01 S02 T01
194	P029			S01 S02 T01
195	P030			S01 S02 T01
196	P031			S01 S02 T01
197	P033			S01 S02 T01
198	P034			S01 S02 T01
199	P036			S01 S02 T01
200	P037			S01 S02 T01
201	P038			S01 S02 T01
202	P039			S01 S02 T01
203	P040			S01 S02 T01
204	P041			S01 S02 T01
205	P042			S01 S02 T01
206	P043			S01 S02 T01
207	P044			S01 S02 T01
208	P045			S01 S02 T01
209	P046			S01 S02 T01
210	P047			S01 S02 T01
211	P048			S01 S02 T01
212	P049			S01 S02 T01
213	P050			S01 S02 T01
214	P051			S01 S02 T01
215	P052			S01 S02 T01
216	P054			S01 S02 T01
217	P056			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process	
218	P058			S01 S02 T01	
219	P059			S01 S02 T01	
220	P060			S01 S02 T01	
221	P062			S01 S02 T01	
222	P063			S01 S02 T01	
223	P064			S01 S02 T01	
224	P065			S01 S02 T01	
225	P066			S01 S02 T01	
226	P067			S01 S02 T01	
227	P068			S01 S02 T01	
228	P069			S01 S02 T01	
229	P070			S01 S02 T01	
230	P071			S01 S02 T01	
231	P072			S01 S02 T01	
232	P073			S01 S02 T01	
233	P074			S01 S02 T01	
234	P075			S01 S02 T01	
235	P076			S01 S02 T01	
236	P077			S01 S02 T01	
237	P078			S01 S02 T01	
238	P081			S01 S02 T01	
239	P082			S01 S02 T01	
240	P084			S01 S02 T01	
241	P085			S01 S02 T01	
242	P087			S01 S02 T01	
243	P088			S01 S02 T01	
244	P089			S01 S02 T01	
245	P092			S01 S02 T01	
246	P093			S01 S02 T01	
247	P094			S01 S02 T01	
248	P095			S01 S02 T01	

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
249	P096			S01 S02 T01
250	P097			S01 S02 T01
251	P098			S01 S02 T01
252	P099			S01 S02 T01
253	P101			S01 S02 T01
254	P102			S01 S02 T01
255	P103			S01 S02 T01
256	P104			S01 S02 T01
257	P105			S01 S02 T01
258	P106			S01 S02 T01
259	P108			S01 S02 T01
260	P109			S01 S02 T01
261	P110			S01 S02 T01
262	P111			S01 S02 T01
263	P112			S01 S02 T01
264	P113			S01 S02 T01
265	P114			S01 S02 T01
266	P115			S01 S02 T01
267	P116			S01 S02 T01
268	P118			S01 S02 T01
269	P119			S01 S02 T01
270	P120			S01 S02 T01
271	P121			S01 S02 T01
272	P122			S01 S02 T01
273	P123			S01 S02 T01
274	P185			S01 S02 T01
275	P188			S01 S02 T01
276	P189			S01 S02 T01
277	P190			S01 S02 T01
278	P191			S01 S02 T01
279	P192			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
280	P191			S01 S02 T01
281	P191			S01 S02 T01
282	P194			S01 S02 T01
283	P196			S01 S02 T01
284	P197			S01 S02 T01
285	P198			S01 S02 T01
286	P199			S01 S02 T01
287	P201			S01 S02 T01
288	P202			S01 S02 T01
289	P203			S01 S02 T01
290	P204			S01 S02 T01
291	P205			S01 S02 T01
292	U001			S01 S02 T01
293	U002			S01 S02 T01
294	U003			S01 S02 T01
295	U004			S01 S02 T01
296	U005			S01 S02 T01
297	U006			S01 S02 T01
298	U007			S01 S02 T01
299	U008			S01 S02 T01
300	U009			S01 S02 T01
301	U010			S01 S02 T01
302	U011			S01 S02 T01
303	U012			S01 S02 T01
304	U014			S01 S02 T01
305	U015			S01 S02 T01
306	U016			S01 S02 T01
307	U017			S01 S02 T01
308	U018			S01 S02 T01
309	U019			S01 S02 T01
310	U020			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process	
3 1 1	U 0 2 1			S 0 1 S 0 2 T 0 1	
3 1 2	U 0 2 2			S 0 1 S 0 2 T 0 1	
3 1 3	U 0 2 3			S 0 1 S 0 2 T 0 1	
3 1 4	U 0 2 4			S 0 1 S 0 2 T 0 1	
3 1 5	U 0 2 5			S 0 1 S 0 2 T 0 1	
3 1 6	U 0 2 6			S 0 1 S 0 2 T 0 1	
3 1 7	U 0 2 7			S 0 1 S 0 2 T 0 1	
3 1 8	U 0 2 8			S 0 1 S 0 2 T 0 1	
3 1 9	U 0 2 9			S 0 1 S 0 2 T 0 1	
3 2 0	U 0 3 0			S 0 1 S 0 2 T 0 1	
3 2 1	U 0 3 1			S 0 1 S 0 2 T 0 1	
3 2 2	U 0 3 2			S 0 1 S 0 2 T 0 1	
3 2 3	U 0 3 3			S 0 1 S 0 2 T 0 1	
3 2 4	U 0 3 4			S 0 1 S 0 2 T 0 1	
3 2 5	U 0 3 5			S 0 1 S 0 2 T 0 1	
3 2 6	U 0 3 6			S 0 1 S 0 2 T 0 1	
3 2 7	U 0 3 7			S 0 1 S 0 2 T 0 1	
3 2 8	U 0 3 8			S 0 1 S 0 2 T 0 1	
3 2 9	U 0 3 9			S 0 1 S 0 2 T 0 1	
3 3 0	U 0 4 1			S 0 1 S 0 2 T 0 1	
3 3 1	U 0 4 2			S 0 1 S 0 2 T 0 1	
3 3 2	U 0 4 3			S 0 1 S 0 2 T 0 1	
3 3 3	U 0 4 4			S 0 1 S 0 2 T 0 1	
3 3 4	U 0 4 5			S 0 1 S 0 2 T 0 1	
3 3 5	U 0 4 6			S 0 1 S 0 2 T 0 1	
3 3 6	U 0 4 7			S 0 1 S 0 2 T 0 1	
3 3 7	U 0 4 8			S 0 1 S 0 2 T 0 1	
3 3 8	U 0 4 9			S 0 1 S 0 2 T 0 1	
3 3 9	U 0 5 0			S 0 1 S 0 2 T 0 1	
3 4 0	U 0 5 1			S 0 1 S 0 2 T 0 1	
3 4 1	U 0 5 2			S 0 1 S 0 2 T 0 1	

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
342	U053			S01 S02 T01
343	U055			S01 S02 T01
344	U056			S01 S02 T01
345	U057			S01 S02 T01
346	U058			S01 S02 T01
347	U059			S01 S02 T01
348	U060			S01 S02 T01
349	U061			S01 S02 T01
350	U062			S01 S02 T01
351	U063			S01 S02 T01
352	U064			S01 S02 T01
353	U066			S01 S02 T01
354	U067			S01 S02 T01
355	U068			S01 S02 T01
356	U069			S01 S02 T01
357	U070			S01 S02 T01
358	U071			S01 S02 T01
359	U072			S01 S02 T01
360	U073			S01 S02 T01
361	U074			S01 S02 T01
362	U075			S01 S02 T01
363	U076			S01 S02 T01
364	U077			S01 S02 T01
365	U078			S01 S02 T01
366	U079			S01 S02 T01
367	U080			S01 S02 T01
368	U081			S01 S02 T01
369	U082			S01 S02 T01
370	U083			S01 S02 T01
371	U084			S01 S02 T01
372	U085			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process	
37 3	U086			S01 S02 T01	
374	U087			S01 S02 T01	
375	U088			S01 S02 T01	
376	U089			S01 S02 T01	
377	U090			S01 S02 T01	
378	U091			S01 S02 T01	
379	U092			S01 S02 T01	
380	U093			S01 S02 T01	
381	U094			S01 S02 T01	
382	U095			S01 S02 T01	
383	U096			S01 S02 T01	
384	U097			S01 S02 T01	
385	U098			S01 S02 T01	
386	U099			S01 S02 T01	
387	U101			S01 S02 T01	
388	U102			S01 S02 T01	
389	U103			S01 S02 T01	
390	U105			S01 S02 T01	
391	U106			S01 S02 T01	
392	U107			S01 S02 T01	
393	U108			S01 S02 T01	
394	U109			S01 S02 T01	
395	U110			S01 S02 T01	
396	U111			S01 S02 T01	
397	U112			S01 S02 T01	
398	U113			S01 S02 T01	
399	U114			S01 S02 T01	
400	U115			S01 S02 T01	
401	U116			S01 S02 T01	
402	U117			S01 S02 T01	
403	U118			S01 S02 T01	

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
404	U119			S01 S02 T01
405	U120			S01 S02 T01
406	U121			S01 S02 T01
407	U122			S01 S02 T01
408	U123			S01 S02 T01
409	U124			S01 S02 T01
410	U125			S01 S02 T01
411	U126			S01 S02 T01
411	U127			S01 S02 T01
412	U128			S01 S02 T01
413	U129			S01 S02 T01
414	U130			S01 S02 T01
415	U131			S01 S02 T01
416	U132			S01 S01 T01
417	U133			S01 S02 T01
418	U134			S01 S02 T01
419	U135			S01 S02 T01
420	U136			S01 S02 T01
421	U137			S01 S02 T01
422	U138			S01 S02 T01
423	U140			S01 S02 T01
424	U141			S01 S02 T01
425	U142			S01 S02 T01
426	U143			S01 S02 T01
427	U144			S01 S02 T01
428	U145			S01 S02 T01
429	U146			S01 S02 T01
430	U147			S01 S02 T01
431	U148			S01 S02 T01
432	U149			S01 S02 T01
433	U150			S01 S02 T01

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
435	U151			S01 S02 T01
436	U152			S01 S02 T01
437	U153			S01 S02 T01
438	U154			S01 S02 T01
439	U155			S01 S02 T01
440	U156			S01 S02 T01
441	U157			S01 S02 T01
442	U158			S01 S02 T01
443	U159			S01 S02 T01
444	U160			S01 S02 T01
445	U161			S01 S02 T01
446	U162			S01 S02 T01
447	U163			S01 S02 T01
448	U164			S01 S02 T01
449	U165			S01 S02 T01
450	U166			S01 S02 T01
451	U167			S01 S02 T01
452	U168			S01 S02 T01
453	U169			S01 S02 T01
454	U170			S01 S02 T01
455	U171			S01 S02 T01
456	U172			S01 S02 T01
457	U173			S01 S02 T01
458	U174			S01 S02 T01
459	U176			S01 S02 T01
460	U177			S01 S02 T01
461	U178			S01 S02 T01
462	U179			S01 S02 T01
463	U180			S01 S02 T01
464	U181			S01 S02 T01
465	U182			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
46	U183			S01 S02 T01
47	U184			S01 S02 T01
48	U185			S01 S02 T01
49	U186			S01 S02 T01
470	U187			S01 S02 T01
471	U188			S01 S02 T01
472	U189			S01 S02 T01
473	U190			S01 S02 T01
474	U191			S01 S02 T01
475	U192			S01 S02 T01
476	U193			S01 S02 T01
477	U194			S01 S02 T01
478	U196			S01 S02 T01
479	U197			S01 S02 T01
480	U200			S01 S02 T01
481	U201			S01 S02 T01
482	U202			S01 S02 T01
483	U203			S01 S02 T01
484	U204			S01 S02 T01
485	U205			S01 S02 T01
486	U206			S01 S02 T01
487	U207			S01 S02 T01
488	U208			S01 S02 T01
489	U209			S01 S02 T01
490	U210			S01 S02 T01
491	U211			S01 S02 T01
492	U213			S01 S02 T
493	U214			S01 S02 T01
494	U215			S01 S02 T01
495	U216			S01 S02 T01
496	U217			S01 S02 T01

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process	
497	U218			S01 S02 T01	
498	U219			S01 S02 T01	
499	U220			S01 S02 T01	
500	U221			S01 S02 T01	
501	U222			S01 S02 T01	
502	U223			S01 S02 T01	
503	U225			S01 S02 T01	
504	U226			S01 S02 T01	
505	U227			S01 S02 T01	
506	U228			S01 S02 T01	
507	U234			S01 S02 T01	
508	U235			S01 S02 T01	
509	U236			S01 S02 T01	
510	U237			S01 S02 T01	
511	U238			S01 S02 T01	
512	U239			S01 S02 T01	
513	U240			S01 S02 T01	
514	U243			S01 S02 T01	
515	U244			S01 S02 T01	
516	U246			S01 S02 T01	
517	U247			S01 S02 T01	
518	U248			S01 S02 T01	
519	U249			S01 S02 T01	
520	U271			S01 S02 T01	
521	U278			S01 S02 T01	
522	U279			S01 S02 T01	
523	U280			S01 S02 T01	
524	U328			S01 S02 T01	
525	U353			S01 S02 T01	
526	U359			S01 S02 T01	
527	U364			S01 S02 T01	

EPA/State ID Number	W	A	D	9	9	1	2	8	1	7	6	7

Continuation of Section XIV. Description of Dangerous Waste

Line Number	A. Dangerous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (enter code)	D. Process
528	U367			S01 S02 T01
529	U372			S01 S02 T01
530	U373			S01 S02 T01
531	U387			S01 S02 T01
532	U389			S01 S02 T01
533	U394			S01 S02 T01
534	U395			S01 S02 T01
535	U404			S01 S02 T01
536				
537	U409			S01 S02 T01
538	U410			S01 S02 T01
539	U411			S01 S02 T01
540	WPCB			S01 S02 T01
541	WP01			S01 S02 T01
542	WP02			S01 S02 T01
543	WP03			S01 S02 T01
544	WSC2			S01 S02 T01
545	WT01			S01 S02 T01
546	WT02			S01 S02 T01

XV. Map

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its dangerous waste treatment, storage, recycling, or disposal units, and each well where it injects fluids underground. Include all sp rings, rivers and other surface water bodies in this map area; and drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary. See instructions for precise requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (see Instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see Instructions for more detail).

XVIII. Certifications

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Operator	Signature	Date Signed
Hector U. Sanchez Senior Vice President of Operations Clean Earth, LLC Name and Official Title (type or print)		March 16, 2021
Facility/Property Owner Same as above Name and Official Title (type or print)	**Signature**	**Date Signed**

XIX. Comments

Sections XV and XVI: See Figures A1-1, Topographic Map, A1-2, Facility Site Plan, and A1-3, Adjacent Land Use.
Section XVII: See attached photographs.

SECTION A. PART A OF THE RCRA PERMIT APPLICATION

40 CFR 270.10(d), 270.11(a) and (d), 270.13
WAC 173-303-806(2), 810(2), 810(12), 810(13)

A1.0 BACKGROUND INFORMATION

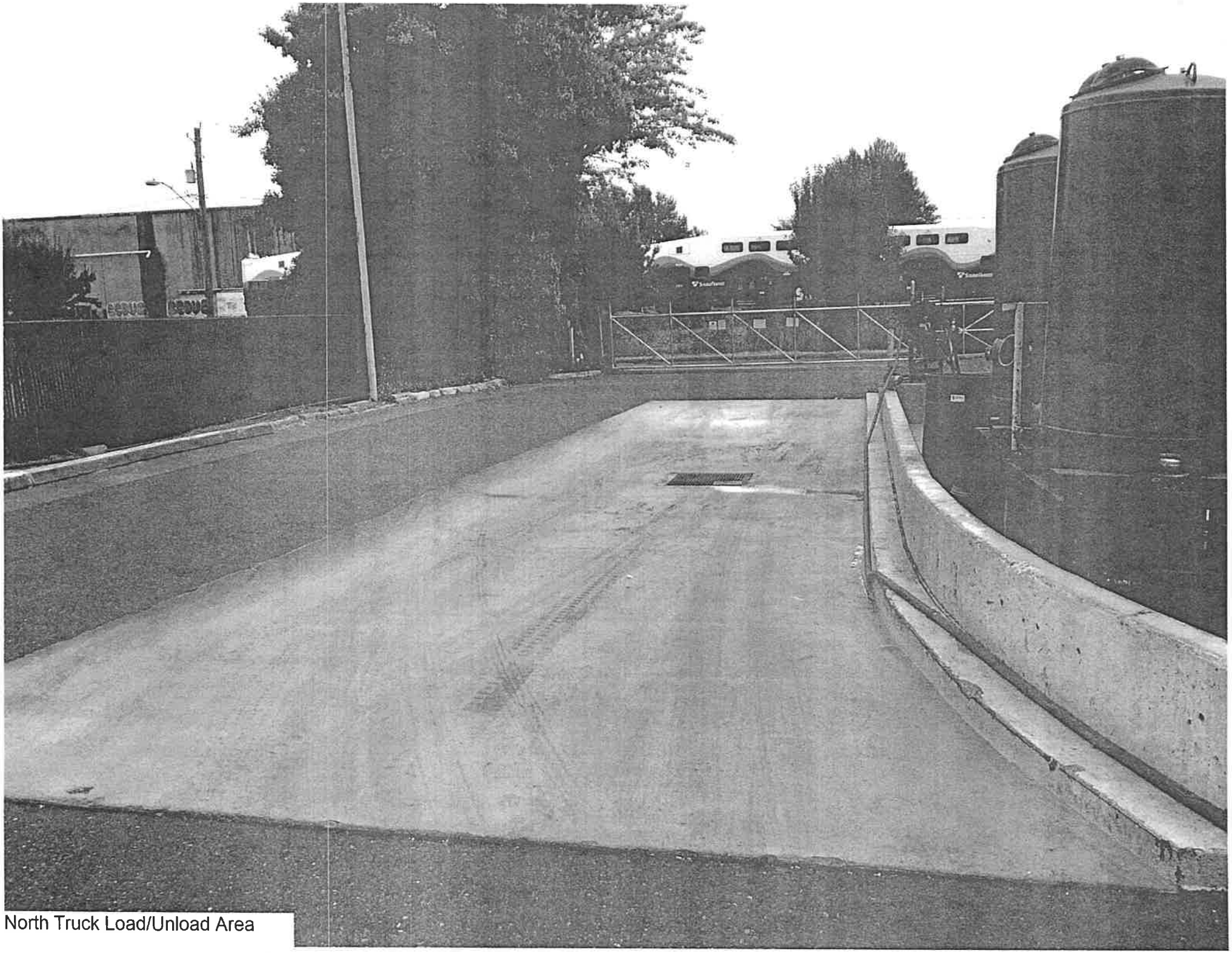
A1.1 Revisions Included in Part A Application for Part B Permit

Burlington Environmental, LLC, is the legal owner of the facility. Burlington Environmental, LLC is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., which is identified as the facility operator on the Part A Form. For simplicity, Stericycle Environmental Solutions, Inc. will be referred to in this document as “Stericycle”, and the facility will be referred to as “the Kent facility” or “Stericycle-Kent”.

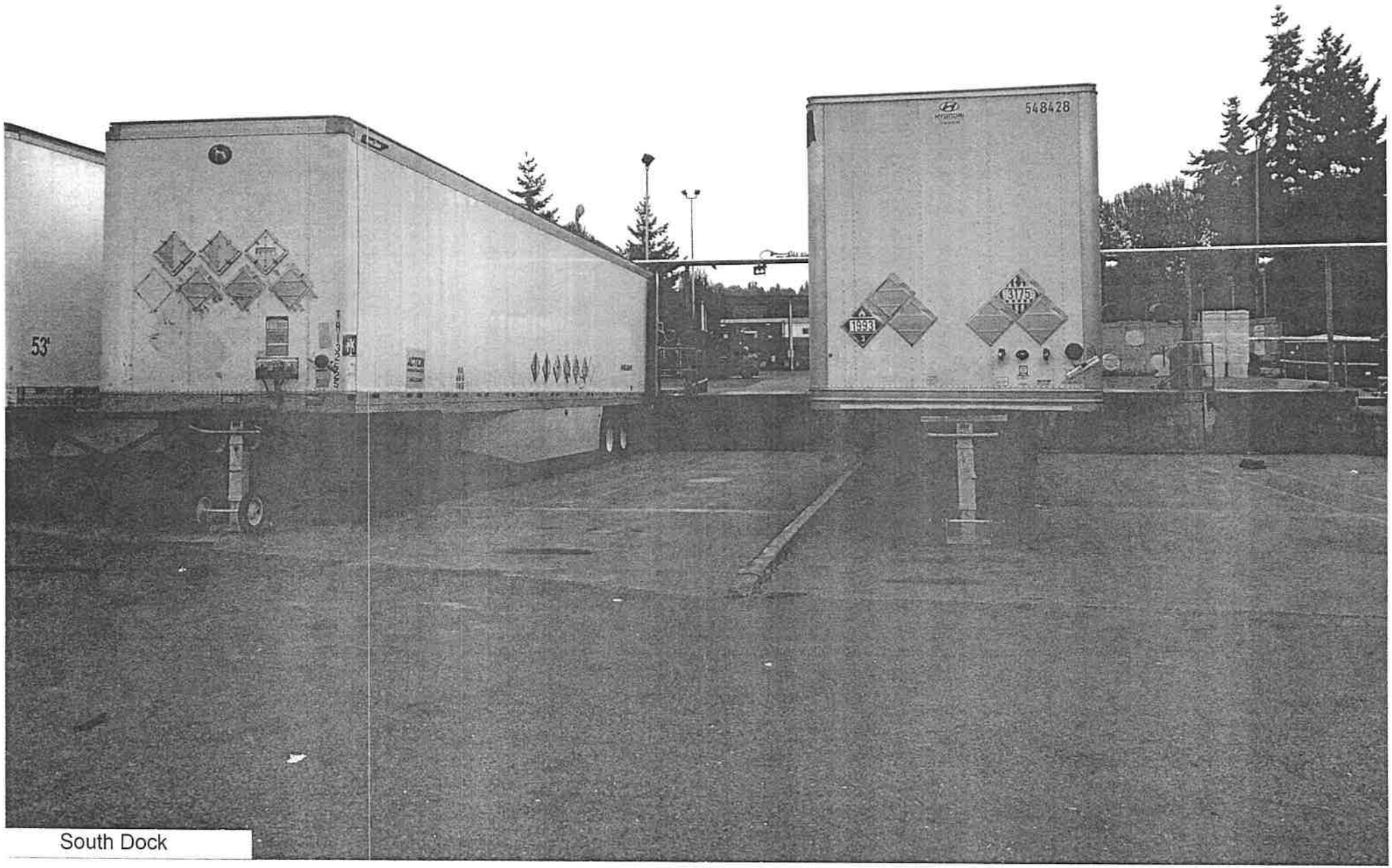
The Kent facility’s original RCRA Part B permit was issued on August 27, 1998, and was renewed on June 25, 2012. This permit modification addresses the relocation of several dangerous waste processes from Stericycle-Kent to Stericycle-Tacoma, and includes a completely updated Dangerous Waste Permit Application Part A Form [ECY 030-71 (08/2002)] on the following pages.



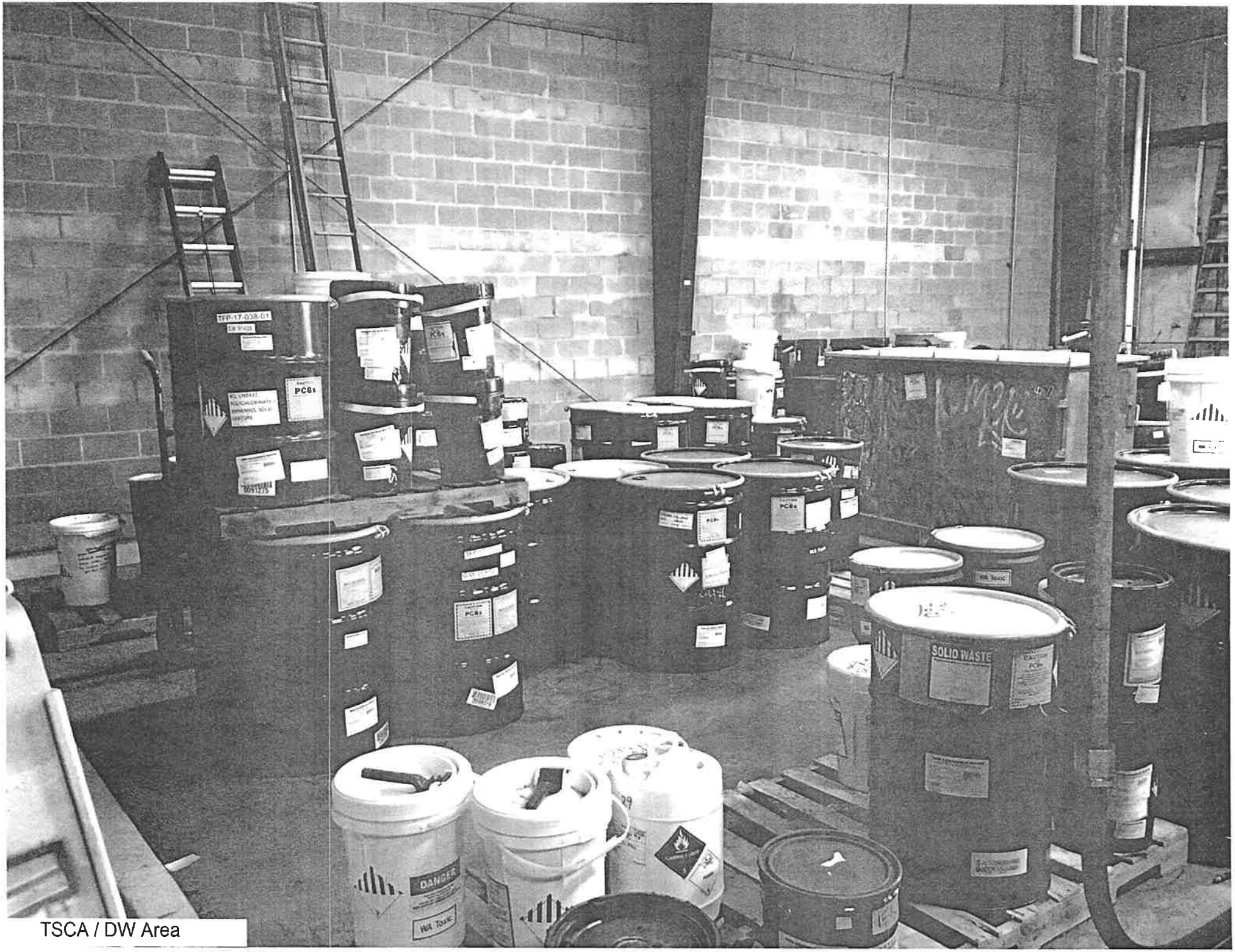
DW Tanks 9A, 9B, 9C



North Truck Load/Unload Area



South Dock



TSCA / DW Area

Stericycle

20245 77th Ave S., Kent, WA 98032

King County GIS Exhibit



Map Legend

- Roads
- 2 Ft. Contours
- Streams and Rivers
- Zoning
- Tax Parcels

2007 King County Natural Color Orthophoto

Stericycle

Title: Topographic Map	
Figure A1-1	Date: 11/16/15

Scale 1" = 200'

0 200 400 ft.

NORTH

SITTS & HILL ENGINEERS, INC.

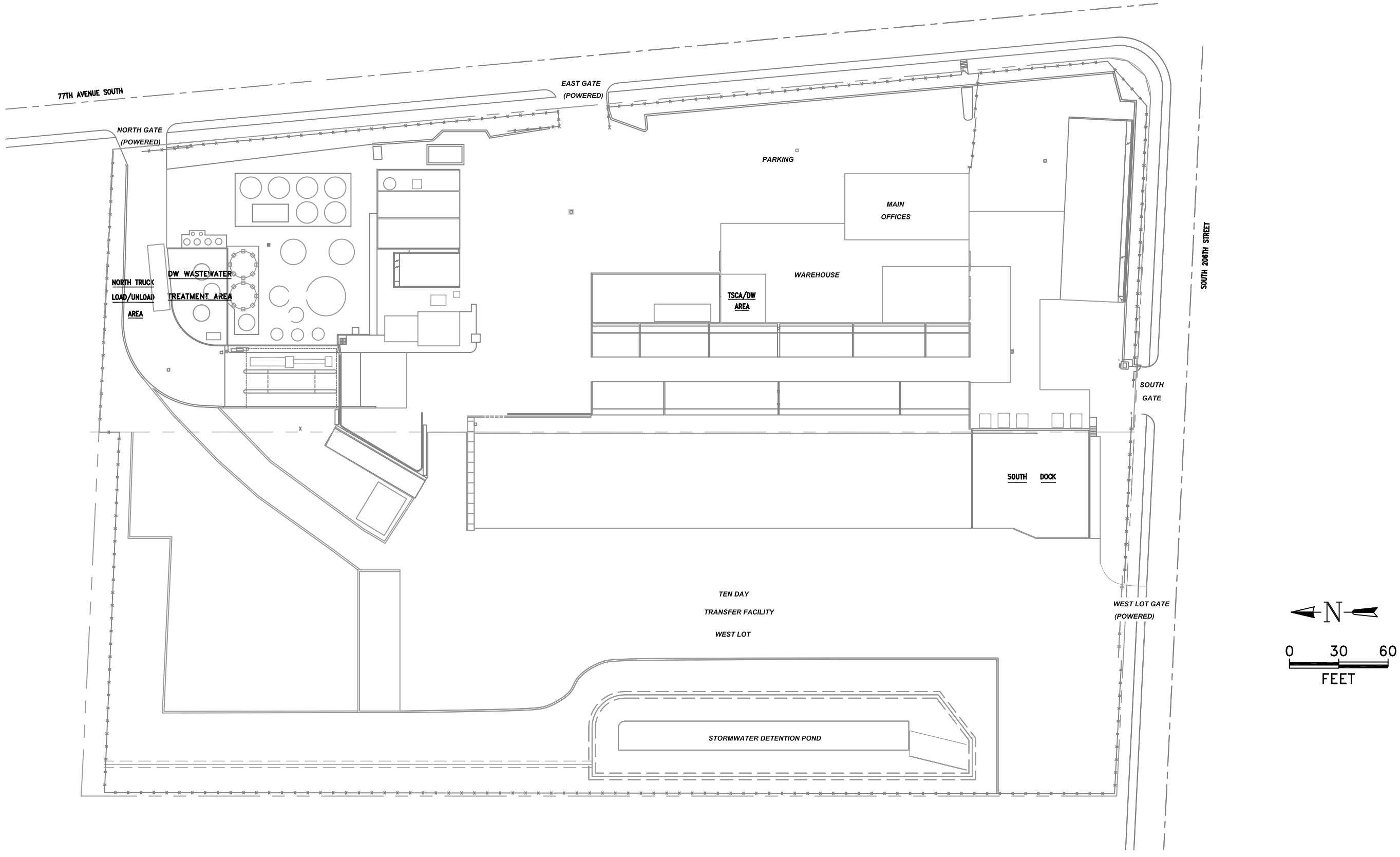
CIVIL ▪ STRUCTURAL ▪ SURVEYING

4815 CENTER STREET TACOMA, WA. 98409

PHONE: (253) 474-9449

The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

Map Notes: Vertical Datum = NAVD 88 Horizontal Datum = D_North_American_1983_HARN Sitts and Hill Job No. 14268

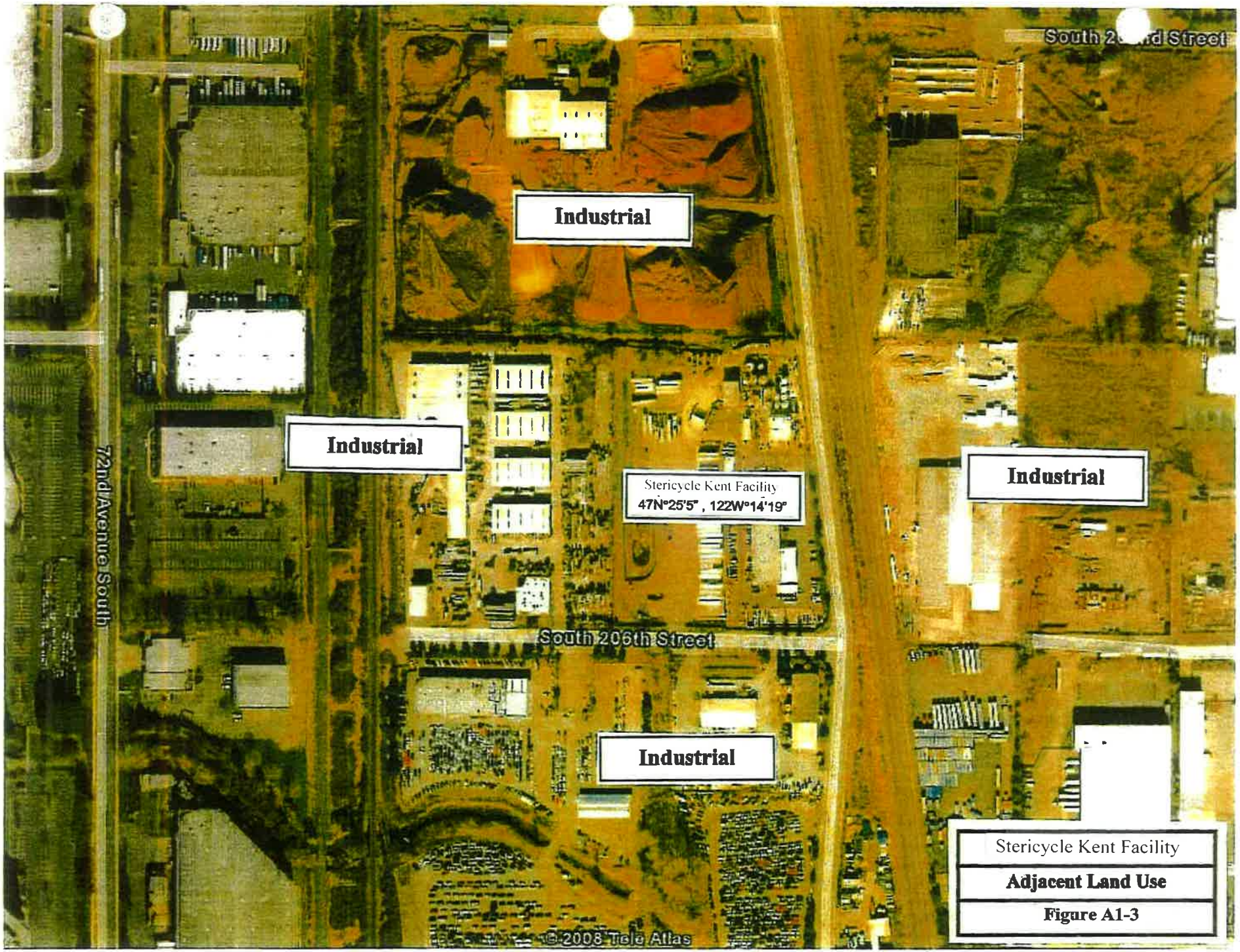


Stericycle®

TITLE:
Facility Site Plan

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: A1–2	
DATE: 8/6/15	REV.:		



Stericycle Kent Facility

Adjacent Land Use

Figure A1-3

SECTION B

FACILITY DESCRIPTION AND GENERAL PROVISIONS

SECTION B FACILITY DESCRIPTION AND GENERAL PROVISIONS

TABLE OF CONTENTS

SECTION PAGE

B1.0 GENERAL FACILITY DESCRIPTION 1
B1.1. Facility Owner/Operator 2
B1.2. Kent Facility History 2
B1.3. Plant Management 3
B1.4. Summary of Waste Types Listed in the Part A 3
B1.5. Facility Operations 4
B1.5.1. DW Container Operations 4
B1.5.2. DW Tank Operations 4
B1.5.3. Non-DW Operations 5
B1.5.3.1. Moderate Risk Waste Operations 6
B1.5.3.2. Solidification Tanks 8
B1.5.3.3. Non-DW Process Equipment 8
B1.5.3.4. Non-DW Wastewater Treatment System 9
B1.5.3.5. Universal Waste 10
B1.5.4. Contact Stormwater Management 11
B1.6 Detailed Process/Activity Descriptions 12
B2.0 TOPOGRAPHIC MAPS 21
B3.0 LOCATION INFORMATION 22
B3.1 Seismic Considerations 22
B3.2 Flood Plain Standard 22
B4.0 TRAFFIC INFORMATION 23
B4.1 On-Site Traffic Volumes and Patterns 24
B4.1.1 Traffic Volumes 24
B4.1.2 Traffic Patterns 24
B4.2 On-Site Traffic Control 26
B4.3 Transportation Routes To/From the Facility 26
B4.4 Roadway Surfaces 27
B4.5 Ten-Day / 24-Hour Transfer Operations 27

Tables and Figures are presented in separate sections following the main body of the text.

LIST OF TABLES

Table B1-1	Non Dangerous Waste Tanks
Table B4-1	Average Weekly Traffic Volumes
Table B4-2	Traffic Volumes and Road Classifications for Transportation Routes

LIST OF FIGURES

Figure B1-1	Facility Location Map
Figure B1-2	Facility Site Plan
Figure B1-3	Wastewater Treatment System Layout
Figure B1-4	Non Dangerous Waste Management in Wastewater Tanks
Figure B1-5	Facility Container Management Areas
Figure B1-6	Facility Tanks and Waste Management Units
Figure B2-1	Local Wind Patterns
Figure B2-2	Stormwater Drainage Patterns and Sewers
Figure B2-3	Facility Stormwater Piping
Figure B3-1	Flood Plain Designation Map
Figure B4-1	Facility Traffic Patterns, Signs, and Paving
Figure B4-2	Facility Access Routes

B1.0 GENERAL FACILITY DESCRIPTION

WAC 173-303-806(4)(a)(i)

Facility Location

Stericycle-Kent
20245 77th Avenue South
Kent, Washington 98032
Phone (253) 872-8030
EPA ID No. WAD 991281767

Facility Owner

Burlington Environmental, LLC
18000 72nd Avenue South
Suite 201
Kent, Washington 98032
Phone (425) 227-0311

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as "Stericycle". The Stericycle Kent Facility (referred to as the "Kent Facility" or "Stericycle-Kent" throughout all sections) is located at 20245 77th Avenue South in King County, Washington, at Section 1, Township 22N., Range 4 E. (North Latitude 47°25'06" and West Longitude -122°14'19"). Refer to Figure B1-1, Kent Facility Location Map. The facility consists of an approximately 6¼ acre contiguous parcel. Dangerous waste (DW) operations occur on the developed three acres of the site. The remaining acreage to the west of the facility is used as a 10-day transfer facility for inbound and outbound shipments of containerized dangerous waste. Land use for the facility is permitted and zoned by the City of Kent as General Industrial (M3).

The Kent Facility is a commercial dangerous waste storage and treatment facility. Types of wastes managed at the facility include wastewaters, oily wastes, sludges, and aqueous and non-aqueous metal-bearing wastes. In addition, Kent is a commercial storage facility for polychlorinated biphenyls. The facility can receive, store, and process wastes in either bulk loads or containers. Detailed information regarding incoming waste streams is presented in Section C, Waste Analysis Plan. Treatment processes are summarized in Section B1.6, Detailed Process/Activity Descriptions. Refer to Section B1.5, Facility Operations, and Section D, Process Information, for detailed descriptions of dangerous waste operations.

B1.1. Facility Owner/Operator

Stericycle Environmental Solutions, Inc. operates two dangerous waste management facilities in Washington State. The company (formerly known as Chemical Processors, Inc.) was founded in Seattle in 1970 to provide an outlet for proper treatment, recycling, and storage for dangerous wastes. The Kent Facility offers alternative fuel blending, waste oil recycling, and bulk or containerized waste treatment services to industries throughout the Pacific Northwest.

Philip Services Corporation purchased the Kent Facility from Burlington Environmental, Inc. (BEI) in 1994. When Philip Services Corporation purchased BEI, the legal entity remained Burlington Environmental, Inc. Philip Services Corporation underwent corporate restructuring between 2000 and 2008 and the parent company was named PSC Environmental Services, LLC (PSC). The Kent facility's legal name, as a result of the restructuring, is Burlington Environmental, LLC.

In April 2014, Stericycle Environmental Solutions, Inc. acquired Burlington Environmental, LLC in a stock purchase. As a result, Burlington Environmental, LLC is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to in this document as "Stericycle" for simplicity.

B1.2. Kent Facility History

The Kent Facility lies within the Green River Valley about two miles north of downtown Kent, four miles south of the city of Renton, and about 1.3 miles east of the Green River.

Prior to 1980, and at least since the 1930s, the site was used for agriculture. In late 1980, Crosby & Overton, Inc. of Long Beach, California, developed the site into a treatment and storage facility for dangerous wastes. Operations began in April, 1981, on the 3 eastern acres of property comprising the active facility. Dangerous waste management activities at the facility included the processing and treatment of acids, bases, oily wastes, phenols, cyanide wastes, sludges, and aqueous metal-bearing wastes. In addition, the facility was used for the commercial storage and transfer of PCB-contaminated materials. Dangerous wastes were stored in containers and in tanks.

The Crosby & Overton, Inc. Kent Plant 2 Facility was purchased by Chemical Processors, Inc. (Chempro), a subsidiary of Burlington Resources, Inc. in 1989. In 1992, Chempro changed its name to Burlington Environmental, Inc. (BEI).

Units formerly used for the management of dangerous waste during Burlington Environmental, LLC operation of the Kent Facility include two portable corrosive treatment tanks (located in the Bulk Receiving Area) and steel container storage units (located along the west fence line, south of the wastewater system). These units were decontaminated and were disposed as scrap steel in February 1990.

Several dangerous waste management units were closed and removed by the former owners of the facility. These units included the RSS reactor, the PCP treatment tank, two waste pretreatment tanks, the truck wash area, the solidification area, and the rotary drum filter. These units were all located in areas of current dangerous waste management at the facility. More recently, during the Burlington Environmental, Inc. (BEI) ownership, the facility closed and removed from service other dangerous waste management units that include a baler, a cuber, and an aerosol depressurization unit.

Tanks T-5305 and T-5306, which were previously used as DW stabilization tanks, are not included in this permit renewal. These tanks were removed from DW service on January 31, 2011, and were closed per WAC 173-303-610 and -640(8) prior to transitioning to Moderate Risk Waste (MRW) service as outlined in Section B1.5.3.2.

B1.3. Plant Management

The Plant Manager is responsible for day-to-day operations at the Kent Facility. The Plant Manager's duties include: managing personnel requirements, scheduling and coordinating plant production and material flow, developing job safety practices, ensuring day-to-day compliance with all applicable regulations and permits, maintaining all required documents and records, and implementing and coordinating Contingency Plan procedures. The Plant Manager reports to the Regional Vice President of Facility Operations. Refer to Section H, Personnel Training, for detailed job descriptions of all positions involved in dangerous waste management operations at the facility.

B1.4. Summary of Waste Types Listed in the Part A

The types and quantities of wastes accepted at the Kent Facility are listed in the Part A Permit Application (see Section A) and the management of these wastes are discussed in detail in Section C, Waste Analysis Plan.

B1.5. Facility Operations

DW and non-DW facility operations are briefly described below. A more detailed description of DW operations is found in Section D, Process Information.

B1.5.1. DW Container Operations

Containerized DWs are managed in the following areas:

Load / Unload only areas (see Section D2.2.3):
South Dock

Container Storage / Processing areas (see Section D2.2.4):
TSCA/DW Area

Refer to Figure B1-2, Facility Site Plan, for the location of these areas. For a more detailed description of these areas, refer to the Section D references above. Wastes received at the facility are confirmed for container contents as described in Section C, Waste Analysis Plan, and are segregated into storage areas according to compatibility as outlined in Section D2.2.2.4. Wastes in containers are processed and consolidated as described in Section B1.6, Detailed Process/Activity Descriptions.

B1.5.2. DW Tank Operations

DW in tanks is managed in the DW wastewater treatment system at the Kent Facility. The DW wastewater treatment system receives liquids from bulk tankers and containers and treats the wastewater for discharge to the local POTW. Table D2-1, Dangerous Waste Tank Uses and Material of Construction and Table D2-2, Dangerous Waste Tank Design Information, provides information for the dangerous waste tanks at the Kent Facility.

B1.5.2.1 Wastewater Treatment Operations

The wastewater treatment system at the facility is regulated under 40 CFR 437, Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards for the Centralized Waste Treatment Point Source Category. Centralized Waste Treatment (CWT) standards apply to all stand-alone wastewater treatment facilities that receive hazardous and non hazardous wastewater from off-site for treatment and discharge. The CWT rule identifies three different categories of wastewaters: Subpart A (metal bearing wastewaters), Subpart B (oily wastewaters), and Subpart C (organic wastewaters). The Kent Facility is permitted by King County's Industrial Waste Program to manage two CWT regulated wastewater categories: Subpart B (oily wastewaters) and Subpart C (organic wastewaters). Wastewaters received at the facility are designated into CWT categories, as outlined in Appendix D-11, Centralized Waste Treatment (CWT) Receipt Classification, which identifies industry processes that generate wastewaters. Examples of types of wastewaters received at the facility include: oil-water emulsions; coolants; oil spill clean up wastewater; bilge rinse waters; tank clean-out wash water; aqueous, solvent; and oil/or mixtures from parts cleaning operations; wastewater from paint washes; landfill leachate, contaminated groundwater clean up; solvent and paint bearing wash waters; and wastewaters from organic chemical production operations.

CWT wastewaters are managed in DW tanks, as described in Section D3.3.2. CWT wastewaters are also managed in non-DW tanks, as described in Section B1.5.3.4. A plan view of the DW and non-DW wastewater treatment systems is located in Figure B1-3. All facility tank locations can be found on Figure B1-6.

Dangerous wastewaters are loaded/unloaded in the North Truck Load/Unload Area. All loading and unloading is conducted in the secondary containment system. The North Truck Load/Unload Area meets the requirements of WAC 173-303-395 (4) for loading and unloading areas.

Confirmation of incoming wastes destined for tank storage/treatment is conducted in accordance with Section C, Waste Analysis Plan. Tank treatment processes incorporate techniques described in Section B1.6, Detailed Process/Activity Descriptions.

B1.5.3. Non-DW Operations

Non-DW operations are described in the following sections. Non-DW management areas are shown in Figures B1-5, Facility Container Management Areas, and Figure B1-6, Facility Tanks and Waste Management Units. Refer to Section C, Waste Analysis Plan for information regarding the designation of residues from MRW treatment.

B1.5.3.1. Moderate Risk Waste Operations

Moderate Risk Waste (MRW) is a class of solid waste that covers Household Hazardous Waste (HHW) and Small Quantity Generator (SQG) waste that arrives at the facility in approved DOT drums, boxes, and bulk containers. MRW check-in occurs in the South Check-In Area, as shown in Figure B1-2. All MRW is inspected during check-in, assigned a waste tracking number, and staged for consolidation or processing at an appropriate location within the facility. All MRW material sent off-site for disposal or recycling is only sent to facilities that meet the performance standards of WAC 173-350-040.

MRW exhibits properties of hazardous waste but is conditionally exempt from dangerous waste regulations. MRW operations at the Kent Facility are regulated under a solid waste permit issued by King County in accordance with WAC 173-350. MRW not accepted at the facility includes explosives, radioactive materials, infectious waste, biological wastes, medical wastes, needles/syringes, ammunition, fireworks, and flares. Typical types of MRW that is accepted at the facility include, but is not limited to the following materials:

Paint Related Materials (PRM): This category consists of flammable or combustible materials such as oil-based paints, kerosene, solvents, paint thinners, contaminated motor oil, caulking, waxes, sealants, and other similar materials. These materials are consolidated and transported off-site as an alternative fuel. The materials can be processed on-site through the PRM Unit described in greater detail below or sent-off site for final disposal.

Lab Pack/Loose Pack Materials: This category consists of small containers of compatible classes of HHW materials that are packed with sorbent material in an open head drum. Materials such as pesticides, poisons, disinfectants, herbicides, acids,

bases, pool and spa chemicals, mercury, and reactive materials are packaged separately according to their DOT hazard class. Lab pack and loose pack materials are consolidated for off-site treatment/disposal, depending on hazard class, generator requirements, or contractual agreements. Some materials (e.g., acids and bases) may be reused on-site as treatment chemicals.

Landfill Ready Materials: This category consists of MRW materials which go directly to either Subtitle C or D landfill. Examples of such materials include contaminated debris, used PPE, floor dry, or oil filters. Landfill ready MRW materials are generally sent to Subtitle D landfill unless generator requirements or contractual agreements require disposal in a Subtitle C landfill.

Cylinders: A variety of compressed gas cylinders are managed at Kent. Cylinders of inert, atmospheric gases (including oxygen, nitrogen, carbon dioxide and mixtures of these gases) may be vented and de-headed, fire extinguishers and propane cylinders are sent off-site for recycling, and all others (refrigerants, herbicides, pesticides, etc.) are sent off-site for disposal. Empty cylinders are sent off-site for scrap metal recycling.

Batteries: Examples of HHW batteries received include automotive batteries, alkaline, alkaline/zinc, lithium/sulfur dioxide, magnesium, mercury, nickel cadmium, nickel hydrogen, zinc carbonaire, and silver oxide. Batteries are sorted by type; alkaline batteries are shredded in the MRW shredder for landfill, and all other types are sent to off-site facilities for recycling or incineration, or landfill, depending on contractual agreements.

Oil Filters: Oil filters that meet the recycling requirements for oil filters are recycled. Other oil filters are managed as “landfill ready material” as described above. Oil filters are managed according the contractual agreement with the customer.

E-waste: Most electronic equipment such as monitors, computer peripherals, and other small electronics (no major appliances) are accepted at the facility as MRW, however, some e-waste may be received as dangerous waste (in which case the material is subject to all DW permit requirements). E-waste is sorted by type and sent to off-site facilities for recycling.

Aerosol Cans: All aerosol paints, cleaners, solvents, starting fluids and similar materials are in this category. Aerosol cans are sorted by DOT compatibility requirements and sent off-site for incineration. Aerosol cans are not punctured, drained or otherwise destructed on-site.

Latex Paint: Any latex paint product can be placed in this category. Depending on recycling specifications or contractual agreements, latex paint is sent off-site for recycling or landfill.

Light Tubes: All types of light tubes can be placed in this category. Depending on generator requirements or contractual agreements, light tubes are sent off-site for recycling or Subtitle C landfill.

PCB Light Ballasts: This category includes PCB-containing light ballasts from HHW sources. Depending on generator requirements or contractual agreements, PCB light ballasts are sent off-site for recycling, landfill, or incineration.

B1.5.3.2. Solidification Tanks

There are two tanks (T-5305 and T-5306) at the Kent Facility where solidification of non-DW is performed. The solidification tanks receive non-DW from drums, vacuum and tanker trucks, end dumps, dump trucks, vans and flatbeds. Waste solids and liquids received in these tanks may be treated by solidification. Liquids may be transferred to the non-DW wastewater treatment system for treatment and discharge to the POTW. The solidification process utilizes a front loader or similar equipment to mix the waste with sawdust or wood chips in order to remove free liquids. The solidified MRW is then loaded into an appropriate shipping container (e.g. roll off box, end dump, or dump truck) and transported to a Class D landfill for disposal. These processes are described in greater detail in Section B1.6. Solidification tanks are located in the Solidification Building which can be found in Figure B1-2.

B1.5.3.3. Non-DW Process Equipment

Much of the MRW assigned for consolidation at the facility is typically packaged manually into 55-gallon drums or other DOT approved containers. Container contents are consolidated with other MRW of the same type and shipped off-site for final disposal

or reuse. Other MRW received at the facility is processed on-site through processing equipment, bulked into larger quantities, and then transported off-site in roll-off boxes, end dumps, or vacuum tanker trucks. MRW designated for processing at the facility is managed in two primary processing units: (1) the Paint Related Processing (PRM) Unit and (2) the MRW Shredder:

B1.5.3.3.1. PRM Unit – Waste technicians at the Kent facility conduct sorting of PRM prior to processing. Containers are sorted to keep incompatible and non-shreddable items out of the PRM Unit. Incompatible and unknown materials are taken directly to the Lab Pack Area for identification and proper disposal. Once sorting is complete, the materials approved for shredding are fed into the PRM Unit. The PRM Unit consists of a conveyor, a shredder, and a vibrating screen. PRM is loaded manually onto a conveyor belt by a waste technician. The conveyor belt delivers PRM into a shredder where material is reduced into smaller pieces. The shredded material collects on a vibrating screen that separates the liquids from the solids while transporting materials from the feed point of the unit to the discharge. Liquids, typically paint, empty out through the bottom of the vibrating screen and are collected in a metal tote (or equivalent liquid container). The collected liquids are pumped from the tote to drums and transported off-site for final disposal as an alternate fuel, or the totes may be placed in container storage areas until they can be pumped into a vacuum tanker truck and transported off-site for final disposal as an alternate fuel. Solids, mostly shredded can parts and paint related debris, are discharged off the end of the screen into a bin. Solids collected in the bin are transferred to T-5305 or T5306 for further processing as described in Section B1.5.3.2.

B1.5.3.3.2. MRW Shredder – The MRW shredder is located in the Solidification Building, adjacent to T-5305, and is used for particle size reduction of solid materials. MRW loaded into the shredder can be fed manually from a platform adjacent to the unit or by using a forklift with a drum dumping attachment. Shredded material is discharged into a tote placed directly beneath the shredder. When the tote becomes full, it is removed and inspected before being placed into T-5305 or T-5306 for solidification, as described above.

B1.5.3.4. Non-DW Wastewater Treatment System

The Non-DW Wastewater System is comprised of non dangerous waste tanks that treat, store, and discharge non dangerous wastewater at the facility. The tanks are located in a segregated containment area and wastewaters managed in these tanks are not commingled with dangerous wastewaters. The Non-DW Wastewater System only accepts non dangerous wastewaters that are CWT Subcategory B (Oils) or C (Organics), as outlined in Appendix D-11.

Examples of types of wastewaters received at the facility include: oil-water emulsions; coolants; oil spill clean up wastewater; bilge rinse waters; tank clean-out wash water; aqueous, solvent; and oil/or mixtures from parts cleaning operations; wastewater from paint washes; landfill leachate, contaminated groundwater clean up; solvent and paint bearing wash waters; and wastewaters from organic chemical production operations. Waste alkaline, acid, and oxidizer liquids are not accepted for treatment and/or storage in tanks in the wastewater treatment system. Stormwater collected in this containment area is considered to be process water and is processed through the Non-DW Wastewater Treatment System. Non-DW wastewater is sampled, treated, and discharged on a batch basis at the facility. After non-DW wastewater has been treated, it is transferred to dedicated storage tanks for final testing to ensure final POTW discharge requirements have been met.

The system equipment includes a rotostrainer, an oil/water separator, and carbon vessels. The rotostrainer is used to remove non-DW debris from wastewater before entering the treatment system. The oil/water separator removes free oil from water after receiving primary treatment. The carbon vessels remove trace organics from wastewater prior to discharge. All non-DW wastewater equipment is managed separately from DW wastewater equipment. Wastes generated from water treatment processing are analyzed and disposed of or reused according to their chemical characteristics and physical properties as described in Section C, Waste Analysis Plan. Oils are sent off-site for fuel blending or recycling. Sludges are solidified on-site and transported to a landfill off-site. Figure B1-4, is a process flow diagram illustrating the non-DW wastewater process. Table B1-1 and Figure B1-6 provide general information for all waste tanks and tank locations, respectively, at the Kent Facility.

B1.5.3.5. Universal Waste

Certain DW commonly generated by businesses and industry are categorized as Universal Waste (UW). Managing DW as UW can simplify and streamline handling of certain materials. For example, outbound manifests or annual reporting requirements are not required in the management of UW. The Kent Facility is a destination facility that is subject to annual reporting requirements for UW.

UW includes batteries, lamps, thermostats containing mercury, and equipment containing mercury. Although pesticides are a federally regulated Universal Waste, they are not considered Universal Waste in Washington State and are therefore managed fully as a dangerous waste or Moderate Risk Waste at the Kent Facility. Universal Waste is stored and managed in the southeast corner of the facility (Areas 1, 2, and 3 on Figure B1-5). Universal Waste is not processed or treated at the facility. These types of waste only require consolidation, repackaging, and/or relabeling before shipping off-site for final disposal.

B1.5.4. Contact Stormwater Management

Contact stormwater is precipitation that falls within the fenced areas of the facility with the exception of the asphalted areas of the West Lot and the secondary containment of the two wastewater treatment areas.

Wastewater Treatment System personnel are responsible for pumping out sumps within the contact areas that accumulate water. Prior to pumping, sumps are inspected for evidence of container leakage or other spills by facility waste technicians. Water in the sumps is visually examined for sheen or any other indicators of contamination such as turbidity or discoloration. If the water in the sump is determined to be contaminated, it is pumped into the Dangerous Wastewater Treatment System and treated to meet the POTW discharge standards or shipped off-site, depending on the characteristics of the water. If liquid in the sumps is identified to be something other than water, it is immediately cleaned up, sampled, and characterized for disposal. Non-contaminated sump-water from contact areas is pumped to Tank 4710 (Silver Bullet). Wastewater Treatment System personnel discharging stormwater log the time, duration, and volume of each batch discharged. The Kent Facility is permitted to discharge 204,000 gallons of stormwater per day. Wastewater Treatment System personnel sample each batch of

wastewater prior to discharge. The laboratory measures, records, and reports pH for each discharged batch, and sends out samples for oil-and-grease, metals, and organic-compound analysis on the stormwater in accordance with the pre-treatment discharge permit. King County wastewater authority performs periodic independent sampling and analysis of discharged stormwater.

Stormwater that collects within the containment areas of the two wastewater treatment systems becomes process water, by regulatory definition, and is treated in the appropriate system in accordance with the King County discharge permit requirements

Non-contact stormwater from the asphalted portion of the West Lot is pumped on demand to the retention pond. The retention pond was included as part of the West Lot development in 2001 and is maintained by the Kent Facility. The water then percolates through a biofiltration swale into Mill Creek. No trailers or roll-off boxes containing DW are parked on the asphalted portions of the West Lot. All of the West Lot parking areas for DW are concrete, and are sloped to collection sumps. Stormwater from these sumps is managed the same as the other contact stormwater in the facility. Refer to Figure B2-2 Stormwater Drainage Patterns and Sewers, for stormwater drainage information at the facility. Figure B2-3, Facility Stormwater Piping, illustrates the piping routes used to transfer stormwater throughout the facility.

B1.6 Detailed Process/Activity Descriptions

This section describes the processes and activities performed to manage wastes at the facility. Treatment of wastes includes chemical and physical treatment. Waste management options include:

- Wastewater Treatment (on-site; DW and non-DW)
- Solidification (on-site; non-DW)
- Solvent Recycling (off-site)
- Alternative Fuel Blending (off-site)
- Incineration (off-site)
- Landfill (off-site)

Within each of these management options, specific processes used to manage waste at the facility include:

- Carbon Adsorption
- Chemical Oxidation
- Chemical Precipitation
- Chemical Reduction
- Coagulation
- Container or Cylinder Depressurization
- Consolidation/Compaction
- Cyanide Destruction
- Decanting/Clarification
- Demulsification
- Drying or Dewatering
- Emulsification
- Filtration
- Flocculation
- Lab Packing
- Loose Packing
- Neutralization
- Sedimentation
- Solidification

Detailed descriptions of these processes and their respective process locations are provided below:

Carbon Adsorption (DW Tanks and non-DW Wastewater Tanks)

Carbon adsorption is a stripping process utilizing the surface adsorptive characteristics of activated carbon for organic molecules. Carbon adsorption is used in both the DW and non DW wastewater treatment systems to remove trace organics from wastewater. DW carbon is managed separately from non DW carbon.

Chemical Oxidation (DW Tanks and non-DW Wastewater Tanks)

Chemical oxidation refers to a reaction in which a substance loses electrons (is oxidized) by action of an oxidizing agent which gains electrons (is reduced). Oxidation

and reduction reactions always occur simultaneously. Oxidation is useful in breaking down chelating agents, phenolic compounds and emulsions. Heat may be used to augment the oxidation process. The facility may use a variety of agents, such as bleach or hydrogen peroxide, to carry out chemical oxidation.

Chemical Precipitation (DW Tanks and non-DW Wastewater Tanks)

Chemical precipitation is applied to metal-containing wastes to chemically convert metal compounds from a soluble to an insoluble form and then to remove the precipitate by settling and decanting. This process is aided by flocculation. The term chemical precipitation refers to both the primary step of forming chemical precipitate and follow-up operations that separate the solid precipitate from the liquid.

The general process chemistry for hydroxide precipitation used at the facility for metal precipitation is as follows:

$M^{n+} + nOH^- \Rightarrow M(OH)_n$ (precipitate)

Some of the precipitating agents that could be used include: sodium hydroxide, calcium hydroxide, magnesium hydroxide, and magnesium oxide. For example:

$Cu^{2+} + 2NaOH \Rightarrow 2Na^+ + Cu(OH)_2$ (precipitate)

$Cu^{2+} + Ca(OH)_2 \Rightarrow Ca^{2+} + Cu(OH)_2$ (precipitate)

$Cu^{2+} + Mg(OH)_2 \Rightarrow Mg^{2+} + Cu(OH)_2$ (precipitate)

$Cu^{2+} + MgO + H_2O \Rightarrow Mg^{2+} + Cu(OH)_2$ (precipitate)

Other chemicals may be used based on the particular constituents of the waste stream being treated.

Chemical Reduction (DW Tanks and non-DW Wastewater Tanks)

Chemical reduction is a process which is used at the facility for converting hexavalent chromium (Cr^{+6}) to trivalent chromium (Cr^{+3}) by addition of a reducing agent. The primary reducing agents used are sodium bisulfite ($NaHSO_3$) or sodium metabisulfite ($Na_2S_2O_5$). Other reducing agents, such as sodium borohydride, sulfur dioxide, ferrous sulfate, and sodium thiosulfate may also be used.

Chemical reduction is also used to destroy strong oxidizing materials such as chlorates, perchlorates, persulfates, inorganic and organic peroxides, nitrates and hypochlorites.

Sodium bisulfite reacts with water to form sulfurous acid (H_2SO_3):

$$NaHSO_3 + H_2O \Rightarrow H_2SO_3 + NaOH$$

The sulfurous acid reduces chromium (Cr^{+6}):

$$2H_2CrO_4 + 3H_2SO_3 \Rightarrow Cr_2(SO_4)_3 + 5H_2O$$

The theoretical amount of sulfurous acid required to reduce a given amount of chromium can be calculated from this equation. The optimum efficiency of chromium reduction occurs at pH 2 to 3 with agitation of the mixture. Chromium (Cr^{+3}) has a low solubility at a high pH, and can be precipitated as chromic hydroxide by the addition of sodium hydroxide or calcium hydroxide (lime).

Coagulation (DW Tanks and non-DW Wastewater Tanks)

Coagulation is the transformation of a liquid into a semi-solid or solid mass. This is usually catalyzed using polymers and serves as another separation technology. Coagulation is used primarily for treatment of the heavy metals prior to sewer discharge.

Consolidation/Compaction (MRW Areas: Central Process Area, Solidification Process Area, South Check-In Area, Lab Pack Area, non-DW Wastewater Tanks; Tanks T-5305 and T-5306) (DW Areas: TSCA/DW Area, DW Tanks)

Consolidation and compaction activities are solely performed for the purpose of reducing waste void spaces in tanks and containers and minimizing the volumes of waste that are stored on-site and shipped from the facility. Consolidation is performed manually by placing smaller volume liquids or solids in to larger tanks or packaging containers. Compaction uses mechanic force (e.g., baler and compaction unit) to further reduce the volume and void spaces in waste consolidation containers. Materials that are compacted include PPE; empty metal, plastic and glass containers; rags, and debris.

Cylinder Depressurization (MRW Areas: Central Process Area, Lab Pack Area) (DW Areas: n/a)

Compressed gas cylinders are categorized into three groups at the facility: inert, recyclable, and incinerable. Cylinders of inert, atmospheric gases (including oxygen, nitrogen, carbon dioxide and mixtures of these gases) may be depressurized on-site. All other compressed gas cylinders are sent off-site for treatment, recycling, or incineration. Pressurized containers and cylinders containing compressed gases are evaluated on a case-by-case basis and are only depressurized according to an approved Standard Operating Procedure (Cylinder Depressurization SOP OP-0046). Empty RCRA containers or cylinders are sent off-site for scrap metal recycling.

Cyanide Destruction (DW Tanks)

Cyanide destruction through alkaline chlorination is a well established technology for the destruction of simple cyanide compounds. In wastewater, cyanide usually exists as CN^- and HCN, or in the form of metal cyanate complexes, most commonly ferrocyanide, Fe of HCN, is pH dependent. For instance, at pH 7.0 and below, all of the cyanide reduces to $[Fe(CN)_6]^{-4}$ or ferricyanide $[Fe(CN)_6]^{-3}$.

The ionization exists as HCN. At pH 11.5 and above, all of the cyanide exists as CN^-. Cyanide removal is achieved by raising the pH of the wastewater and dosing with chlorine or an oxidizing agent. In an alkaline environment (pH >10), cyanide is oxidized to cyanate according to the following reaction:

$$NaCN + OCl^- \Rightarrow CNO^- + NaCl$$

$$NaCN + OCl^- + H_2O \Rightarrow Na^+ + 2OH^- + CNCl$$

$$Na^+ + 2OH^- + CNCl \Rightarrow CNO^- + H_2O + NaCl$$

The oxidation of cyanides to cyanogen chloride (CNCl) occurs instantaneously at all pH levels. The hydrolysis of CNCl to cyanate occurs slowly at pH levels near 7.0, but increases rapidly at pH values near 9.0. Because cyanogen chloride is a highly toxic gas, it is important to hydrolyze it quickly to avoid large concentrations in solution. Therefore, first stage chlorination is done at pH levels of 11.5 or above to immediately hydrolyze cyanogen chloride and prevent the release of hydrogen cyanide gas.

Cyanate undergoes further oxidation with excess alkali in the presence of free chlorine:

$2CNO^- + 3OCl^- + H_2O \Rightarrow 2CO2 + 3Cl^- + N_2 + 2OH^-$

Non reactive cyanide destruction is only performed on trace amounts of cyanides present in wastewater to meet POTW discharge limits.

Decanting/Clarification (DW Tanks and non-DW Wastewater Tanks)

Decanting and clarification are the processes of separating materials by utilizing differing specific gravities. Decanting is used to separate liquid-solid systems. Clarification is used to separate liquid-liquid systems where the liquid phases are immiscible and/or have differing specific gravities. Decanting and clarification are used for the following:

- Separating solid-liquid systems by settling out the solids or preferentially concentrating the solids in a smaller fraction of the liquid system.
- Separating two phase systems of solvents and water.
- Separating water and oil phases.

Demulsification (DW Tanks and non-DW Wastewater Tanks)

Demulsification is the process of "breaking" an unwanted emulsion, especially water-in-oil types. The facility uses a combination of heat treatment, chemical precipitation, dewatering, clarification, flocculation and oxidation for demulsification.

Drying or Dewatering (DW Tanks and non-DW Wastewater Tanks)

Drying or dewatering is a process used to remove residual water from solvents after distillation by addition of inorganic salts such as calcium chloride ($CaCl_2$). This process utilizes the hygroscopic properties of salts to attract water from a water/solvent blend and form a water/desiccant phase from which the solvent may be decanted. Drying may also refer to the removal of water from other waste streams by mechanical of physical means.

Emulsification (DW Tanks and non-DW Wastewater Tanks)

Emulsification is a process used to mix immiscible or insoluble components into a homogeneous phase using agitation or mechanical means.

Filtration (DW Tanks and non-DW Wastewater Tanks)

Filtration is the separation of a heterogeneous mixture of fluids and suspended solids by a filter medium that permits the flow of the fluid through the medium, but retains the particles. This process is used to dewater and reduce the volume of sludges formed in the metals precipitation and settling processes.

Flocculation (DW Tanks and non-DW Wastewater Tanks)

Flocculation is the combination or aggregation of suspended colloidal particles in such a way that they form small clumps. Flocculation is one of the steps in the wastewater treatment process. It is used in combination with precipitation and coagulation to lower metal concentrations. Flocculated particles may be removed by gravity sedimentation, filtration, or by skimming. Flocculation is aided at the site through the use of cationic and anionic polymers.

The process begins with the adjustment of pH, using sulfuric acid and alum as necessary, to maintain the pH at 4 - 5. A cationic polymer is added to precipitate out any metals. An anionic polymer is added, and anionic particles are skimmed off.

Lab Packing (MRW Areas: Lab Pack Area) (DW Areas: n/a)

Lab packing is used to manage an accumulation of small quantities of wastes through inventory, identification, classification, segregation, packaging, documentation, transport, and disposal. Lab packs must meet the requirements of WAC 173-303-161, which also reference DOT regulations at 49 CFR Parts 173, 178, and 179. Lab packs consist of small inner containers (typically one gallon or less) stored within a larger DOT approved container (usually a 55-gallon open top drum), with the outer container providing adequate secondary containment and segregation for incompatible materials. Lab packs are shipped with an inventory packing list that identifies each individual container by trade name or chemical composition, physical state, EPA waste code(s), and quantity of material. Lab packs are packed with materials that are chemically compatible per Table D1-2, but may be different in chemical composition (e.g. laboratory chemicals are a typical example of lab pack material). Lab packs are also packaged with floor dry or adsorbent to protect inner containers from breaking during shipping as required by 49 CFR 173.12(b). The facility receives a variety of lab pack wastes including lab wastes, household wastes, and discarded chemical products from retail stores. The lab packing procedure is described in Section D2.2.6.3.

DOT hazard classes of containers that are managed in the Lab Pack Area include hazard classes 3 (flammable liquid), 4.1 (flammable solids), 4.3 (dangerous when wet), 5.1 (oxidizers), 5.2 (organic peroxides), 6.1 (toxics, excluding PG1 Zone A), 8 (corrosives), and 9 (miscellaneous materials). The amounts of hazardous materials permitted in Lab Pack Area are limited to the maximum allowable quantities listed in the table in Appendix D-11.

Loose Packing (MRW Areas: PRM Unit, Central Process Area, Solidification Process Area, Lab Pack Area) (DW Areas: n/a)

Loose packs are also a collection of smaller individual containers (typically 5-gallon cans or less) that are placed inside a larger DOT approved container (usually a 55 or 85-gallon open top drum or cubic yard box). However, unlike lab packs, the inner containers of a loose pack are all of the same type (e.g. oil based paint cans, aerosol cans, latex paint cans, batteries, etc.). They usually are assembled at a household collection event or at a large retail store. Containers are packed and secured tightly within the shipping container to prevent the inner containers from moving or opening during transportation. Loose packs differ from lab packs in that they do not meet the standards of WAC 173-303-161 for overpack containers and do not have absorbent material or a detailed inventory list of contents. Since the individual inner containers are all of the same type in loose packs, the outer waste or marker provides the necessary content information to manage the waste, which includes the proper DOT shipping name and treatment or disposal options. Refer to Section B1.5.3 for a detailed description of the management of this waste.

Neutralization (DW Tanks and non-DW Wastewater Tanks)

Neutralization occurs at the equivalence point of an acid-base reaction, which is typically at a pH 7. The equivalence point is not necessarily attained at pH 7.0. A strong acid reacting with a weak base will result in a pH less than 7.0, and a strong base reacting with a weak acid will result in a pH greater than 7.0. The acid-base reaction is carried out by the addition of alkaline wastes, such as lime (calcium hydroxide), sodium carbonate, calcium carbonate, or sodium hydroxide, to acidic wastes, such as sulfuric acid, chromic acid, hydrochloric acid, or hydrofluoric acid.

Sedimentation (DW Tanks and non-DW Wastewater Tanks)

Sedimentation involves the settling out by gravity of solid particles suspended in a liquid. This method is used in water clarification. Sedimentation augments the other separation processes described above.

Solidification (Tanks T-5305 and T-5306)

Solidification is the process of mixing a liquid or liquid/solid non dangerous waste with an absorbent material (sawdust or wood chips) in order to reduce or eliminate free liquid in waste. Removal of free liquid is required for landfill disposal. Generally, wastes for solidification include containerized wastes and settled solids/sludges removed from tanks or containers. Sawdust used for the solidification process is stored in the Wood Chip Storage Shed in the West Lot, as shown in Figure B1-2.

B2.0 TOPOGRAPHIC MAPS

40 CFR 270.14(b)(19)
WAC 173-303-806(4)(a)(xviii)

WAC 173-303-806(4)(a)(xviii) requires that certain features be presented on topographic maps. The required items are presented as follows:

The location of the facility in relation to the greater Puget Sound area is depicted in Figure B1-1, Kent Facility Location Map.

Figure B1-2, Facility Site Plan shows the locations of the processing and storage operations used for dangerous waste management at the facility, including access control points.

Figure A1-1, Topographic Map, was obtained from aerial mapping conducted in June 1990. Contour intervals of two feet are depicted on the figure, with spot elevations indicated to the nearest 0.1 foot. All elevations shown are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). This figure also shows the facility boundary, map scale, date, and orientation.

Land use in the vicinity of the facility, which was obtained through a visual survey of the surrounding properties and a review of the city zoning code, is shown on Figure A1-3, Adjacent Land Use. All land immediately adjacent to the facility is used for industrial or transportation purposes.

Figure B2-1, Local Wind Patterns, includes a wind rose depicting local wind patterns and a map depicting the facility's location in relation to the Puget Sound area. Prevailing storm winds are primarily from the north and south/southwest. During the period between 1998 and 2006, winds greater than 4 mph or more occurred about 50 percent of the time, of which approximately 70 percent were from the a northerly or southerly direction.

Stormwater drainage patterns and the on-site storm sewer system are shown in Figure B2-2 (also see Appendix D-7). Drainage patterns for stormwater run-off from non-process areas slope away from the dangerous waste secondary containment systems and are channeled to stormwater drainage areas on site. Run-on from non-process

areas to dangerous waste management areas is prevented by secondary containment system walls and berms and the elevation (above grade level) of the concrete pads beneath each dangerous waste handling area. Stormwater collected in the Dangerous and Non Dangerous Wastewater System containment areas is considered to be contact process water and is processed through the respective wastewater treatment system for discharge. Stormwater in waste management areas is prevented from run-off to non-process areas (as described in Sections D2.3.2, Containers; Containment System Capacity and Drainage Control and D3.2.2, Tank Systems; Containment System Capacity and Drainage Control) and managed according to the discharge permit.

The facility is also not located within a 100-year floodplain; the proximity of the nearest 100-year floodplain is shown on Figure B3-1, Flood Plain Designation Map. The locations of fire control equipment are shown in Figure G4-5. There are no groundwater withdrawal wells within 1,000 feet of the facility.

B3.0 LOCATION INFORMATION

B3.1 Seismic Considerations

40 CFR 264.18(a), 270.14(b)(11)(i), (ii)
WAC 173-303-806(4)(a)(xi)

There are no faults, nor is there evidence of Holocene displacement within 200 feet of the facility (reference: Geotechnical Engineering Study performed by Earth Consultants for Crosby & Overton, Inc. Kent Plant 2 Facility, February, 1980. Refer to Appendix D-8, Seismic Study.

All tank and containment structures have been constructed in accordance with the current building codes at the time of construction. All tanks have been designed with base anchorage to resist sliding or overturning due to wind or seismic loads. Original tank anchors were designed to withstand the Uniform Building Code (UBC) Exposure C wind loading and Zone 3 seismic loads. Tanks constructed after 2003 have been design to withstand International Building Code (IBC) Exposure C wind loading and Zone D seismic loads.

B3.2 Flood Plain Standard

40 CFR 264.18(b), 270.14(b)(11)(iii)
WAC 173-303-806(4)(a)(xviii)(B)

The 100-year flood elevation in the vicinity of the Kent Facility is at 23 feet NGVD. Although there are locations on the currently undeveloped half of the facility property which are at elevations below 23 feet, they are isolated areas into which flood waters could not encroach. There are no units at the Kent Facility that are located within the 100-year flood plain. No surface water drainage ditches and or creeks are present on the facility. Refer to Figure B3-1, Flood Plain Designation Map.

B4.0 TRAFFIC INFORMATION

40 CFR 270.14(b)(10)
WAC 173-303, 806(4)(a)(x)

Traffic in the operational facility area is restricted to waste transportation vehicles, intra-facility operational equipment such as forklifts, and service vehicles as needed. All other vehicles (e.g., employee and visitor) are required to remain outside the active portions of the facility (see Section F1.1, Barrier and Means to Control Entry). Visitors may park next to the main office inside the facility and are required to sign in before entering the active portion of the facility. Visitors are escorted or otherwise monitored by facility personnel while onsite.

Wastes are transported to and from the existing facility in tank trucks, trucks (e.g., roll-off boxes, intermodals, end dumps), flat beds, and vans. Tank trucks carry bulk liquids and sludges and have approximate capacities of 2,000 to 8,200 gallons. Solidification wastes are transported in trucks (e.g., roll-off boxes, intermodals, end dumps) with approximate capacities of 10 to 30 tons. Liquid and solid containerized material is transported by flat beds and vans with approximate capacities of 20 to 96 drums or 2 to 20 totes.

Waste shipments are pre-scheduled when possible to avoid back-ups or delays. All incoming and outgoing dangerous waste loads are recorded by the internal waste tracking system and are manifested per Washington Department of Ecology (Ecology) and Department of Transportation (DOT) regulations.

Personnel and drivers are familiarized with the general facility site plan and traffic patterns. Waste transportation drivers are directed and guided, by facility personnel, into their designated load/unload area. Forklift operators are trained and certified (see Section H, Personnel Training).

B4.1 On-Site Traffic Volumes and Patterns

Trucks, vans, forklifts, vacuum tanker trucks, front loaders, and personal vehicles are permitted to operate on-site at the Kent Facility. The following sections describe how these transportation activities are managed.

B4.1.1 Traffic Volumes

The average weekly traffic volumes on-site are summarized in Table B4-1. The data presented in the table was calculated from historical records (waste receipts and manifests), the capacities of the dangerous waste management units, and the anticipated volume of waste coming into the facility. Peak periods of incoming and outgoing transportation activity currently occur during the hours of 10:00 to 11:00 am and 3:00 to 5:00 pm.

B4.1.2 Traffic Patterns

The existing traffic patterns for waste transportation vehicles and intra-facility operational equipment are described in the following paragraphs and depicted in Figure B4-1. This figure also depicts traffic signs, facility access control points, and differentiates between concrete and asphalt paved surfaces.

Drivers delivering container loads to the facility must check-in with the main office prior to delivery and escorted or otherwise monitored while onsite. Kent Facility and third party drivers are given explicit directions on where their load is to be delivered and the gate they must use to enter the facility. Incoming container loads enter the facility through the West Lot Gate located in the southwest corner of the site, which is accessed from South 206th Street. The North Gate on 77th Avenue South can be used as an alternate inbound route, if traffic on South 206th is congested. Incoming loads that cannot be offloaded immediately are parked in the 10-Day Transfer Facility. Vehicles

with approved shipments ready to be received by the facility proceed eastward to the South Dock.

Outbound container loads are loaded at the South Dock, and exit through the West Lot Gate. The North Gate on 77th Avenue South can be used as an alternate outbound route, if traffic on South 206th is congested. Outbound trailers may be moved from the loading dock and parked in the 10-Day Transfer Facility until transportation arrangement can made.

Incoming bulk solids loads enter the facility off 77th Avenue South through the east gate near the solidification area. Vehicles proceed southbound, and then back up towards the solidification tanks for off-loading. Outbound bulk solids loads exit the facility through the east gate near the solidification area, or may be temporarily parked in the Roll-off Box Containment Area, which is a concrete pad in the 10-Day Transfer Facility (as shown on Figure B1-2).

Incoming bulk liquid loads enter the facility off 77th Avenue South through the northeast gate and proceed to the North Truck Load/Unload Area for off-loading into the wastewater treatment system. After off-loading, these trucks exit the facility through the northeast gate.

Vehicles follow the directions of facility personnel and adhere to traffic control signs at all times. If the vehicle's load/unload destination is occupied, the vehicle will pull up next to the load/unload area and wait for the next available opportunity to be loaded/unloaded. Dangerous waste vehicle and forklift traffic patterns are shown on Figure D1-16. Moderate risk waste (MRW) and empty transportation containers may use any of the available transportation routes within the facility, as illustrated in Figure B4-1. Empty transportation containers are staged in the north end of the West Lot where they await to be reloading with outbound materials, sent off-site to another storage location, or delivered to customer site.

Employee and visitor vehicles park in the designated lot to the east of the office. Additional employee parking is located in the southwest corner of the West Lot.

Intra-facility traffic typically consists of forklifts, pick-up trucks, tank trucks, and a front-end loader (or equivalent). Most forklifts operate in the container storage areas, the

check-in area, the truck dock, and near the solidification area. A front-end loader typically operates in the solidification area. Pick-up trucks are used and parked throughout the facility. Personnel operating intra-facility vehicles are instructed to give right-of-way to pedestrians and waste transportation vehicles. Intra-facility vehicles are equipped with lights, horns, and back-up alarms.

B4.2 On-Site Traffic Control

On-site traffic is controlled by scheduling waste shipments, controlling access to waste management areas, using established traffic routes, and traffic control signs. These measures and procedures are described in the following paragraphs.

To avoid backups and delays, waste transportation vehicles are pre-scheduled for arrival or pickup when possible, and the vehicles are directed to the proper loading/unloading or operational area by facility personnel. If a waste transport vehicle can not be offloaded immediately, it can be staged in the 10-Day Transfer Facility located adjacently to the west of the operating facility. Refer to Section B4.5 for a description of the 10-Day Transfer Facility operation.

Access to the facility is controlled at all gates for waste transporters and for visitors. All traffic gates into the facility are electronically controlled by the plant front office management. Visitors are required to sign-in at the office before entering the waste management area of the facility and are either escorted or under observation by Kent Facility personnel while in these areas.

Traffic control signs are shown on Figure B4-1.

B4.3 Transportation Routes To/From the Facility

Vehicles transporting waste and product to and from the Kent Facility use the facility main entrance road from 77th Avenue South or the West Lot Gate entrance from South 206th. Access routes to the Kent Facility are shown in Figure B4-2.

The traffic volumes and road classifications for the transportation routes in the immediate area leading to the facility are summarized in Table B4-2.

B4.4 Roadway Surfaces

This section discusses the adequacy and load-bearing capacities of the access roadways, facility roadways, and facility loading/unloading areas.

South 212th Street, South 206th Street, and 77th Avenue South are constructed of asphalt and are under the jurisdiction of the City of Kent. State Route 167, and Interstate Routes 5 and 405 also are constructed of asphalt and are under the jurisdiction of Washington State. The maximum gross vehicle weight for these roads is 80,000 pounds (lb) as established by the Washington State Department of Transportation per WAC 480-12-180.

Transportation routes and vehicle staging areas within the facility are paved with concrete or asphalt and constructed to handle the maximum load limit of the transportation vehicles (80,000 lb gross). The Kent Facility maintains the facility's roadways and surfaces on an as-needed basis. The truck dock and container storage areas are constructed of concrete.

B4.5 Ten-Day / 24-Hour Transfer Operations

The Kent Facility operates a Ten-Day Transfer Facility located on the 3-acre parcel west of the main operating facility, as shown in Figure D1-1.

The Ten-Day Transfer Facility is used for parking of waste loads that are not manifested to or from the Kent facility. These shipments must continue in their course of transportation within 10 days of arrival in the Ten-Day Transfer Facility.

The South Dock and adjacent two southernmost stalls are specific to the management of inbound and outbound loads that are manifested to or from the Kent facility. This area is identified as the 24-Hour Inbound/Outbound Area as shown on Figure D1-3. Signage will be used to clearly distinguish this area from the Ten-Day Transfer Facility.

Inbound DW loads that are manifested to the facility must park in the 24-Hour Inbound Area and must be received and checked-in within 24-hours of arrival at the facility. The load's arrival time is recorded on the drop sheet to document compliance with the 24-hour limit. For inbound "live offloads" the load's arrival time is time stamped on the manifest(s).

A time stamp is then placed on the piece count verification form when the load is offloaded to document compliance with the 24-hour limit.

Outbound DW loads that are generated by the Kent facility must park in the 24-Hour Outbound Area and must be shipped offsite within 24 hours of being parked in this area. Time stamps on the drop sheet are used to document compliance with the 24-hour limit.

LIST OF TABLES

Table B1-1 Non Dangerous Waste Tanks

Table B4-1 Average Weekly Traffic Volumes

Table B4-2 Traffic Volumes and Road Classifications for Transportation Routes

Table B1-1
Kent Facility Waste Tanks

Tank Number	Dangerous Waste Service	Waste Type Processed	Tank Usage	Tank Coatings		Materials of Construction	Nominal Volume
				Interior	Exterior		gallons
T1	No	CWT	Oil/Water Separator Receiving	epoxy	enamel	welded carbon steel	39,900
T2	No	CWT	Wastewater Storage	epoxy	enamel	bolted and gasketed carbon steel	10,800
T6A	No	CWT	Oil/Sludge Storage	epoxy	enamel	bolted and gasketed carbon steel	22,300
T6B	No	CWT	Oil/Sludge Storage	epoxy	enamel	bolted and gasketed carbon steel	22,300
T8	No	CWT	Oil Storage	epoxy	enamel	bolted and gasketed carbon steel	6,000
T9A	Yes	DW / CWT	Wastewater Storage	none	enamel	welded carbon steel	13,500
T9B	Yes	DW / CWT	Wastewater Treatment	none	enamel	welded carbon steel	12,100
T9C	Yes	DW / CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	9,500
T11	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	19,100
T12	No	CWT	Oily Wastewater Storage	none	enamel	welded carbon steel	19,100
T13	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T14	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T15	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T16	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T17	No	CWT	Wastewater Treatment	none	none	welded carbon steel	31,100
T18	No	CWT	Wastewater Treatment	none	none	welded carbon steel	31,100
S1	No	CWT	Treatment Sludge Storage	none	enamel	welded carbon steel	6,600
F1	No	CWT	Treatment Sludge Storage	none	enamel	welded carbon steel	6,600
5305	No	MRW	Solidification	none	none	welded carbon steel	1,650
5306	No	MRW	Solidification	none	none	welded carbon steel	1,870
		CWT	Centralized Waste Treatment Regulated King County (under 40 CFR 437)				
		MRW	Moderate Risk Waste (solid waste management) Regulated by King County				
		DW	Washington State Dangerous Waste Regulated by the Department of Ecology				

Table B4-1 Average Weekly Traffic Volumes

Vehicle Type	Destination and Total Number of Loads					
	North Truck Load/Unload Area Wastewater System		Solidification Tanks		South Dock	
	In	Out	In	Out	In	Out
Vans/Flat Beds	N/A	N/A	N/A	N/A	40	25
Bulk Solids Trucks	N/A	N/A	20	20	N/A	N/A
Tank Trucks	30	N/A	*	N/A	N/A	N/A

N/A Not Applicable

* Bulk non-dangerous wastewaters may be offloaded directly to the Non-dangerous wastewater system, or may be offloaded to the Non-dangerous wastewater system via the solidification tank (T-5306).

Table B4-2 Traffic Volumes and Road Classifications for Transportation Routes

ROAD	SEGMENT	ESTIMATED VOLUME (VEHICLES/DAY)	CLASSIFICATION
77th Ave. South	North of South 212th St.	Unavailable [a],[b]	Collector [a] Arterial
South 212th St.	West of 77th Avenue South	24,200[a]	Minor Arterial[a]
South 212th St.	East of 77th Avenue South	25,300[a]	Minor Arterial[a]
State Route 167	At onramp to South 212th St.	89,780[c]	Principal Arterial[c]
State Route 167	At onramp to Interstate Route 405	123,550[c]	Principal Arterial[c]

(a) Information on traffic volumes and road classifications supplied by City of Kent Dept. of Public Works Engineering Division, March 2006.

(b) No traffic volumes available for this segment of 77th Avenue South. Traffic volumes are low here because 77th Avenue South is a not a through street.

(c) Information on traffic volumes and road classifications supplied by Ramp & Roadway 2006 Traffic Volumes, Traffic Management Center Summary Report, SR-167, Washington State Department of Transportation.

LIST OF FIGURES

Figure B1-1 Facility Location Map

Figure B1-2 Facility Site Plan

Figure B1-3 Wastewater Treatment System Layout

Figure B1-4 Non Dangerous Waste Management in Wastewater Tanks

Figure B1-5 Facility Container Management Areas

Figure B1-6 Facility Tanks and Waste Management Units

Figure B2-1 Local Wind Patterns

Figure B2-2 Stormwater Drainage Patterns and Sewers

Figure B2-3 Facility Stormwater Piping

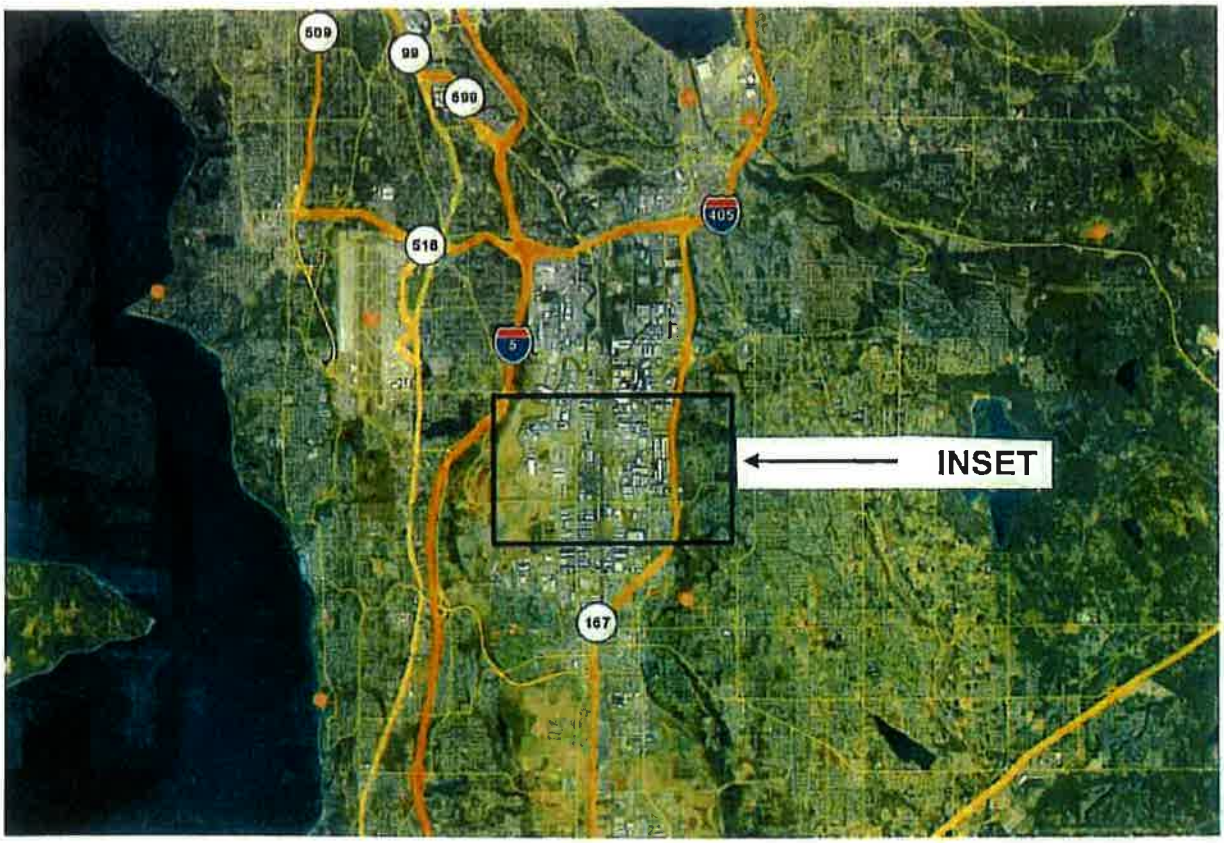
Figure B3-1 Flood Plain Designation Map

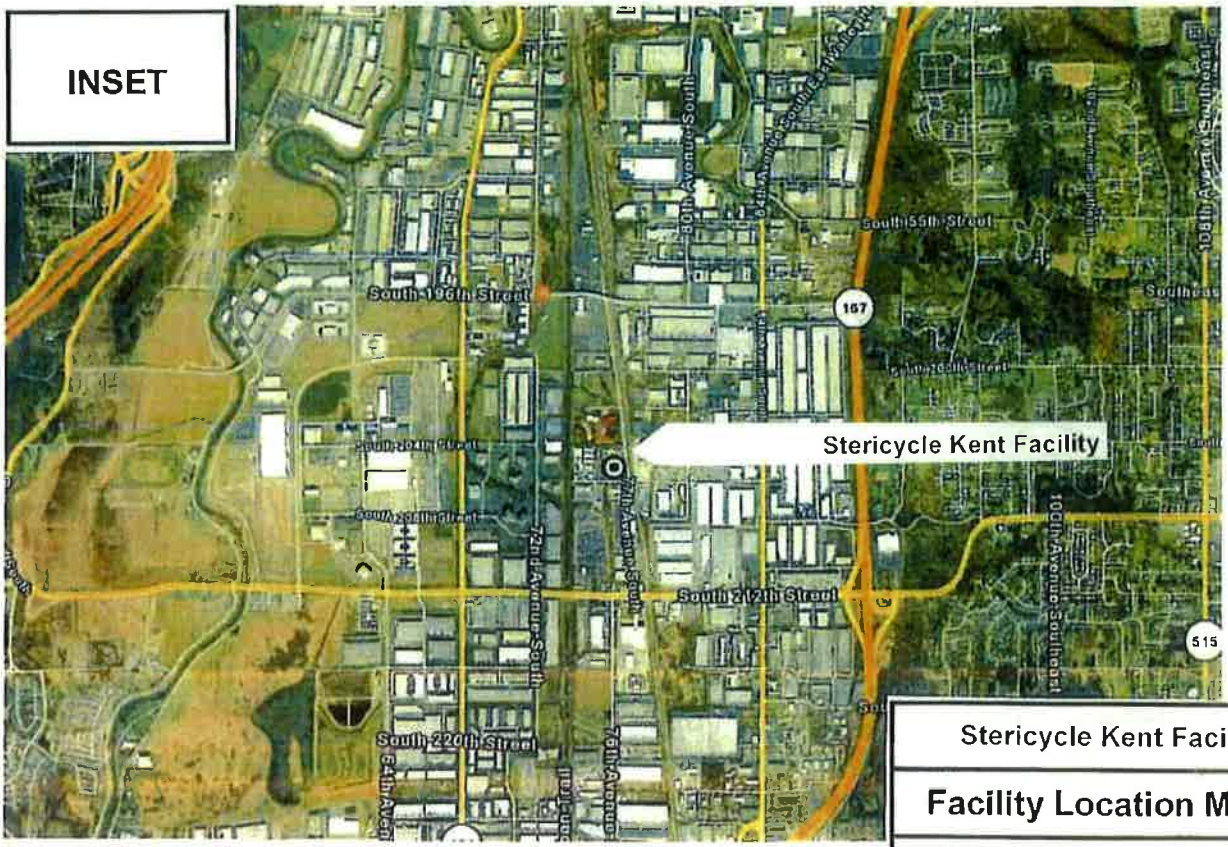
Figure B4-1 Facility Traffic Patterns, Signs, and Paving

Figure B4-2 Facility Access Routes

Table B1-1
Kent Facility Waste Tanks

Tank Number	Dangerous Waste Service	Waste Type Processed	Tank Usage	Tank Coatings		Materials of Construction	Nominal Volume
				Interior	Exterior		gallons
T1	No	CWT	Oil/Water Separator Receiving	epoxy	enamel	welded carbon steel	39,900
T2	No	CWT	Wastewater Storage	epoxy	enamel	bolted and gasketed carbon steel	10,800
T6A	No	CWT	Oil/Sludge Storage	epoxy	enamel	bolted and gasketed carbon steel	22,300
T6B	No	CWT	Oil/Sludge Storage	epoxy	enamel	bolted and gasketed carbon steel	22,300
T8	No	CWT	Oil Storage	epoxy	enamel	bolted and gasketed carbon steel	6,000
T9A	Yes	DW / CWT	Wastewater Storage	none	enamel	welded carbon steel	13,500
T9B	Yes	DW / CWT	Wastewater Treatment	none	enamel	welded carbon steel	12,100
T9C	Yes	DW / CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	9,500
T11	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	19,100
T12	No	CWT	Oily Wastewater Storage	none	enamel	welded carbon steel	19,100
T13	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T14	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T15	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T16	No	CWT	Wastewater Storage/Discharge	none	enamel	welded carbon steel	20,800
T17	No	CWT	Wastewater Treatment	none	none	welded carbon steel	31,100
T18	No	CWT	Wastewater Treatment	none	none	welded carbon steel	31,100
S1	No	CWT	Treatment Sludge Storage	none	enamel	welded carbon steel	6,600
F1	No	CWT	Treatment Sludge Storage	none	enamel	welded carbon steel	6,600
5305	No	MRW	Solidification	none	none	welded carbon steel	1,650
5306	No	MRW	Solidification	none	none	welded carbon steel	1,870
		CWT	Centralized Waste Treatment Regulated King County (under 40 CFR 437)				
		MRW	Moderate Risk Waste (solid waste management) Regulated by King County				
		DW	Washington State Dangerous Waste Regulated by the Department of Ecology				

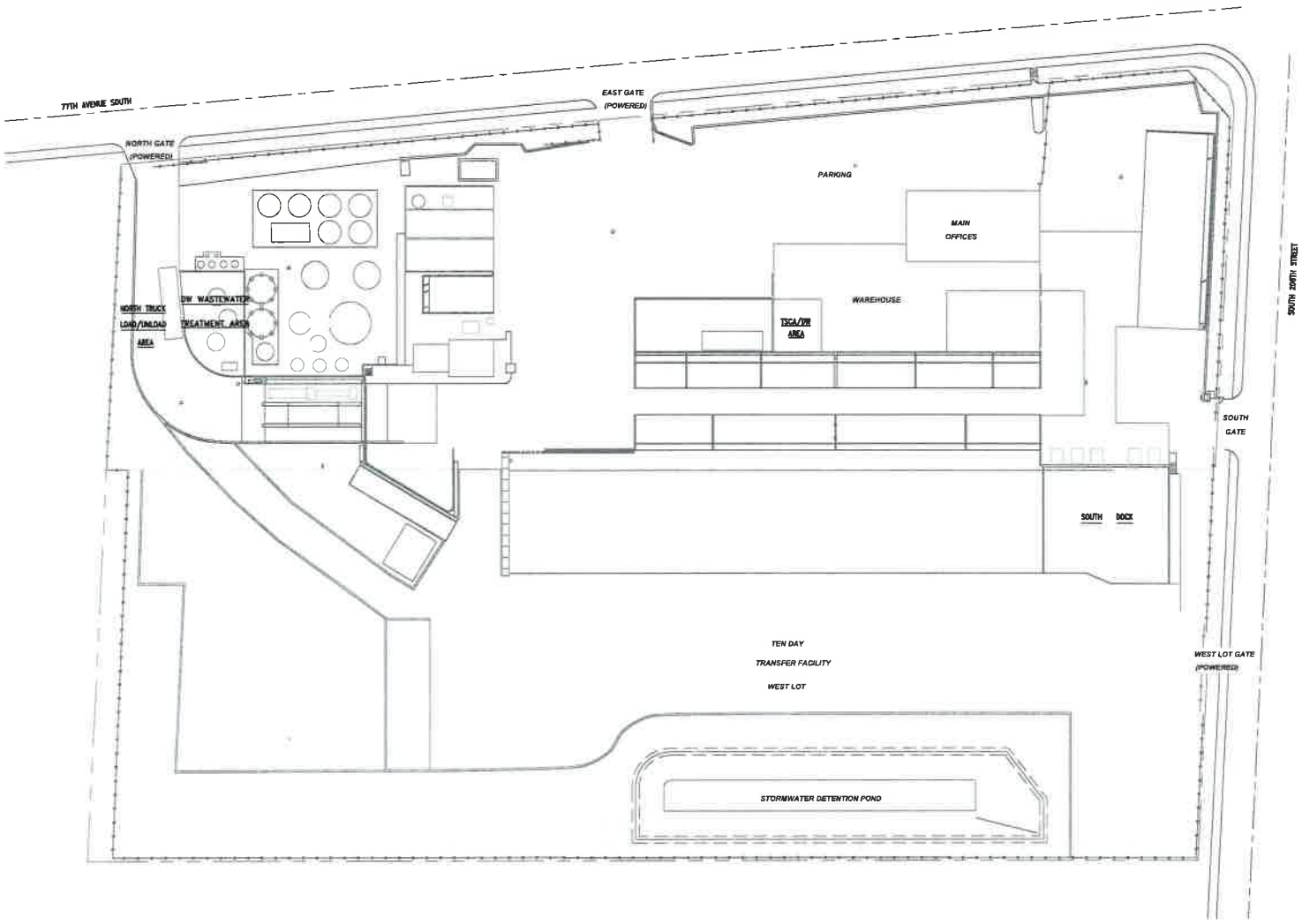




Stericycle Kent Facility

Facility Location Map

Figure B1-1

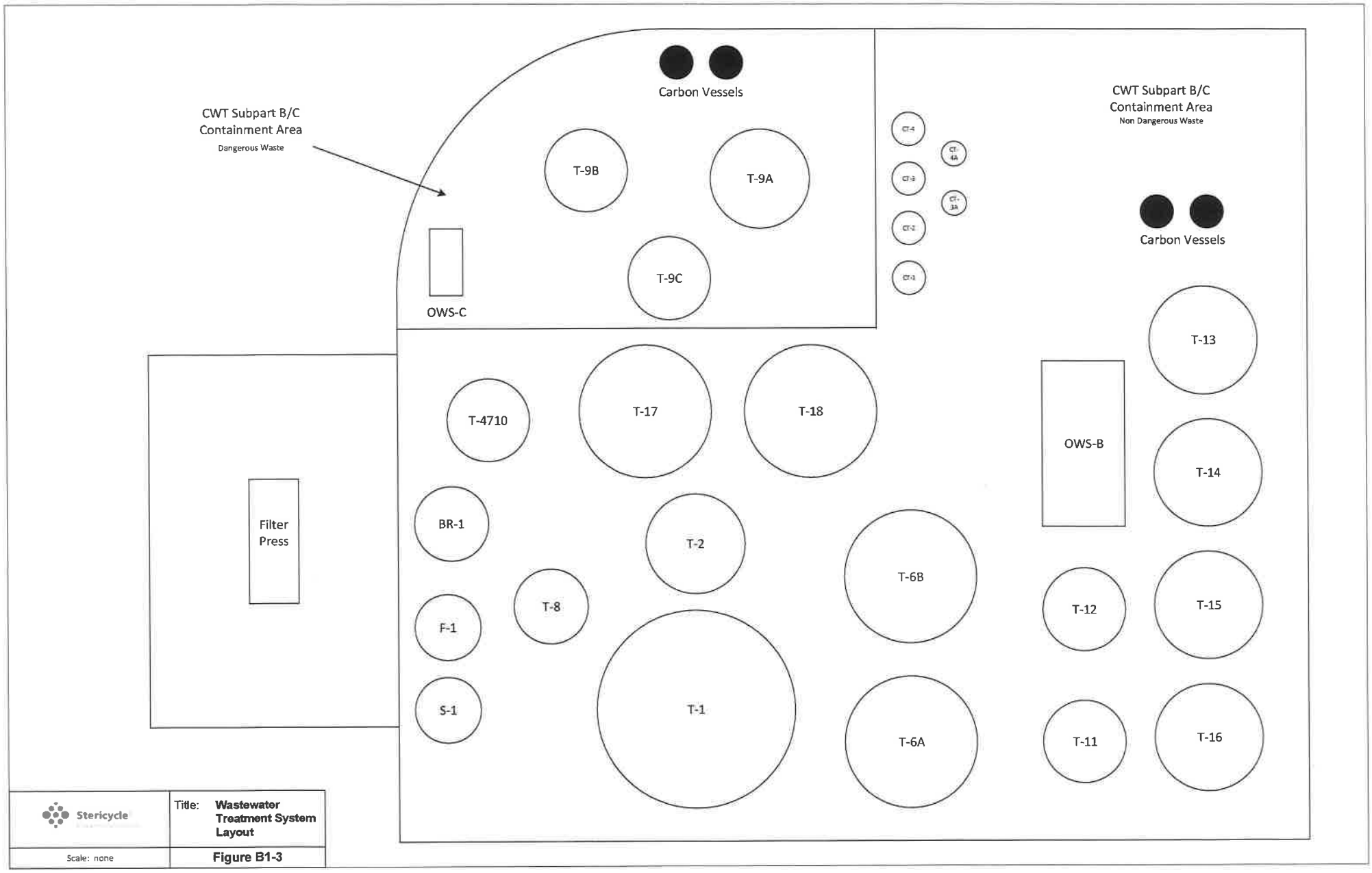


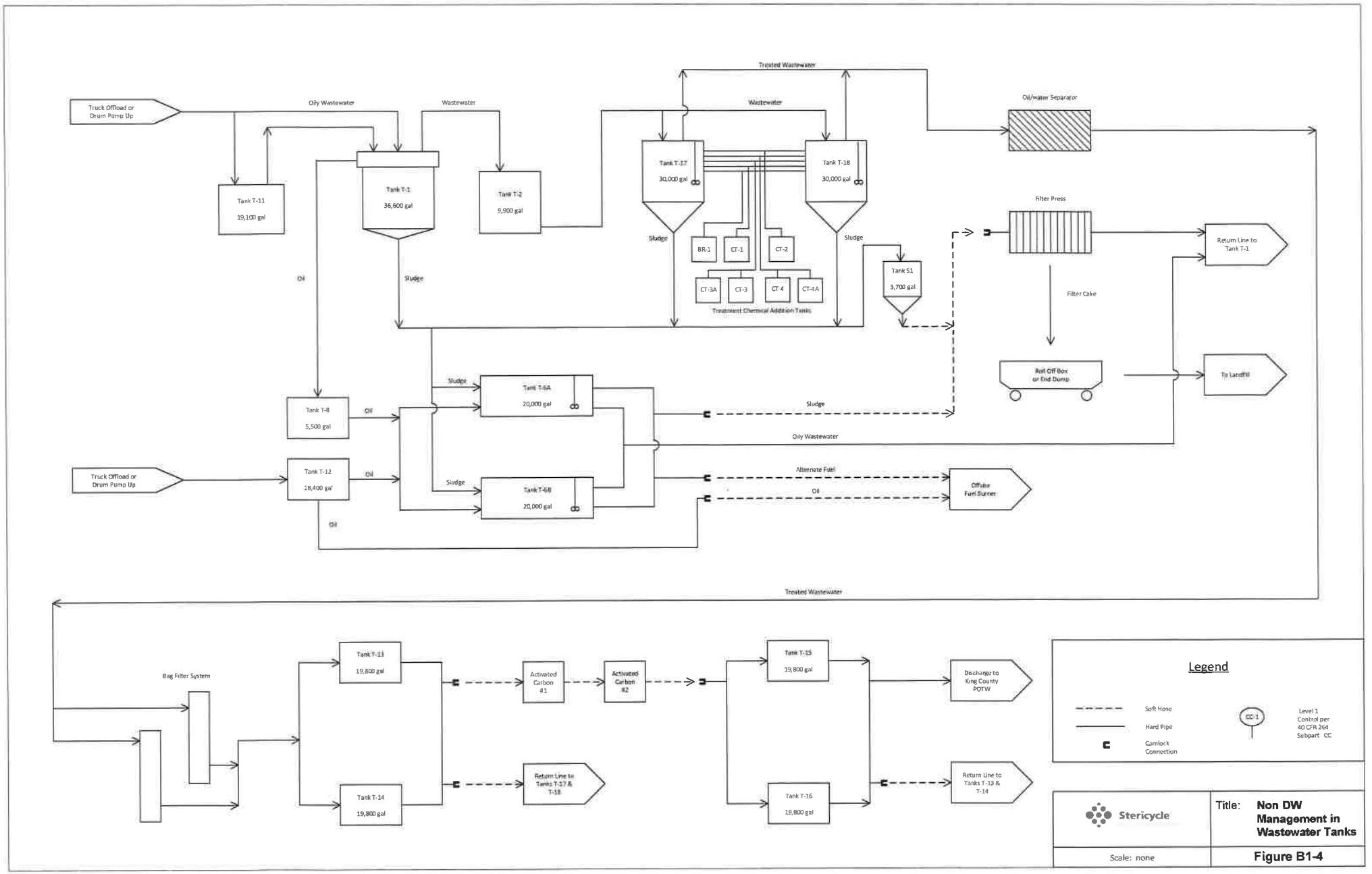
Stericycle

TITLE:
Facility Site Plan

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: B1-2	
DATE: 8/6/15	REV.:		


CWT Subpart B/C
Containment Area
Dangerous Waste
Carbon Vessels
T-9B
T-9A
T-9C
OWS-C
CT-4
CT-4A
CT-3
CT-3A
CT-2
CT-1
CWT Subpart B/C
Containment Area
Non Dangerous Waste
Carbon Vessels
T-13
T-14
T-15
T-16
OWS-B
T-12
T-11
T-4710
T-17
T-18
Filter
Press
BR-1
T-2
T-6B
T-8
F-1
S-1
T-1
T-6A
Stericycle
Title: Wastewater Treatment System Layout
Scale: none
Figure B1-3

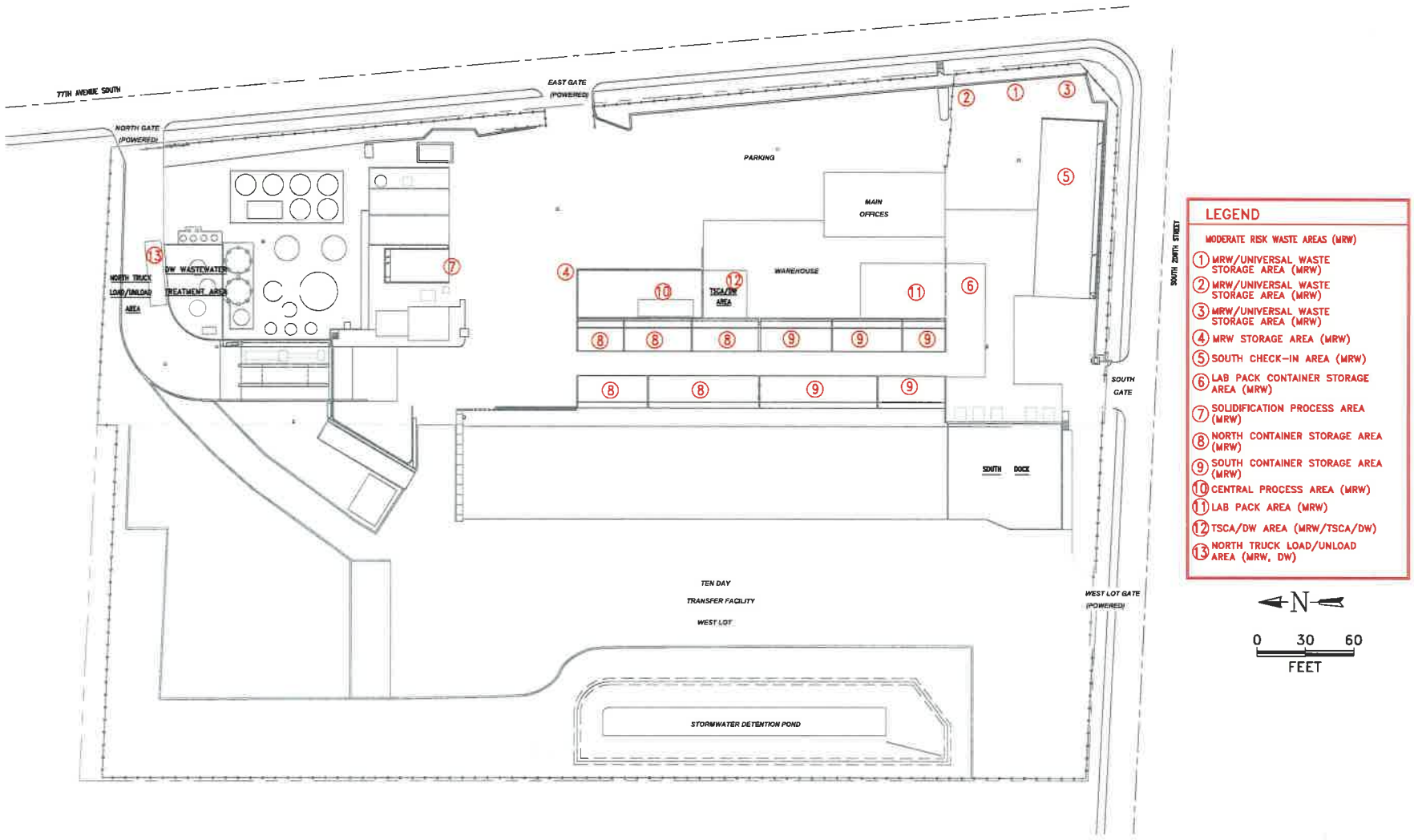


Stericycle

Title: **Non DW Management in Wastewater Tanks**

Scale: none

Figure B1-4

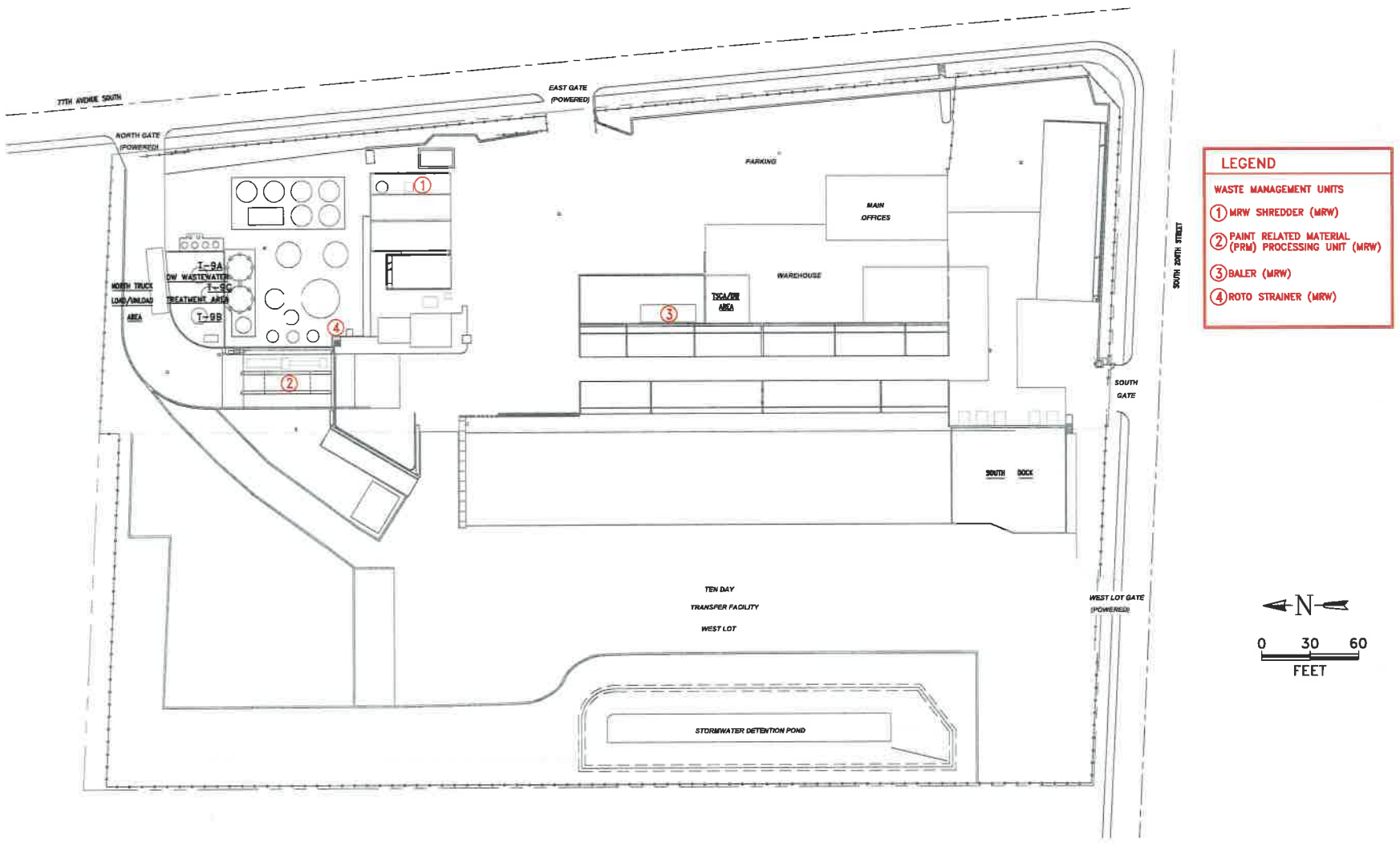


Stericycle

TITLE:
Facility Container Management Areas

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: B1-5	
DATE: 8/6/15	REV.:		

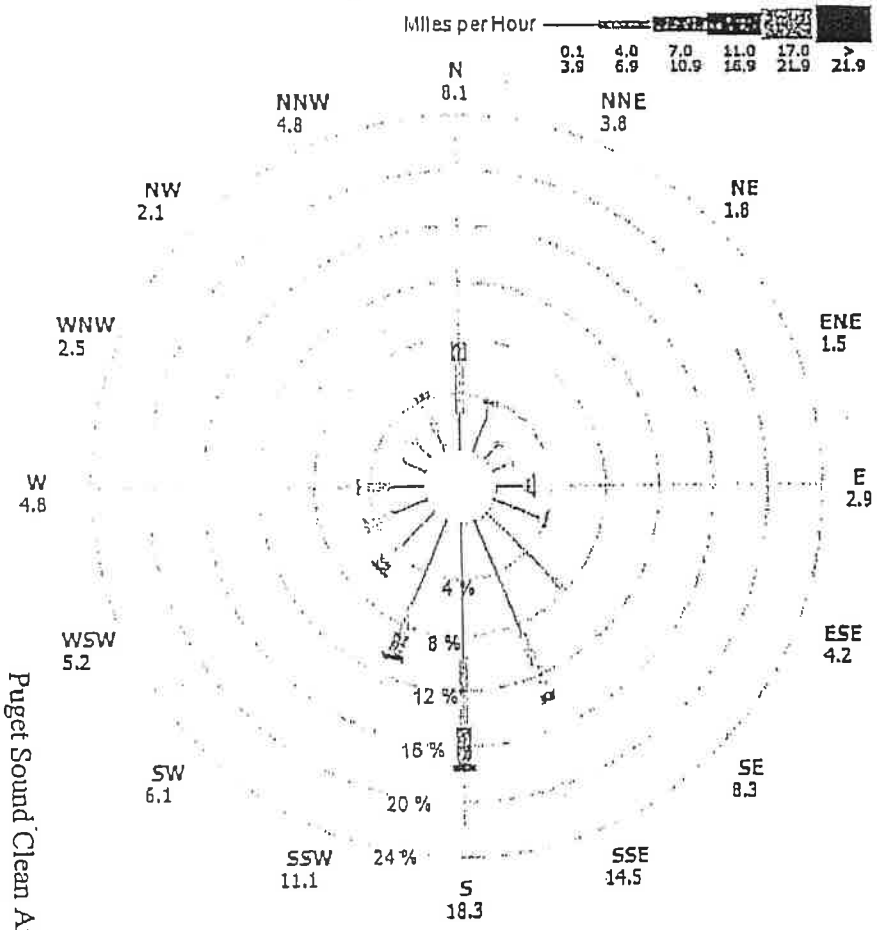


Stericycle

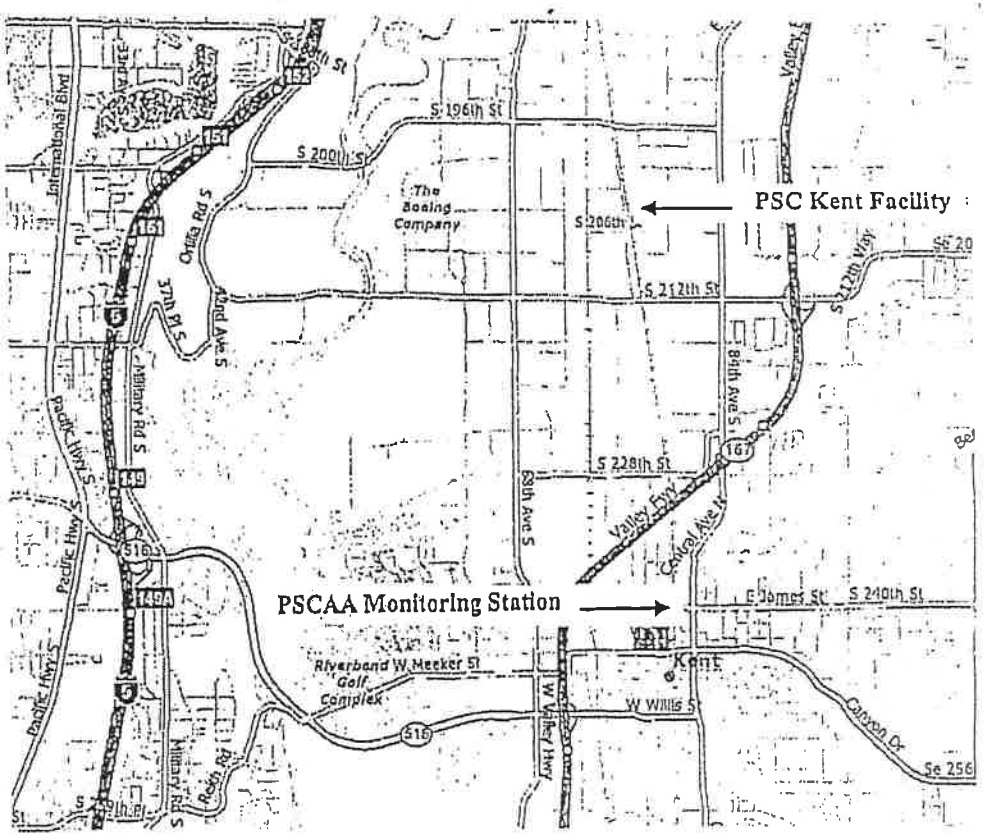
TITLE:
Facility Tanks and Waste Management Units

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:		
DATE: 8/6/15	REV.:	FIGURE NO.: B1-6	

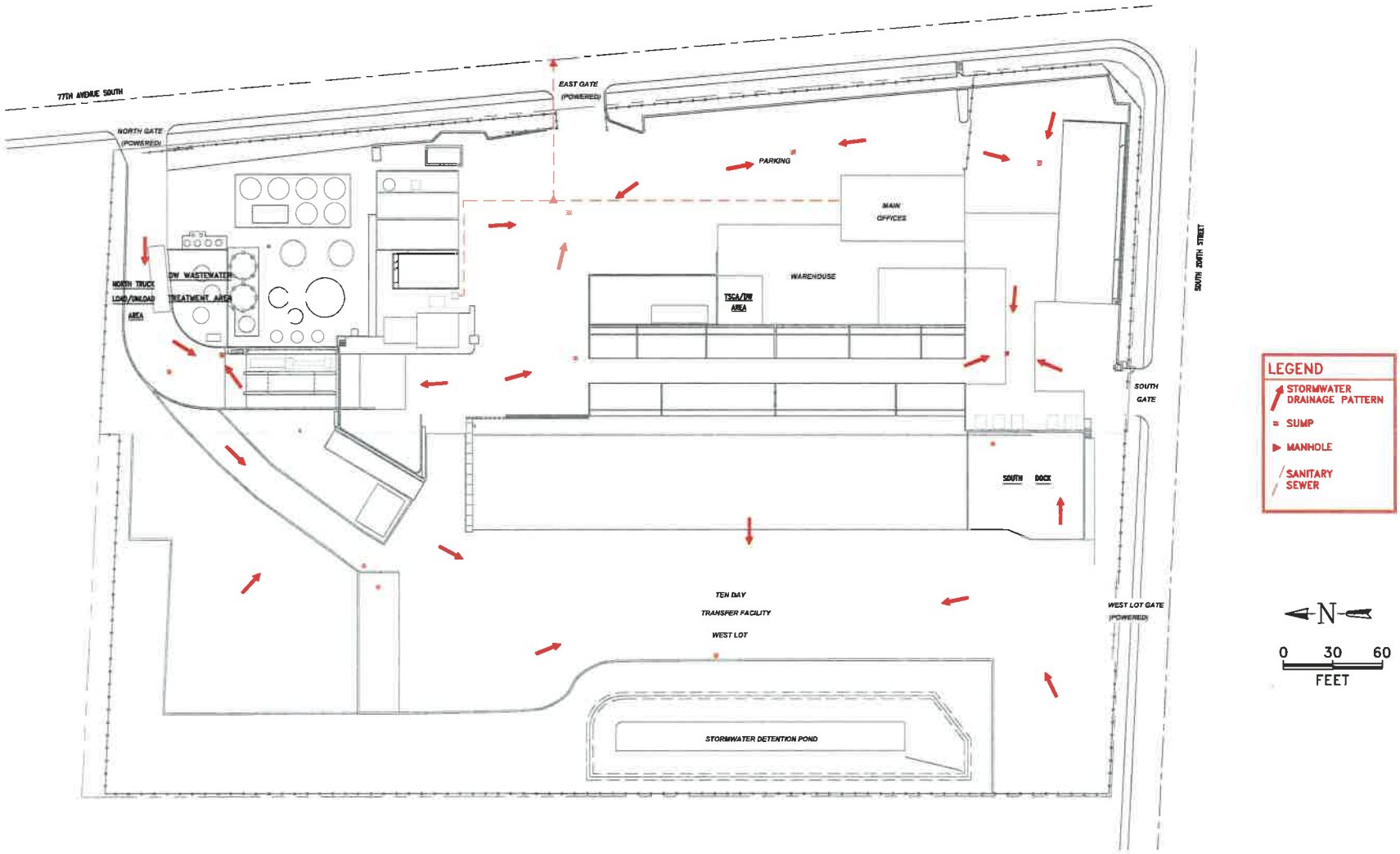


Hour Average Wind Speed
Kent ~ 74,794 Observations
01 Jan 1998 through 08 Aug 2006



Stericycle Kent Facility
Local Wind Patterns
Figure B2-1

Puget Sound Clean Air Agency

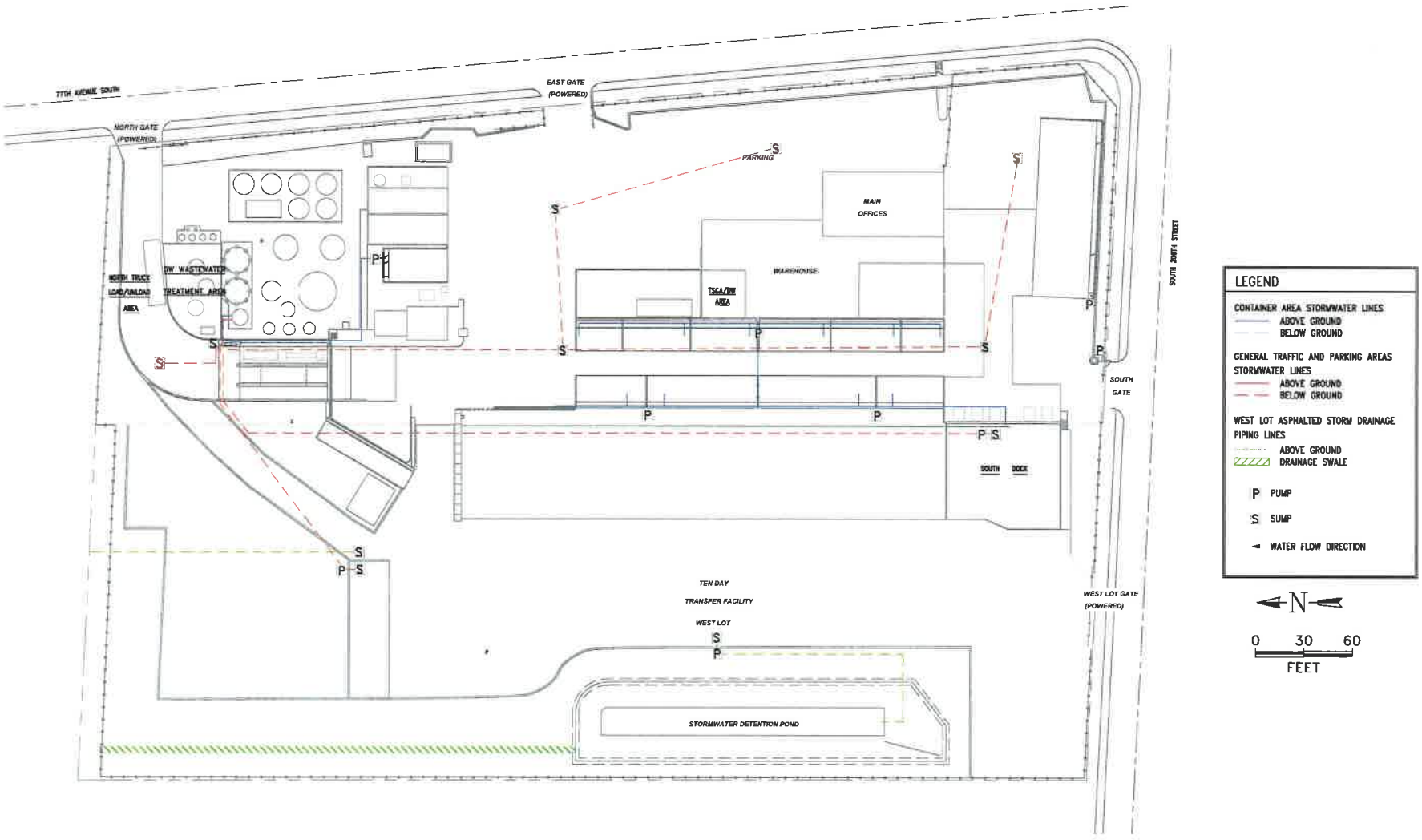


Stericycle

TITLE:
Facility Stormwater Drainage Patterns and Sewers

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: B2-2	
DATE: 8/6/15	REV.:		

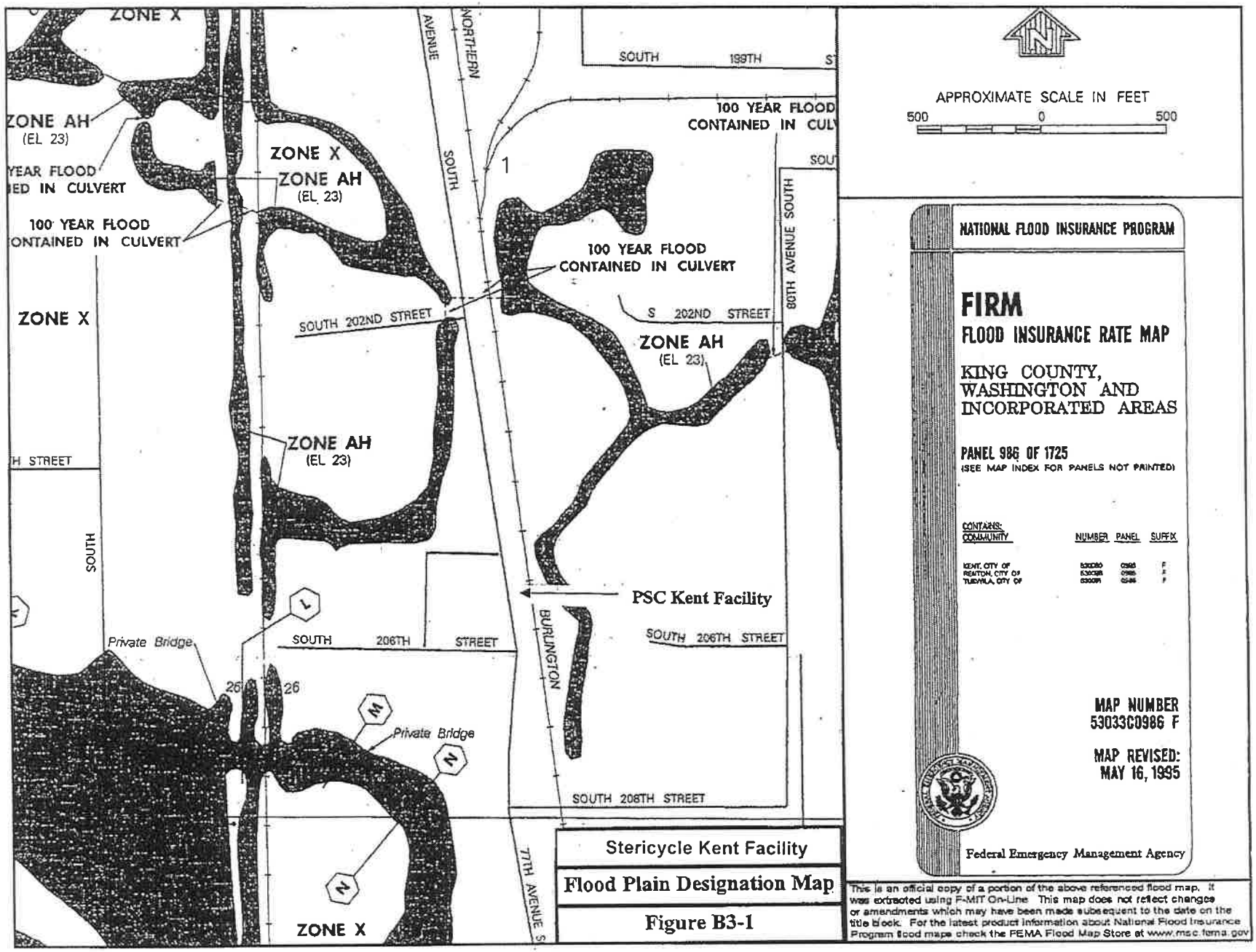


Stericycle

TITLE:
Facility Stormwater Piping

Stericycle Kent Facility

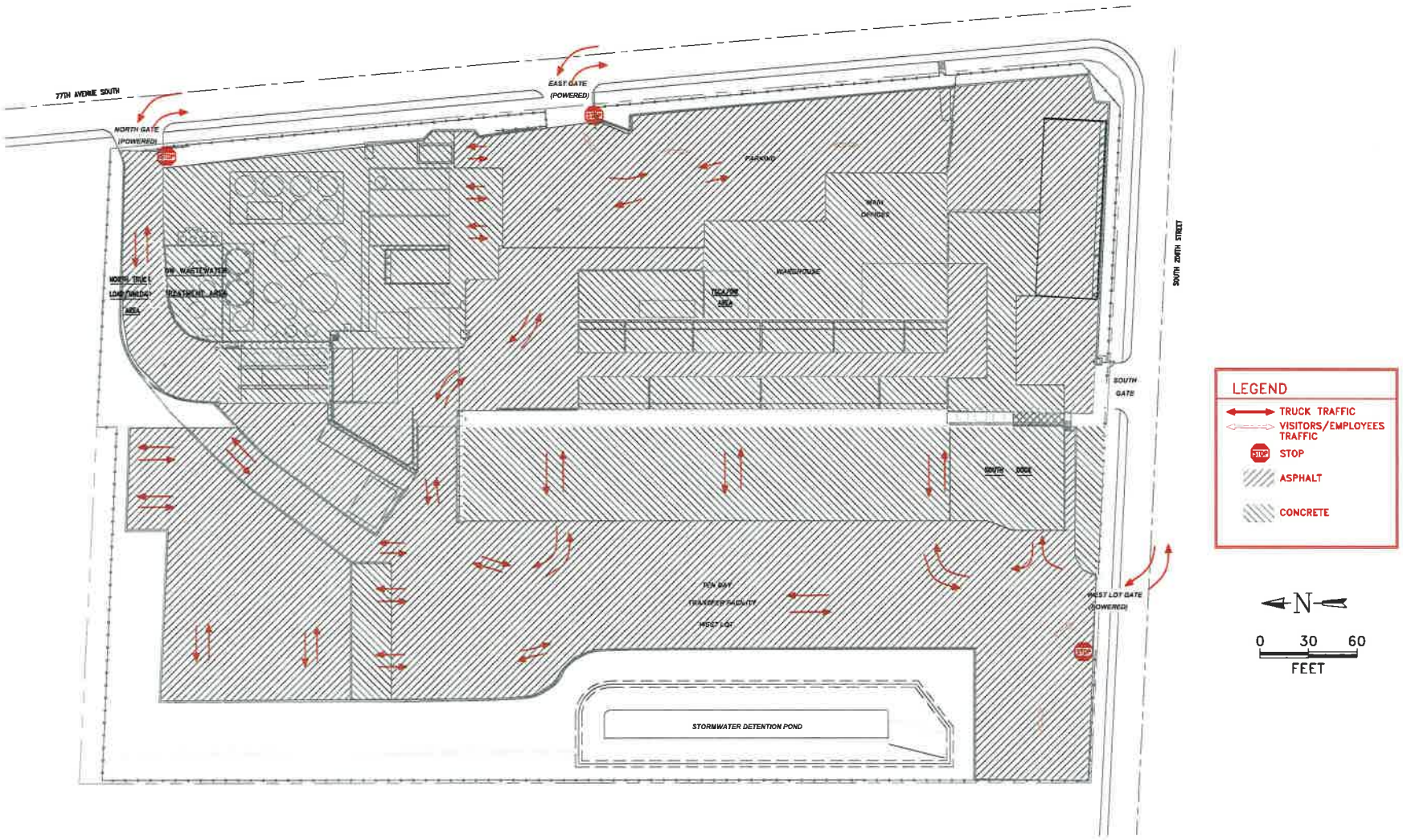
DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: B2-3	
DATE: 8/6/15	REV.:		



Stericycle Kent Facility

Flood Plain Designation Map

Figure B3-1

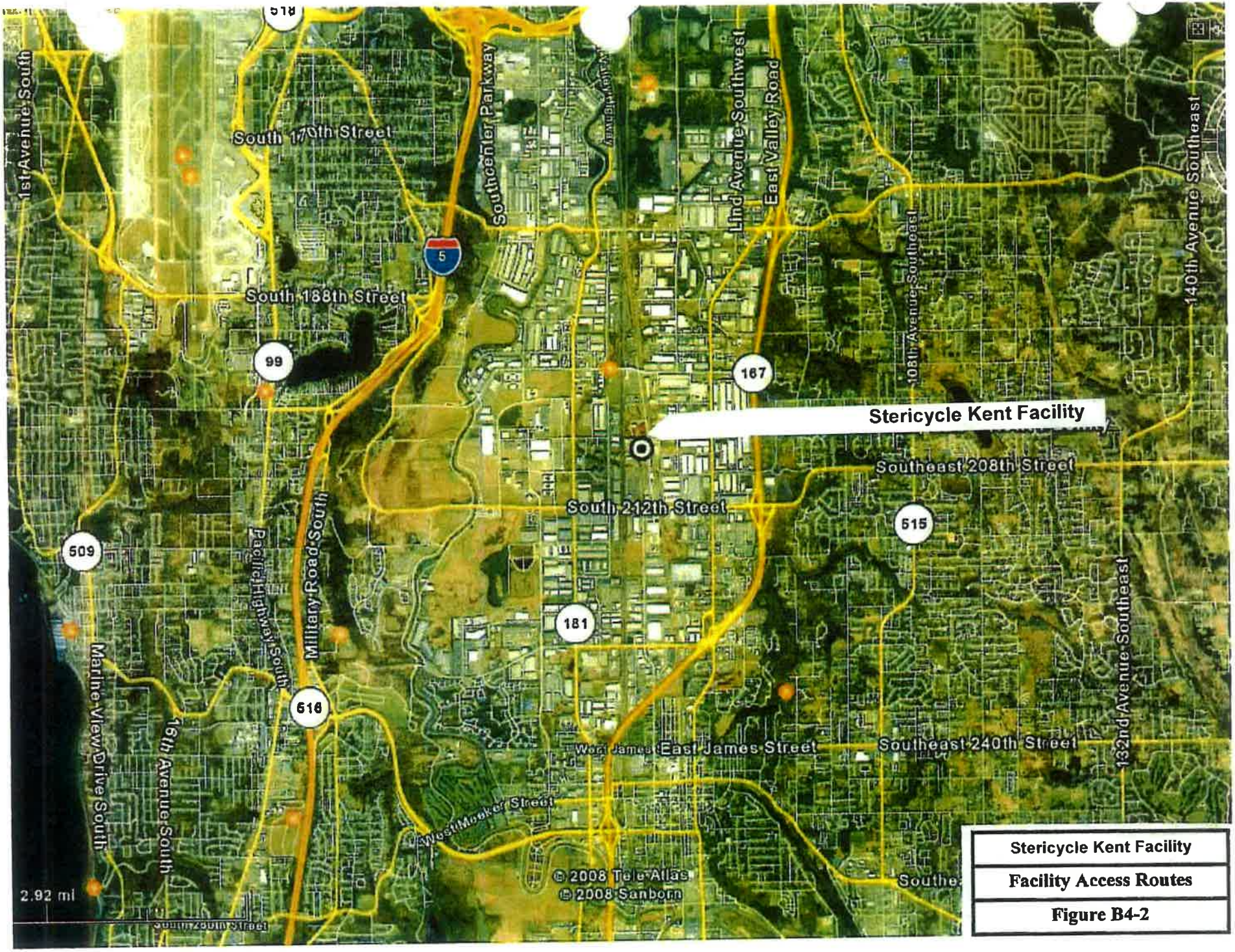


Stericycle

TITLE:
Facility Traffic Patterns, Signs, and Paving

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: B4–1	
DATE: 8/6/15	REV.:		


Stericycle Kent Facility
South 170th Street
South 188th Street
Southeast 208th Street
South 212th Street
East James Street
Southeast 240th Street
West Meeker Street
1st Avenue South
Southcenter Parkway
Lind Avenue Southwest
East Valley Road
140th Avenue Southeast
108th Avenue Southeast
132nd Avenue Southeast
Military Road South
Pacific Highway South
Marine View Drive South
16th Avenue South
5
99
167
515
509
181
516
2.92 mi
© 2008 Tele Atlas
© 2008 Sanborn
Stericycle Kent Facility
Facility Access Routes
Figure B4-2

SECTION C

WASTE ANALYSIS PLAN

SECTION C. WASTE ANALYSIS PLAN

TABLE OF CONTENTS

SECTION PAGE

C1. GENERAL INFORMATION 1
C2. DEFINITIONS 3
C3. CHEMICAL AND PHYSICAL CHARACTERISTICS OF WASTE 6
C3.1. Types of Dangerous Wastes Managed 6
C3.1.1. Wastewater 6
C3.1.2. Waste for Consolidation 6
C3.1.3. Storage 7
C4. WASTE ANALYSIS PERSONNEL RESPONSIBILITIES 7
C4.2. Materials Management Group: 7
C4.3. Supervisory Personnel 8
C4.4. Environmental Technician 9
C4.5. Laboratory Personnel 9
C5. WASTE PROFILE PRE-ACCEPTANCE PROCEDURES 9
C5.5. Prohibited Wastes 10
C5.7. Waste Streams Not Requiring Laboratory Analysis for Profiling 11
C5.10. Waste Stream Pre-Acceptance 13
C5.11. Profile Development 14
C6. WASTE PROFILE SYSTEM 18
C7. INCOMING WASTE PROCEDURES (VERIFICATION) 20
C7.2. Containerized Loads 20
C7.3. Bulk Loads 23
C7.4. All Received Waste 24
C7.8. Waste Management 27
C8. SAMPLING AND ANALYSIS METHODOLOGIES 28
C8.5. Mandatory Verification Analyses 29
C8.6. Supplemental Analyses 30
C8.7. Process Analyses 32
C8.8. Tolerance Limits for Determining Profile Conformance During Verification 32
C8.9. Sampling Methods and Equipment 35
C8.10. Frequency of Sampling and Analysis 36
C8.11. Process Generated Wastes 38
C8.12. Record Keeping and Waste Tracking 39

Tables, Figures, and Appendices are presented
in separate sections following the main body of the text.

LIST OF TABLES

Table C2-1	Analytical Parameters, Methods, and Rationale
Table C2-2	Waste Analysis Summary
Table C2-3	Storage and Process Limitations
Table C2-4	Sampling Methods and Equipment
Table C2-5	Sample/Container Compatibility
Table C2-6	Waste Processing Analysis Compatibility Limitations
Table C2-7	Summary of Processing Analysis Tests

LIST OF FIGURES

Figure C1-1	Kent Facility Site Plan
Figure C2-1	Waste Overview
Figure C2-1a	Waste Pre-acceptance
Figure C2-1b	Waste Acceptance
Figure C2-1c	Waste Management

LIST OF APPENDICES

Appendix C-1	Example Forms
Appendix C-2	Analytical Test Methods
Appendix C-3	Quality Assurance Program Plan
Appendix C-4	Problem Manifest Procedure
Appendix C-5	Process Under Supervision Only (PUSO) Procedures
Appendix C-6	Stericycle National Accounts Profile Approval

SECTION C. WASTE ANALYSIS PLAN

WAC 173-303-300(5) and (6), and WAC 173-303-806(4)(a)(ii)

C1. GENERAL INFORMATION

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as “Stericycle”.

C1.1. This Waste Analysis Plan (WAP) describes the actions Stericycle - Kent must take in order to receive, process, and manage incoming wastes within specific periods of time, as well as to obtain detailed chemical, physical, and/or biological analysis for all dangerous waste managed at the Kent facility. This plan also requires specific sampling methodologies, analytical techniques, profile development, waste acceptance procedures, and waste tracking systems which must be utilized for safe waste management and recordkeeping.

C1.2. As required by WAC 173-303-300(5), this WAP has been developed and must be followed by the Stericycle-Kent facility located in King County, Washington. A current copy of this WAP must be maintained at the facility at all times.

C1.3. Stericycle-Kent is a commercial dangerous waste (DW) storage and treatment facility. The facility can receive, store, and process DW in either bulk loads or containers. Details and locations of all the DW management units including tank systems and container storage areas are provided in Section D, Process Information. All DW are managed only in areas authorized for DW management under the conditions of this permit. Analytical requirements applicable to each facility waste management option are summarized in, Table C2-2, Waste Analysis Summary, and in Table C2-3, Storage and Process Limitations. Waste management options for containerized wastes are described in Section D2.2 and Section D3.3 describes tank management practices.

C1.4. Stericycle-Kent will comply with all requirements in this WAP for all DW managed at the facility. This includes Small Quantity Generator (SQG) wastes received from off site that are managed under the dangerous waste permit. The procedures described in this WAP apply to materials that are DW per WAC 173-303-070.

C1.4.1. Stericycle-Kent is authorized to accept only those dangerous wastes codes from off-site generators which are specified in their current Part A Permit Forms and which meet any other applicable limits in this permit. Dangerous waste may only be accepted from generators with a valid State/EPA identification number, legitimate small quantity generators (SQG), and foreign sources subject to requirements in C1.4.1.2. (Dangerous waste codes are the same as dangerous waste numbers throughout the text).

C1.4.1.1. In emergency situations such as those described in WAC 173-303-145, Stericycle-Kent may accept DW from generators who do not have a State/EPA identification number.

C1.4.1.1.1. Emergency acceptance requires prior written authorization from Ecology, which may be via telecommunications (e.g., email or fax).

C1.4.1.1.2. If written authorization, pursuant to C1.4.1.1.1, is not possible, and if delay of acceptance of such waste may result in harm to human health or the environment, Stericycle-Kent may accept the wastes without prior authorization. In such cases Stericycle-Kent must notify Ecology of the emergency situation within 24 hours of the arrival of the waste at the facility.

C1.4.1.2. Stericycle will notify Ecology in writing at least four weeks before the facility expects to receive DW from a foreign source, as required by WAC 173-303-290(1). Notice of subsequent shipments of the same waste from the same foreign source in the same calendar year is not required.

C1.4.2. Before receiving a DW from a particular off-site source, Stericycle will inform the generator in writing that the facility has the appropriate permits for and will accept the DW the generator is shipping as required by WAC 173-303-290(3). Stericycle-Kent will keep a copy of this written notice in the operating record.

C1.4.3. Solid Waste that does not designate as DW accepted into the facility will be managed through either the Industrial Pretreatment discharge permit, or the Moderate Risk Waste (MRW) permit, both of which are issued by King County. Solid

waste can include water that doesn't meet discharge criteria but is not otherwise regulated as DW.

C1.4.3.1. Managing wastes under the Industrial Pretreatment discharge permit will in no way hamper Stericycle-Kent from meeting requirements in the DW permit, including performance standards in WAC 173-303-283, for any area or activity subject to the DW permit.

C1.4.3.2. Managing wastes under the MRW permit will in no way hamper Stericycle-Kent from meeting requirements in the DW permit, including performance standards in WAC 173-303-283, for any area or activity subject to the DW permit.

C1.4.4. All wastes generated on-site are designated per WAC 173-303-070 and managed according to this WAP and all other applicable requirements of this permit. This includes waste generated from treating wastes and materials in Solid Waste operations addressed in permit condition C1.4.3.

C1.5. The forms presented in this WAP are the forms currently used by the facility, and may be revised as needed to address regulatory changes, facility operations, and customer needs. This will require a permit modification if it reduces the content or minimum information displayed on the form. Changes that only affect the format or appearance of the form do not require a permit modification.

C1.6. Records required by this WAP may be kept in either paper or electronic format. Records must be furnished upon request and made available at all reasonable times for inspection.

C1.7. For the purpose of implementing this WAP, the Stericycle-Kent laboratory will follow the requirements presented herein. The Stericycle-Kent laboratory and any third-party contract laboratories are required to follow quality assurance for sample handling and preservation, sample preparation, and sample analysis specified by the testing method(s), as referenced in Table C2-1.

C2. DEFINITIONS

For the purposes of this WAP, the following terms are defined:

C2.1. Acceptability is the condition of the facility to be able to properly receive and safely manage a waste stream based on facility permit conditions, treatability, and applicable regulations.

C2.2. Compatibility is the combining of wastes without unexpected chemical or physical reaction; i.e., there is no fire, explosion, or sudden or non-sudden excessive heat generated or other unexpected and adverse reactions.

C2.3. Confirmation - Checking that the profile is accurate and complete before approving the waste stream for shipment to the facility. Confirmation is performed by Materials Management after all requested supporting information has been submitted, and may include laboratory analytical data.

C2.4. Knowledge means sufficient information about a waste stream to reliably substitute for direct testing of the waste. To be sufficient and reliable, the “knowledge” used must provide information necessary to manage the waste stream in accordance with the requirements of WAC 173-303-300(2)(a).

C2.5. Process Under Supervision Only (PUSO) is an operating procedure that details precautions for the treatment, storage or consolidation of potentially reactive or unstable waste.

C2.6. Profile – a detailed and comprehensive physical, chemical and regulatory description of a waste stream, including all applicable DW numbers/codes to assist the Stericycle in determining whether a waste can be safely managed in compliance with the Part B permit. Stericycle is responsible for ensuring an adequate profile for the waste streams they accept.

C2.7. Profiling or Waste Characterization - The process of evaluating a waste stream for acceptance at the facility. This includes gathering and compiling information from the generator, testing the waste stream if information is insufficient, and determining whether the waste can be safely managed as well as accepted under permit conditions.

C2.8. QA/QC (Quality Assurance/Quality Control) is laboratory procedures that assure that chemical analyses are precise and accurate (see SW 846).

C2.9. Recertification of a Profile - Generator certification of a Waste Profile Questionnaire (WPQ) and Stericycle certification of the profile at a regular interval as required by the Permit.

C2.10. Reprofiling – Re-initiating the profiling process for a waste stream currently accepted by Stericycle when the process or operation generating the waste changes (for example, generator feedstocks change), when there is a verification failure, or at regular interval as required by the Permit.

C2.11. Verification are the procedures with criteria for determining waste received is the same as the waste described on the manifest and matches the profile. This may include: visual inspection, container count, and verification analysis.

C2.12. Mandatory Verification Analysis (MVA) - The results of screening analysis that provide the key elements of the waste stream for comparison with the physical and chemical characteristics of the profile.

C2.13. Waste Profile Questionnaire (WPQ) is a document, usually filled out by the generator, to assist Stericycle in determining whether the waste stream can be safely managed in compliance with the permit.

C2.14. Waste Shipment is a DW transferred from point A to point B by a single waste manifest or shipping paper. For operating tracking purposes, the term waste receipt is used synonymously.

C2.15. Waste Stream is DW from a single generator that is specific and unique to the waste generation process.

C3. CHEMICAL AND PHYSICAL CHARACTERISTICS OF WASTE

WAC 173-303-806(4)(a)(ii), 300(1)-(5)

This section generally describes the DW that are stored, treated or generated at Stericycle-Kent. Any DW listed on the Stericycle-Kent Part A Application and not prohibited as outlined in Section C5.5 may be managed on-site. Although it is not feasible to provide detailed descriptions of all possible wastes that could be received, incoming waste streams can be categorized by the management option that will be used to manage the waste. Detailed descriptions of facility management options and treatment processes are provided in Section D.

C3.1. Types of Dangerous Wastes Managed

The types of dangerous wastes allowed for each waste management option occurring at Kent are described below. Section D provides detailed information on procedures and requirements for each management option.

C3.1.1. Wastewater

The Kent facility DW tanks manage only wastewaters classified as subcategory B (oils subcategory) and/or subcategory C (organics subcategory) according to the Centralized Wastewater Treatment (CWT) Receipt Classification (see Appendix D-11). Wastewaters containing greater than 10% organic compounds may be accepted. Metal bearing wastewaters, waste acid, alkaline and oxidizer liquids are not accepted for storage or treatment in this area. Additional waste streams not allowed in the waste water treatment system are those of non-aqueous composition, those containing PCBs, or those otherwise restricted as listed in Section C5.5.

C3.1.2. Waste for Consolidation

Containerized waste streams that are consolidated include, but are not limited to TSCA-regulated PCB items and debris. Containerized and bulk wastes for consolidation for further treatment or final disposal at offsite facilities may include facility-generated wastes, such as PPE and drum heels, or other permitted wastes. Incompatible wastes are not consolidated.

C3.1.3. Storage

Any waste received in a container at Kent may be stored without treatment and trans-shipped in the original container to a final disposal facility. Wastes stored at the facility must satisfy other requirements in the dangerous waste permit. Containers may be stored for up to one year, and are stored in accordance with segregation criteria described in Section D.

C3.2. Any of the wastes identified above and in the Part A may be generated at the facility as a result of one of the waste management options used to receive, store and treat waste. DW generated at the facility are consolidated, treated on-site, or sent off-site for treatment and/or final disposal. Prior to disposal, wastes are sampled and analyzed as described in Section C8. The wastes are designated per WAC 173-303-070 and outbound profiles are managed by the Materials Management department. All treatments at the facility are in compliance with the LDR dilution prohibition.

C4. WASTE ANALYSIS PERSONNEL RESPONSIBILITIES

C4.1. Account Representative / Customer Service Representative:

C4.1.1. Makes the following waste stream determinations:

C4.1.1.1. Initial contact with waste stream generator.

C4.1.1.2. Development of the Waste Profile Questionnaire.

C4.1.1.3. Feasibility of waste stream receipt at facility.

C4.1.1.4. Contacts the generator if discrepancies arise during waste acceptance procedures.

C4.2. Materials Management Group:

C4.2.1. Materials Management (which includes the Central Profile Group as described in C5.11 is responsible for evaluating whether to accept or reject the waste stream. This decision is made based on:

C4.2.1.1. A review of generator information and a review of additional information generated by Stericycle to supplement and confirm the generator information as described in Section C5 and requirements of this permit,

C4.2.1.2. Material Management's experience and judgment; and

C4.2.1.3. Any additional documentation, including information that the waste stream is subject to the Land Disposal Restrictions of 40 CFR Part 268, if appropriate.

C4.2.2. Materials Management makes the following waste stream determinations:

C4.2.2.1. Acceptability of the waste stream at the Stericycle-Kent facility based on permit conditions, treatability and applicable disposal regulations.

C4.2.2.2. Treatability protocols for new waste streams including identification that "Process Under Supervision Only (PUSO)" is needed.

C4.2.2.3. Selection of management option(s). This determines how the waste can be treated or disposed. For each waste stream, this itemizes the legal management options in the profile. Management options may include one or more of those performed at the facility as listed in Section D, or may specifically refer to off-site management only.

C4.2.2.4. That generators have the required DW notifications in place (i.e. EPA ID number).

C4.2.2.5. That information necessary to manage the waste stream in accordance with requirements of the dangerous waste permit is available on the waste stream.

C4.2.2.6. That Stericycle-Kent obtained all necessary information about the waste stream to develop an accurate and complete profile.

C4.2.2.7. Evaluation and approval of all inbound and outbound profiles.

C4.3. Supervisory Personnel

Supervisory personnel consists of Plant Manager or Plant Supervisor, and they make the following waste management determinations:

C4.3.1. The selection of a management option approved by materials management from those listed in the profile.

C4.3.2. Discrepancy determinations based on mandatory verification analysis.

C4.3.3. The Plant Manager or Materials Manager may approve PUSO procedures.

C4.4. Environmental Technician

Under direction of Supervisory Personnel, the Environmental Technician may select a management option for the waste stream for storage, shipping, or processing purposes only in those instances where Materials Management has indicated more than one waste management option in a profile. An Environmental Technician may choose the most appropriate management option from only the predetermined set of waste categories as listed in the profile.

C4.5. Laboratory Personnel

The Stericycle–Kent laboratory personnel are responsible for performing verification analysis, identifying any inconsistencies or discrepancies between waste stream profile and analytical results, coordination of samples to a third-party lab and communicating results to Materials Management, Account Representative / Customer Service Representative and / or Supervisory Personnel.

C5. WASTE PROFILE PRE-ACCEPTANCE PROCEDURES

C5.1. Stericycle-Kent has developed a series of control procedures to determine the acceptability of each waste stream proposed for management at the facility. Pre-acceptance procedures dictate whether there is sufficient and reliable information on the waste stream to complete a profile and what information Stericycle-Kent must obtain to determine the acceptability of the waste stream for management. At a minimum, Stericycle-Kent must obtain all the information required by WAC 173-303-300(2), and other information necessary to safely manage a waste. Pre-acceptance procedures allow Stericycle-Kent to determine the acceptability of a given waste stream based on

permit limitations, regulatory requirements, and whether the facility can safely manage the material.

C5.2. Stericycle-Kent pre-acceptance procedures described in this WAP must be completed prior to acceptance of the initial shipment of the waste. Figure C2-1a outlines the procedures and personnel involved in waste profiling and pre-acceptance evaluations.

C5.3. Stericycle-Kent will obtain detailed chemical, physical, and biological (as applicable) information of each waste stream prior to approval for the initial shipment of that waste stream to the Facility. The waste stream information may be based on: (1) acceptable knowledge as defined by WAC 173-303-300(2); or (2) data obtained by analytical testing; or (3) a combination of (1) and (2).

C5.4. This information shall be representative of the waste stream. The information gathered from the generator, the generator site, and/or additional analysis through the profiling process must be sufficient and reliable to account for all dangerous waste characteristics and all the constituents of the waste stream, and any variability in characteristics and constituent concentrations over time. This information will include all the dangerous waste numbers known to be assignable to the waste from the dangerous waste lists, characteristics, or criteria as required by WAC173-303-070(6) and -380(2)(a).

C5.5. Prohibited Wastes

The following waste streams are not allowed to be accepted at the facility and will be rejected during the pre-acceptance process if the material is:

C5.5.1. Radioactive waste – defined in WAC 246-220-010

C5.5.2. Reactive waste – defined in WAC 173-303-090(7)(a)(vi), (vii) and (viii) and DOT Class 1- series 1-1.6 explosives.

C5.5.3. Infectious waste – defined in 40 CFR 60.51c

C5.5.4. A waste category that is specifically excluded from acceptance at the facility under the terms of this permit or other applicable requirement.

C5.5.5. A waste stream that cannot be safely treated, processed, or stored at the facility.

C5.5.6. A waste stream that does not meet the process limits outlined in Table C2-3 of the permit.

C5.6. Waste profiling must be repeated as necessary to ensure that it is accurate and current. At a minimum waste profiling must be completed:

C5.6.1. during profile creation,

C5.6.2. every 2 years (re-profiling),

C5.6.3. after a verification failure, or

C5.6.4. if Stericycle has been notified or has reason to believe that the process or operation generating the waste has significantly changed.

C5.7. Waste Streams Not Requiring Laboratory Analysis for Profiling

The following waste streams do not require laboratory analysis as part of their pre-acceptance procedures unless such analysis is needed to manage the waste stream in accordance with this Permit, Chapter 173-303 WAC, and the land disposal restrictions in 40 CFR 268, or there is a waste discrepancy. These waste streams may require a site visit, review of similar profiles, literature review, or other documentation if Stericycle-Kent determines one or more of those is necessary to confirm or supplement generator information to ensure an adequate profile (see Figure C2-1a).

C5.7.1. Waste streams that designate under WAC 173-303-080, Dangerous Waste Lists, and which have no waste codes associated with characteristic or criteria dangerous wastes;

C5.7.2. Laboratory chemicals packaged in accordance with WAC 173-303-161 (lab packs);

C5.7.3. Empty product containers as defined in WAC 173-303-160;

C5.7.4. Unused commercial products (i.e., off-specification or outdated materials) that have materials safety data sheet (SDS) sufficient to ensure safe and effective management of the wastes in compliance with this Permit;

C5.7.5. Residue and debris from the clean up of spills or releases of:

C5.7.5.1. A single known substance;

C5.7.5.2. A commercial product; or

C5.7.5.3. Other material for which a SDS or waste profile can be provided;

C5.7.6. Equipment removed from service (i.e., ballasts, batteries, cathode ray tubes, fluorescent light bulbs, hydraulic equipment, switches, transformers, and electrical equipment) that contains DW that can be adequately identified using acceptable knowledge for proper designation and management;

C5.7.7. Debris from the demolition and/or dismantling of equipment from known processes and which is contaminated with DW which can be adequately identified using acceptable knowledge for proper designation and management;

C5.7.8. Confirmed non-infectious single organic solvent waste stream (such as xylene, acetone, ethyl alcohol, or isopropyl alcohol) from medical or related biotechnical sources. These types of waste streams must be confirmed non-infectious by the generator, and the process generating the waste stream must be reviewed by Materials Management personnel.

C5.7.9. Universal Waste meeting the requirements in WAC 173-303-573, including batteries, thermostats, mercury-containing equipment, and lamps.

C5.7.10. Compressed gases. Generators are required to complete a compressed gas cylinder inspection report for all cylinders. Materials Management reviews each report prior to approving the profile and granting approval to ship.

C5.8. The waste profile sheet shall be signed and dated by the generator, and is filed along with supporting documentation in the Regional Corporate Office or in the office of sales origin. An electronic version of each profile is accessible from the Corporate Office and Stericycle-Kent Facility and hard copies of profile documentation

and any supporting documentation are available upon request at reasonable times during an inspection.

C5.9. In emergency response circumstances, (including abandoned DW containers, or spills / discharges as outlined in WAC 173-303-145) acceptance of waste may precede final approval of profile, provided the waste remains in drum-jail until the profile is approved. This option may be used if the waste is pending laboratory analysis only, and all other approval steps have been taken. All recordkeeping and reporting requirements are performed per section C8.12.

C5.10. Waste Stream Pre-Acceptance

The waste stream pre-acceptance process functions as follows:

C5.10.1. A generator seeking waste disposal services contacts Stericycle.

C5.10.2. The Stericycle Account Representative/Customer Service Representative (AR/CSR) assigned to a particular generator is the person responsible for gathering and assembling initial profile information. The profile information may be based on analytical testing or generator knowledge or a combination of these. If profile information is based on generator knowledge, then Stericycle will confirm the accuracy, sufficiency and reliability of the information by one or more of the following:

C5.10.2.1. Be familiar with the generator's processes by conducting site visits, and reviewing sampling data, analysis, and other information provided by the generator to ensure they are adequate for safe management of the waste;

C5.10.2.2. Ensure waste analysis contained in documented studies on the generator's waste is based on representative and appropriate sampling and test methods;

C5.10.2.3. Compare the generator's waste generating process to documented studies of similar waste generating processes to ensure the waste profile is accurate and current;

C5.10.3. The AR/CSR will use preliminary waste stream information given by the generator to determine possible service options. The AR/CSR may contact

Stericycle-Kent plant management to discuss whether the Kent facility has the capacity to manage the waste stream.

C5.10.4. The AR/CSR will make an initial evaluation of the acceptability of the waste stream based on such factors as:

C5.10.4.1. Is the waste stream acceptable at the facility?

C5.10.4.1.1. Are all the waste codes listed in the Part A?

C5.10.4.1.2. The waste stream is not specifically excluded from acceptance (i.e., explosive, infectious, radioactive). Waste from a generator that is potentially infectious (e.g., hospital waste, etc.) will require the generator to complete a 'Non-infectious Waste Certification Form'.

C5.10.4.1.3. What management option is most suitable for the waste stream in terms of Land Disposal Restrictions / discharge limits / disposal vendor acceptance criteria?

C5.11. Profile Development

C5.11.1. The AR/CSR will assist the generator with the completion of a Waste Profile Questionnaire (WPQ). The waste profile questionnaire describes the waste stream, the process generating the waste, and identifies all applicable dangerous waste numbers determined through the waste designation procedures required by WAC 173-303-070.

C5.11.2. The AR/CSR will use information from the WPQ to help create a profile. This information populates the fields within the profile database and includes:

C5.11.2.1. Generator (and customer if applicable) name, address, contact information, EPA ID if applicable.

C5.11.2.2. Profile type (whether 'regular', 'lab pack', MRW).

C5.11.2.3. Waste name – adequately descriptive of the waste stream.

C5.11.2.4. Process creating the waste stream– provided in enough detail to determine whether waste stream is a listed waste.

C5.11.2.5. Supporting documentation on file (SDS, analytical).

C5.11.2.6. Form, source and origin codes.

C5.11.2.7. Physical Characteristics - phase(s), color, percent liquid, flash point, pH, specific gravity, heat of combustion (as applicable).

C5.11.2.8. Chemical Composition – list constituents and concentration range.

C5.11.2.9. Other chemical info – whether reactive, CERCLA, TSCA, debris, etc.

C5.11.2.10. Waste Codes and whether Subpart CC waste.

C5.11.2.11. DOT Proper Shipping Name, any Not Otherwise Specified (N.O.S). constituents.

C5.11.2.12. Anticipated shipment volumes and frequency.

C5.11.2.13. Special handling requirements – e.g., generator requested disposal facility, etc.

C5.11.2.14. Expected waste category or categories (management options).

C5.11.2.15. Generator status (e.g., SQG, MQG, LQG)

C5.11.3. As part of the profiling process, generators will be required to certify whether or not their waste is subject to emission control requirements of WAC 173-303-692 [40 CFR 264 Subpart CC] (i.e., does the waste contain ≥ 500 ppmw volatile organics). This determination may be made through the use of EPA-approved test methods or through generator knowledge. Stericycle-Kent evaluates the reliability of the generator's information as part of their confirmation procedures outlined in sections C5.10 and C5.11.6. If Stericycle determines the information is inadequate or unreliable to determine whether WAC 173-303-692 applies, Stericycle will conduct additional evaluation or require the generator to conduct additional evaluation.

C5.11.4. If the waste stream does not require sampling per conditions listed in Section C5.7, the AR/CSR will then forward the profile information to Materials Management who will review it for accuracy and completeness.

C5.11.5. Materials Management will make the determination whether the supplied information and supporting documentation fulfills the requirements of WAC 173-303-300(2) and the DW permit.

C5.11.6. If the waste stream is not one of those listed in Section C5.7, lab analysis is required. The AR/CSR will conduct a site visit, and confirm that the waste generating process is as described by the generator. If the generator has not provided analytical data, the AR/CSR will obtain a representative sample from the generator. The AR/CSR then submits the information to and consults with Materials Management to determine the scope of testing required for profiling, and to verify profile information is sufficient. During the site visit, the AR/CSR will assess the process generating the waste stream, identify sources of potential cross-contamination, and look for additional waste streams that may impact the generator's status. This information will be recorded on the WPQ. The sample will be submitted to the Stericycle-Kent laboratory or third-party laboratory and any other information relating to the waste stream will be entered into the profile. The Stericycle laboratory will note the management option and log the sample for appropriate analysis in accordance with guidance supplied by Materials Management.

C5.11.7. Stericycle-Kent laboratory is able to perform some confirmation analyses to confirm that the physical characteristics of the sample match those entered into profile as generator information.

C5.11.8. The main reasons for confirmation testing are to correctly designate a waste, and to evaluate all of the constituents of a waste to determine if and how a waste can be safely managed at the facility. When a generator, Stericycle, or a third-party lab uses analytical methods to designate a waste stream, Stericycle will ensure test procedures listed as acceptable by WAC 173-303-110 are used.

C5.11.9. The confirmation analyses that the Stericycle-Kent laboratory can perform include pH, flash point, specific gravity, heat of combustion, and screening analysis for cyanide, sulfide, and halogens. Other analyses required to complete an adequate profile are subcontracted to a third-party laboratory.

C5.11.10. Analytical results are entered into the appropriate fields in the profile. Stericycle Materials Management will obtain additional analyses from a third-party laboratory if that is needed to complete sufficient and reliable characterization in accordance with WAC 173-303-300(2).

C5.11.11. Upon receipt of the analytical report for the additional analyses, the results will be uploaded into the profile and sent to Materials Management for regulatory review and approval.

C5.11.12. Materials Management will then review the entire profile for sufficient and reliable characterization in accordance with the waste stream generation process, chemical constituents, physical description, proper waste codes, and any analytical results.

C5.11.12.1. Materials Management will determine whether the management option is appropriate for the waste stream description and confirm that the waste stream can be accepted for storage or treatment operations conducted at Stericycle-Kent in accordance with existing permits and operational constraints.

C5.11.12.2. At any time, Materials Management may require additional documentation to support generator information.

C5.11.13. The pre-acceptance evaluation is concluded with documentation in the electronic profile of the decision regarding the acceptability of the waste stream and the proposed method of management.

C5.11.13.1. If the information supplied is determined to be sufficient and reliable, Materials Management will approve the profile, and forward it to the AR/CSR to obtain the approval signature from the generator. Certain generators grant signatory authority to Stericycle for profile approval; in such instances, a statement of generator authorization will be retained with profile documentation.

C5.11.13.2. Approval and certification of a profile is granted by Materials Management. Materials Management are the only personnel with the permission to approve a profile.

C5.11.13.3. Stericycle has a number of National Account businesses as customers that regularly generate waste, some of it for receipt at Kent. These waste streams are primarily generated by retail stores, freight companies, or other distribution entities, and consist of off-spec, damaged, or returned consumer products. As part of the profile information gathering process, an SDS for each product is provided. Profiles representing waste streams for National Accounts are identified as such. National Account profiles are approved by a Central Profile Group staff member specifically trained in the approval requirements of the individual receiving permitted facilities. Refer to Appendix C-6 for more information.

C6. WASTE PROFILE SYSTEM

WAC 173-303-300(4)

C6.1. Stericycle is responsible for obtaining sufficient and reliable information for every waste stream they approve for shipment. Incomplete or outdated information provided by the waste generator must be made current and complete prior to approval of the waste stream being accepted. Inaccurate or incomplete waste analysis information provided by the generating site is not a defense for noncompliance with the waste management requirements and conditions in the DW permit, Chapter 173-303 WAC, and the land disposal restrictions in 40 CFR Part 268, as incorporated into Chapter 173-303 WAC.

C6.2. The Waste Profile Questionnaire information is provided by the generator and is used by Stericycle to develop a waste profile.

C6.2.1. Stericycle Materials Management is responsible for evaluating the information provided by the generator and confirming that it is reliable and sufficient to adequately characterize the waste stream in accordance with WAC 173-303-070, WAC 173-303-300(2), and this permit.

C6.2.2. Stericycle Materials Management is responsible for obtaining additional information on the waste stream in order to develop a complete and accurate profile.

C6.2.3. Documentation of the information gathered during the pre-acceptance profiling process shall be retained by Stericycle Materials Management and will include any analytical data, SDSs, and site visit documentation gathered during profiling. This documentation shall be considered part of the profile which is put into the operating record, and is retained at the Stericycle Regional Corporate Office or in the office of sales origin. These records must be furnished upon request and made available at all reasonable times for inspection.

C6.2.4. Waste stream profiles are reviewed by Materials Management to:

C6.2.4.1. Confirm the sufficiency and reliability of physical and chemical information. Materials Management considers sufficient information to be enough knowledge of a waste stream to accurately designate according to WAC 173-303, and to evaluate all of the constituents of the waste stream to determine if and how it can be safely managed at the facility in compliance with the permit.

C6.2.4.2. Ascertain the compatibility group for storage, recorded in the operational comments of the profile.

C6.2.4.3. Decide if the waste stream is acceptable under Stericycle-Kent facility permits.

C6.2.4.4. Determine the appropriate management option(s) for the waste stream;

C6.2.4.5. Determine the necessity for extraordinary precautions under the “Process Under Supervision Only” (PUSO) procedures as described in Appendix C-5, recorded in the operational comments of the profile. PUSO procedures may be applied to any waste stream, based on disposal option, that may be potentially difficult or hazardous to treat.

C6.2.5. If the review by Stericycle Materials Management confirms that information to develop a profile is sufficient, (i.e., the designation is correct and the physical / chemical property descriptions are sufficient), and the material is acceptable, a copy of the profile is sent to the generator for approval and signature. If Materials Management determines that profile information is insufficient and requires laboratory analysis, a sample is analyzed to determine the waste stream’s acceptability at Stericycle-Kent (see Sec C5.11.6). If the profile review or review of laboratory results by

Materials Management deems the waste stream as unacceptable, the material will not be received at the facility. Stericycle AR/CSR personnel may recommend to the generator alternative facilities for the waste stream.

C6.2.6. Stericycle Materials Management is responsible for obtaining sufficient and reliable information to develop an accurate profile for every waste stream approved for shipment to Stericycle - Kent.

C7. INCOMING WASTE PROCEDURES (VERIFICATION)

WAC 173-303-300(3)

The purpose of these procedures is to verify that the contents of each waste stream in each shipment matches the identity of the waste stream as specified on the manifest and profile information. This is accomplished for each waste stream through the following steps (see Fig C2-1b, Waste Acceptance):

C7.1. Waste shipments arriving at the facility are directed to the appropriate unloading area. These are:

C7.1.1.1. The South Truck Dock for containerized loads destined for the TSCA/DW Area.

C7.1.1.2. North Truck Load/Unload Area for bulk wastewater loads.

C7.2. Containerized Loads

C7.2.1. Inbound trailers of containerized loads manifested to the facility are offloaded immediately to the TSCA/DW Area or parked in the ten-day transfer facility. Inbound loads parked in the ten-day transfer facility must be received and checked-in within 24 hours of arrival at the transfer facility. The load’s arrival time is recorded on the drop sheet to document compliance with the 24-hour limit.

C7.2.2. Upon arrival of a containerized load at the facility, the manifest is reviewed by Administrative Personnel (Admin) who will confirm that all profiles indicated on the manifest are approved (see Section C5.11.13.2) within the profile database, waste streams are permitted for receipt at the facility, that weight/volume fields are

complete, and that proper shipping names correspond to profile descriptions. Admin will also verify that correct LDR notification and certification information have been provided. A notification must accompany the initial shipment of each waste that is subject to LDR and includes such information as the waste code(s), the hazardous constituents present in the waste, and waste analysis data.

C7.2.3. Once the Administrative Personnel verifies the manifest information is complete, profiles are active and all manifested waste is acceptable per Sections C5.1 through C5.11, the trailer offloading packet will be generated. The offloading packet consists of a piece count verification form, all manifests on the trailer and copy of the drop sheet.

C7.2.3.1. If the load is scheduled for 'live offloading[1]', the driver will be directed to the South Truck Dock. A piece count verification form will be given to the Environmental Technician indicating the number of pieces manifested.

C7.2.3.1.1. Once the piece count is verified the Environmental Technician will record the number of pieces offloaded and initial the piece count verification form and time stamp the manifest to document compliance with the 24-hour limit.

C7.2.3.1.2. When the trailer is to be offloaded, facility personnel will move the trailer to the South Truck Dock, and the Environmental Technician staging the containers for receipt will verify the piece count as described in C7.2.3.1.1.

C7.2.3.1.3. Once the containers are offloaded and counted the Environmental Technician will record the number of pieces received and initial the piece count verification form and time stamp the manifest to document compliance with the 24-hour limit.

C7.2.4. The Environmental Technician will verify that the information on the manifest, the profile and the container label(s) are all in agreement, the piece-count is

[1] a 'live offload' is one in which the driver remains at the plant until the trailer is offloaded. Generally, trailers are 'dropped' into the 10-day yard and offloaded within 24 hours of arrival.

accurate per line of the manifest and will verify that the containers are not leaking, are properly closed and labeled, and are approved storage and shipping containers.

C7.2.5. Containers subject to Subpart CC requirements are inspected to ensure that the containers do not have any visible holes, gaps, or other open spaces. Containers >119 gallons that contain “light material” (total volatile organic constituents make up >20% of the material volume) are verified that the container meets Subpart CC requirements using techniques described in Section 8.3.3 EPA Method 21. Documentation of container non conformance will be via an Administrative Verification Form (AVF) (Stericycle Standard Form #FM-0011 or equivalent).

C7.2.6. Each container will have a unique tracking number that is associated with each manifest received. Record keeping and waste tracking procedures are discussed in Section C8.12.

C7.2.7. When the containers are checked-in, the unique tracking number is recorded on the check-in form, and a minimum of ten percent (10%) of containers for each waste stream are sampled (see Section C8.10.2) and analyzed for the appropriate parameters for that waste (Refer to Table C2-2, and Section C8.5).

C7.2.8. Once the containers are checked-in as described in sections C7.2.1 through C7.2.7 and cleared as conforming to the profile by the lab the manifest will be signed by Administrative Personnel as the receiving facility.

C7.2.9. If a manifest discrepancy is discovered per WAC 173-303-370(5) and cannot be resolved immediately, the containers in question must be marked with a Discrepancy Label identifying the nature of the discrepancy (see Appendix C-4i), the discrepancy documented on an AVF and placed in drum jail based on hazard class in the TSCA/DW Area, as shown on Figure D1-2.

C7.2.10. Lab pack containers are checked in, verified to be lab packs by the presence of a packing list attached to the outside of the container, marked as lab packs, and managed according to the Lab Pack De-pack Procedure (SOP OP-0037). If there is no packing list attached to the outside of the container it must be verified to be a lab-pack by visual inspection.

C7.3. Bulk Loads

C7.3.1. Upon arrival of a bulk load at the facility, the manifest is reviewed by Administrative Personnel (Admin) who confirms that the profile indicated on the manifest is approved (see Section C5.11.13.2) within the profile database, that the weight/volume field is complete, and that proper shipping name corresponds to the profile description. Admin will verify that correct LDR notification and certification information have been provided. A notification must accompany the initial shipment of waste that is subject to LDR and includes such information as the waste code(s), the hazardous constituents present in the waste, and waste analysis data.

C7.3.2. If the load corresponds to the manifest, the driver will proceed to the North Truck Load/Unload Area. The load volume will be measured and representative sample(s) will be obtained. Methods to confirm that bulk loads are within 10% of the manifested weight are provided in Appendix C-4.

C7.3.3. Every bulk DW shipment is sampled for verification analysis. The sample will be taken to the facility laboratory and verification analyses will be performed. When verification demonstrates that the load is acceptable, the Admin staff will sign the manifest, give the transporter a signed copy, and an Environmental Technician will offload the waste.

C7.3.4. The Environmental Technician will receive a unique tracking number from Admin personnel for each bulk waste shipment and will record the number on the Input Log. Record keeping and waste tracking procedures are discussed in Section C8.12.

C7.3.5. If a manifest discrepancy is discovered per WAC 173-303-370(5) and cannot be resolved immediately, the bulk load must be marked with a Discrepancy Label and placed on the concrete paved area in Kent’s ten-day transfer facility, or in the North Truck Load/Unload Area. Manifest discrepancies are managed according to the Problem Manifest Procedure presented in Appendix C-4, however, any discrepancies must be resolved within 10 days.

C7.4. All Received Waste

For all received waste, information on the signed manifest is double-checked and verified to be current and accurate against information on the profile by an Environmental Technician. The following information is verified:

C7.4.1. Correct waste codes have been assigned to the waste stream.

C7.4.2. Safe and effective management in conformance with the conditions of this permit is possible. The following factors are addressed:

C7.4.2.1. Compatibility of the waste stream during treatment and storage.

C7.4.2.2. Reactivity of the waste stream.

C7.4.2.3. Ignitability of the waste stream.

C7.4.2.4. Facility and process limits.

C7.5. Waste Acceptance

C7.5.1. Upon verification that the waste stream on the shipment is properly represented by the approved and certified waste profile, the waste stream may be processed. All containers and bulk loads must be verified and placed into storage or staged for processing within 24 hours of their arrival. This time period starts when manifest is time stamped.

C7.5.2. For non-bulk loads (containers) prior to mandatory verification analysis the transporter is given a signed copy of the manifest, indicating the facility accepts the shipment. Signing the manifest occurs after verification that information on the manifest matches the waste stream profiles, and that Stericycle-Kent can accept waste streams represented by each profile. The manifest is signed after a piece count verification is conducted.

C7.6. Waste Inconsistencies and Discrepancies

C7.6.1. If during the course of Mandatory Verification Analysis there is found to be an inconsistency between a parameter value and the corresponding range

of values in the waste profile, Laboratory personnel shall contact Supervisory Personnel who will then decide if a supplemental analysis need be performed (see Section C8.6). If supplemental analysis confirms inconsistency, an AVF shall be generated.

C7.6.2. A determination shall be made by Laboratory Personnel whether the measured value is reasonable given the make-up of the waste as indicated by other waste stream descriptions within the profile (e.g., chemical constituents, waste name, etc.) and within tolerance limits as described in Section C8.8). If it is determined that the measured value is consistent with the general description of the waste stream as described in the profile, the received waste will not be judged as discrepant, and an AVF will be generated. Depending on the nature of the inconsistency, details of the inconsistency may be submitted to waste-tracking personnel who will contact the appropriate Account Representative / Customer Service Representative for that generator requesting that the profile parameter be modified to reflect rational values that would be possible given the waste description. In some instances it may not be appropriate to modify a parameter although an apparent inconsistency may exist (e.g., a false positive for a constituent). In such cases, recognition of the inconsistency shall be noted in the operating record.

C7.6.3. When there is an actual discrepancy between a generator's waste designation, or a parameter value is outside the range of values that would be possible given the description of the waste stream on the waste profile, as determined by verification analysis or other waste analyses or waste evaluation, the following steps shall be taken in addition to generation of an AVF:

C7.6.3.1. The container is placed in 'drum jail' and visually segregated, or if bulk, the bulk load is moved to the 10-day area and visually segregated (See C7.8.2).

C7.6.4. DW containers placed in drum jail will be managed in accordance with Appendix C-4.

C7.6.5. Bulk loads that do not verify must be marked with a Discrepancy Label, valves and fittings will be secured, and the load will be placed in Kent's 10-day transfer facility. Bulk loads may not be unloaded or remanifested until the discrepancy is resolved. If the discrepancy is not resolved within the 10-day limit, the waste will be

rejected back to the generator or sent to an alternate TSD Facility (Refer to Appendix C-4).

C7.6.5.1. The generator will be informed of the discrepancy and given the following options:

C7.6.5.1.1. Amend the current profile or manifest, or submit a new profile which properly represents the waste stream.

C7.6.5.1.2. Provide Stericycle-Kent permission to transport the load to an alternate TSD Facility. If Stericycle-Kent chooses or is instructed by the generator to reject the load (i.e., reject as the designated and/or alternate facility and send to an alternate facility or return to the generator), Stericycle-Kent will check the appropriate box (item 18a on the UHWM) indicating the reason for the rejection of the waste. If waste is rejected back to the generator, Stericycle will notify Ecology.

C7.6.5.2. A significant manifest discrepancy will be resolved within 15 days after receipt of the waste stream. If a longer period is required, Stericycle-Kent will notify Ecology in accordance with WAC 173-303-370(5)(c). Bulk load discrepancies will be resolved within 10-days to comply with the 10-day limit for transfer facilities.

C7.6.5.3. Resolution of the inconsistency shall be recorded on the AVF which shall be retained in the operating record.

C7.7. DW brought on-site cannot leave a check-in area (see Section D) until the manifest number, and unique tracking number for containerized waste, has been recorded on logging and tracking forms. After verification has been completed, containers will be moved from check-in to storage or for processing. Upon completion of manifest and profile verification of incoming waste stream, as described in this section, the waste stream shall be entered into the facility waste tracking system within 72 hours after manual entry of the information on forms.

C7.8. Waste Management

C7.8.1. Waste streams that are acceptable to be received into Stericycle-Kent or generated by a process at the facility will be managed within the general categories listed in Section C3.1.

C7.8.2. Waste management options (Section C3.1) are sometimes referred to as dispositions. Waste management options may be refined by the use of waste categories, and consider factors such as waste stream regulatory status, physical variations, generating source, disposal requirements, etc. Stericycle Materials Management is the principal decision-making unit with respect to waste management option assignment.

C7.8.3. Due to the variable nature inherent in some waste streams, multiple waste management options may be applied to an inbound waste profile. For example, this may occur as a result of a generator containerizing discreet portions of a waste generated in a large volume. Such a waste may be predominately water but may have varying amounts of solids from container to container. While a water management option would be appropriate for a solids fraction of <20%, those containers received with a solids fraction of >20% would more appropriately be solidified.

C7.8.4. Each resulting waste stream from batch processes at Stericycle-Kent is designated in accordance with WAC 173-303-070, or in the case of wastewater treatment, managed under the requirements of the Industrial Wastewater Discharge Permit issued by the King County Department of Natural Resources and Parks.

C7.8.5. Profiles representing outbound waste streams are specific as to regulatory status, waste stream management category, and disposal vendor.

C7.8.6. Stericycle-Kent management is responsible for ensuring that each outbound load is represented by a complete and accurate profile, documenting the waste designation in accordance with WAC 173-303-070.

C8. SAMPLING AND ANALYSIS METHODOLOGIES

WAC 173-303-300(5)(c), 110(2)

C8.1. The Stericycle-Kent sampling and analysis procedures are designed to obtain representative information used to evaluate a waste stream. A representative sample of a material is analyzed to:

C8.1.1. Verify generator supplied waste stream information on manifests, waste profile sheets and LDR notifications.

C8.1.2. Determine safe and appropriate treatment or disposal processes based on waste characteristics.

C8.1.3. Determine treatment process control information.

C8.1.4. Facilitate profile creation and confirmation process.

C8.1.5. Confirm that treated waste meets outbound parameters.

C8.2. Analytical results obtained under this WAP are a part of and must be incorporated in the operating record.

C8.3. The usage and applicability of analyses are described herein. The analytical procedures and methods described in this text and in Appendix C-2, whether standard procedures or procedures developed by Stericycle through its operating experience, have been chosen for their ability to identify waste and to provide the information required to properly and safely manage wastes. In accordance with waste stream's physical properties and management category, the laboratory performs the appropriate testing as described from those listed below according to the needs and requirements specified for profile analyses, incoming shipment identification analyses, and process analytical testing (refer to Tables C2-1, C2-2 and C2-3). Analysts performing analyses in the Kent Laboratory record their results on forms which are reviewed by one of the laboratory staff, and the results are entered into the database, with inconsistencies being recorded on an AVF form.

C8.4. Analytical tests are classified as either mandatory, supplemental or process:

- Mandatory Verification Analyses: All waste streams receive mandatory verification analyses as a first step in the verification analytical process.

- Supplemental Analyses: Supervisory Personnel may select additional supplemental analyses to obtain information required for efficient process control, when verification does not match the profile (see C7.6), or to further evaluate a positive result from a mandatory screening test (for example, a flash point may be run to provide more specific waste data when a positive flammability potential is reported during the mandatory analysis testing).

- Process Analyses: When waste is processed at the facility, processing analyses are conducted to ensure the wastes are effectively and safely managed. This includes further confirmation that the waste stream was correctly assigned its management option and is used to help verify effective treatment (see Table C2-2).

C8.5. Mandatory Verification Analyses

Mandatory analyses include basic screening procedures or “fingerprints” that are performed to provide a general identification of the waste stream, to verify that the waste received is as described in the profile, and to help supervisory personnel select a management option identified in the profile.

C8.5.1. The parameters and associated rationale for these analyses are described below (also refer to Table C2-1).

- Physical Description is used to determine the general properties of the waste stream (color, physical state, layering, odor, etc.). This facilitates subjective comparison of the sampled waste stream with prior waste descriptions or samples. It applies to all incoming waste streams and is used to identify any obvious differences between the waste stream and its profile in the waste stream’s physical properties.
- Ignitability Screen is used to indicate the potential ignitability of the waste stream. This test is used to identify any obvious difference in waste type such as waste flammable solvent substituted for waste mineral acid. This test is not performed on solids unless the waste contains free liquids as defined in 40 CFR 260.10, or on liquids with the characteristic code of D001.

- pH is used to indicate the pH and, in general, the corrosive nature of the waste stream. The pH test may not apply to certain wastes, such as organic solvents, waste oil or insoluble solid wastes. Results will be used to assure profile agreement and that corrosive wastes are handled in areas suitable for storage and treatment of these types of wastes.
- Halogen Screen (Beilstein Screen or field test kit) is used to indicate the presence of halogenated organic compounds in organic waste streams.
- Specific Gravity provides information regarding the general chemical composition of a waste stream. It is used to compare and identify differences between the waste and its profile.
- Radiation Screen is used to detect the presence of radioactive constituents in a waste stream. This screen applies to all incoming waste streams.
- Cyanide Screen is used to indicate whether the waste produces hydrogen cyanide upon acidification below pH 2. It is performed on those waste streams with a pH greater than 7 identified or suspected of containing cyanide (e.g., photography wastes, plating bath wastes, etc.).
- Sulfide Screen is used to indicate whether the waste produces hydrogen sulfide upon acidification below pH 2. It is performed on those waste streams with a pH greater than 7 identified or suspected of containing sulfide (e.g., oil and oil sludges, paint and paint sludges, aluminum chemical milling wastes, etc.).
- Compatibility Screen is used to determine the compatibility and potential reactivity of bulk and container shipments to be consolidated.
- Water Compatibility Screen is used to determine the compatibility and potential water reactivity of any waste stream that will contact water during its storage or processing. This test does not apply to waste streams that are water-based.

C8.6. Supplemental Analyses

C8.6.1. Appropriate supplemental tests are performed on wastes accepted at the facility when one or more of the following four conditions are met:

C8.6.1.1. If a discrepancy is noted during mandatory verification testing;

C8.6.1.2. If additional information is required to determine how to manage the waste.

C8.6.1.3. If additional or more precise information is required in order to manage the waste safely within the facility's permit conditions; or

C8.6.1.4. If Stericycle personnel has reason to believe the composition of the waste has changed from that described in the profile.

C8.6.2. The results of these supplemental analyses, which are documented in the AVF, provide Supervisory Personnel (see Section C4.3) with another level of confidence concerning the proper means of treatment, storage, and disposal. Each waste management option has a unique set of limitations. Once Supervisory Personnel has made a preliminary decision as to the acceptability of the waste stream for a particular management option, supplemental analyses may be conducted as necessary to ensure that the waste stream does not exceed a parameter limitation for that option. Refer to Table C2-2 for a description of the supplemental analyses applicable to specific management options.

C8.6.3. Supplemental analyses include, but are not limited to the following:

- Heat of Combustion (BTU) is used to determine the heating value of materials to be blended for use as waste-derived fuel in cement kilns.
- Flash Point is used to further characterize ignitable liquid waste streams to establish proper storage modes and conformance with permit conditions.
- Total Metals is used to quantify the concentration of specified metals in a waste stream.
- Total Chlorine is used to quantify the concentration of halogens as necessary to comply with off-site receiving facility criteria.
- Total Cyanides is used to quantify cyanides as necessary to comply with LDRs and off-site receiving facility criteria.
- Total Sulfides is used to quantify sulfides as necessary to comply with LDRs and off-site receiving facility criteria.

- TCLP is used to provide a determination whether a waste stream exhibits the characteristic of toxicity, or to determine if a treated waste stream meets an LDR treatment standard.
- PCBs is used to determine the presence of polychlorinated biphenyls in a waste stream. It is performed on waste streams suspected of containing PCBs.

C8.7. Process Analyses

C8.7.1. Process analyses are analyses that ensure the safe, compliant, and effective treatment of wastes. Wastes designated for treatment or consolidation are tested under processing analysis. Organic consolidation and wastewater waste streams consolidation are subject to compatibility testing. Wastewater treatments are also bench tested. Waste streams designated for stabilization are screened for potential problems during the preacceptance process. Waste streams that are designated for PUSO are analyzed by developing a treatment protocol. See Table C2-6 for process limitations.

C8.7.1.1. Compatibility Testing (ASTM 5058A) is used to determine if waste when commingled will lead to an adverse reaction. Compatibility testing is used for all container and bulk consolidations with the exception of certain solid (i.e., no free liquids) waste streams such as PPE, drum heels, or debris.

C8.7.1.2. Wastewater bench treatments, performed for every batch, are used to determine the effectiveness of wastewater treatment and as a precautionary tool to ensure the treatment reaction is controlled. A wastewater bench treatment uses a sample of consolidated wastewater. In the laboratory, the technician adds treatment chemicals tailored to the quality of the water. Upon developing a recipe that yields a treated sample in terms of disposal parameters, a treatment will be scaled-up to process volume. Wastewaters, subsequent to treatment, are discharged to POTW or shipped off-site for final disposal.

C8.7.1.3. “Process Under Supervision Only” (PUSO) procedures (see Appendix C-5) are used to identify potentially reactive wastes designated for treatment and to ensure adequate precautions are used in the treatment of these wastes.

C8.8. Tolerance Limits for Determining Profile Conformance During Verification

C8.8.1. As part of waste stream verification, results from verification analysis are compared to the profile information to determine conformance with the profile (See Section C7.6). The primary purpose of verification is to help ensure the waste stream received is the one represented on the profile. For example, verify that the waste stream received:

C8.8.1.1. has constituents and characteristics within expected ranges of the waste stream represented on the profile.

C8.8.1.2. is not from a different generating process than the waste stream represented on the profile.

C8.8.1.3. has not been commingled with other wastes or materials.

C8.8.2. Due to the nature of waste, there will often be variations from container to container and from load to load of a waste stream.

C8.8.2.1. Significant variation between profile parameter and sample result will trigger procedures for discrepancy management. For example, discrepancies which make it necessary to add a waste code, or manage the waste stream using a different waste management option than listed in the profile, or indicate the waste stream may be from a different generating process are significant discrepancies.

C8.8.2.2. Many inconsistencies can be considered insignificant and will not trigger procedures for discrepancy management, however a record of the inconsistency and subsequent determination of significance or insignificance will be recorded using an AVF.

C8.8.3. The following includes verification analyses followed by descriptions of tolerance limits, within which an inconsistency could be considered insignificant unless they indicate the waste stream may be from a different generating process.

C8.8.3.1. Physical Description – By nature a subjective visual description of a sample. Gross differences in properties such as color, material phase, particle size, or viscosity could initiate inconsistency evaluation. Tolerance for the various physical description parameters are as follows:

- Difference in percentage of free liquids as listed in profile is ≤20%.
- Color – reasonable agreement with profile information (i.e., any color variation that can be explained by the generating process or expected constituents of the waste stream)
- Phase – number of phases should equal profile description, difference in percentage of a phase ≤20%.
- Particle size – reasonable agreement with stated description on the profile
- Viscosity – agreement with one of three general ranges (low, medium, high)

C8.8.3.2. Ignitability Screen – Observe quality of burn if for fuel. If management option indicates fuel, and ignitibility test suggests heat of combustion is <5K BTU/lb, perform supplemental bomb calorimetry. Flash Point should be within ranges listed in Appendix C-2.

C8.8.3.3. pH – If management option is for acid treatment, a pH of ≤4 is acceptable. If management option is for alkaline treatment, a pH of ≥10 is acceptable. For other management options, a ≤2 pH difference from the range on the profile is acceptable unless it adds a D002 waste code or indicates waste stream may be from a different generating process.

C8.8.3.4. Halogen Screen – Not applicable for inorganics, solid waste fuels <1000 ppm, DW fuels <10%, unless specifically contradictory to profile.

C8.8.3.5. Specific Gravity – when expected miscibility of containerized waste is contradicted, or if ‘opposite’ side of 1 than expected, resample. For bulk material, a difference ≤0.1 is acceptable.

C8.8.3.6. Radiation Screen – see Appendix C-2, no tolerance.

C8.8.3.7. Cyanide Screen – No tolerance for unexpected positive result. However there are many sources of false positives (e.g., nitrates are a common one and are present in some coolants). Consider source of waste stream and whether there

are other constituents that cause a false positive when determining whether the waste stream is discrepant.

C8.8.3.8. Sulfide Screen – No tolerance for unexpected positive result. However, there may be false positive results (e.g., darkly colored waste). Consider source of waste stream and whether there are other constituents that cause a false positive when determining whether the waste stream is discrepant.

C8.8.3.9. Compatibility Screen – During consolidation compatibility testing, temperature rise limit is listed in Table C2-6.

C8.8.3.10. Water Compatibility Screen – waste stream dependent, see Table C2-6.

C8.9. Sampling Methods and Equipment

C8.9.1. Stericycle-Kent uses sampling methods presented in SW-846 (Test Methods for Evaluating Solid Waste, 3rd edition, November 1986 and subsequent updates and revisions) and ASTM Methods (American Society for Testing Materials) as referenced in WAC 173-303-110(2). Sampling is performed at the Stericycle-Kent by Environmental Technicians (check-in or wastewater treatment personnel) who are properly trained in representative sampling methodology (refer to Section H, Personnel Training). Samples are obtained in the manner relative to the analytical method being performed. Sample quantities range from 40ml (EPA8260) to ~100ml for verification analysis to 1L (EPA1664, 8270). In all cases, the sampling technician will obtain a representative sample by selecting appropriate sampling equipment.

C8.9.2. The sampling devices are selected according to size and type of container and the specific material matrix involved. The sampling method and equipment used for the various materials and types of containers (e.g., bulk or non-bulk) are presented in Table C2-4. Sampling equipment is rinsed or disposed between sampling events to avoid cross contamination. Rinsate and/or sampling equipment is disposed with a compatible waste stream from the area where sampling occurs. Disposable sampling equipment is repackaged and disposed appropriately in accordance with WAC 173-303.

C8.9.3. Depending on the nature of the waste material and the feasibility of obtaining a sample, a top-to-bottom sample is generally obtained from the container (bulk or non-bulk). A stratified waste stream will be sampled from top to bottom to ensure the analysis is performed on a representative sample.

C8.9.4. Sample containers are provided with a standardized label. Samples are preserved in accordance with the analytical method, and taken to the appropriate sample storage location in the laboratory for analysis. Sample preservation and tracking procedures are described in Appendix C-3, Quality Assurance Program Plan.

C8.9.5. Samples are stored in containers that are compatible with the sampled material. All samples are stored in glass or plastic containers, except chlorinated solvents or chlorinated solvent-contaminated materials that are stored in glass or metal containers only, and hydrofluoric acid that is stored in plastic containers only. Solid samples and oils can be stored in plastic, glass or metal containers. Containers are liquid-tight and range in size from 40 ml to 1,000 ml. Sample/container compatibility is summarized in Table C2-5.

C8.9.6. Samples are retained within the laboratory for a sufficient amount of time to allow for the laboratory staff to analyze, record, and review the analytical data. Sample retention times can vary according to analyses performed and volume of samples submitted to the laboratory. Samples for designation may be retained for a period up to the hold time specified in the applicable analytical method. Treatability samples may be retained longer than one week on a case by case basis. Final disposition of samples, after analyses and data review are complete, is determined by the most suitable treatment process for that sample.

C8.10. Frequency of Sampling and Analysis

WAC 173-303-300(5)(d)

C8.10.1. A minimum of 10% of all non-bulk containers of each waste stream received from off-site shall be randomly sampled. Each bulk container is sampled as well.

C8.10.2. For mandatory verification analysis, containers are randomly selected for sampling by the Environmental Technician. Each container has a unique tracking number that is listed on the check-in sheet. The technician chooses at least one container out of every ten containers for sampling, based on the unique tracking number. When less than ten containers of a waste stream are received, at least one container is randomly selected for sampling by the technician assigning the unique tracking numbers. Samples will be delivered to the laboratory immediately after being sampled.

C8.10.3. If the mandatory verification analyses indicate that the material does not match the profile, supplemental analyses must be performed to see if the waste could match another profile from the same generator (e.g., a manifest error), or to determine whether the waste stream may be from a different generator than on the profile (e.g., transcription error by sampler). Supplemental analyses may also be performed to confirm a result obtained from mandatory verification analyses or to develop treatment or management information. Table C2-2 describes the mandatory and supplemental analyses applicable to a given waste management option.

C8.10.4. Waste streams sent off-site for treatment and/or disposal are also sampled as required by the receiving facility, and as necessary to comply with the land disposal restrictions in 40 CFR Part 268. At no time are wastes diluted to achieve LDRs.

C8.10.5. Waste samples collected pursuant to this WAP are analyzed as described in Table C2-2.

C8.10.6. Mandatory verification samples are not required from the following materials:

C8.10.6.1. Not regulated by WAC 173-303;

C8.10.6.2. Household hazardous waste exempted by WAC 173-303-071(3)(c) and managed under the King County MRW permit;

C8.10.6.3. Small quantity generator waste managed under the King County MRW permit per WAC 173-303-070(8)(b)(iii)(C);

C8.10.6.4. Special waste managed per WAC 173-303-073;

C8.10.6.5. Waste received from another Stericycle facility, provided the waste has been fully characterized and verified in accordance with Stericycle-Kent's WAP and the waste tracking procedures as described in Section C8.12;

C8.10.6.6. Loose packs and retail wastes for which obtaining a single representative sample would not be possible;

C8.10.6.7. Lab packs assembled per WAC 173-303-161 for which obtaining a single representative sample would not be possible; and

C8.10.6.8. Universal Waste regulated under WAC 173-303-573.

C8.11. Process Generated Wastes

C8.11.1. Process generated wastes are waste streams generated on-site and include treated wastewater and wastewater treatment residuals, and the resulting waste from various consolidations. With the exception of treated wastewater for discharge, all wastes sent to final disposal are represented by a Stericycle waste stream profile.

C8.11.1.1. Profiles representing outbound waste streams are developed and maintained by Materials Management. Stericycle generated wastes are properly designated as required by WAC 173-303 before a management option is applied.

C8.11.1.2. Outbound profiles are normally unique to a disposal vendor, but not necessarily a single location of that vendor. Outbound profiles must conform to a disposal vendor's acceptance criteria for the management option that they have applied to a particular Stericycle waste stream.

C8.11.1.3. Waste to be discharged to the POTW are analyzed to confirm that that the wastewater meets discharge parameters listed in the discharge permit.

C8.11.1.4. Waste streams that are consolidated retain the waste codes collectively applied to the inbound profiles, and outbound profiles reflect these waste codes.

C8.11.2. At the point of generation, waste streams that are going to be consolidated for energy recovery must individually possess sufficient Heat of Combustion such that they are considered to have fuel value.

C8.12. Record Keeping and Waste Tracking

WAC 173-303-300(6) and 380(1)(c)

This section describes the record keeping procedures for waste analysis and handling and the tracking procedures for identifying each waste movement at the facility (see Figure C2-1c).

C8.12.1. As required by WAC 173-303-380(1)(c) all records of test results, waste analyses, or other determinations performed for the purpose of designating, treating, storing, or disposing of dangerous waste are kept in the operating record until final facility closure.

C8.12.1.1. Stericycle-Kent retains LDR paperwork in order to track wastes that are subject to LDR and to ensure that those wastes receive proper treatment prior to disposal.

C8.12.1.2. Manifests of on-site generated waste signed by the initial transporter are kept at least three years, or until a signed copy is received from the receiving facility. The signed facility copy is kept at least five years, as required by WAC 173-303-210(1).

C8.12.1.3. Original copies of waste profiles and associated documentation (e.g., lab records, decision notes) are filed at the Stericycle Regional Corporate Office or in the office of origin, and electronic versions of profiles are available to plant personnel. If a profile and associated documentation hardcopy is needed at the facility, it can be readily obtained from the Regional Corporate Office or the office of origin. Records must be furnished upon request and made available at all reasonable times for inspection.

C8.12.1.4. All laboratory records are retained at the facility, along with documentation of inconsistencies and discrepancies (e.g., AVFs).

C8.12.2. As required by WAC 173-303-300(6), the procedures for identifying each waste movement at the facility are described in this section. Information regarding bulk shipments and wastes in containers received from off-site are recorded on a Check-In Sheet. The unique tracking number printed on each Check-In Sheet (see Appendix C-1) is the core of the waste tracking system at Stericycle-Kent. Each waste container has a unique tracking number to track its progress through the facility.

C8.12.3. Specific details of waste tracking are described below.

C8.12.3.1. Container Tracking

C8.12.3.1.1. Each inbound manifest or waste shipment has a unique tracking number. The unique tracking number allows easy identification of the waste shipment and correlates to a specific manifest and generator.

C8.12.3.1.2. Each container of waste received at the facility has a unique tracking number that is attached to the container in bar-code format. The unique tracking number and the identity of the material in the container is recorded on the Check-In Sheet. The Check-In Sheet is attached to the manifest and entered into the operating record.

C8.12.3.1.3. Each time a container is processed, the unique tracking number of the container and the process being performed on the material is recorded on the Waste Process Form (see Appendix C-1). Documentation of compatibility testing will be retained with these forms. Any time a new container of material is produced during processing, the new container is issued a unique tracking number that is affixed to the new container. The new unique tracking number and the identity of the newly generated material is recorded on the Waste Process Form. At the end of each shift, the Waste Process Form is submitted to the Admin staff for entry into the data tracking system.

C8.12.3.1.4. These procedures provide a tracking record of each container as it passes through the facility. Any waste generated during the processing of the material can be traced back to the original container by use of the Waste Process Form.

C8.12.3.2. Tracking of Waste in Tanks

Bulk wastes arriving at the facility are issued a unique tracking number and are sampled before offloading. The sample from the actual load is analyzed and the results are compared to the profile. All analytical records are retained in the operating record or in records required under the POTW discharge permit. Compatibility tests are performed prior to offloading. Shipping papers are checked to ensure the waste matches the description on the profile. The manifest number, unique tracking number, generator name, waste type, gallons received, percent solids and tank number are recorded in the operating record. Additionally, in accordance with D3.3.4.4.1 and Appendix D-10 Section 3.5, documentation demonstrating that the maximum organic vapor pressure of the dangerous waste in each tank does not exceed 11.1 psi at any point in time will be tracked and be available on-site.

C8.12.3.3. Processed material prepared for shipment.

C8.12.3.3.1. When a container is prepared for shipment off-site, the unique tracking number of the container is recorded on the outgoing waste handling form. The outgoing waste handling form is attached to the generator copy of the outgoing manifest and submitted to the Admin staff for entry into the data tracking system.

C8.12.3.3.2. A Waste Tracking Specialist performs a QC check on each outbound load to confirm that the correct profile(s) is (are) being shipped to the appropriate disposal facility as indicated in the profile(s), that the paperwork is accurate and complete including manifest(s) and LDR(s) if applicable. Stericycle-Kent personnel trained in proper DOT-container closure will verify that containers are properly closed and transport-ready.

LIST OF TABLES

Table C2-1 Analytical Parameters, Methods, and Rationale

Table C2-2 Waste Analysis Summary

Table C2-3 Storage and Process Limitations

Table C2-4 Sampling Methods and Equipment

Table C2-5 Sample/Container Compatibility

Table C2-6 Waste Processing Analysis Compatibility Limitations

Table C2-7 Process Analyses

TABLE C2-1 ANALYTICAL PARAMETERS, METHODS, AND RATIONALE

Parameter	Method Reference[1]	Rationale (in addition to profile agreement)
Mandatory Verification Analyses		
Physical Description	ASTM D 4979	Determine variations in waste type
Ignitability Screen	see Appendix C-2	Determine variations in waste type; storage limitations; compatibility
pH	SW 846 Methods 9040, 9041, or 9045	Determine variations in waste type; storage limitations; compatibility
Halogens (containers)	Beilstein Screen	Determine variations in waste type
Halogens (bulk loads)	field test kit[2]	Determine variations in waste type
Specific Gravity (containers)	ASTM D 4979 (see Appendix C-2)	General chemical composition; variations in waste type
Specific Gravity (bulk loads)	ASTM D 1298	General chemical composition; variations in waste type
Radiation Screen	Geiger Counter (see Appendix C-2)	Restricted material
Cyanide Screen	field test kit[3]	Determine variations in waste type; storage limitations; compatibility
Sulfide Screen	field test kit[3]	Determine variations in waste type; storage limitations; compatibility
Compatibility Screen	D 5058A	Determination of compatibility and proper management option
Water Compatibility Screen	D 5058C	Determination of compatibility and proper management option
Supplemental Analyses		
Heat of Combustion (BTU)	ASTM D-240	Alternative fuel blending specifications
Flash Point	SW 846 Method 1020	Determination of ignitability; storage limitations; compatibility
Total Metals	see Appendix C-2[4]	Alternative fuel specifications; discharge limits; LDR compliance
Total Chlorine	SW-846 Method 9076[4]	Off-site receiving facility criteria
Total Cyanides	SW 846 Method 9010[4]	Off-site receiving facility criteria; LDR compliance
Total Sulfides	APHA Method 427[4]	Off-site receiving facility criteria; LDR compliance
TCLP	SW 846 Method 1311[4]	Determination of toxicity characteristic; LDR compliance
PCBs	SW 846 Method 8082	Off-site disposal specifications

1. See Appendix C-2 for complete references.
2. Field test kit used will be Chlor-D-Tect, CHEMetrics or equivalent.
3. Field test kit used will be CHEMetrics or equivalent.
4. Conducted at a third-party lab.

TABLE C2-2 WASTE ANALYSIS SUMMARY

Waste Analysis	Water Treatment	Storage	Consolidation
Mandatory Verification Analyses*			
Physical Description	✓	✓	✓
Ignitability Screen	✓	✓	✓
pH	✓	✓	✓
Halogen Screen		✓	✓
Specific Gravity	✓	✓	✓
Radiation Screen	✓	✓	✓
Cyanide Screen	✓	✓	✓
Sulfide Screen	✓	✓	✓
Compatibility Screen	✓		✓
Water Compatibility Screen	✓	✓	✓
Supplemental Analyses			
Heat of Combust.(BTU)		✓	✓
Flash Point	✓	✓	✓
Total Metals	✓	✓	✓
Total Chlorine		✓	✓
PCBs		✓	✓
Total Cyanides	✓	✓	✓
Total Sulfides	✓	✓	✓
TCLP		✓	✓
Process Analyses			
Wastewater Bench Treatment	✓		
Compatibility test	✓		✓
PUSO (as needed)	✓	✓	✓
Water compatibility test			✓

* The applicability of mandatory tests is described in Section C8.5.

TABLE C2-3 STORAGE AND PROCESS LIMITATIONS

Waste Analysis	Water Treatment	Storage	Consolidation
Physical Description	semisolid liquid	solid/liquid/gas	solid/liquid
VOC Concentration	n/a	no limit	n/a[1]
Total Organic Content	n/a	no limit	no limit
pH	2 - 14	0 - 14	0 - 14
Specific Gravity	T9A and T9B <1.2 T9C < 1.6	limited by container type	limited by container type
Radiation Screen	<20 cpm	<20 cpm	<20 cpm
Heat of Combust.(BTU)	no limit	no limit	no limit
Flash Point	no limit	no limit	no limit
Total Metals	as allowed per treatment assessment	no limit	no limit
Total Halogens	0 - 10 %	no limit	no limit
PCBs	none	no limit	no limit
Cyanides	<20ppm	no limit	no limit
Sulfides	<500ppm	no limit	no limit
Compatibility Screen	≤+5°F , ≤25°F if PUSO	n/a	≤+5°F , ≤25°F if PUSO
Water Compatibility Screen	≤+5°F , ≤25°F if PUSO	≤+5°F	≤+5°F , ≤25°F if PUSO
TCLP	n/a	n/a	n/a

See Appendix C-2 for a discussion on results of the radiation screen.

1. Air controls on process equipment will allow >500ppm VOC. Container to container consolidation will be performed in compliance with Subpart CC regulations

TABLE C2-4 SAMPLING METHODS AND EQUIPMENT

WASTE TYPE	EQUIPMENT TYPES BY CONTAINMENT VESSEL see SW846 (a) Table 9.7		METHOD REFERENCE
	DRUM/CONTAINER	TANK (ER)	ASTM(b)
Free flowing liquids and slurries	-Glass/PVC Tube -COLIWASA	-Weighted bottle Dipper COLIWASA Glass/PVC Tube	D5743-97 D6759-09
Sludges	-Glass/PVC Tube -Trier	-Dipper Trier Metallic tube	D5743-97 D6759-09
Extremely viscous liquid/sludge	-Scoop -Auger -Metallic tube	-Shovel Scoop Metallic tube Auger	D140-09
Soil-like and packed solids	-Auger -Metallic tube -Trier	-Trier Metallic tube Shovel Scoop Auger	D1452-09
Solids (impervious)	-Auger -Knife -Saw	N/A	N/A

(a) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846, Third Edition (November 1986, and subsequent updates).

(b) ASTM-American Society for Testing Materials. Annual Book of ASTM Standards, Philadelphia, PA.

TABLE C2-5. SAMPLE/CONTAINER COMPATIBILITY

Sample	Plastic	Container Glass	Metal
Acids(except HF)	*	*	
HF	*		
Alkalines	*	*	
Solvents		*	*
Oils	*	*	*
Solids	*	*	*
Aqueous	*	*	

***** Sample compatible for storage in this type of container.

TABLE C2-6 WASTE PROCESSING ANALYSIS COMPATIBILITY LIMITATIONS

PROCESS	Significant Vapor Generated	Layering	Polymerization	Bubbling/Foaming	Solidification	Violent Reaction	Precipitation	Emulsification	Heat Generation
Wastewater Treatments	U(1)	A	U	U(2)	U(3)	U	A	U	No reaction permitted with temperature difference $\geq$ 10°F
Container Consolidation for Tank Storage (wastewater treatment)	U	A	U	U(2)	U	U	A	U	No reaction permitted with temperature difference $\geq$ 10°F
Fuel Consolidation	U	A	U	U	U	U	U	A	No reaction permitted with temperature difference $\geq \pm$5°F
Container to Container Consolidation	U	A	U	U	U	U	U	A	No reaction permitted with temperature difference $\geq \pm$5°F

"U" denotes that the reaction, except as footnoted, is unacceptable and the process or consolidation will not be conducted.
"A" denotes that the reaction is acceptable and the process or consolidation may be conducted.

Footnotes:

(1) Generation of vapor acceptable if limited and expected based on the process or treatment occurring, and the specific wastes or chemical reagents involved.

(2) Some bubbling/foaming is acceptable if expected based on the process or treatment occurring. Reaction will be controlled as necessary by limiting addition rates and/or use of chemical defoamer.

(3) Incidental salt generation and or crystallization is acceptable.

TABLE C2-7 SUMMARY OF PROCESSING ANALYSIS TESTS

TEST	APPLICABILITY	PURPOSE
Wastewater Bench Treatment	Applies to wastewater that has been consolidated for treatment.	Determine effectiveness of treatment, determine proper treatment stoichiometry, and identify wastes that exceed process limits in Table C2-6 when treated.
Compatibility test	Applies to all consolidation, transfer, and treatment of wastes in tanks from other tanks, containers or transportation vehicles. Also applies to consolidation of wastes in containers. Transfer of wastewater streams that have been neutralized are not subject to compatibility testing.	Identify wastes that exceed process limits in Table C2-6 when consolidated, transferred, or treated.
PUSO	Applies to waste with potential for extraordinary hazards or reactivity (developed at the discretion of Stericycle-Kent for individual situations).	Prescribe specific procedures for managing waste that have potential for extraordinary hazards or reactivity.
Water compatibility test	Applies to wastes that are not water-based but will be consolidated, transferred, or treated with waste that do contain water. (Note, this test will not be required at the time of waste consolidation, transfer, and treatment if done at the time of waste verification.)	Identify waste that may exceed process limits in Table C2-6 when consolidated, transferred or treated.

LIST OF FIGURES

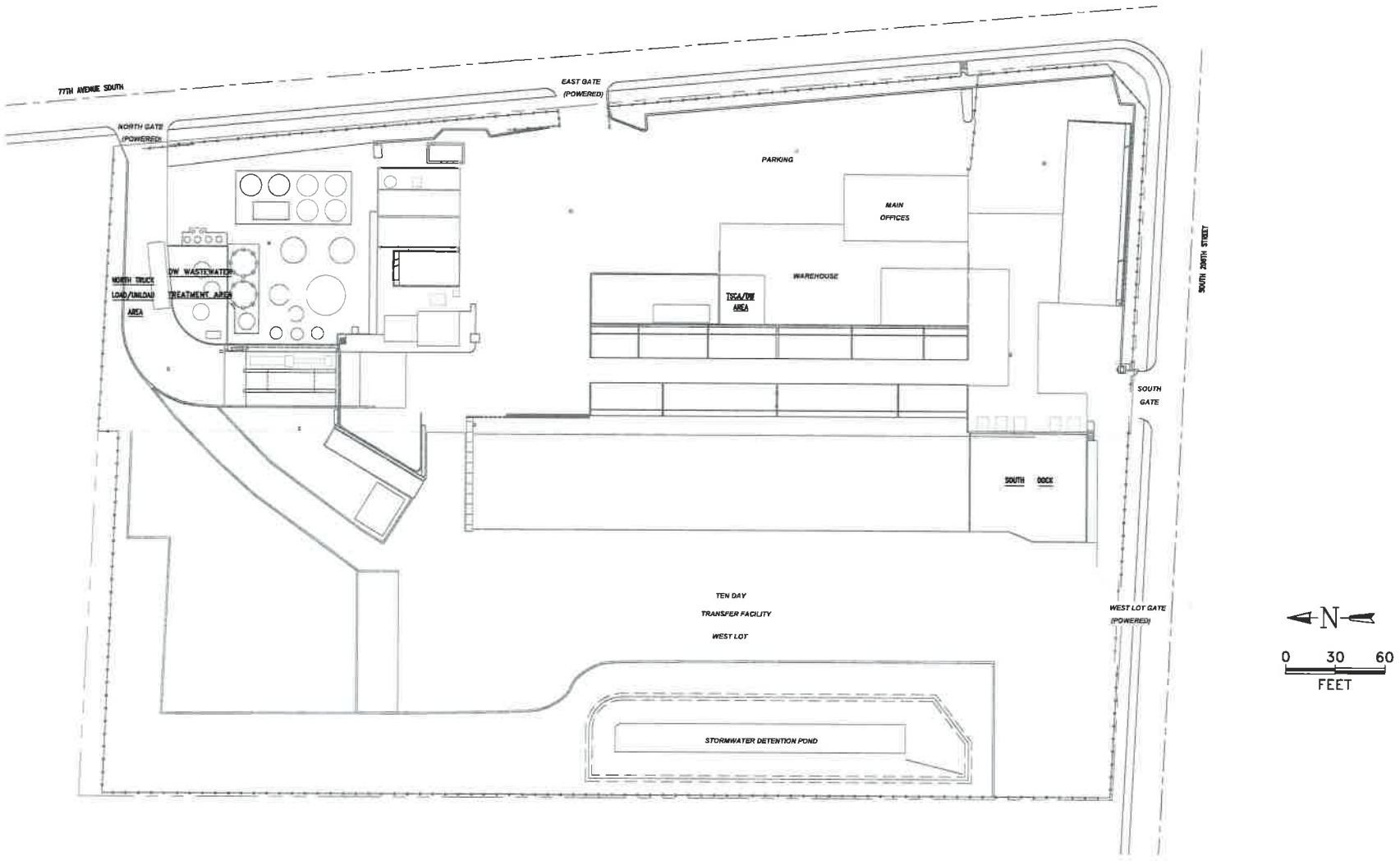
Figure C1-1 Kent Facility Site Plan

Figure C2-1 Waste Overview

Figure C2-1a Waste Pre-acceptance

Figure C2-1b Waste Acceptance

Figure C2-1c Waste Management

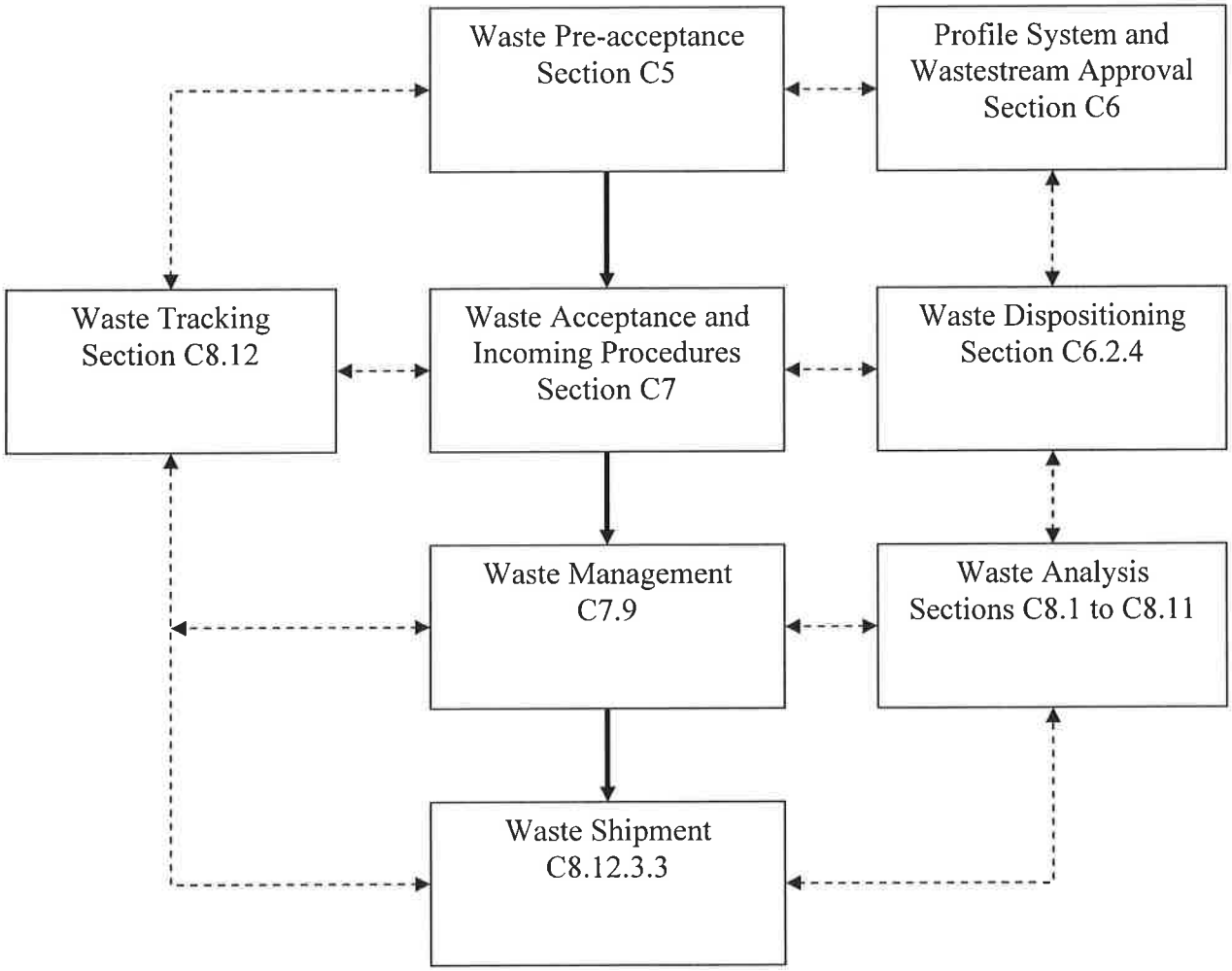


Stericycle

TITLE:
Facility Site Plan

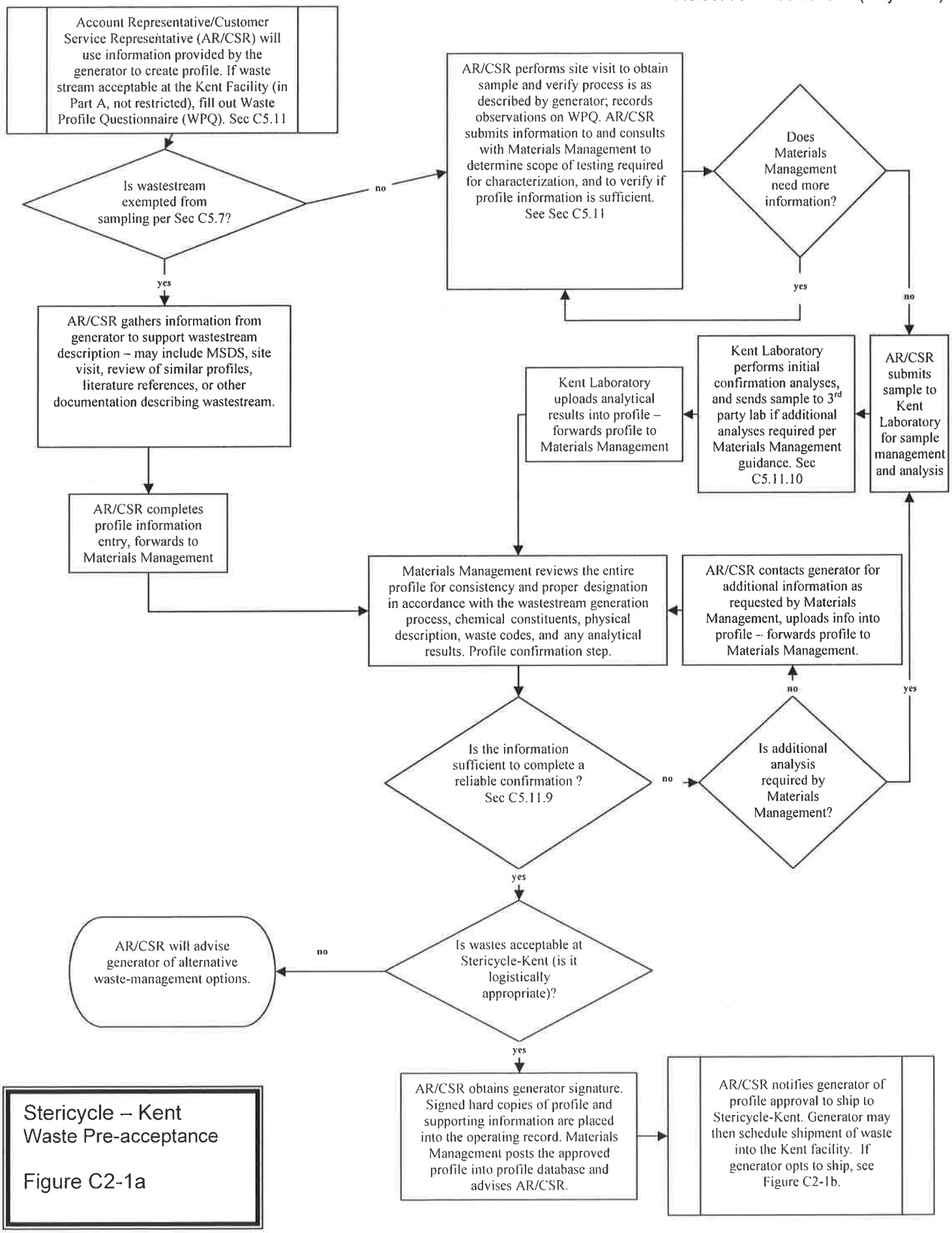
Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: C1-1	
DATE: 8/6/15	REV.:		



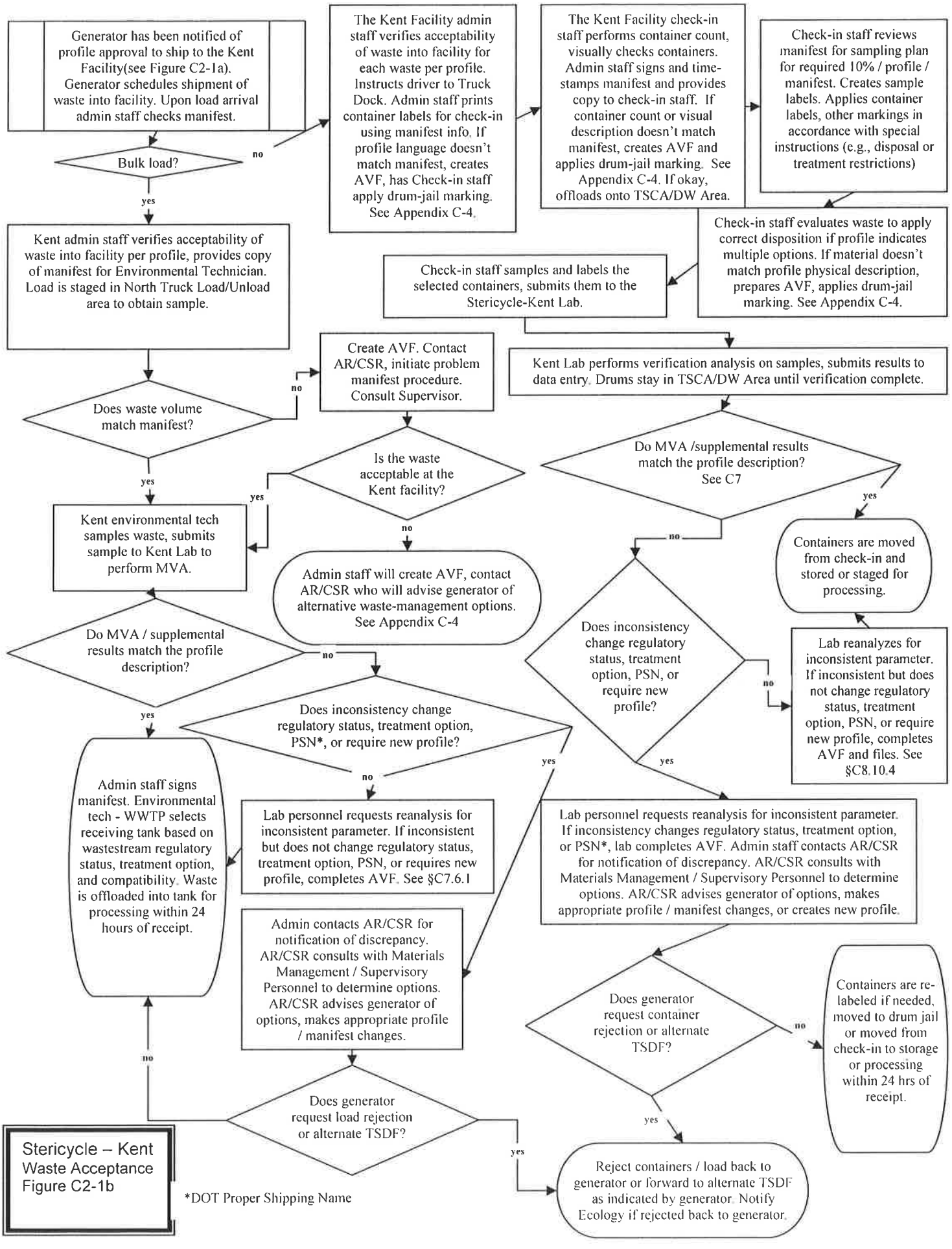
Stericycle – Kent
Waste Overview

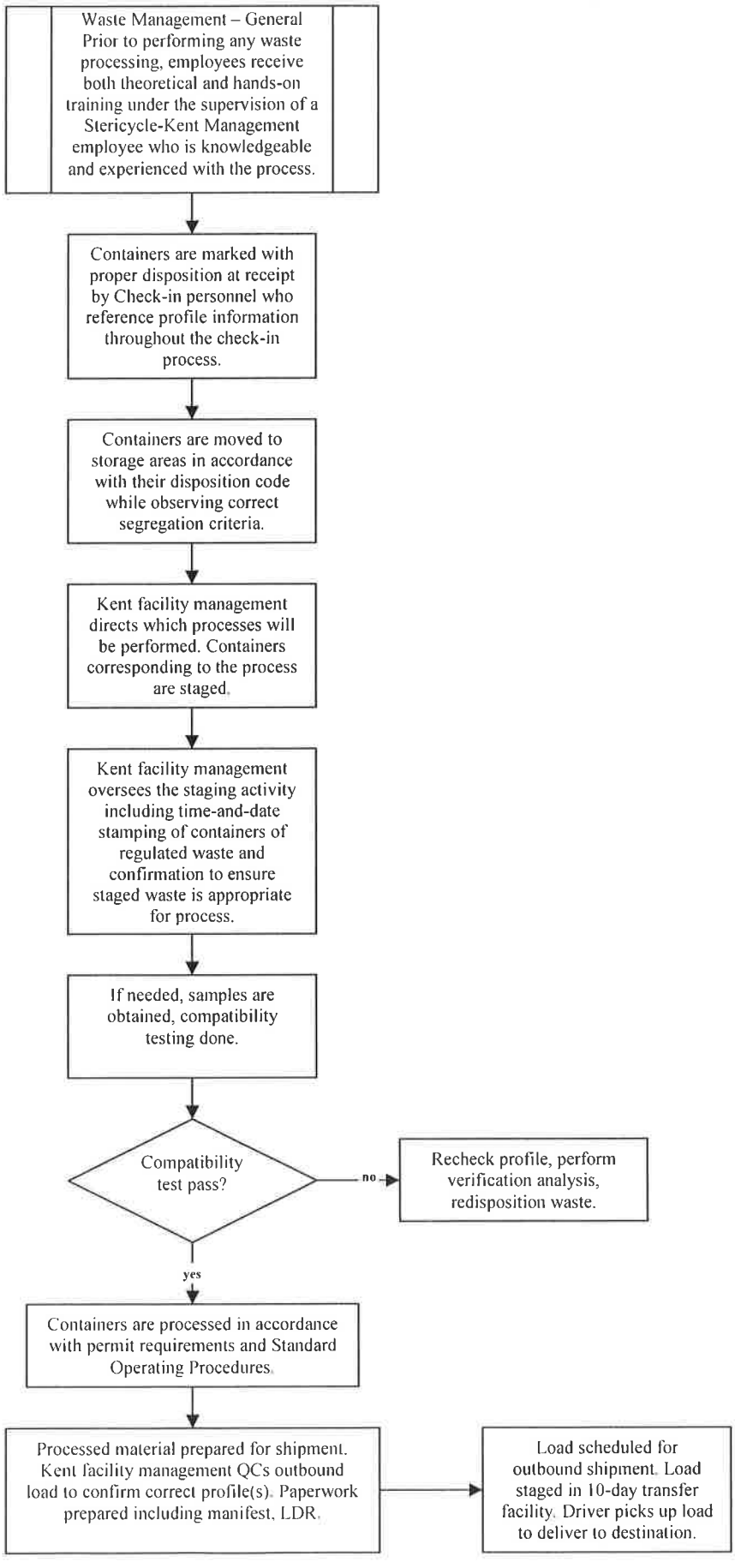
Figure C2-1



Stericycle – Kent
Waste Pre-acceptance

Figure C2-1a


Generator has been notified of profile approval to ship to the Kent Facility(see Figure C2-1a). Generator schedules shipment of waste into facility. Upon load arrival admin staff checks manifest.
Bulk load?
no
yes
The Kent Facility admin staff verifies acceptability of waste into facility for each waste per profile. Instructs driver to Truck Dock. Admin staff prints container labels for check-in using manifest info. If profile language doesn't match manifest, creates AVF, has Check-in staff apply drum-jail marking. See Appendix C-4.
The Kent Facility check-in staff performs container count, visually checks containers. Admin staff signs and time-stamps manifest and provides copy to check-in staff. If container count or visual description doesn't match manifest, creates AVF and applies drum-jail marking. See Appendix C-4. If okay, offloads onto TSCA/DW Area.
Check-in staff reviews manifest for sampling plan for required 10% / profile / manifest. Creates sample labels. Applies container labels, other markings in accordance with special instructions (e.g., disposal or treatment restrictions)
Kent admin staff verifies acceptability of waste into facility per profile, provides copy of manifest for Environmental Technician. Load is staged in North Truck Load/Unload area to obtain sample.
Check-in staff evaluates waste to apply correct disposition if profile indicates multiple options. If material doesn't match profile physical description, prepares AVF, applies drum-jail marking. See Appendix C-4.
Check-in staff samples and labels the selected containers, submits them to the Stericycle-Kent Lab.
Create AVF. Contact AR/CSR, initiate problem manifest procedure. Consult Supervisor.
no
Does waste volume match manifest?
yes
Kent Lab performs verification analysis on samples, submits results to data entry. Drums stay in TSCA/DW Area until verification complete.
Is the waste acceptable at the Kent facility?
yes
no
Kent environmental tech samples waste, submits sample to Kent Lab to perform MVA.
Admin staff will create AVF, contact AR/CSR who will advise generator of alternative waste-management options. See Appendix C-4
Do MVA /supplemental results match the profile description? See C7
yes
no
Containers are moved from check-in and stored or staged for processing.
Do MVA / supplemental results match the profile description?
no
yes
Does inconsistency change regulatory status, treatment option, PSN, or require new profile?
no
yes
Lab reanalyzes for inconsistent parameter. If inconsistent but does not change regulatory status, treatment option, PSN, or require new profile, completes AVF and files. See §C8.10.4
Does inconsistency change regulatory status, treatment option, PSN*, or require new profile?
yes
no
Admin staff signs manifest. Environmental tech - WWTP selects receiving tank based on wastestream regulatory status, treatment option, and compatibility. Waste is offloaded into tank for processing within 24 hours of receipt.
Lab personnel requests reanalysis for inconsistent parameter. If inconsistent but does not change regulatory status, treatment option, PSN, or requires new profile, completes AVF. See §C7.6.1
Lab personnel requests reanalysis for inconsistent parameter. If inconsistency changes regulatory status, treatment option, or PSN*, lab completes AVF. Admin staff contacts AR/CSR for notification of discrepancy. AR/CSR consults with Materials Management / Supervisory Personnel to determine options. AR/CSR advises generator of options, makes appropriate profile / manifest changes, or creates new profile.
Admin contacts AR/CSR for notification of discrepancy. AR/CSR consults with Materials Management / Supervisory Personnel to determine options. AR/CSR advises generator of options, makes appropriate profile / manifest changes.
Does generator request container rejection or alternate TSDF?
no
Containers are re-labeled if needed, moved to drum jail or moved from check-in to storage or processing within 24 hrs of receipt.
yes
Does generator request load rejection or alternate TSDF?
no
yes
Reject containers / load back to generator or forward to alternate TSDF as indicated by generator. Notify Ecology if rejected back to generator.
Stericycle – Kent
Waste Acceptance
Figure C2-1b
*DOT Proper Shipping Name



Stericycle – Kent
Waste Management
Figure C2-1c

APPENDIX C-1

EXAMPLE FORMS

Waste Profile Questionnaire (WPQ)
Subpart CC certification
Process Form
Check-in Sheet
Administrative Verification Form (AVF)

WASTE PROFILE QUESTIONNAIRE

Stericycle

Customer Service Representative:

Account Representative:

Requested Code

Profile Number:

Order Number

A: GENERATOR INFORMATION

NAICS Code:

1. US EPA ID No:

2. State ID No:

3 Name :

4 Site Address :

City: State: Zip:

Contact: 6 Title: 7 Phone:

8 Consultant (if any) : 9 Company: 10 Fax:

11 Form Code: 12 Source Code: 13 Origin Code: Phone:

B: MAIL INVOICES TO:

1 ☐ Generating Facility at above address:

2 Company Name: 3 Phone:

4 Address:

City: State: Zip:

5 Attention: Fax:

C: WASTE INFORMATION:

1 Name of Waste :

2 Process generating Waste (be specific) :

3 Is this waste an unused commercial product? Yes ☐ No ☐ Is this waste a spill residue? Yes ☐ No ☐

4 Generator has provided the following: ☐ Waste Analysis ☐ Sample ☐ MSDS ☐ Other

D PHYSICAL CHARACTERISTICS OF WASTE

Check all that apply:

1 Color: brownish clear

2 Physical State @ 70° F:
☐ Solid ☐ Semi-Solid ☐ Powder
☐ Liquid ☐ Monolithic Solid
☐ Compressed gas/aerosol

3 Layers:
☐ Multi-layered
☐ Bi-Layered
☐ Single Phased

4 Specific Gravity:
☐ < 0.8 ☐ 1.1 - 1.2
☐ 0.8 - 1.0 ☐ 1.3 -1.4
Exact/Other:

5 Free Liquids:
☐ No
☐ Yes

6 Strong Odor : ☐ Yes ☐ No % Ash : % Halogens : BTU/lbs range: <500 Viscosity : ☐ L ☐ M ☒ H

Pumpable : ☐ Yes ☐ No

7 pH: ☐ N/A ☐ ≤2 ☐ >2 -4 ☐ 4 - 6 ☐ 6 - 8 ☐ 8 - 10 ☐ 10-<12.5 ☐ ≥12.5 ☐ Range:

8 Liquid Flash Point: ☐ <73° F ☐ 73-100° F ☐ 101-141° F ☐ 142-200°F ☐ >200°F ☐ None ☐ Closed Cup ☐ Open Cup

E TOTAL COMPOSITION OF WASTE (all hazardous & non-hazardous) :

1 Include Sludge and water as constituents.

	RANGE Min	-	Max
		-	
		-	
		-	
		-	
		-	
		-	
		-	
		-	

PLEASE NOTE: The TOTAL compositon must be greater than or equal to 100% :

TOTAL: %

2 Indicate if this waste contains any of the following:

Not Present :		☐ Lab Analysis Attached :		☐ Generator Knowledge :	
☐ PCB	ppm	☐ Dioxin	ppm	☐ Pesticides	ppm
☐ Cyanides: Amenable	ppm	☐ Benzene	ppm	☐ Ammonia	ppm
☐ Cyanides: Total	ppm	☐ Herbicides	ppm		
☐ Phenolics	ppm	☐ TOC	ppm		
☐ Sulfides	ppm	☐ VOC	ppm	Waste is subject to Subpart CC:	☐ Yes ☐ No

F **METALS:** Indicate of this waste contains any of the following metals, and which test method was used :

	TCLP:		TOTAL :		Generator Knowledge : [X]
Arsenic (As)	D004	[ ]	< 5 ppm	ppm	
Barium (Ba)	D005	[ ]	< 100ppm	ppm	
Cadmium (Cd)	D006	[ ]	< 1ppm	ppm	
Chromium (Cr)	D007	[ ]	< 5ppm	ppm	
Lead (Pb)	D008	[ ]	< 5ppm	ppm	
Mercury (Hg)	D009	[ ]	< 0.2ppm	ppm	
Selenium (Se)	D010	[ ]	< 1ppm	ppm	
Silver (Ag)	D011	[ ]	< 5ppm	ppm	
Zinc (Zn)		[ ]		ppm	
Copper (Cu)		[ ]		ppm	
Hexavalent Chrome		[ ]		ppm	
Antimony (Sb)		[ ]		ppm	
Beryllium (Be)		[ ]		ppm	
Nickel (Ni)		[ ]		ppm	
Thallium ((Ti)		[ ]		ppm	

G Is this waste any of the following :

[ ] Ignitable Solid [ ] Water Reactive [ ] Reactive (other)
[ ] Oxidizer [ ] Shock Sensitive [ ] Asbestos

[ ] Cyanide Reactive [ ] Radioactive [ ] Infectious [ ] Explosive [ ] CERCLA
[ ] Medical [ ] Sulfide Reactive [ ] Regulated Organics [ ] None Apply [ ] Debris

H USEPA / STATE / GENERATOR STATE WASTE IDENTIFICATION:

1 Hazardous Waste : [ ] Yes [ ] No 2 NESHAPS generator?: [ ] Yes [ ] No CESQG [ ] Yes [ ] No
3 PCB Regulated by TSCA? [ ] Yes [ ] No 4 State Codes: _____
5 List ALL applicable RCRA wste codes: _____
6 List all applicable State waste codes : _____

A. Universal waste? [ ] Yes [ ] No

I ORGANICS

Results based on Generator Knowledge : [ ] [ ] No Analysis : [ ] Yes [ ] No

Results expressed in TCLP (mg/l) Total (mg/kg) :

Endrin	< 0.02		1,2-Dichloroethane	< 0.8	
Lindane	< 0.4		1,1 Dichloroethylene	< 0.7	
Methoxychlor	<10.0		2,4 Dinitrotoluene	< 0.13	
Toxaphene	< 0.5		Heptachlor	< 0.008	
2,4-D	< 10.0		Hexachlorobenzene	<0.13	
Silvex (2,4,5-TP)	< 1.0		Hexachlorobutadiene	< 0.5	
Benzene	< 0.5		Hexachloroethane	< 3.0	
Carbon Tetrachloride	< 0.5		Methyl Ethyl Ketone	< 200	
Chlordane	< 0.03		Nitrobenzene	< 2.0	
Chlorobenzene	< 100		Pentachlorophenol	< 100	
Chloroform	< 6.0		Pyridine	< 5.0	
O-Cresol	< 200		Tetrachloroethylene	< 0.7	
M-Cresol	< 200		Trichloroethylene	< 0.5	
P-Cresol	< 200		2,4,5 Trichlorophenol	< 400	
Cresol	< 200		2,4,6 Trichlorophenol	< 2.0	
1,4 Dichlorobenzene	< 7.5		Vinyl Chloride	< 0.2	

GENERATOR KNOWLEDGE:

J IDENTIFY ALL UHC's IN THIS WASTE STREAM :

K SHIPPING INFORMATION :

1 Is this a DOT Hazardous Material? ☐ Yes ☐ No 2 Reportable Quantity (RQ) in pounds: _____

3 Method of Shipment: ☐ Bulk Liquid ☐ Bulk Solid ☐ Container (type/size): _____

4 Number of Units to Ship Now: _____ 5 ☐ Anticipated Volume/Units per Year: _____ OR ☐ One Time

US DOT DESCRIPTION: USE THE FULL BASIC DESCRIPTION ON THE HAZARDOUS WASTE MANIFEST:

7 PROPER SHIPPING NAME : ( ) (if generic "n.o.s.", indcate the two predominant constituents in parenthesis)

8 HAZARD CLASS 9 DOT ID NUMBER 10 PACKING GROUP NUMBER 11 ADDITIONAL INFORMATION

L SPECIAL HANDLING INFORMATION:

Prepared by

Signature: _____ Title: _____ Date: _____

Generator's Waste Profile 709223-00

Status : ACTIVE

Starts : 01 JUL 2015

Expires: 30 JUN 2016

Sales Rep 220 Rahim Mohideen

Acct Mngr 225 Curtis Martin

GENERATOR CERTIFICATION

I hereby certify, as an authorized representative of the Generator named above, that Burlington Environmental, LLC has been fully informed of all information known about this waste, including but not limited to, the waste's generation process, composition, and physical characteristics, necessary to identify proper treatment and disposal of waste and this information is true and accurate.If this is an existing profile which is being renewed, I hereby certify that there have been no changes in this waste, chemical, physical, or regulatory designation since full characterization by sample testing.

This profile has greater than 500 ppm volatile organic compounds and is subject to Subpart CC of the RCRA regulations.

Signature	Printed Name	Title	Date

Burlington Environmental, LLC maintains the appropriate permits for and will accept the dangerous waste the generator is shipping as required by WAC 173-303-290(3).

FM-0023 Process Form	Page 1 of 1	FM-0023
Created on: February 4, 2002	*General Forms*	
Revised On: July 22, 2008	STANDARD FORM	

Process Form No._____

Date-	Technicians-
Operator-	
Shift-	No. of New Containers-
Process Type-	Shipping Container #-

(T)reatment-waste still tracked under original #	(N)Dst Container-waste now found under new destination container #	(D)isposal-waste no longer tracked (final process)

Start Time for Tank KNT-12 _____

Outbound transportation container has been properly lined and tarped(init)_____

Original Container #	% of Waste Moved	Action T, N, D	Destination Container #	Container Type	Waste Category	Storage Location	Sample	En. Free - liquid test pass y/n

Date : 07/02/2015
Time : 14:42:20

Waste Receipt Container Check-In : KNT-A3735

Date 08/25/2014 **Generator** 217284 Phnsy & Imf
Govt No **Carrier** BUR200 Burlington Environmental, Llc
InBy RAHIMM **Bill To** 63935 Alpha Technical Services
Manifest 012474165JJK

SIC Code 9999 **Order** 1868561
Benzene No
Neshap No **Containers** 4
Doc No. 237220-14 **CD Required** Pcb

Name _____ **Date/Time Checked In** _____ **Analyzed By** _____

No.	PgL	Inter-Co #	Profile #	Waste Categories	Physical Description	Type	Quantity	U	IS	%Sol	Location	S/C
001	1		598141-00	PCB11	Debris C/w Pcbs	D10	16.00	P	0	100	PCB	N N
002	2		640904-00	PCB05	Pcb In Hexane, D001	D10	19.00	P	0	100	PCB	N N
003	3		605196-00	PCB02	Pcb Debris W/lead (d008)	D05	3.00	P	0	100	PCB	N N
004	4		649597-00	PCB11	Pcb Debris W/ Asbestos & Rcra Metals	D20	16.00	P	0	100	PCB	N N

** End Waste Receipt Container Check-In Form (pvWrcCif) Printed 07/02/2015 at 14:42:20 by RONP

E.T. Initials _____ **Date** _____ **R.C. Initials** _____ **Date** _____

FM-0011 Administrative Verification Form (2)	Page 1 of 1	FM-0011
Created on: March 17, 2011	*General Forms*	
Revised On: March 17, 2011	**STANDARD FORM**	

ADMINISTRATIVE VERIFICATION FORM

GENERATOR:_____ ARRIVAL DATE:_____ MANIFEST #_____

WASTE RECEIPT #_____ CHECK-IN DATE_____

CHECK IN PERSONAL: NAME:_____ SIGNATURE:_____

Page line or Profile	Drum #	Description of Problem		Resolution – Contact Person (Sales Rep/Generator/Etc.)
		❒ Sampled		
		❒ Sampled		
		❒ Sampled		
		❒ Sampled		

Date Sample Received:_____ Lab Analysis Requested:_____

DISCREPANCY: Yes No Management Signature:_____

Label Management Completed: Yes No By Whom:_____ Date:_____

APPENDIX C-2

ANALYTICAL TEST METHODS

MANDATORY VERIFICATION ANALYSES (Kent Lab)

Physical Description
Ignitability Screen
pH
Halogen Screen (Beilstein Screen)
Halogen Screen (field test kit)
Specific Gravity
Radiation Screen
Cyanide Screen
Sulfide Screen
Compatibility Screen
Water Compatibility Screen

SUPPLEMENTAL ANALYSES

Heat of Combustion (BTU)
Flash Point
Total Metals *
Total Chlorine *
Total Cyanides *
Total Sulfides *
TCLP *
PCBs*

* performed at third-party or other off-site lab

MANDATORY VERIFICATION ANALYSES

Physical Description

ASTM Method D 4979

Ignitability Screen: (This procedure is based on ASTM Method D4982; see last page of this appendix for complete reference).

A small amount of material is passed through a flame at a controlled rate of approximately one foot/second. For liquid samples the flash point is recorded as less than 70°F, if the sample ignites prior to reaching the flame. If the liquid sample ignites while passing through the flame, the flash point is recorded as 70-99°F. If ignition does not occur until the sample passed through the flame a second time, the flash is recorded as 100-139°F. The flash point is recorded as 140-199°F if it must be passed through the flame a third time before it ignites. If the liquid sample ignites only after more sustained heating is observed, the flash point is recorded as >200°F. Halogenated solvents typically give off vapors that burn but do not sustain combustion when not directly in contact with the flame. Wastes exhibiting these characteristics are reported as having no flash and are checked for chlorinated solvents.

Solvents used to standardize the analyst's techniques are as follows.

Flash Point Range	Solvent	Actual Flash Point
<70°F	Methyl Isobutyl Ketone	60°F
70-99°F	Xylenes	84°F
100-139°F	Diesel	100°F
140-199°F	Kerosene	150-185°F
>200°F	Paraffin (Mineral) Oil	444°F

pH

SW-846 Methods 9040, 9041 or 9045 (see the last page of this Appendix for complete reference).

Halogens (containerized waste) by Beilstein Screen

"Prudent Practices for Disposal of Chemicals from Laboratories," (page 97), National Academy of Sciences, National Academy Press, 1983 (see last page of this appendix for complete reference).

Mandatory Verification Analyses (cont.)

Halogens (bulk shipments) by field test kit

Performed using Chlor-D-Tect, CHEMetrics, or an equivalent field test kit.

Specific Gravity (initial determination)

ASTM Method D 4979 (physical description) can be used to provide an initial determination of the specific gravity of a waste by noting the solubility or insolubility of each phase, and if insoluble, noting if it is heavier or lighter than water.

Specific Gravity (quantitative)

ASTM Method D 1298-85, Standard Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method.

Radiation Screen

A sample of the material is passed by a Radalert 100 radiation detection meter. Radioactivity levels >20% above background (background is 12cpm ± 4cpm s.d.) are noted, recorded and investigated. Any samples that produce levels >20% above background (>20 counts per minute, (cpm)) will be immediately referred to the EHS or Location Manager. The generator of the waste will be contacted and the type and intensity of radiation determined. If the waste is determined to be a radioactive waste or represents a health risk to Stericycle personnel, the load will be rejected. If the radiation level is detected after the waste has been placed into a container staging or storage area, the material will be isolated and appropriate warning signs will be posted. The generator and the appropriate regulatory agencies will be contacted for proper handling and disposal. Meter is calibrated on an annual basis by third-party calibration service.

Cyanide Screen

Performed using CHEMetrics or an equivalent field test kit.

Sulfide Screen

Performed using CHEMetrics or an equivalent field test kit.

Mandatory Verification Analyses (cont.)

Compatibility Screen

ASTM Method D 5058A.

Water Compatibility Screen

ASTM Method D 5058C.

SUPPLEMENTAL ANALYSES

Heat Of Combustion (BTU)

ASTM D-240

Flash Point

SW-846 Method 1020.

Total Metals

Extractions: SW-846 Methods 1311 (TCLP)*, 3010*, 3020*, 3050*, 3051 (Total)*.
Instrumentation: SW-846 Methods 6010 (ICP)*, 7470* & 7471 (Hg cold vapor)*.

Total Chlorine

SW-846 Method 9076*.

Total Cyanides

SW 846 Method 9010*.

Total Sulfides

APHA Method 427* (see last page of this appendix for complete reference).

TCLP

SW 846 Method 1311*.

PCBs

SW-846 Method 8082*

*performed at third-party lab

REFERENCES

(1) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846, Third Edition (November 1986, and subsequent updates).

(2) Standard Methods for the Examination of Water and Wastewater, 18th Edition, American Public Health Association, 1992 (and subsequent updates).

(3) Prudent Practices for Disposal of Chemicals from Laboratories, National Academy of Sciences, National Academy Press, 1983 (and subsequent updates).

(4) Annual Book of ASTM Standards, American Society for Testing Materials, 1916 Race Street, Philadelphia, PA 19103, March 1986 (and subsequent updates).

APPENDIX C-3

QUALITY ASSURANCE PROGRAM PLAN

1.0 Purpose

The purpose of this Quality Assurance Program Plan (QAPP) is to outline quality assurance and quality control (QA/QC) measures that assure the quality of data generated for waste evaluation meets the requirements of the facility Waste Analysis Plan (WAP). The WAP is part of the Permit for Storage of Dangerous Waste (the Permit) issued by the Washington State Department of Ecology.

The facility laboratory conducts limited screening and qualitative analysis on behalf of dangerous waste generators, and data is for internal purposes only. Data is produced in the Stericycle-Kent laboratory for:

- Verification testing of incoming waste,
- Limited confirmation testing,
- Process analysis and control.

This QAPP is an integral part of the Stericycle-Kent WAP; as such, any change requires a permit modification. This plan will be reviewed on an annual basis.

2.0 Scope

Stericycle-Kent is a permitted dangerous waste Treatment, Storage, and Disposal Facility (TSDF). Treatment processes include chemical oxidation and precipitation, carbon adsorption, sludge dewatering, and solidification. The facility also performs consolidation of a variety of types of waste streams. In order to properly manage the various waste streams, Stericycle-Kent performs tests to minimize the possibility of waste stream mismanagement. These tests are performed in a timely manner to facilitate the efficient processing of waste. Verification testing is performed to ensure that waste streams received at the facility match their profiles.

The Stericycle-Kent laboratory performs the analyses required for verification, and many of the analyses required for waste stream confirmation. Some of the analyses required for confirmation are performed by third-party contract laboratories. Stericycle-Kent selects contract laboratories that follow procedures, including QA/QC requirements, for sample handling and preservation, sample preparation, and sample analysis for the selected method(s). If the contract laboratory is in Washington, it will be accredited by

the Washington State Department of Ecology for the analytical method at the time of the request.

Data generated under this plan will be primarily used by Facility Operations and Materials Management staffs that are responsible for approving wastes for shipment and verification of waste upon acceptance at the facility.

3.0 Staff Qualifications

The Plant Manager is responsible for laboratory quality control ensuring adherence to this plan. The Plant Manager serves as technical advisor to laboratory personnel, provides technical oversight to the laboratory operation, and is responsible for implementation of the QAPP.

Laboratory technicians are required to have an AA Degree in Chemistry or related field, or equivalent experience, and be knowledgeable in environmental regulations.

Orientation and Task-Specific Training that is required for the laboratory staff is defined in Section H of the Stericycle-Kent facility Permit.

4.0 Documentation and Records

Laboratory personnel will be notified by the Plant Manager whenever modifications are made to the WAP or the QAPP. A current version of each plan will be maintained at the facility. Training for the WAP (which includes training on the QAPP) is specified in the facility training plan; training records are retained in the employee's training file as part of the facility operating record.

Chain of Custody records are maintained according to the date received for a minimum of 30 days following analysis. Calibration and maintenance information is retained in the laboratory. Laboratory analysis records and related documentation is retained at the facility. Manifests are retained in the operating record for 5 years following waste receipt. Audit reports are retained as part of the facility operating record. Records associated with profile approval are maintained at the Stericycle Regional Corporate location and are available upon request. Current profile information is available

electronically at all times. Records relating to profile confirmation and verification are maintained in the operating record until facility closure.

5.0 Sample Handling

Verification analysis is performed on 100% of received bulk waste streams, and 10% of containers per waste stream (profile) per manifest. As defined in WAP Section C2.15, a Waste Stream is Dangerous Waste from a single generator that is specific and unique to the waste generating process. Each waste stream has a unique profile.

Stericycle-Kent uses sampling methods presented in SW-846 (Test Methods for Evaluating Solid Waste, 3rd edition, November 1986 and subsequent updates and revisions) and ASTM Methods (American Society for Testing Materials) as referenced in WAC 173-303-110(2). Sampling is performed at Stericycle-Kent by Environmental Technicians (check-in or wastewater treatment personnel) who are properly trained in representative sampling methodology (refer to Section H, Personnel Training). Samples are obtained in the manner relative to the analytical method being performed. Sample quantities range from 40ml (EPA8260) to ~100ml for verification analysis to 1L (EPA1664, 8270). In all cases, the sampling technician will obtain a representative sample by selecting appropriate sampling equipment.

The sampling devices are selected according to size and type of container and the specific material matrix involved. The sampling method and equipment used for the various materials and types of containment vessels are presented in Table C2-4, Sampling Methods and Equipment. Sampling equipment is rinsed or disposed between sampling events to avoid cross contamination. Rinsate and/or sampling equipment is disposed with a compatible waste stream from the area where sampling occurs. Disposable sampling equipment is repackaged and disposed appropriately in accordance with WAC 173-303.

Depending on the nature of the waste material and the feasibility of obtaining a sample, a top-to-bottom sample is generally obtained from the container (bulk or non bulk). A stratified waste stream will be sampled from top to bottom to ensure the analysis is performed on a representative sample.

Sample containers are provided with a standardized label. Samples are preserved in accordance with the analytical method, and taken to the appropriate sample storage location in the laboratory for analysis. Confirmation samples are stored under lock and key and verification samples pending analysis are under the control of the laboratory technician.

Samples are stored in containers that are compatible with the sampled material. All samples are stored in glass or plastic containers, except chlorinated solvents or chlorinated solvent-contaminated materials that are stored in glass or metal containers only, and hydrofluoric acid that is stored in plastic containers only. Solid samples and oils can be stored in plastic, glass or metal containers. Containers are liquid-tight and range in size from 40 ml to 1,000 ml. Sample/container compatibility is summarized in Table C2-5.

Samples are retained within the laboratory for a sufficient amount of time to allow for the laboratory staff to analyze, record, and review the analytical data. Sample retention times can vary according to analyses performed and volume of samples submitted to the laboratory. Samples for designation may be retained for a period up to the hold time specified in the applicable analytical method. Treatability samples may be retained longer than one week on a case by case basis. Final disposition of samples, after analyses and data review are complete, is determined by the most suitable treatment process for that sample.

Samples collected for verification purposes are labeled with the appropriate unique tracking number, and are delivered to the laboratory by facility personnel after completion of verification sampling for a shipment. Although there are no specific preservation requirements for concentrated waste samples, verification samples are analyzed as soon as possible and no later than 24-hours after sample collection.

Confirmation samples that are collected at generator locations must be accompanied by chain of custody documentation that lists the sample ID, the sampling date and time, and the required analytical testing. Samples requiring refrigeration must be packaged such that the sample temperature is maintained at 4º±2ºC. For confirmational sampling, a visual inspection is performed to see if it was tampered with and a note is made of its general condition. A project number will be assigned by the laboratory for each sample or group of samples represented by a single chain of custody. All samples for

wastewater discharge monitoring analysis will be preserved as appropriate and refrigerated as soon as possible after sampling.

Personnel obtaining samples are trained in proper sampling techniques as required by the Section H (Training Plan). Sampling will be performed in accordance with WAP Table C2-4, Sampling Methods and Equipment, and Table C2-5, Sample / Container Compatibility.

Information accompanying confirmation samples must at a minimum include the following:

- Sample ID
- Sampling Date
- Generators Name

For verification samples, the unique tracking number which is unique to a manifest (therefore generator) will serve as the Sample ID.

A Chain of Custody form must accompany all samples delivered from off-site locations. Upon receipt at the Kent facility laboratory, the Chain of Custody is reviewed for completeness by Laboratory personnel, and a project number is assigned to a sample (or group of samples if from a single generator). The project number is recorded in a sample log which is retained in the lab. The Chain of Custody is reviewed and signed by Kent laboratory personnel and a copy is given to the person relinquishing the sample to the lab. The project number / sample ID combination creates a unique identifier which facilitates tracking each sample from the Kent lab to a third-party lab. Kent lab personnel review the sample label to check for completeness and legibility, and apply the project number to each sample container.

6.0 Analyses

Analyses and analytical methods used by the Stericycle – Kent laboratory are:

- Physical Description – ASTM D 4979
- pH Screen – SW-846 9040, 9041, and 9045
- Flash Point Screen – SW-846 1020

- Specific Gravity – ASTM D 4979, 1298
- Heat of Combustion – ASTM D 240
- Compatibility Screen – ASTM D 5058A, 5058C
- Halogens – SW-846 9077
- Cyanide Screen – field test kit or equivalent
- Sulfide Screen – field test kit or equivalent

QC measures conducted by Stericycle-Kent laboratory are in accordance with the methods listed above. For analyses performed in the Kent Laboratory that are not associated with an above-referenced method (e.g., Cyanide Screen), Stericycle-Kent uses other QC techniques to verify accuracy of the screening techniques. These include periodic calibration, blind samples, standards and/or blanks, depending on the nature of the analysis and whether instrumentation is used. Instruments are calibrated and maintained in accordance with the manufacturers' recommendations or as prescribed in the analytical method. Records of calibration are kept in binders within the laboratory. See Analysis QC Summary for details of frequency.

The Stericycle-Kent laboratory observes good standard laboratory practices to minimize possibility of cross-contamination or other artifacts that could bias or otherwise influence results. These practices include use of disposable supplies or thorough cleaning, rinsing and drying of durable supplies, using only analytical grade reagents, observing expiration dates on the reagents, and properly storing the reagents.

Third-party contract-laboratories used by Stericycle-Kent are responsible for adherence to their own QAPP and to the quality control procedures as specified in each analytical method performed. Samples sent to third-party contract-laboratories must be accompanied by clear and concise documentation that lists the sample ID, the project number, the sampling date and time, and the required analytical testing. Samples requiring refrigeration must be packaged such that the sample temperature is maintained at 4º±2ºC. Delivery of samples to a third-party contract-laboratory must be indicated on the chain-of-custody. Persons involved with transporting samples must complete appropriate 'received by/relinquished by' fields on the chain-of-custody unless a custody seal has been used on the sample cooler. Samples sent to a third-party contract-laboratory are tracked as such on the laboratory sample log.

The Plant Manager will direct quarterly audits of analyses and measurement systems performed in the Kent lab, and of record keeping systems in the laboratory. These audits test the measurement systems with samples of known composition to evaluate bias and imprecision. The Plant Manager will direct preparation and submittal of samples into the normal sample flow without the analyst's knowledge (blinds). Third-party laboratories may be used to verify the performance of the Kent laboratory analyses as appropriate (see Analysis QC Summary). Each analysis will be evaluated using a blind (and split as appropriate) on a quarterly basis. Samples will be chosen from varying matrices throughout each evaluation period. Results of blind sample analyses will be evaluated against known qualities / concentrations using tolerance limits listed in Section C8.8.3. Results reported outside of tolerance limits will require discussion with analyst to determine cause of inaccuracy and action needed to correct. Quarterly audit results and documentation must be furnished upon request and made available at all reasonable times for inspection.

7.0 Data Acquisition and Review

Analytical data may be recorded on laboratory bench-sheets or directly into a laboratory notebook. Additional information will include the sample ID, analyst’s initials, and date of analysis. All analytical records are retained until facility closure.

Verification data is reviewed by a Stericycle-Kent employee and compared to profile data to identify inconsistencies and possible discrepancies. Details regarding discrepancy management are located in Section C7.6 and Appendix C-4 of the WAP.

Record keeping systems will be audited to verify conformance with WAP requirements for data retention and discrepancy management. Frequently encountered operational errors will be noted and management of such recorded.

8.0 Audit Program of WAP Procedures Using Third Party Laboratory

Within one year of the effective date of the Permit, Stericycle-Kent will complete the initial Audit Program outlined in this section. The Program will include randomly selected waste streams received by the facility. Samples of the selected waste streams will be taken and split for testing of relevant parameters by a third-party laboratory. Over a one year period, Stericycle-Kent will randomly select 10 waste streams, potentially within a

targeted group of waste streams, for the Audit Program. For the first year, waste streams destined for wastewater treatment will be targeted.

Upon arrival at the facility of a waste stream selected for this Program, Check-In personnel will be informed that the waste stream is part of the Audit Program and that the waste stream must be sampled accordingly. Waste stream samples will be split, and one portion delivered to outside laboratories for the needed analyses. Only outside laboratories accredited by Ecology for the analytical methods requested will be used. The other portion of the split sample will be subject to normal verification analyses by the Stericycle-Kent laboratory. During the Audit Program, samples will be submitted to outside laboratories to evaluate verification testing results from the Stericycle Kent laboratory and profile information obtained through Stericycle-Kent WAP procedures. Parameters requested for analyses by third party laboratories will include:

- analyses required for that waste stream for verification testing, and
- analyses for parameters that can reasonably be expected to be present in that waste stream to develop an accurate and complete profile as that is described in the WAP.

Once results are received from Audit Program testing, they will be reviewed and compared to the verification results reported by the Stericycle-Kent laboratory and to the applicable generator profile. Discrepancies in any of the results will be investigated and corrective action will be taken as necessary according to normal discrepancy resolution procedures.

Stericycle-Kent will then prepare a report for Ecology. This report will include the following at a minimum:

- summary of results of the quality check, noting any discrepancies;
- outline of corrective measures to address discrepancies, along with a target date for implementation;
- copies of signed profile for waste streams analyzed for the quality check; and
- copies of laboratory data reports.

In the report, and based on the Audit Program results, Stericycle-Kent will recommend continuation, modification, or discontinuation of the Audit Program. Stericycle-Kent will formally continue, modify, or discontinue the program upon approval by Ecology.

If the Program is to be continued, within 30 days of that determination, Stericycle-Kent will provide a Plan to Ecology for the next annual quality check. The scope of the quality check may vary each year based on results of the previous year's quality check and current practices underway at the Stericycle-Kent facility. Upon Ecology approval of the Plan, Stericycle-Kent will have twelve months to implement the Plan and report on its results.

Test	Method	Calibration	Blank	Standard/spike	Quarterly blind	Comments
Physical Description	ASTM D 4979	no instrumentation used, calibration not applicable	not applicable	not applicable	yes	
Ignitability Screen	Flame test	no instrumentation used, calibration not applicable	not applicable	not applicable	yes	compounds for standardization as recommended in WAP
pH	SW-846 Methods 9040, 9041, or 9045	pH meters calibrated per manufacturers' instructions	not applicable	pH 2 and pH 12.5 check standards	yes	calibrated daily per shift / blind split with 3rd party confirmation quarterly
Halogens (containers)	Beilstein Screen	no instrumentation used, calibration not applicable	DI water	not applicable	yes	blank with water, blind with MeCl
Halogens (bulk loads)	SW-846 Method 9077(Clor-d-tect)	no instrumentation used, calibration not applicable	not applicable	not applicable	yes	Clor-d-tect; use current (non-expired) test-kits
Specific Gravity (containers)	ASTM D 4979	no instrumentation used, calibration not applicable	not applicable	not applicable	yes	
Specific Gravity (bulk loads)	ASTM D 1298	calibration not applicable	not applicable	DI water to check hydrometer accuracy	yes	
Radiation Screen	Rad-alert	Radiation meter sent to manufacturer for calibration annually	background	not applicable	not applicable	Rad-alert certificate of calibration
Cyanide Screen	spot test w/9014 reagents	no instrumentation used, calibration not applicable	DI water	NaCN check standard	yes	blank and spike run daily
Sulfide Screen	lead acetate paper	no instrumentation used, calibration not applicable	DI water	Na_2S check standard	yes	blank and spike run daily
Compatibility Screen	D 5058A	no instrumentation used, calibration not applicable	not applicable	not applicable	yes	
Water Compatibility Screen	D 5058C	no instrumentation used, calibration not applicable	not applicable	not applicable	yes	
Heat of Combustion (BTU)	ASTM D-240	thermometer reference	not applicable	confirmation of BTU value of spike oil	yes	check thermometer against reference weekly / bomb benzoic acid tablet to calculate EE quarterly
Flash Point	SW-846 Method 1020	thermometer reference	not applicable	not applicable	yes	check thermometer against reference weekly / blind split with 3rd party confirmation quarterly

APPENDIX C-4

PROBLEM MANIFEST PROCEDURE

PROBLEM MANIFESTS PROCEDURE

Introduction

The recordkeeping system requirements specified by 40 CFR 264.72 and WAC 173-303-370 for facility operators include a section specifically for the manifest system.

The purpose of this procedure is to set criteria for manifest discrepancies, unmanifested wastes and rejecting a shipment.

A. MANIFEST DISCREPANCIES

Manifest discrepancies are significant discrepancies between the quantity or type of dangerous waste designated on the manifest or shipping paper and the quantity or type of dangerous waste a facility actually receives. Significant discrepancies in quantity are variations greater than ten percent in weight for bulk quantities (e.g., tanker trucks, railroad tank cars, etc.), or any variations in piece count for non-bulk quantities (i.e., any missing container or package would be a significant discrepancy). Significant discrepancies in type are obvious physical or chemical differences which can be discovered by inspection or waste analysis (e.g., waste solvent substituted for waste acid) or when it is necessary to add a waste code, or manage the waste stream using a different waste management option than listed in the profile, or indicate the waste stream may be from a different generating process. Significant discrepancies also include when verification analyses do not match information on the waste profile (e.g., exceed established tolerance limit for verification results. See Sec 8.8). Bulk loads are sampled and verification analysis performed prior to offloading.

Stericycle-Kent will ensure that bulk loads received are within 10% by weight of that represented on the manifest prior to offloading using either a weight ticket or an outage table. These methods are briefly described below:

- Weight tickets must include the following information:
    - Tare (empty) weight and gross (loaded) weight of the vehicle;
    - Location and date the weight was obtained;
    - Identification of the vehicle weighed.
- Outage tables must show the capacities or volumes for various liquid levels measured at the reference gauge point specific to the design and capacity of the tanker in question.

If a weight ticket or outage table for an arriving bulk load is not available through all reasonable efforts, Stericycle-Kent will conduct Mandatory Verification Analyses (including compatibility evaluation) prior to offloading the material into a compatible receiving tank. The following procedures apply in this situation:

- Before offloading Stericycle will take a representative sample of a sufficient quantity in an appropriate container that is compatible with the waste. The sample will be utilized for supplemental and processing analyses, as required and as necessary to ensure that the facility permit and operational process limits are not exceeded. This sample will also be available if needed for analyses to reprofile the waste.
- If through using the receiving tank gauge reading and the specific gravity of the waste, the weight is shown to be within 10% of the manifest (i.e., no manifest discrepancy) then Stericycle will proceed as per regular Waste Analysis Plan requirements and standard operating procedures for bulk load processing.
- If through using the receiving tank gauge reading and the specific gravity of the waste, the weight is not within 10% of the manifest (i.e., manifest discrepancy) then Stericycle will immediately place the waste sample in a cooler.
- If the manifest discrepancy cannot be resolved within 24-hours, Stericycle will take and preserve samples (in accordance with procedure described in the analytical method selected) from the larger sample to support supplemental, processing and any other analyses if that proves to be necessary to either 1) establish that it is the waste represented on the profile, or 2) if the analyses indicate the waste does not match the profile, establish sufficient information to allow Stericycle to determine how the waste can be safely and legally managed (e.g., develop an adequate waste profile, meet Land Disposal Restrictions and/or meet other regulatory requirements).
- Manifest discrepancy resolution, including waste analyses information will be documented and placed in the facility operating record.

Steps to Manage a Manifest Discrepancy:

Stericycle will contact the generator by telephone to inform the generator of the discrepancy.

1. Stericycle will ask the generator for permission to correct the manifest to match the load. When permission is received, Operations shall make the necessary corrections and

initial each correction. Any correction made will be entered on all copies of the manifest received by the facility.

2. Immediately after the corrections are entered and initialed, the discrepancy space on the manifest (Item 18) must be completed with the following information. The manifest continuation sheet (Block 35) may be used for additional space.

   a) What the discrepancy is.

   b) A statement to the effect that "on day/month/year (name of person contacted) gave permission to correct the discrepancy stated above."

   c) Full signature of operations personnel correcting discrepancy and date.

4. If the manifest discrepancy cannot be resolved within 24-hours, the discrepant wastes will be marked with a Discrepancy Label and placed in drum jail to ensure that the discrepancy is resolved prior to processing or storage at the facility. Drum jail containers will be segregated in accordance with Table D1-2. An example of a Discrepancy Label that may be used is included as an attachment to this procedure. The information contained on the label will be maintained, although the label itself may change in appearance.

5. If the load consists of drums, and the discrepancy is of waste type (e.g., acid manifested, alkaline received), the drum must be relabeled and marked (prior to storage) to match the corrected manifest and the corrected waste stream.

6. Bulk loads that do not verify through MVAs must be marked with a Discrepancy Label, valves and fittings must be secured, and the load will be placed in Kent's 10-day transfer facility. Bulk loads may not be unloaded or re-manifested until the discrepancy is resolved. This does not apply to loads with weight discrepancies that are resolved using tank gauge readings as described above. Bulk load discrepancies will be resolved within ten days to comply with the ten day limit for transfer facilities.

7. If Stericycle cannot reach the generator, EHS will be notified. EHS will work with Sales and Operations to insure the discrepancy is resolved within the allowed time frame of 15 days.

8. In the event that a discrepancy cannot be resolved within 15-days, in accordance with WAC 173-303-370(5)(c), Stericycle will submit to WDOE a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.

B. UNMANIFESTED LOADS

The following describes the steps taken if a regulated dangerous waste is received without an accompanying manifest.

Steps to Manage an Unmanifested Load

1. Operations shall contact EHS immediately if a regulated dangerous waste load is received without a manifest.

2. EHS, Operations and Sales will determine whether to accept or reject the load.

3. If the load is accepted, an unmanifested waste report meeting the requirements of WAC 173-303-390(1) must be completed and filed with the WDOE within 15 days after the waste is received.

4. Unmanifested load discrepancies shall be managed according to line item 4 of manifest discrepancies, described above. The waste in question shall be placed in drum jail until a manifest is received, or an unmanifested waste report is filed.

C. Rejecting a Shipment

If a shipment arrives at the facility that cannot be managed properly, as determined by Plant Management and/or EHS, the load shall be rejected. The generator shall be contacted by Operations, Sales or EHS to:

1. Notify them of the rejection.

2. Obtain instruction from the generator whether to send the shipment back to the generator or to another designated facility.

Examples of loads which cannot be managed properly are:

- The waste is not listed on the respective facility's Part A Permit.

- The load does not match the manifest, and the waste cannot be treated, stored or disposed of at that facility.

3. Rejected shipments shall be managed according to line item 4 of manifest discrepancies, described above. The rejected shipment shall be placed into drum jail until the wastes can be transported off-site.

4. If Stericycle-Kent chooses or is instructed by the generator to reject the load (i.e., reject as the designated and/or alternate facility and send to an alternate facility or return to the generator), Stericycle-Kent will check the appropriate box (Item 18a on the UHWM) indicating the reason for the rejection of the waste, and will notify Ecology in the event of waste being rejected back to the generator.

D. Unmanageable, Non-Transportable Loads

Should a shipment arrive at the facility which cannot be properly managed due to the reasons stated above, and the load cannot be safely transported back to the generator or to an alternate facility because it is damaged or would pose a risk to public health or the environment the following steps shall be taken:

1. Examine manifest and load to determine if the problem can be resolved with reasonable effort, time and supplies.

2. If the load cannot be rendered safe, implement the Contingency Plan and call a clean up contractor if necessary.

3. Inform EHS so the proper authorities and agencies can be contacted as necessary. Notify Sales so that they can keep the generator informed.

APPENDIX C-5

PROCESS UNDER SUPERVISION ONLY PROCEDURES

Appendix C-5 Process Under Supervision Only Procedures

"Process Under Supervision Only" (PUSO) procedures are designed for waste streams that may potentially create reactivity problems during any treatment or consolidation process. These wastes are identified during the pre-acceptance evaluation by a qualified chemist or Materials Management personnel. These wastes are then designated for PUSO treatment and require a set procedure for treatment. The materials are identified as PUSO in the operational comments of the profile and on the inbound manifest.

Identification as PUSO material alerts the Environmental Technician that the waste requires special procedures. The technician will implement the following procedures:

1. Placing green "Process Under Supervision Only" stickers on the top and side of each container of PUSO material.

2. Initiate the "PUSO Treatment and Contingency Check List" for the waste stream. The plant management initiates and determines the precise protocol with the assistance of the lab technician and Materials Management. the Plant Manager or Materials Manager may approve PUSO procedures. The attached form provides an example form for this procedure.

3. At a minimum, the following information will be completed:

    a) Unique tracking number.
    b) Profile #.
    c) Generator.
    d) Date checked in.
    e) Material type.
    f) Person initiating form.

4. Forward the partially completed form to the plant supervisor or manager.

The plant supervisor in conjunction with the plant laboratory will develop a specialized treatment protocol for the waste stream. This protocol is identified and described on the PUSO checklist. At no time will a PUSO treatment protocol exceed the process limits established in Table C2-3.

Upon completion of the protocol development the plant supervisor will designate personnel to conduct the treatment and review procedures with each technician chosen to do the treatment. The supervisor will ensure adequate emergency precautions are taken prior to treatment.

Once the waste is treated, the PUSO check list will be retained in the operating record.

Stericycle

PROCESS UNDER SUPERVISION ONLY TREATMENT AND CONTINGENCY CHECKLIST

1) CHECK-IN INFORMATION

Drum Number		Generator	
Profile Number		Date Checked In	
Material Type		Check-in Tech Name	

Supervisor Confirmation of Document Receipt:_____
(signature)

2) TREATMENT METHODOLOGY AND PROCESS PLAN

_____

_____

_____

_____

Name of Materials Management/Laboratory rep who confirmed

Date confirmed

Plant Manager / Materials Manager Signature:_____

3) CONTINGENCY MEASURE CHECKLIST

SUPERVISOR MUST BE PRESENT DURING COMPLETION OF THIS CHECKLIST

	Item Complete
Has the profile been reviewed by the technician and supervisor?	
Has a signed treatment plan been reviewed by tech and supervisor?	
Have contingency measures been accounted for?	
Is the proper PPE being utilized?	
Is the material a possible fire hazard?	
If yes to fire hazard, is proper fire prevention on hand?	

After satisfactory completion of the above checklist, the drum may be processed. Please return this form to supervisor's office upon completion.

_____
Supervisor Name

_____
Technician Name

_____
Supervisor Signature

_____
Technician Signature

Process form #_____

APPENDIX C-6

STERICYCLE NATIONAL ACCOUNTS PROFILE APPROVAL

Appendix C-6 Stericycle National Accounts Profile Approval

Stericycle has a number of National Account businesses which regularly generate waste, some of it for receipt at Kent. These waste streams are primarily generated by retail stores, freight companies, or other distribution entities, and consist of off-spec, damaged, or returned consumer products. The profiles representing these waste streams are developed by Stericycle's National Account Coordinator located in Stericycle's Business Center in Houston. As part of the profile information gathering process, an SDS for each product is submitted to the National Account Coordinator. Profiles representing waste streams from National Accounts have a unique 'profile type' identifier in the profile database (HHQ) which facilitates control of these profile types by user authorizations defined in the database.

Materials Management Review

Each request for HHQ profile review and approval is initiated by the Account Coordinator for that generator. If any of the waste generated under a National Account profile is to be received at the Kent facility, the profile must be approved by Kent Materials Management. The Kent facility cannot be authorized to accept a profile except by Kent Materials Management personnel. Unless the Kent facility has been 'attached' to the profile as a TSDF, the waste cannot be tracked into the Kent facility, and the Kent facility cannot be a destination facility for that waste stream on a manifest.

Kent Materials Management reviews the SDS provided by the Account Coordinator in order to confirm proper designation of the waste, verifying that applicable waste codes are present, also using information about the product gathered from both the SDS and from standard toxicity data sources (ECOTOX, etc) to determine whether Washington State Dangerous Waste codes need to be applied specifically for the waste profiled into the Kent facility.

The last step in the approval process is for Kent Materials Management to notify the Account Coordinator that the profile has been approved for acceptance into the Kent facility. i

SECTION D
PROCESS INFORMATION

Note:

This section describes the Kent facility layout and operations following relocation of the majority of dangerous waste container operations to the Stericycle Tacoma facility. Interim operations at Kent (i.e., until completion of Tacoma construction and relocation of and closure of Kent operations) are described in Section Di, Process Information (Interim).

SECTION D. PROCESS INFORMATION

TABLE OF CONTENTS

SECTION PAGE

D1 GENERAL 1
D2 CONTAINERS 1
D2.1 Description of Containers 2
D2.2 Container Management Practices 4
D2.2.1 Stacking Patterns 4
D2.2.2 Safe Management Practices for Moving, Transferring, Staging, and Storing 4
D2.2.3 Load/Unload Only Areas 6
D2.2.3.1 South Dock 6
D2.2.3.2 North Truck Load/Unload Area 7
D2.2.4 Container Storage / Processing Areas 7
D2.2.4.1 TSCA/DW Area 8
D2.3 Secondary Containment System Design and Operation 9
D2.3.1 Design and Construction of Base 9
D2.3.2 Containment System Capacity and Drainage Control 10
D2.3.2.4 Summary of Indoor Container Storage Capacity 11
D2.4 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Containers 11
D2.4.1 Ignitable and Reactive Wastes 11
D2.4.2 Incompatible Wastes 12
D2.4.3 Ten-Day / 24-Hour Transfer Operations 14
D3 TANK SYSTEMS 15
D3.1 Design Specifications and Structural Integrity of Tanks 15
D3.1.6 Tank Integrity Assessments 16
D3.2 Secondary Containment Systems for Tanks 18
D3.2.1 Design and Construction of Base 18
D3.2.2 Containment System Capacity and Drainage Control 19
D3.3 Tank Operations and Management Practices 20
D3.3.1 Tank System Transfer Operations 20
D3.3.2 Dangerous Waste Management in Tanks 21
D3.3.3 Tank System Sump Operations and Management 27

D3.3.4 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Tanks 28
D3.3.4.4 Ignitable Wastes 28
D3.3.4.5 Reactive Wastes 29
D3.3.4.6 Incompatible Wastes 29
D3.3.5 Labeling of Tanks 30

Tables, Figures and Appendices are presented in separate sections following the main body of the text.

LIST OF TABLES

D1-2 Segregation of Hazardous Materials
D1-3 Container Management Areas Operating Limits
D2-1 DW Tank Uses and Materials of Construction
D2-2 DW Tank Design Information
D2-3 Design Information for DW Tank System Sump

LIST OF FIGURES

D1-1 Facility Site Plan
D1-2 TSCA/DW Area
D1-3 Ten-Day / 24-Hour Transfer Locations
D1-6 (a) Container Stacking (1 of 2)
D1-6 (b) Container Stacking (2 of 2)
D1-13 North Truck Load/Unload Area
D1-14 Facility Stormwater Piping
D1-15 Traffic Patterns, Signs, and Paving
D1-16 Forklift Traffic Patterns in Concrete Areas
D2-1 DW Management in Wastewater Tanks
D2-2 Wastewater Treatment System Layout

LIST OF APPENDICES

Appendix D-1 Engineering Designs
Appendix D-2 Manufacturer's Data
Appendix D-3 Secondary Containment Calculations
Appendix D-4 Tank Certifications
Appendix D-5 Tank Data Sheets
Appendix D-6 Soil Study
Appendix D-7 Storm Drainage Study
Appendix D-8 Seismic Study
Appendix D-10 Air Quality Program
Appendix D-11 Supplementary Regulatory Information and Correspondence

SECTION D. PROCESS INFORMATION

WAC 173-303-190, 340(3), 395(1), (4), (6), 630, 670, 691, 692, 806(4)(a), (b), (c), (j), (k), (m),

D1 GENERAL

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as “Stericycle”.

Dangerous wastes (DW) are treated and stored in tanks and in containers at the Kent Facility in units identified on Figure D1-1, Kent Facility Site Plan. This section provides detailed descriptions, designs, and operating information for DW storage and treatment units at the Kent Facility.

D2 CONTAINERS

This section describes container management practices and structural design information for the DW containers managed at the facility. Containerized DW will only be managed in the areas outlined in this section:

- **Load / Unload only areas (see Section D2.2.3):**

South Dock

- **Container Storage / Processing areas (see Section D2.2.6):**

TSCA/DW Area

This DW container management area is discussed in detail in the following sections. Refer to Figure D1-1 for the location of these areas, and engineering design information is provided in Appendix D-1, Engineering Designs.

D2.1 Description of Containers

WAC 173-303-160(2), 190, 395(6), 630(2), 630(3), 630(4), 630(5), 692,

D2.1.1 The facility receives DW in labeled US DOT approved containers, appropriate for the material being shipped (in accordance with 49 CFR 172.101) that are visually examined for structural integrity and leakage prior to acceptance.

D2.1.2 Wastes are stored in the containers in which they are received unless the container is damaged or leaking. The condition of containers in storage is assessed during the inspections described in Section F2.2, General Inspection Requirements.

D2.1.3 Any containers showing evidence of leakage or damage are placed in overpack containers, processed immediately, or the waste is transferred into a container in acceptable condition as described in Section G4, Emergency Response Procedures. As required by the DOT in 49 CFR 173.204(a)(2) the facility certifies on each manifest that containers are in proper shipping condition prior to transporting containers.

D2.1.4 Containers of waste will remain securely closed and sealed except when adding to, removing from, inspecting, or sampling the waste. DW containers will not have accumulation of waste on their sides or tops.

D2.1.5 Containers subject to Level 1 and Level 2 air emission requirements of WAC 173-303-692(2) [40 CFR 264.1086(c) and (d)] are discussed in Appendix D-10, Air Quality Program.

D2.1.6 Containers of waste whether received from an off-site facility or consolidated on-site, are marked and labeled at the point of generation to identify the major risk(s) associated with the contents of the container. Upon acceptance, Stericycle ensures that containers of DW received from off-site are labeled to identify the major risk(s) associated with their contents, as required by WAC 173-303-630(3). Washington State only dangerous wastes will be labeled in accordance with WAC 173-303-190(5).

D2.1.6.1 A container received at the Kent facility without appropriate labeling will be properly labeled or marked as required in WAC 173-303-630(3) during

verification as outlined in Section C. Washington State only dangerous wastes will be labeled in accordance with WAC 173-303-190(5).

D2.1.6.2 All labels placed by the facility are printed with waterproof ink and placed on the container's side to ensure that it is visible for inspection.

D2.1.6.3 Section F.2 describes the inspection procedures for ensuring that containers are properly labeled. Labels found to be obscured, illegible or peeling off are replaced or reattached.

D2.1.6.4 Additionally, containerized wastes have a unique tracking number that is printed on a label. The label has the date in which the container was placed in storage and is affixed to the container for recordkeeping purposes. Waste tracking procedures are described in Section C8.12.

D2.1.7 Prior to being shipped off-site, containers of waste are marked and labeled in accordance with WAC 173-303-190(2) and (3) and 49 CFR 172. Washington State only dangerous wastes are marked and labeled in accordance with WAC 173-303-190(5).

D2.1.8 Drum or bulk containers emptied during processing or off-loading are inspected by environmental technicians assigned to the emptying or off-loading process to ensure containers are empty as specified in WAC 173-303-160(2).

D2.1.8.1 DW labels will be removed or destroyed as soon as a container is rendered empty per WAC 173-303-160(2). Labels or placards are removed or otherwise obscured to assure that previous identification information is no longer visible.

D2.1.8.2 Empty containers destined for off-site reconditioning or salvage plants are again checked by facility personnel during loading to ensure that all labels have been properly removed.

D2.1.8.3 Containers that previously held acutely hazardous waste, 'P'-listed waste, or Washington State extremely hazardous waste (EHW) are decontaminated in accordance with the requirements of WAC 173-303-160(2)(b) (i.e., "triple rinsing").

Rinsate generated from the decontamination process will be treated on-site through the DW Wastewater Treatment System or sent off-site for final disposal.

D2.2 Container Management Practices

WAC 173-303-190(2), (3), 340(3), 370(4), (5), 395(4), 630(5), and 806(4)(b)

This section describes safe management practices for moving, stacking, and storing containerized wastes.

D2.2.1 Stacking Patterns

D2.2.1.1 Container stacking takes place in the TSCA/DW Area.

D2.2.1.2 Containers are stacked according to Figures D1-2, D1-6(a) and D1-6(b) to maximize the stability of the stack.

D2.2.1.3 A minimum 30-inch aisle space must be provided between each row to facilitate inspection. At a minimum, containers will be stacked 30-inches from any emergency equipment, and all stacking arrangements will allow free access to emergency equipment.

D2.2.1.4 All containers, whether holding DW or not, are considered full and are counted toward the total capacity limit in storage and staging areas.

D2.2.1.5 DW containers will be oriented to allow inspection of the labels required per 173-303-190(2) and (3) and the unique tracking number.

D2.2.1.6 Wastes received are grouped based on DOT hazardous materials classifications and are segregated according to Section D2.2.2.4.

D2.2.2 Safe Management Practices for Moving, Transferring, Staging, and Storing

D2.2.2.1 Containers of waste arrive at the facility on flat-bed trucks and vans and are loaded/unloaded by facility employees, using a forklift with a drum handling attachment or a drum dolly. Vehicles are parked at the South Dock for container loading and off-loading.

D2.2.2.2 Staging, storing, and processing of waste in containers is not permitted in load/unload-only areas (i.e., the South Dock). These areas are only used to facilitate the movement of containers in and out of the facility. Loading/unloading operations will only occur in areas constructed of concrete that are designed and maintained to meet the requirements of WAC 173-303-395(4).

D2.2.2.3 After off-loading, containers are placed in the TSCA/DW Area. Waste check-in and discrepancy procedures are discussed further in Section C7, Incoming Waste Procedures. All discrepancies are managed as described in Appendix C-4, Problem Manifest Procedure and in accordance with WAC 173-303-370(4) and WAC 173-303-370(5), as applicable.

D2.2.2.4 After the contents of incoming waste have been verified, the containers are stored in a manner that complies with Table D1-2, Segregation for Hazardous Materials, Table D1-3, Container Management Areas Operating Limits, and Figures D1-2, D1-6(a), and D1-6(b).

D2.2.2.4.1 Container operations are managed in accordance with Table D1-3, which specifies the duration, capacities, and processing capability of each container management area at the facility.

D2.2.2.5 General vehicle traffic patterns are shown in Figure D1-15. Forklift routes for transferring containers to and from the container management areas are shown in Figure D1-16. The containers are transferred by forklift and stacked on top of or next to existing containers already in the storage area. The forklift sets the containers down and backs away. The forklift attachment automatically releases the containers, where they are securely rested. The forklift then returns and repeats the process as necessary.

D2.2.2.6 The forklift drum-handling attachment is designed to safely transport two containers at a time without creating unnecessary stress or strain on the containers. This handling method guards against container ruptures and leaks. Drum dollies are also used for safely moving containers within the facility. Forklift operators and facility operators receive training in the proper handling of forklifts and containers. Forklift operators are required to yield to truck and pedestrian traffic within the facility.

D2.2.2.7 Container management practices to prevent spills, air emissions, and leakage include keeping containers closed, except when adding, removing, inspecting, or sampling waste, and using the appropriate tools when opening containers in accordance with WAC 173-303-692(2) [40 CFR 264 40 CFR 264.1086(c) and (d)]. See Section 3.3 of Appendix D-10 for more specific information.

D2.2.2.7.1 Plant employees that open containers are also responsible for properly closing the containers. All fastening devices (e.g., bungs, rings, etc.) are secured when properly closing a container.

D2.2.2.7.2 Containers are inspected during unloading for signs of leakage and for proper closure of lids. The containers are also inspected and observed during routine operations, as described in Section F2.2.

D2.2.3 Load/Unload Only Areas

The South Dock and North Truck Load/Unload Areas are used for vehicle loading and unloading only (i.e., no staging, storage or processing). Containers may be briefly placed on the apron of these areas during active loading or unloading of the transport vehicle. Transport vehicles are parked in areas meeting the requirements in WAC 173-303-395(4), which are constructed of concrete and sloped to blind sumps that collect accumulated liquids, and are coated with a chemically resistant coating as specified in Appendix D-2. Precipitation collected in the vehicle parking area is pumped to the wastewater treatment system.

D2.2.3.1 South Dock

The South Dock is the main load/unload area of the facility. As described in Table D1-3, inbound and outbound vehicles may be placed in this area for up to 24 hours. The maximum capacity of this area is 30,000 gallons, which represents six fully loaded vans[1].

[1] *A van is an enclosed, flatbed trailer used to transport containerized materials. In this section, a van is assumed to be fully loaded with 88 55-gal equivalent containers.*

D2.2.3.2 North Truck Load/Unload Area

D2.2.3.2.1 The North Truck Load/Unload Area is used to load and unload trucks containing both DW and non-DW bulk liquids to/from the DW and non-DW wastewater treatment systems.

D2.2.3.2.2 The construction of the foundation is in accordance with ACI 350 specifications, and includes water stops at construction joints, and a blind sump coated with a chemically resistant coating as specified in Appendix D-2. The area meets the standards of WAC 173-303-395(4).

D2.2.3.2.3 All portions of the vehicle that pose a potential for release of DW (i.e., all valves, hoses, pumps, and active connections) will be within secondary containment. Procedures for safe waste transfers from this area are described in Section D3.3.1, Tank System Transfer Operations.

D2.2.3.2.4 Bulk loads are stored according to requirements in Figure D1-13.

D2.2.4 Container Storage / Processing Areas

The areas described below are used for container storage and processing activities. The requirements outlined in Sections D2.2.5.1 through D2.2.5.5 above apply to these areas.

Consolidation of DW materials may be conducted in the TSCA/DW Area. This is solely performed for the purpose of reducing waste void spaces in containers and minimizing the volumes of waste that are stored on-site and shipped from the facility. Consolidation is performed manually by placing smaller volume liquids or solids in to larger packaging containers.

Loose packs are also a collection of smaller individual containers (typically 5-gallon cans or less) that are placed inside a larger DOT approved container (usually a 55 or 85-gallon open top drum or cubic yard box). However, unlike lab packs, the inner containers of a loose pack are all of the same type (e.g., ballast, equipment, debris, etc.). They usually are assembled at a household collection event or at a large retail

store. Containers are packed and secured tightly within the shipping container to prevent the inner containers from moving or opening during transportation. Loose packs differ from lab packs in that they do not meet the standards of WAC 173-303-161 for overpack containers and do not have absorbent material or a detailed inventory list of contents. Since the individual inner containers are all of the same type in loose packs, the outer waste or marker provides the necessary content information to manage the waste, which includes the proper DOT shipping name and treatment or disposal options. Loose packs are only packed and depacked in the TSCA/DW Area, subject to the limitations in Sections D2.2.4.1.

D2.2.4.1 TSCA/DW Area

D2.2.4.1.1 The TSCA/DW Area is located inside the main warehouse, and is used to manage TSCA-regulated PCBs. TSCA-regulated activities in this area are governed by a commercial storage permit issued by EPA Region 10.

D2.2.4.1.2 Containers may be stacked in rows three-high and two-wide with 30 inch aisle spacing between rows, and are stored in accordance with the requirements in Figure D1-2.

D2.2.4.1.3 Only TSCA or TSCA/DW is allowed to be stored or processed in this area.

D2.2.4.1.4 The storage area has a coated concrete floor and berms on four sides to provide adequate secondary containment as demonstrated in Appendix D-3. Secondary containment for this area is in accordance with the design standards in 40 CFR, Section 761.65 for TSCA wastes.

D2.2.4.1.5 TSCA operations include check-in, container storage, PCB fluid draining, consolidation, flushing, and decontamination.

D2.2.4.1.6 TSCA/DW containers are off-loaded from the South Dock and taken directly to the TSCA/DW Area to be checked-in.

D2.2.4.1.7 PCB-liquids may be drained from equipment and consolidated with other PCB-liquids prior to shipment off-site. Consolidation of all

TSCA/DW is performed over portable containment trays to contain materials that potentially could spill during transfers. Consolidation is performed manually without mechanical forces. There are no air controls in this area, but materials containing volatile organic compounds will be managed in compliance with WAC 173-303-692 [40 CFR 264.1086(c) and (d)]. No incompatible wastes will be stored or processed in a common containment tray.

D2.2.4.1.8 All TSCA regulated materials are sent off-site to a TSCA permitted facility for final disposal.

D2.2.4.1.9 On occasion, TSCA/DW combined waste is received at the facility. TSCA/DW materials with free liquids must be placed on secondary containment trays that meet the requirements of WAC 173-303-630(7) or placed in overpack containers. No incompatible wastes will be stored or processed in a common containment tray. Containment tray information can be found in Appendix D-2. TSCA/DW materials without free liquids do not require containment trays and may be consolidated for the sole purpose of reducing void spaces in containers prior to shipping. Containment trays are inspected as required in Appendix F-1, Inspection Forms. Combined TSCA/DW waste subject to Subpart CC requirements will be managed in accordance with Appendix D-10.

D2.3 Secondary Containment System Design and Operation

WAC 173-303-806(4)(a)(vii), (4)(b)(i)(A),(B),(C),(D),&(E), 395(4), 630(7)(a)(i),(ii),& (iii) and 630(7)(b

This section provides design and construction information which demonstrates that the container storage areas are capable of adequately containing precipitation (outdoor storage) and/or leakage from containers. Operational information demonstrating that containers are kept from contact with standing liquids and are properly stored and maintained is also provided.

D2.3.1 Design and Construction of Base

WAC 173-303-630(7)(a)(i), 806(4)(b)(i)(A)

Engineering design drawings (plans, sections, and details) for the container storage containment structures are provided in Appendix D-1.

D2.3.1.1 The TSCA/DW secondary containment structure is designed according to the standards of the American Concrete Institute's (ACI) "Concrete Sanitary Engineering Structures" (ACI 350-83). The structure is constructed of concrete, and reinforcement is provided by a double layer of tied rebar. The design is adequate to support the load imposed on the concrete from the storage of containers. The containment area is coated with a chemically resistant coating material, and construction joints are sealed with a chemically compatible sealant.

D2.3.1.2 Material specifications and supporting documents for sealant and and coating products are included in Appendix D-2. If scheduled inspections of the containment area indicates coating deterioration, new coatings of equivalent or superior resistance and durability properties will be reapplied per manufacturers' instructions.

D2.3.1.3 The integrity of the containment system for the TSCA/DW Area described in Section D2.2.4.1 will be maintained. As outlined in Section F, the containment system ise inspected weekly and semi-annually to determine that structural integrity is unchanged. The floor, joints, coating and curbing are visually examined for signs of deterioration or cracks. All cracks, gaps, loss of integrity, deterioration, corrosion, or erosion of the containment system will be repaired. All cracks are filled with an appropriate grouting material as specified in the construction specifications. Containment systems will be maintained free of cracks and gaps. Example inspection forms for the containment system are included in Appendix F-1. Completed forms are maintained on-file in the facility operating record.

D2.3.2 Containment System Capacity and Drainage Control

WAC 173-303-806(4)(b)(i)(A),(B),(C),(D),&(E), 630(7)(a)(i),(ii), & (iii), 630(7)(b)

D2.3.2.1 The secondary containment system is inspected daily for leakage as described in Section F2.2, General Inspection Requirements. Any material identified as a spill will be immediately cleaned up.

D2.3.2.2 Accumulated uncontaminated washwater in the containment area will be removed and directed to an appropriate storage or treatment vessel. These accumulated liquids will be processed through the wastewater treatment system, or sent off-site for treatment and/or disposal if necessary.

D2.3.2.3 Accumulated waste liquids and contaminated washwater in the containment area are pumped into an empty labeled container(s), tank, or tanker truck depending on the quantity and type of liquid collected. This material is then stored in the container(s) or tank within a compatible storage compartment and treated, or sent off-site to a facility permitted to accept the waste.

D2.3.2.4 Summary of Indoor Container Storage Capacity

D2.3.2.4.1 Indoor secondary containment systems must provide adequate capacity to contain 100% of the volume of the largest container stored or 10% of the volume of all containers storing DW regulated free liquids whichever is greater. For storage of TSCA regulated waste, containment system must also meet the requirements in 40 CFR, Section 761.65. Since rainwater does not reach indoor storage areas, containment capacity need not be provided for accumulation of rainwater.

D2.3.2.4.2 The maximum number of 55-gallon containers (or equivalent volume) which can be stored indoors is as follows:

TSCA/DW Area	9,900 gallons	(e.g. 180 55-gallon containers)

D2.4 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Containers

40 CFR 270.15(c),(d), 264.17, 264.176, & 264.177
WAC 173-303-806(4)(b)(iv),& (v), 380(1)(c), 395(1), 630(8)(a),(b), 630(9)

This section describes the practices and procedures implemented at the Kent Facility to prevent a reaction of ignitable, reactive, and incompatible waste in containers.

D2.4.1 Ignitable and Reactive Wastes

Ignitable and reactive wastes specified in the Part A (see Section A) are accepted for storage/processing in containers at the facility. Waste characteristics are identified and documented through customer (generator) analyses and waste acceptance procedures as described in Section C, Waste Analysis Plan.

D2.4.1.1 Reactive wastes exhibiting the characteristics identified for explosives in WAC 173-303-090(7)(a)(vi), (vii) and (viii) are specifically restricted from storage or treatment at the facility as stated in Section C5.5, Prohibited Wastes. Reactive wastes identified in WAC 173-303-090(7)(a)(i)-(v) are consolidated in the TSCA/DW Area and stored for shipment off-site.

D2.4.1.2 Per WAC 173-303-395(1)(a), ignitable and reactive wastes are separated and protected from sources of ignition or reaction including, but not limited to open flames, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. No hot work is allowed within 50 feet of any areas where ignitable or reactive wastes are present unless a second employee is providing fire watch by standing ready with a compatible fire extinguisher in accordance with 29 CFR 1519.504 OSHA requirements. Smoking is prohibited in storage and operating areas within the active facility. Wherever a hazard exists from ignitable or reactive wastes, "Danger - No Smoking, No Open Flames" signs are posted prominently.

D2.4.1.3 Ignitable and reactive wastes are stored with compatible wastes in segregated secondary containment systems, as outlined in Tables D1-2 and D1-3. Section F3, Preparedness and Prevention Measures, discusses procedures to prevent generation of extreme heat or pressure, fire, explosion, or violent reaction, uncontrolled mists, fumes, or gases, and to prevent structural damage to the storage area from storage of ignitable or reactive wastes.

D2.4.2 Incompatible Wastes

Container storage operations and the following procedures are designed to prevent the simultaneous storage of incompatible wastes within the same containment system.

D2.4.2.1 Compatible Packaging

The facility will ensure that all containers used for DW management are made of or lined with materials which will not react with or are otherwise compatible with the DW to be stored.

D2.4.2.2 Clean Containers

The facility will not place DW in an unwashed container that previously held an incompatible waste or material. The only time an unwashed container will be used is at the same time compatible wastes are being processed and labels are still on all containers (e.g., when numerous containers of compatible wastes are pumped up, the residual solids may be consolidated into one or more containers).

D2.4.2.3 Clean Equipment

The facility will ensure that all dedicated and non-dedicated equipment used for transfer of DW to and from containers is compatible with the wastes and is decontaminated before it is used for the transfer of incompatible wastes as defined in WAC 173-303-395(1)(b).

D2.4.2.4 Separation of Incompatibles

D2.4.2.4.1 Containerized wastes and other materials that are incompatible shall be separated in accordance with the requirements outlined in Tables D1-2 and D1-3.

D2.4.2.4.1.1 Incompatible materials shall not be stored, processed or staged within the same secondary containment area; and

D2.4.2.4.1.2 Incompatible materials in lab packs shall be assembled in compliance with Department of Transportation compatibility requirements and WAC 173-303-161.

D2.4.2.5 Consolidation of containerized wastes is only performed on compatible wastes. Incompatible wastes are not mixed. The compatibility of wastes is determined by the compatibility procedures described in Section C8.5, Mandatory Verification Analyses.

D2.4.3 Ten-Day / 24-Hour Transfer Operations

WAC 173-303-240(6)

The Kent Facility operates a Ten-Day Transfer Facility located on the 3-acre parcel west of the main operating facility, as shown in Figure D1-1.

The Ten-Day Transfer Facility is used for parking of waste loads that are not manifested to or from the Kent facility. These shipments must continue in their course of transportation within 10 days of arrival in the Ten-Day Transfer Facility.

The South Dock and adjacent two southernmost stalls are specific to the management of inbound and outbound loads that are manifested to or from the Kent facility. This area is identified as the 24-Hour Inbound/Outbound Area as shown on Figure D1-3. Signage will be used to clearly distinguish this area from the Ten-Day Transfer Facility.

Inbound DW loads that are manifested to the facility must park in the 24-Hour Inbound Area and must be received and checked-in within 24-hours of arrival at the facility. The load's arrival time is recorded on the drop sheet to document compliance with the 24-hour limit. For inbound "live offloads" the load's arrival time is time stamped on the manifest(s). A time stamp is then placed on the piece count verification form when the load is offloaded to document compliance with the 24-hour limit.

Outbound DW loads that are generated by the Kent facility must park in the 24-Hour Outbound Area and must be shipped offsite within 24 hours of being parked in this area. Time stamps on the drop sheet are used to document compliance with the 24-hour limit.

D3 TANK SYSTEMS

WAC 173-303-395, 640, 806(4)(c)

This section provides all necessary tank design, construction, and operational information to adequately assess the suitability of DW tanks for their designated usages. There are three tanks in DW service at the Kent Facility: T-9A, T-9B, and T-9C. Specific tank information is provided in Table D2-1, DW Tank Uses and Materials of Construction and Table D2-2, DW Tank Design Information. All other tanks at the facility are non-DW tanks. Figure D1-1 shows the locations of these tank systems.

D3.1 Design Specifications and Structural Integrity of Tanks

WAC 173-303-640(2)(a)(c)(e),& (3)(a)(b), 806(4)(c)(i),(ii), (iii), iv, (v), & vii.

D3.1.1 Tank design and operating information is provided on the Tank Data Sheets in Appendix D-5. These sheets also specify the intended use of the tank and the type of waste stored within it. The maximum capacity of each DW tank is equal to the working volume in Table D2-2. DW tanks are not permitted to manage DW in excess of the listed working capacities. More specific information on waste characteristics for the wastes stored within tanks is provided in Section C, Waste Analysis Plan.

D3.1.2 In compliance with the requirements of WAC 173-303-640(2), all DW tanks undergo tank integrity assessments. These assessments determine that the tank is adequately designed and has sufficient structural strength and compatibility with the waste to be stored or treated to ensure that it will not collapse, rupture, or fail. Tank assessments are certified by an independent, qualified, registered professional engineer. A schedule for periodic integrity assessments over the life of the tank is described in Section F2.4, Tank Condition Assessment. Refer to Section D3.1.6, Tank Integrity Assessments, for more information.

D3.1.3 Tanks at the Kent Facility are all designed to accepted industry standards. Tank foundations have been designed in accordance with the applicable building codes. Welded tanks meet American Petroleum Institute (API) 650 design standards.

D3.1.4 Tank design drawings are provided in Appendix D-1 and tank certifications are provided in Appendix D-4. Appendix D-5 provides additional information on the material of construction, types of coating used (if applicable), and tank processes. Seismic information is provided in Appendix D-8. Additionally, tanks subject to the air emission requirements of WAC 173-303-692 are discussed in Appendix D-10.

D3.1.5 The secondary containment structures for the DW tanks are sloped to facilitate drainage. Tanks are provided with sufficient base anchorage designed to resist sliding or overturning due to wind or seismic loads. Design details for the DW tank foundations are shown in Appendix D-1.

D3.1.6 Tank Integrity Assessments

WAC 173-303-640(2) and (7)

D3.1.6.1 Tank integrity assessments are conducted to determine that the tank systems as designed and constructed have sufficient structural strength and compatibility with the waste(s) so that it will not collapse, rupture, or fail. The assessments are reviewed and certified by an independent, qualified registered professional engineer. A copy of the written assessment is on file at the facility.

D3.1.6.2 The tank integrity assessments for tank systems consider the design standards to which the tank systems are constructed and the design standards used to evaluate for certification.

D3.1.6.3 The tank integrity assessment provides for an evaluation of the following items:

D3.1.6.3.1 the dangerous characteristics of the wastes that have been or will be handled in the tank system,

D3.1.6.3.2 the existing measures for the control of corrosion in tank systems,

D3.1.6.3.3 the documented age of the tank system,

D3.1.6.3.4 design drawings,

D3.1.6.3.5 the results from either a leak test, internal inspection, or other tank system integrity examination that addresses cracks, leaks, corrosion, and erosion; and

D3.1.6.3.6 tank wall thickness

D3.1.6.4 DW tanks are certified by an independent qualified registered professional engineer after a thorough integrity examination. This integrity examination consists of both internal and external inspections. All surfaces and welds are inspected for cracks, leaks, corrosion, erosion and general condition. The results of these internal inspections are written in the integrity assessment.

D3.1.6.5 External inspections of the tanks include visual inspection of tank shells and welds for cracks, leaks, corrosion, erosion, and general condition. Ultrasonic thickness measurements are taken from the top, sides and bottom of all tanks. Tank support structures are inspected for cracks, corrosion, and weld conditions. The results of these external tests are documented in the tank integrity assessment.

D3.1.6.6 Leak testing for ancillary equipment is performed in accordance with ANSI B31-1, ANSI B31-3 for piping, or other nationally recognized standards.

D3.1.6.7 Tanks and ancillary equipment found to be leaking or unfit for use are removed from service and either repaired, replaced or taken out-of-service. Procedures and requirements in WAC 173-303-640(7) will be followed. Repairs are certified pursuant to WAC 173-303-640(7)(f). Leaks are subject to the reporting requirements of WAC 173-303-640(7)(d). Tanks, equipment, and/or containment structures taken out-of-service will undergo closure per the requirements in Section I.

D3.1.6.8 Section F2.4, Tank Condition Assessment, provides a schedule for continuing integrity assessments based on materials of construction and characteristics of waste(s) handled over the life of the tank. Tank integrity certifications for tanks are presented in Appendix D-4.

D3.2 Secondary Containment Systems for Tanks

WAC 173-303-640(4)(b),(d),& (e), 806(4)(c)(vii)

The DW tank secondary containment system is designed, installed, and operated to prevent any waste or accumulated liquid from entering the soil, groundwater, or surface water at any time during use of the tank system. The containment system is capable of collecting releases and accumulated liquids until the collected material can be removed.

This section also provides design and construction information on the structural integrity of tank system bases and information on their ability to prevent migration of wastes or accumulated liquid. Secondary containment structures have been designed in accordance with the recommendations of soil study provided in Appendix D-6 and storm drainage information in Appendix D-7. Secondary containment structures are inspected per the requirements outlined in Section F (including an in-depth integrity inspection by an engineer every six months.)

D3.2.1 Design and Construction of Base

WAC 173-303 640(4)(c),(d),& (e)

D3.2.1.1 Each tank system base and secondary containment system is constructed of, coated, or lined with materials having sufficient strength, thickness, and resistance to prevent failure due to pressure gradients, physical contact with wastes, climatic conditions, and the stress of daily operations. Containment structures are placed on a base that is capable of providing support, resisting pressure gradients above and below the system, and preventing failure due to settlement, compression, and uplift.

D3.2.1.2 In accordance with 40 CFR 264.193(e)(1) and WAC 640(4)(e), outdoor tank secondary containment systems are designed and operated to contain the precipitation from a 25-year/24-hour rainfall event, where applicable. Tank secondary containment systems are also designed and installed to prevent migration of wastes. Facility stormwater piping is shown in Figure D1-14.

D3.2.1.3 The DW tank system secondary containment structures consist of impermeable concrete foundations sloped to collection sumps that are coated with a

chemically resistant coating system as specified in Appendix D-2.. The secondary containment structures are built in accordance with the engineering design drawings and specifications in Appendix D-1. Construction and installation of the tank foundation was performed in accordance with standard ACI specifications.

D3.2.1.4 Impermeability of concrete containment for the DW tank system at the facility is achieved by joint sealants and coatings as shown in the back of Appendix D-2, Addendum A, DW Wastewater Containment Area Upgrades and Maintenance Plan. The interior of tank secondary containment surfaces are coated with chemical resistant coating and joints are filled with a chemically resistant elastomeric sealant compatible with appropriate for the wastes stored in that area. Appendix D-2, Addendum A, provides manufacturers' technical data for concrete coating and sealant products used in this area.

D3.2.2 Containment System Capacity and Drainage Control

WAC 173-303-640(4)(c)(iii),& (iv), 806(4)(c)(ix)

D3.2.2.1 The DW tank secondary containment system is designed to contain 100 percent of the volume of the largest tank. The containment system is also capable of containing precipitation from a 25-year/24-hour storm event. The supporting calculations for the containment system design volumes are in Appendix D-3.

D3.2.2.2 The berm height in the tank system is sufficient to prevent run-on from a 25-year/24-hour storm. Secondary containment capacity for run-on is therefore not provided. This is demonstrated in the storm drainage study in Appendix D-7.

D3.2.2.3 Per Section F, the secondary containment area sump is inspected daily. Sump contents are removed as discussed in Section D3.3, Tank Operations and Management Practices. The sump location is shown in Appendix D-3. Design information for the sump is provided in Table D2-3, Design Information for DW Tank System Sump.

D3.2.2.4 The sump and secondary containment system is designed to have adequate structural integrity. The system is designed to have sufficient strength and

thickness to prevent failure caused by contact with the waste, pressure gradients, climatic conditions, and the stress of daily operations.

D3.3 Tank Operations and Management Practices

WAC 173-303-806(4)(c)(iii),(iv) & (ix), 395, 640(5)(b),(d)&(e), 9,10&11,691,692

This section describes tank operations and management practices associated with the storage, transfer, and treatment of DW. The procedures and equipment used to prevent overfilling of tanks and accidental spills are described. Treatment processes and activities are discussed in detail. Sump operation and management practices are also described.

D3.3.1 Tank System Transfer Operations

D3.3.1.1 Tanks receive DW and non-DW from tanker trucks. Sound operating practices are followed to prevent spills, fires, or explosions during loading and unloading (See Section F).

D3.3.1.2 All DW loading and unloading activities will be conducted within approved DW secondary containment identified in Table D1-3.

D3.3.1.2.1 Transferring of waste from tanks to containers will only occur within the DW tank secondary containment system when tank cleaning for maintenance or inspection purposes is necessary. Figure D2-1, DW Management in Wastewater Tanks, illustrates the processing of waste materials through the tank system.

D3.3.1.3 Liquid transfers between tanks at the Kent Facility are performed using pumps, hoses, and/or piping. Camlock fittings on hoses secure the connection between pumps, pipes, and tanks. Bungee cords are used as an additional security measure to ensure camlocks do not release during transfer operations. Buckets are used under connection points to collect drips when hoses are disconnected.

D3.3.1.3.1 Prior to using transferring equipment, hoses, pipes, valves, and pumps are checked for damage or deterioration. These items are inspected per the

inspection schedule in Table F2-3, Operational Equipment: Inspection Schedule. Tanker trucks containing DW are loaded/unloaded in DW secondary containment.

D3.3.1.3.2 To ensure liquids are not released outside the DW tank secondary containment area, loading and unloading only occurs in the adjacent North Truck Load/Unload Area. Steel piping is provided to transfer treated wastewater from the DW tank containment area to the POTW discharge location. All DW wastewater transfer piping is located within a secondary containment system.

D3.3.1.4 During loading/unloading a truck, the truck driver and at least one designated Kent facility wastewater technician are present. The driver ensures that the parking brake is set securely. The driver never leaves the vehicle unattended and does not remain in the vehicle during transfer. The wastewater technician is instructed in proper transfer procedures and is alerted to potential problems (overfilling, leaks, spills, vapor, or liquid explosions, fire, etc.). The driver and plant employee are instructed to remain alert and aware of operations at all times during the waste transfer process.

D3.3.1.5 In addition to sound operating procedures for preventing overfilling of tanks and spillage during transfers, tanks are equipped with chain-float gauge boards, as shown in Appendix D-9. Gauges are continually monitored by facility wastewater technician during transfers to ensure tanks are not overfilled.

D3.3.2 Dangerous Waste Management in Tanks

WAC 173-303-640 (11), 691, 692, 806(4)(c)(iv)

D3.3.2.1 Tanks in which DW are stored and treated include T-9A, T-9B, and T-9C. DW tank treatment processes are described in Section D3.3.2.9. Analytical procedures utilized during treatment processes are identified in Table C2-2, Waste Analysis Summary. Figure D2-1 illustrates the process flow of DW in tanks at the facility.

D3.3.2.2 The wastewater treatment system at the facility is regulated under 40 CFR 437, Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards for the Centralized Waste Treatment Point Source Category.

Centralized Waste Treatment (CWT) standards apply to all stand-alone wastewater treatment facilities that receive hazardous and non hazardous wastewater from off-site for treatment and discharge.

D3.3.2.2.1 The CWT rule identifies three different categories of wastewaters: Subpart A (metal bearing wastewaters), Subcategory B (oily wastewaters), and Subcategory C (organic wastewaters). The Kent Facility is permitted by King County's Industrial Waste Program to manage two CWT regulated wastewater subcategories: Subcategory B (oily wastewaters) and Subcategory C (organic wastewaters).

D3.3.2.2.2 Refer to Appendix D-11 for a complete listing of types of wastewaters that are received at the facility.

D3.3.2.3 The DW tanks treat and store wastewaters that could potentially contain greater than 500 ppm VOC and ten percent organic compounds, and therefore are subject to WAC 173-303-691 (40 CFR 264 Subpart BB) and WAC 173-303-692 (40 CFR 264 Subpart CC). Waste alkaline, acid, and oxidizer liquids are not accepted for treatment and/or storage in tanks in this area. A plan view of the DW Wastewater Treatment System is located in Figure D2-2.

D3.3.2.4 Tanks managing DW wastewaters are located in a segregated concrete containment area protected with a chemical compatible coating. Concrete construction joints are sealed with an elastomeric joint compound. Tanks are assessed and maintained for DW service as described in Section D3.1.6. The DW tank secondary containment system was not constructed with waterstops at the construction joints, and is therefore subject to additional inspection requirements. The inspection requirements of this area are detailed in Section F2.3.1.4, Table F2-5, and Appendix F-1.

D3.3.2.5 DW wastewaters are sampled, treated, and discharged on a batch basis at the facility. Samples are taken from inbound containers and verified for contents as described in Section C7, Incoming Waste Procedures.

D3.3.2.6 DW wastewaters managed in these tanks are not commingled with non-DW wastewaters outside of the DW tank secondary containment area. DW wastewaters must meet the federal pretreatment standards for existing sources (PSES)

in 40 CFR 437 as well as local limits stated in the King County Wastewater Discharge Permit prior to discharge.

D3.3.2.7 All wastes generated from water treatment processing are profiled, analyzed, and disposed of according to their chemical characteristics and physical properties as described in Section C8.11, Process Generated Wastes.

D3.3.2.8 Figure D2-1 is a process flow diagram illustrating this operation. Table D2-1 provides tank uses and materials of construction information. Table D2-2 details design information for DW tanks at the facility. Specifications and operating parameters for conservation vents on tanks are located in Appendix D-2.

D3.3.2.9 Detailed process descriptions for DW treatment in tanks is presented below:

D3.3.2.9.1 Carbon Adsorption (DW Tanks)

Carbon adsorption is a stripping process utilizing the surface adsorptive characteristics of activated carbon for organic molecules. Carbon adsorption is used in both the DW and non DW wastewater treatment systems to remove trace organics from wastewater. The DW carbon units are separate from the non DW carbon units, and are housed within the DW Tank secondary containment area. DW carbon is managed separately from non DW carbon.

D3.3.2.9.2 Chemical Oxidation (DW Tanks)

Chemical oxidation refers to a reaction in which a substance loses electrons (is oxidized) by action of an oxidizing agent which gains electrons (is reduced). Oxidation and reduction reactions always occur simultaneously. Oxidation is useful in breaking down chelating agents, phenolic compounds and emulsions. Heat may be used to augment the oxidation process. The facility may use a variety of agents, such as bleach or hydrogen peroxide, to carry out chemical oxidation.

D3.3.2.9.3 Chemical Precipitation (DW Tanks)

Chemical precipitation is applied to metal-containing wastes to chemically convert metal compounds from a soluble to an insoluble form and then to remove the precipitate by settling and decanting. This process is aided by flocculation. The term chemical

precipitation refers to both the primary step of forming chemical precipitate and follow-up operations that separate the solid precipitate from the liquid.

The general process chemistry for hydroxide precipitation used at the facility for metal precipitation is as follows:

$M^{n+} + nOH^{-} \Rightarrow M(OH)_n$ (precipitate)

Some of the precipitating agents that could be used include: sodium hydroxide, calcium hydroxide, magnesium hydroxide, and magnesium oxide. For example:

$Cu^{2+} + 2NaOH \Rightarrow 2Na^{+} + Cu(OH)_2$ (precipitate)

$Cu^{2+} + Ca(OH)_2 \Rightarrow Ca^{2+} + Cu(OH)_2$ (precipitate)

$Cu^{2+} + Mg(OH)_2 \Rightarrow Mg^{2+} + Cu(OH)_2$ (precipitate)

$Cu^{2+} + MgO + H_2O \Rightarrow Mg^{2+} + Cu(OH)_2$ (precipitate)

Other chemicals may be used based on the particular constituents of the wastestream being treated.

D3.3.2.9.4 Chemical Reduction (DW Tanks)

Chemical reduction is a process which is used at the facility for converting hexavalent chromium (Cr^{+6}) to trivalent chromium (Cr^{+3}) by addition of a reducing agent. The primary reducing agents used are sodium bisulfite ($NaHSO_3$) or sodium metabisulfite ($Na_2S_2O_5$). Other reducing agents, such as sodium borohydride, sulfur dioxide, ferrous sulfate, and sodium thiosulfate may also be used.

Chemical reduction is also used to destroy strong oxidizing materials such as chlorates, perchlorates, persulfates, inorganic and organic peroxides, nitrates and hypochlorites.

Sodium bisulfite reacts with water to form sulfurous acid (H_2SO_3):

$$NaHSO_3 + H_2O \Rightarrow H_2SO_3 + NaOH$$

The sulfurous acid reduces chromium (Cr^{+6}):

$$2H_2CrO_4 + 3H_2SO_3 \Rightarrow Cr_2(SO_4)_3 + 5H_2O$$

The theoretical amount of sulfurous acid required to reduce a given amount of chromium can be calculated from this equation. The optimum efficiency of chromium reduction occurs at pH 2 to 3 with agitation of the mixture. Chromium (Cr^{+3}) has a low solubility at a high pH, and can be precipitated as chromic hydroxide by the addition of sodium hydroxide or calcium hydroxide (lime).

D3.3.2.9.5 Coagulation (DW Tanks)

Coagulation is the transformation of a liquid into a semi-solid or solid mass. This is usually catalyzed using polymers and serves as another separation technology. Coagulation is used primarily for treatment of the heavy metals prior to sewer discharge.

D3.3.2.9.6 Cyanide Destruction (DW Tanks)

Cyanide destruction through alkaline chlorination is a well established technology for the destruction of simple cyanide compounds. In wastewater, cyanide usually exists as CN^- and HCN, or in the form of metal cyanate complexes, most commonly ferrocyanide, Fe of HCN, is pH dependent. For instance, at pH 7.0 and below, all of the cyanide reduces to $[Fe(CN)_6]^{-4}$ or ferricyanide $[Fe(CN)_6]^{-3}$.

The ionization exists as HCN. At pH 11.5 and above, all of the cyanide exists as CN^-. Cyanide removal is achieved by raising the pH of the wastewater and dosing with chlorine or an oxidizing agent. In an alkaline environment (pH >10), cyanide is oxidized to cyanate according to the following reaction:

$$NaCN + OCl^- \Rightarrow CNO^- + NaCl$$

$$NaCN + OCl^- + H_2O \Rightarrow Na^+ + 2OH^- + CNCl$$

$$Na^+ + 2OH^- + CNCl \Rightarrow CNO^- + H_2O + NaCl$$

The oxidation of cyanides to cyanogen chloride (CNCl) occurs instantaneously at all pH levels. The hydrolysis of CNCl to cyanate occurs slowly at pH levels near 7.0, but increases rapidly at pH values near 9.0. Because cyanogen chloride is a highly toxic gas, it is important to hydrolyze it quickly to avoid large concentrations in solution. Therefore, first stage chlorination is done at pH levels of 11.5 or above to immediately hydrolyze cyanogen chloride and prevent the release of hydrogen cyanide gas.

Cyanate undergoes further oxidation with excess alkali in the presence of free chlorine:

$2CNO^- + 3OCl^- + H_2O \Rightarrow 2CO2 + 3Cl^- + N_2 + 2OH^-$

D3.3.2.9.7 Decanting/Clarification (DW Tanks)

Decanting and clarification are the processes of separating materials by utilizing differing specific gravities. Decanting is used to separate liquid-solid systems. Clarification is used to separate liquid-liquid systems where the liquid phases are immiscible and/or have differing specific gravities. Decanting and clarification are used for the following:

- Separating solid-liquid systems by settling out the solids or preferentially concentrating the solids in a smaller fraction of the liquid system.
- Separating two phase systems of solvents and water.
- Separating water and oil phases.

D3.3.2.9.8 Demulsification (DW Tanks)

Demulsification is the process of "breaking" an unwanted emulsion, especially water-in-oil types. The facility uses a combination of chemical precipitation, dewatering, clarification, flocculation and oxidation for demulsification.

D3.3.2.9.9 Drying or Dewatering (DW Tanks)

Drying or dewatering is a process used to remove residual water from solvents after distillation by addition of inorganic salts such as calcium chloride ($CaCl_2$). This process utilizes the hygroscopic properties of salts to attract water from a water/solvent blend and form a water/desiccant phase from which the solvent may be decanted. Drying may also refer to the removal of water from other waste streams by mechanical of physical means.

D3.3.2.9.10 Emulsification (DW Tanks)

Emulsification is a process used to mix immiscible or insoluble components into a homogeneous phase using agitation or mechanical means.

D3.3.2.9.11 Filtration (DW Tanks)

Filtration is the separation of a heterogeneous mixture of fluids and suspended solids by a filter medium that permits the flow of the fluid through the medium, but retains the

particles. This process is used to dewater and reduce the volume of sludges formed in the metals precipitation and settling processes.

D3.3.2.9.12 Flocculation (DW Tanks)

Flocculation is the combination or aggregation of suspended colloidal particles in such a way that they form small clumps. Flocculation is one of the steps in the wastewater treatment process. It is used in combination with precipitation and coagulation to lower metal concentrations. Flocculated particles may be removed by gravity sedimentation, filtration, or by skimming. Flocculation is aided at the site through the use of cationic and anionic polymers.

The process begins with the adjustment of pH, using sulfuric acid and alum as necessary, to maintain the pH at 4 - 5. A cationic polymer is added to precipitate out any metals. An anionic polymer is added, and anionic particles are skimmed off.

D3.3.2.9.13 Neutralization (DW Tanks)

Neutralization occurs at the equivalence point of an acid-base reaction, which is typically at a pH 7. The equivalence point is not necessarily attained at pH 7.0. A strong acid reacting with a weak base will result in a pH less than 7.0, and a strong base reacting with a weak acid will result in a pH greater than 7.0. The acid-base reaction is carried out by the addition of alkaline wastes, such as lime (calcium hydroxide), sodium carbonate, calcium carbonate, or sodium hydroxide, to acidic wastes, such as sulfuric acid, chromic acid, hydrochloric acid, or hydrofluoric acid.

D3.3.2.9.14 Sedimentation (DW Tanks)

Sedimentation involves the settling out by gravity of solid particles suspended in a liquid. This method is used in water clarification. Sedimentation augments the other separation processes described above.

D3.3.3 Tank System Sump Operations and Management

D3.3.3.1 Sumps and sump pumping systems are used to collect and remove liquids which accumulate from precipitation, spills, and equipment decontamination. Sumps and secondary containment systems are inspected as described in Section

F2.2, General Inspection Requirements. Design information for sumps is provided in Table D2-3.

D3.3.3.2 Stormwater collected in the secondary containment area is considered to be contact process water and is managed through the DW tanks.

D3.3.4 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Tanks

WAC 173-303-806(4)(c)(x), 640(9) & (10), 395(1)

D3.3.4.1 Ignitable and reactive wastes may be stored and treated in tanks at the Kent Facility. Storage and treatment of these materials will be conducted in accordance with the requirements of WAC 173-303-640(9).

D3.3.4.2 Waste materials that have the potential to react during mixing or treatment are managed according to the directions in the “Process under Supervision Only” (PUSO) Form. PUSOs detail step-by-step procedures that ensure potentially reactive wastes are handled in a safe and controlled environment without incident. Material Management personnel, prior to acceptance, identify materials requiring a PUSO on the profile. PUSOs are prepared on a case-by-case basis by supervisory personnel, reviewed by a qualified chemist, and are approved by the plant management prior to handling. All PUSOs include specific contingency measures in case of an uncontrolled reaction. Refer to Appendix C-5 for additional information.

D3.3.4.3 DW tanks containing potentially ignitable or reactive waste are adequately located away from (a) a property line which is or can be built upon, and (b) the nearest side of any public way or from the nearest public building, as required by the National Fire Protection Association's (NFPA) buffer zone requirements for ignitable or reactive wastes. The NFPA also specifies minimum distances between tanks holding ignitable and reactive materials and adjacent tanks.

D3.3.4.4 Ignitable Wastes

D3.3.4.4.1 Ignitable wastes may be accepted in tanks, but organics are in low concentrations and the mixture inside the tanks will not exceed a vapor pressure

of 11.1 psi at any point in time. Dangerous waste tanks are all less than 20,000 gallon capacity. Ignitable wastes are consolidated with compatible materials; this consolidation does not render the waste non-ignitable, but ignitable storage is protected from any material or conditions that may cause the waste to ignite, so it complies with WAC 173-303-640(9)(a)(ii).

D3.3.4.4.2 In addition to meeting buffer zone requirements, all ignitable waste is stored away from ignition sources in an open area as discussed in Section F5.1, Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste. "Danger-No Smoking, No Open Flames" signs are posted prominently in the DW tank area, and smoking is confined to specific areas away from storage and treatment areas. All containers are grounded when ignitable wastes are being transferred, and all tanks managing ignitable wastes are permanently grounded and bonded. Tankers are grounded when transferring ignitable wastes to or from tanks. These measures provide adequate protection from the discharge of static electricity.

D3.3.4.5 Reactive Wastes

Only wastewaters with low level residual cyanides are treated at the facility. Reactive wastes exhibiting characteristics specified in WAC 173-303-090(7)(a)(i)-(v) may be accepted for treatment in tanks. Reactive wastes identified in WAC 173-303-090(7)(a)(vi), (vii), and (viii) are specifically restricted from acceptance at the facility. Wastewater containing cyanide or sulfide bearing reactive waste as defined in WAC 173-303-090(v) may be stored and treated in the DW tanks or sent off-site. These waste streams will be assessed for treatability through bench-scale testing during pre-acceptance procedures, and will only be approved for receipt if the material can be treated to meet discharge limits. These wastes are treated using an alkaline chemical oxidation process. Residual cyanides must be treated to meet levels in the POTW permit prior to discharge.

D3.3.4.5.1 Tanks which may be used for treatment of reactive wastes are located a minimum of 15 ft from a property line and 5 ft from a public way.

D3.3.4.6 Incompatible Wastes

Wastes are tested for compatibility with wastes already in the tank prior to being introduced to the tank. Waste incompatibility for all wastes is determined by the procedures described in Section C8.5, Mandatory Verification Analyses. Waste profiles and check-in procedures are discussed in Section C7, Incoming Waste Procedures.

D3.3.4.6.1 Incompatible wastes or materials are not placed in the same tank or in an unwashed tank that previously held an incompatible material unless the requirements of WAC 173-303-395(1)(b) are met. Before a tank can be used for storage of a material which is incompatible with residue in the tank, the tank is cleaned of residual waste. Incompatible wastes may be mixed during the alkaline treatment process under controlled conditions (see Section F5.2, General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste).

D3.3.5 Labeling of Tanks

WAC 173-303-395(6), 640(5)(d), 806(4)(c)(xi)

D3.3.5.1 DW tanks are labeled to identify the major risks associated with the waste being stored. Labels are visible from 50 feet away. Tanks containing DW or hazardous materials are labeled with appropriate labels which identify the major risks associated with the tank contents for employees, emergency personnel, and the general public. Labels are inspected daily to ensure that labels are not obscured, removed, or unreadable per WAC 173-303-395(6). National Fire Protection Association (NFPA) labels are used to meet this requirement.

D3.3.5.2 Tanks are labeled with NFPA labels in addition to the tank number, material contained, and the major risk. The NFPA labels provide information on waste characteristics such as reactivity, flammability, and health hazard. Additional information such as reactivity with water and other special fire fighting information is provided on this label as well. The hazard characteristics are color coded on the label. The color yellow indicates reactivity, red-flammability, and blue-health characteristics. Each characteristic is rated from 0 to 4 indicating the degree of hazard ranging from 0 as no special hazard, to 4 as a severe hazard. The NFPA labels are typically 12 inches-square and each character is approximately 3 inches high resulting in visibility from a distance of 100 feet.

D4 PROCESS EQUIPMENT

D4.1 This section describes process equipment utilized for DW management at the Kent Facility. The locations of the process equipment are shown in Figure D3-1i. Process equipment units are tools that assist in the processing of the waste. These units do not contain waste in the same way as a tank contains waste, and therefore, they are not considered to be tanks.

D4.2 Appendix D-9i, Process Equipment (interim), gives information and specifications on typical processing equipment.

D4.3 Containers to be processed are moved to the process equipment by forklift, handtruck, or manually to the location of the units.

D4.4 All pieces of process equipment are located in containment trays that are designed to contain any waste material released during processing and precipitation from a 25 year/24 hour rainfall event.

D4.5 Containment tray heights in the Central Process Area are lower than the concrete containment wall and therefore do not displace container area containment volume. Dimensions, specifications, and calculations demonstrating that containment trays are suitable for this service are provided in Appendix D-3i.

D4.6 Usage frequency of process equipment varies depending on the inventory of material to be processed.

D4.7 Incompatible wastes are not to be processed simultaneously in process areas.

D4.8 Changing the location of any of the process equipment identified in this section or adding additional dangerous processing equipment would necessitate a modification per WAC 173-303-830.

D4.9 Compactor
(uncovered; one unit)

D4.9.1 This process equipment is used for consolidating wastes containing void spaces to facilitate handling and to reduce bulk prior to disposal at an off-site facility.

D4.9.2 Compaction is performed by removing the lid from 55-gallon container that contains compatible, non-compacted material with no free liquids (e.g. rags, paper, plastic, debris, small containers) and placing the container into the compactor. A hydraulic ram piston is activated and lowers into the container that compacts the material inside. Additional waste material is added to the container to fill void spaces created by compaction. This process is repeated until the container is full.

D4.9.3 The lid is immediately secured back onto the container after the compaction process is complete.

D4.9.4 The compactor was manufactured by Compaction Technologies International (CTI), Model 8560, and is located in the Central Process Area.

D4.9.5 Wastes processed in the compactor may exceed 500 ppm VOCs. Air controls are provided to control emissions from this unit, as illustrated in Figure D3-2i, and described in Section D4.12.

D4.10 Baler
(uncovered; one unit)

D4.10.1 This equipment is similar to compaction units in that it is used to reduce bulk and facilitate handling of waste materials (e.g. rags, cardboard, debris). As with the compaction unit, the baling process is used solely for the purpose of reducing waste void spaces prior to being placed into shipping containers.

D4.10.2 Baling materials are removed from containers and manually placed into the baling chamber by waste technicians. A hydraulic ram piston is activated and lowers into the baling chamber that compacts the material inside. This process is repeated until the desired bale size is achieved. Baled materials is removed by forklift,

wrapped in plastic, immediately placed into a DOT container, and placed in storage prior to shipping.

D4.10.3 The baler is a Nova Model 660, and is located in the Central Processing Area.

D4.10.4 Wastes processed in the baler may exceed 500 ppm VOCs. Air controls, as described in Section D4.12 and illustrated in Figure D3-2, are provided to control emissions from this unit.

D4.11 Shredder
(uncovered; one unit)

The shredder is used for size reduction and separation of wastes with no free liquids (e.g., manufacturing debris, PPE, rags, cardboard, empty containers, or similar materials), shredding containers and their contents using low-speed, high torque cutting teeth. Shredded materials are placed directly into containers and transported off-site for final disposal. Flammables, reactives, incompatibles, and materials containing > 500 ppm VOCs will not be processed in the shredder. The shredder is equipped with a fire suppression system meeting IFC requirements. The shredder is Shredding Systems Inc, (SSI), Model 1200 and is located outside, west of the Solidification Process Area. Material is transferred from the Solidification Process Area to the shredder in closed drums or totes over concrete surfaces. Covers are removed, and the containers are lifted via forklift and rotated to empty contents into the shredder hopper. Material passing through the shredder falls into a 2-cubic yard steel tub skid that is within a secondary containment tray.

D4.12 Air Controls for Process Equipment

Air controls are provided to capture VOC emissions from the compactor and the baler (the shredder does not process any material with >500 ppm VOC). VOC emissions are collected in a ventilation hood and are routed via a blower to two carbon vessels in series.

On a monthly basis, emissions will be monitored after the first carbon unit for breakthrough and recorded as described in Appendix D-10, Air Quality Program

(Interim). Breakthrough is achieved when VOC contaminants leaving the first carbon vessel exceed 500 ppm VOC, as measured by PID/FID. When breakthrough occurs, the first carbon unit will be replaced.

LIST OF TABLES

Table D1-2 Segregation of Hazardous Materials

Table D1-3 Container Management Areas Operating Limits

Table D2-1 DW Tank Uses and Materials of Construction

Table D2-2 DW Tank Design Information

Table D2-3 Design Information for DW Tank System Sump

Table D1-2 Segregation for Hazardous Materials

Compatibility Group[1]	Flammable Liquids/Gases (2.1, 3)	Flammable Solids (4.1 & 4.2)	Oxidizers/Organic Peroxides (5.1 & 5.2)	Class 9 / Non Toxic Gases (2.2 & 9)	Corrosives - Acids (8a)	Corrosives - Bases (8b)	Cyanides & Sulfides (8c)	Dangerous When Wet (4.3)	Toxics[2] (2.3 & 6.1- including PGI Zone A)
Flammable Liquids/ Gases (2.1, 3)		x	x		x	x		x	x
Flammable Solids (4.1 & 4.2)	x		x		x	x		x	x
Oxidizers / Organic Peroxides (5.1 & 5.2)	x	x			x	x	x	x	x
Class 9 / Non Toxic Gases (2.2 & 9)									
Corrosives - Acids (8a)	x	x	x			x	x	x	x
Corrosive - Bases (8b)	x	x	x		x			x	x
Cyanides & Sulfides (8c)			x		x			x	x
Dangerous When Wet (4.3)	x	x	x		x	x	x		x
Toxics[2] (2.3 & 6.1- including PG I Zone A)	x	x	x		x	x	x	x	

[1]Compatibility is based on 49 CFR, Table 174.81 and 40 CFR, Part 265, Appendix V. Materials will be segregated by their primary hazard class. The requirements of this table do not apply to containers that meet the requirements in WAC 173-303-161 (lab packs).

[2] Except when there is a subsidiary hazard class, the waste will be segregated according to that hazard class.

An "X" designates that materials are incompatible. Incompatible materials must:

- Not be placed in a secondary containment areas at one time: TSCA/DW Area.

Table D1-3
Container Management Areas Operating Limits

Area	Area Function	Time Limit	Maximum Capacity	Largest Container	Processing Permitted[1]	See Figure	Other Restrictions
South Dock	Load/Unload (containers)	24 hours	30,000 gal	350 gal	no	D1-1	no staging or storing outside of vans
TSCA/DW Area	Storage	1 year	9,900 gal	350 gal	yes	D1-2	Flammable liquid storage not to exceed 120 gallons Incompatible wastes will not be stored or processed in a common containment tray.

[1]Processing dangerous waste includes:

1. transferring/consolidating materials from one container to another container.
2. pumping liquids from containers to a tanker truck or tank.

Table D2-1

Tank Uses and Materials of Construction

Tank number	*Tank Status*		*Tank Usage*	*Tank Coatings*		*Materials of Construction*
	Dangerous Waste	*Existing / Planned*		*Interior*	*Exterior*	
T-9A	Yes	existing	Wastewater Storage	none	enamel	welded carbon steel
T-9B	Yes	existing	Wastewater Treatment	none	enamel	welded carbon steel
T-9C	Yes	existing	Wastewater Storage/Discharge	none	enamel	welded carbon steel

Table D2-2

Tank Design Information

Tank Number	*Inside Diameter*		*Tank Body Height*		*Cone Height*		*Working Volume*	*Nominal Volume*	*Inside Surface Area*	*Maximum Specific Gravity*
	ft	in	ft	in	ft	in	gallons	gallons	sq ft	
T-9A	12	0	16	0	0	0	12,700	13,500	641	1.20
T-9B	10	6	18	0	2	0	11,400	12,100	670	1.20
T-9C	9	0	20	0	0	0	9,000	9,500	593	1.20
							33,100	35,100		

S02 capacity in Part A is based on working volume (33,100 gal.)

TABLE D2-3

DESIGN INFORMATION FOR DW TANK SYSTEM SUMP

	Sump Dimensions ft.	Sump Volume gal. (ft^3)	Total Containment Volume gal. (ft^3)
DW Tank Area (9A, 9B, 9C)	2' x 2' x 2'	90 (12.0)	23,619 (3,157.6)

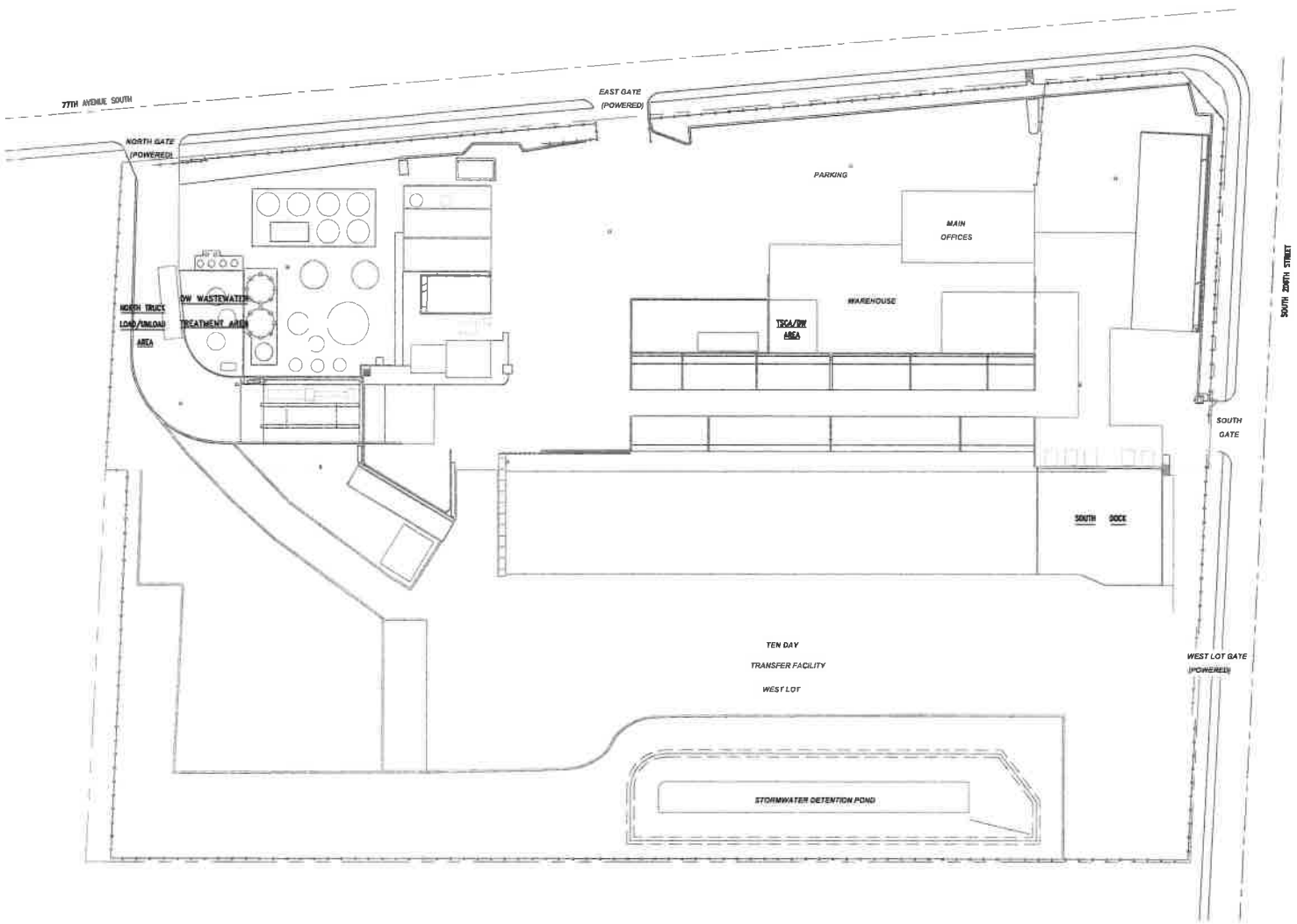
TABLE D2-3

DESIGN INFORMATION FOR DW TANK SYSTEM SUMP

	Sump Dimensions ft.	Sump Volume gal. (ft^3)	Total Containment Volume gal. (ft^3)
DW Tank Area (9A, 9B, 9C)	2’ x 2’ x 2’	90 (12.0)	23,619 (3,157.6)

LIST OF FIGURES

D1-1	Facility Site Plan
D1-2	TSCA/DW Area
D1-3	Ten-Day / 24-Hour Transfer Locations
D1-6 (a)	Container Stacking (1 of 2)
D1-6 (b)	Container Stacking (2 of 2)
D1-13	North Truck Load/Unload Area
D1-14	Facility Stormwater Piping
D1-15	Traffic Patterns, Signs, and Paving
D1-16	Forklift Traffic Patterns in Concrete Areas
D2-1	DW Management in Wastewater Tanks
D2-2	Wastewater Treatment System Layout



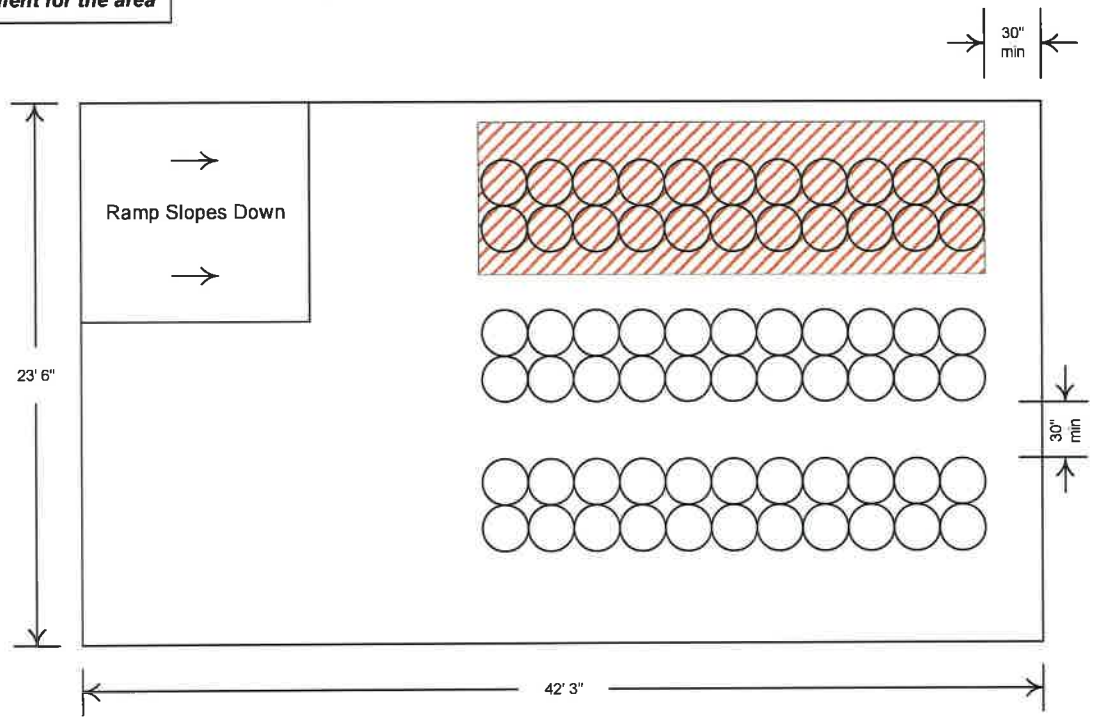
Stericycle

TITLE:
Facility Site Plan

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APP'D:	FIGURE NO.: D1-1	
DATE: 8/6/15	REV.:		

The figure below depicts one example of the maximum container storage arrangement for the area



Drum Jail
(locations shown are typical; Drum Jail could take up entire cell if necessary)

Container Storage Capacity

- Maximum of **9,900** gallon equivalents (e.g. 180 55-gallon containers).
- Containers of various sizes may be placed anywhere in the storage area as long as the following requirements below are met.

Dangerous Waste Container Storage Requirements

- Minimum 30 inch aisle spacing between container rows, walls, berms, and other structures. Containers must be inspectable.
- A row of containers can not be more than 2 containers wide.
- Refer to Figures D1-6(a) and (b) for container stacking requirements.
- TSCA/DW containers containing free liquids must be stored or processed over containment trays as specified in Appendix D-2.
- Incompatible wastes will not be stored or processed in a common containment tray.
- Containers will be managed in a manner to meet the requirements in Table D1-2 and Table D1-3.

← N

Container Equivalent Volumes

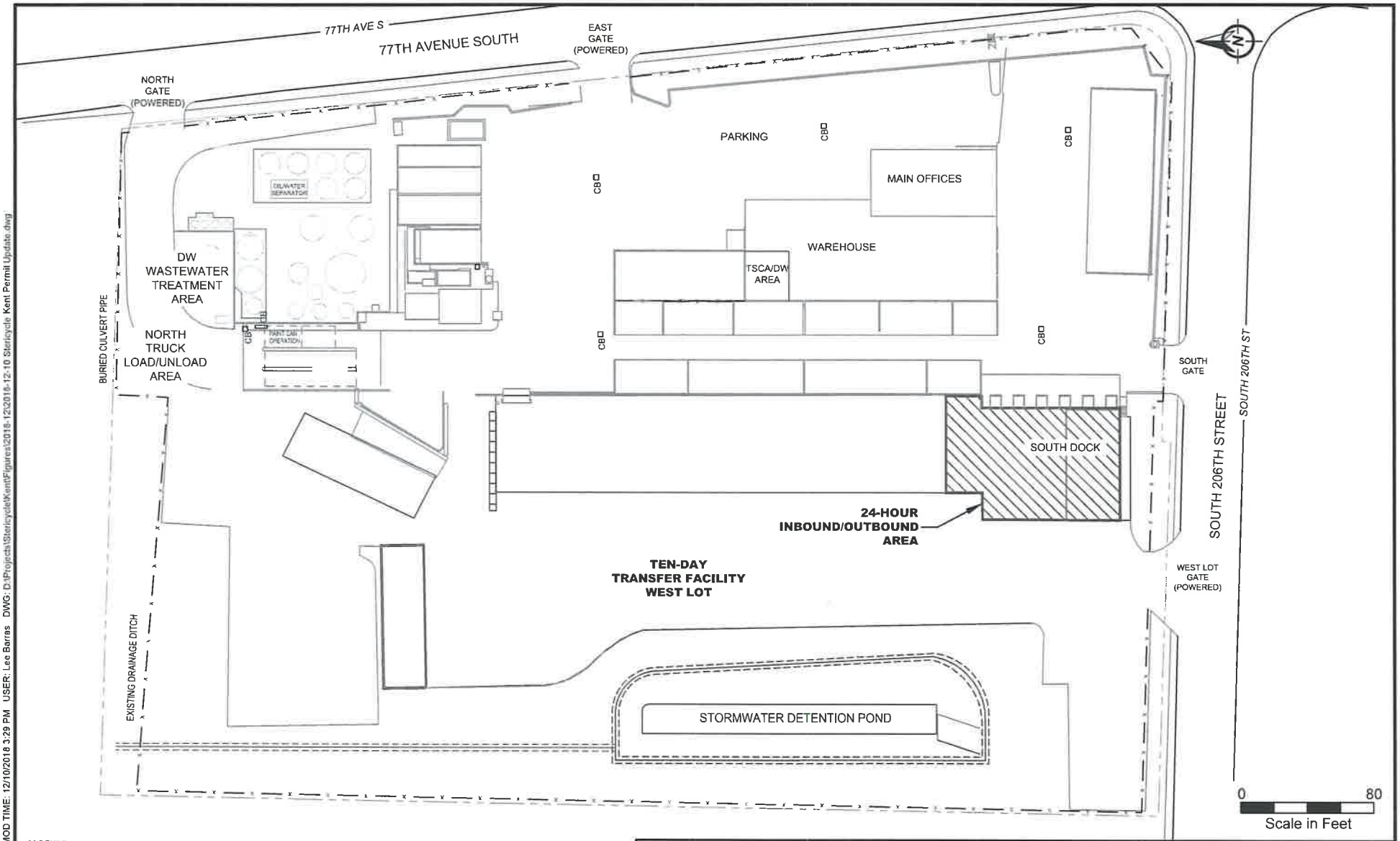
Liquid Totes = 250 gallons
Cubic Yard Box = 200 gallons
Over pack drums = 95 gallons (polys), 85 gallons (steel)

Stericycle

Title: **TSCA/DW Area**

scale: 1" = 8'

Figure D1-2



NOTES:

1. **Ten-Day Transfer Facility Activities**
   The Kent Ten-Day Transfer Facility is used for parking of waste loads that are not manifested to or from the Kent facility. These shipments must continue in their course of transportation within 10 days of arrival in the Ten-Day Transfer Facility. All Kent inbound/outbound dangerous waste loads must be parked in the 24-Hour Inbound/Outbound Area for a maximum of 24-hours.
2. **West Lot (Ten-Day Transfer Facility)**
   No Kent inbound/outbound loads: only in-transit loads to other facilities for up to 10 days.
3. **24-Hour Inbound/Outbound Area**
   Includes the South Dock and the adjacent 2 stalls for parking of Kent inbound/outbound loads only for up to 24 hours.

STERICYCLE
KENT, WASHINGTON FACILITY

TEN-DAY / 24-HOUR TRANSFER LOCATIONS

DALTON OLMSTED FUGLEVAND

FIGURE D1-3

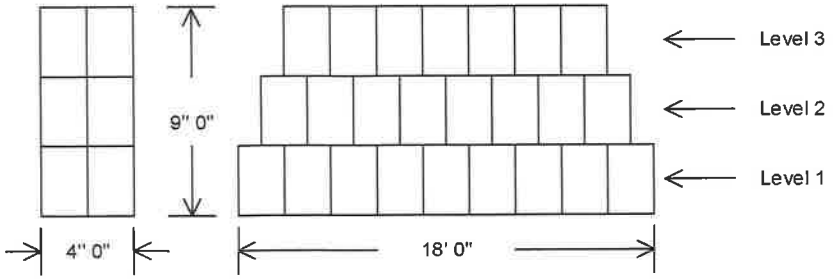
DECEMBER 10, 2018

PLOT TIME: 12/10/2018 3:29 PM MOD TIME: 12/10/2018 3:29 PM USER: Lee Barras DWG: D:\Projects\Stericycle\Kent\Figures\2018-12\2018-12-10 Stericycle Kent Permit Update.dwg

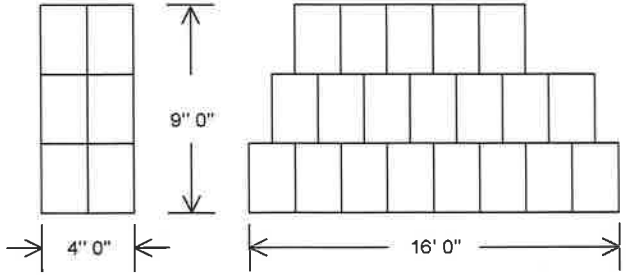
Stacking Arrangements for Container Storage Areas

(unless otherwise noted on specific storage area figures)

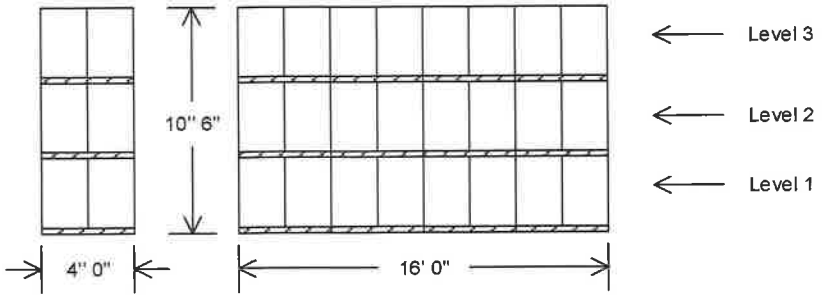
Non Flammable Storage Cells (without pallets)



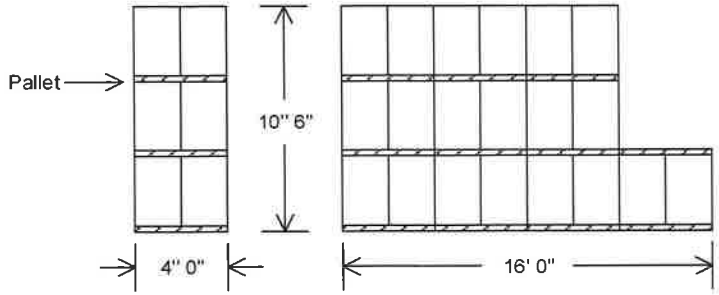
Flammable Storage Cells (without pallets)



Non Flammable Storage Cells (with pallets)



Flammable Storage Cells (with pallets)



Container Storage Area - Stacking Requirements

- 55-gallon containers are stacked 3 high maximum.
- Totes, cubic yard boxes, and overpacks are stacked 2 high maximum.
- Level 1 containers can be stacked 3 high maximum, not to exceed Level 1 height.
- Level 2 containers (> 5 gallons) can be stacked 1 high maximum, not to exceed Level 2 height.
- Level 2 containers (≤ 5 gallons) can be stacked 2 high maximum, not to exceed Level 2 height (without pallets).
- Level 2 containers (≤ 5 gallons) can be stacked 3 high maximum, not to exceed Level 2 height (with pallets).
- Level 3 containers can be stacked 1 high maximum, not to exceed Level 3 height.
- Containers can not tip (slope) more than <10% from level position.
- Large containers will not be stacked on smaller containers.
- Stacked containers that are plastic wrapped, banded, or bundled together, less than 36 inches, count as 1 high.

Check-In Area - Stacking Requirements

- Containers ≥ 5 gallons are one high only.
- Containers ≤ 5-gallons are stacked to a maximum of 4 high, not to exceed a maximum of 48 inches.

Container Equivalents

Liquid Totes = 250 gallons
Cubic Yard Box = 200 gallons
Over pack drums = 95 gallons (polys), 85 gallons (steel)
Level 1 = Maximum of 42 inches high (pallet) – 36 inches high (no pallet)
Level 2 = Maximum of 84 inches high (pallet) - 72 inches high (no pallet)
Level 3 = Maximum of 126 inches high (pallet) – 108 inches high (no pallet)

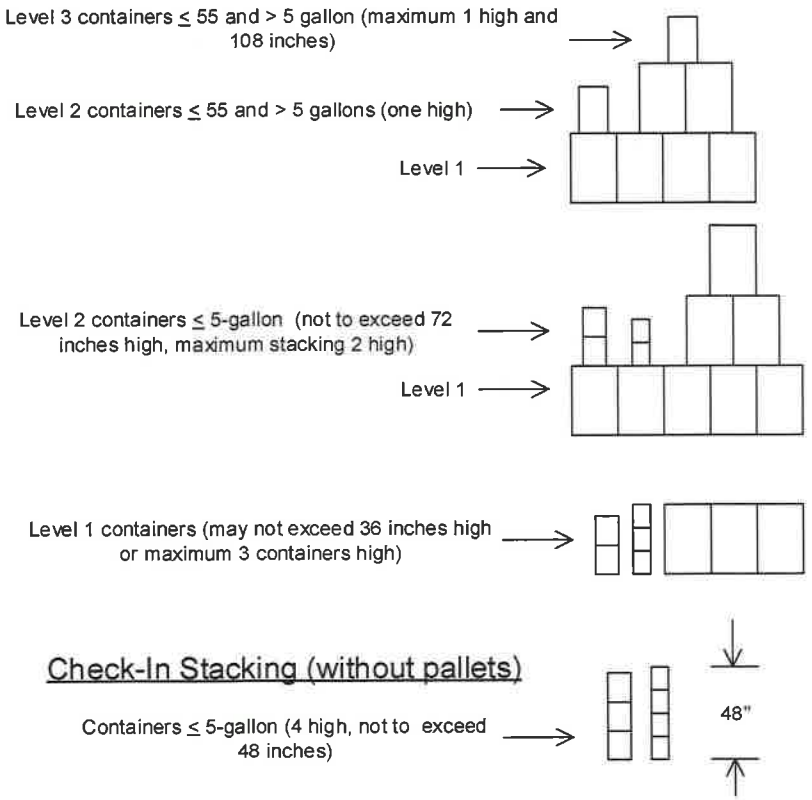
Stericycle Environmental Solutions

Title: **Container Stacking** (1 of 2)

scale: none

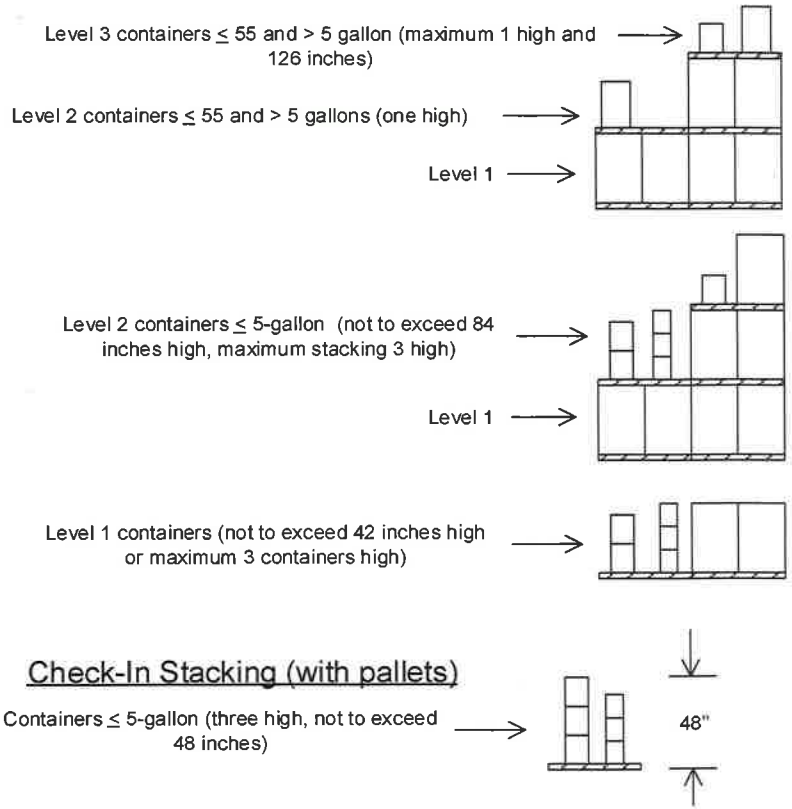
Figure D1-6 (a)

Container Storage Areas – Examples of Smaller Container Stacking Arrangements (without pallets)



Check-In Stacking (without pallets)

Container Storage Areas – Examples of Smaller Container Stacking Arrangement (with pallets)



Check-In Stacking (with pallets)

Container Storage Area - Stacking Requirements

- 55-gallon containers are stacked 3 high maximum.
- Totes, cubic yard boxes, and overpacks are stacked 2 high maximum.
- Level 1 containers can be stacked 3 high maximum, not to exceed Level 1 height.
- Level 2 containers (> 5 gallons) can be stacked 1 high maximum, not to exceed Level 2 height.
- Level 2 containers (≤ 5 gallons) can be stacked 2 high maximum, not to exceed Level 2 height (without pallets).
- Level 2 containers (≤ 5 gallons) can be stacked 3 high maximum, not to exceed Level 2 height (with pallets).
- Level 3 containers can be stacked 1 high maximum, not to exceed Level 3 height.
- Containers can not tip (slope) more than <10% from level position.
- Large containers will not be stacked on smaller containers.
- Stacked containers that are plastic wrapped, banded, or bundled together, less than 36 inches, count as 1 high.

Check-In Area - Stacking Requirements

- Containers ≥ 5 gallons are one high only.
- Containers ≤ 5-gallons are stacked to a maximum of 4 high, not to exceed a maximum of 48 inches.

Container Equivalents
Liquid Totes = 250 gallons
Cubic Yard Box = 200 gallons
Over pack drums = 95 gallons (polys), 85 gallons (steel)
Level 1 = Maximum of 42 inches high (pallet) – 36 inches high (no pallet)
Level 2 = Maximum of 84 inches high (pallet) - 72 inches high (no pallet)
Level 3 = Maximum of 126 inches high (pallet) – 108 inches high (no pallet)

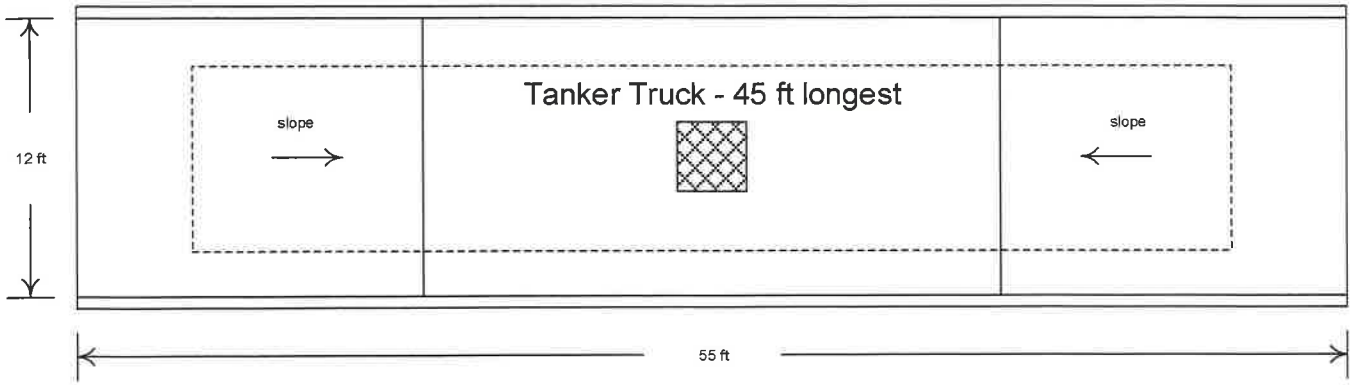
Stericycle Environmental Solutions

Title: **Container Stacking** (2 of 2)

scale: none

Figure D1-6 (b)

The figure below depicts one example of the maximum container storage arrangement for the area



N

Container Equivalent Volumes

Liquid Totes = 250 gallons
Cubic Yard Box = 200 gallons
Over pack drums = 95 gallons (polys), 85 gallons (steel)

Loading/Unloading Capacity

- Maximum of 1-5,000 gallon tanker truck

Dangerous Waste Loading/Unloading Requirements

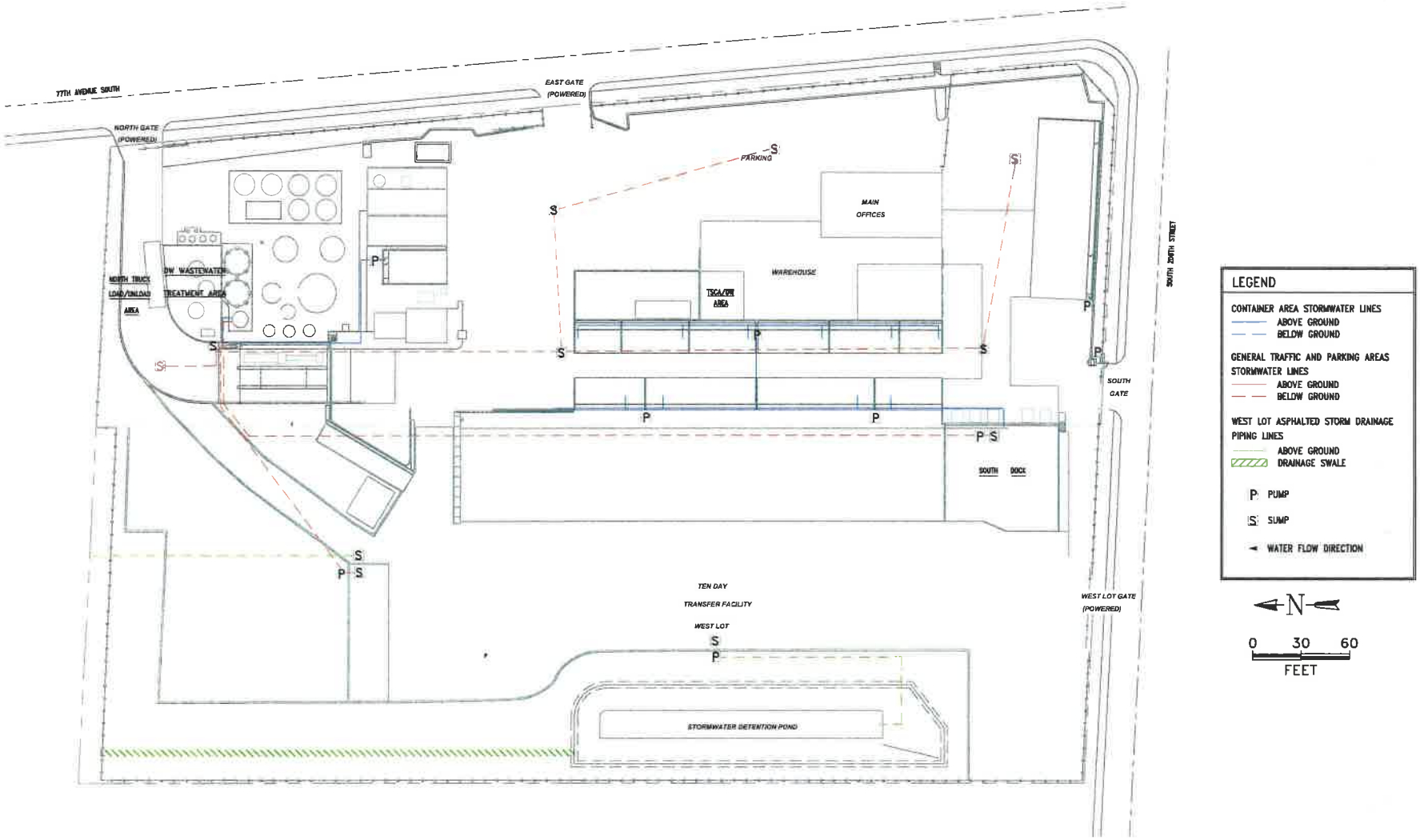
- No other containers allowed in area when tanker truck is present.
- No processing permitted during loading activities.
- The entire tanker truck and any potential DW release points will be kept inside the containment area during loading/unloading activities.
- Container will be managed in a manner to meet the requirements in Table D1-2 and Table D1-3.

Stericycle Environmental Solutions

Title: **North Truck Load/ Unload Area**

scale: 1" = 8'

Figure D1-13

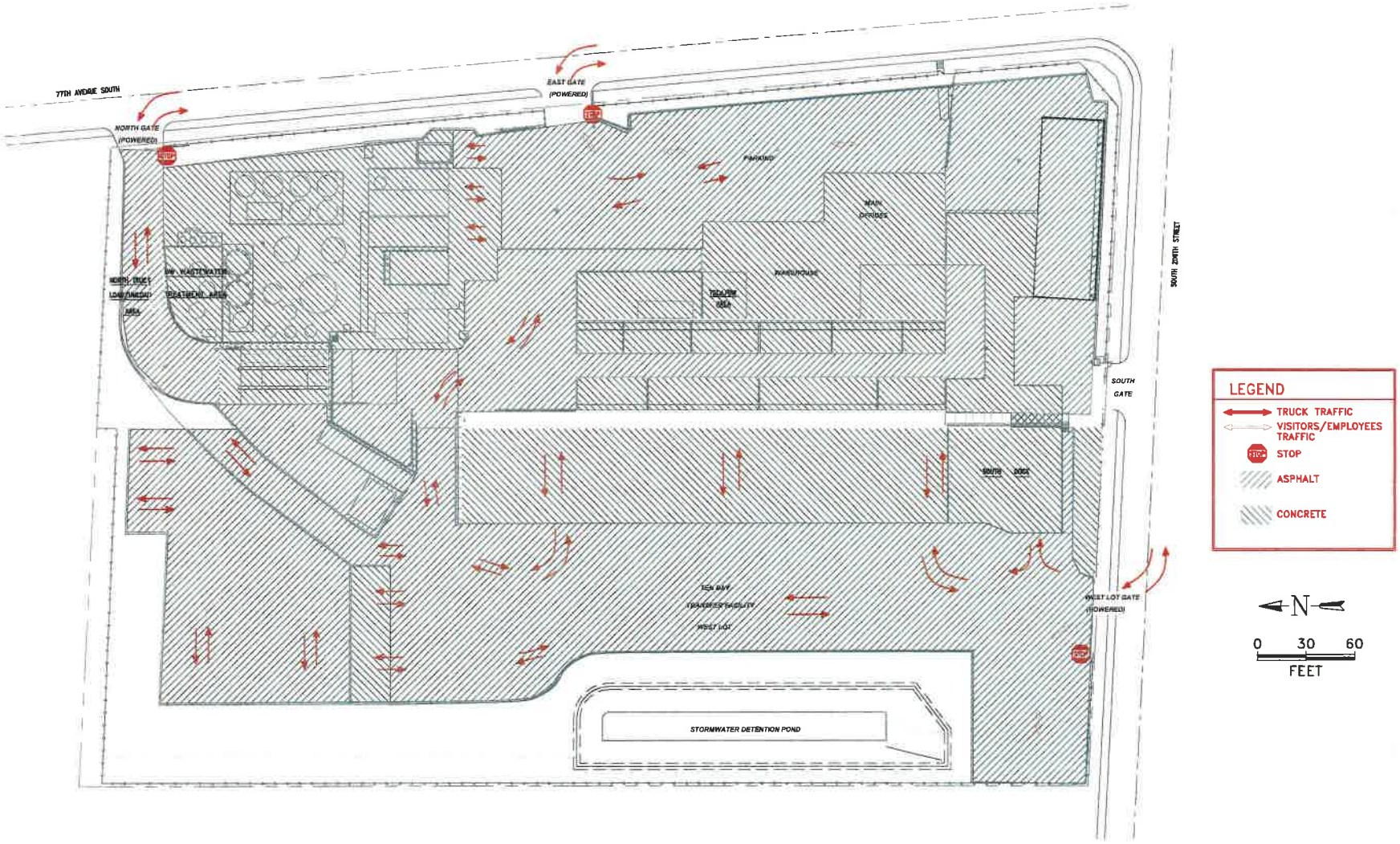


Stericycle

TITLE:
Facility Stormwater Piping

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: D1-14	
DATE: 8/6/15	REV.:		

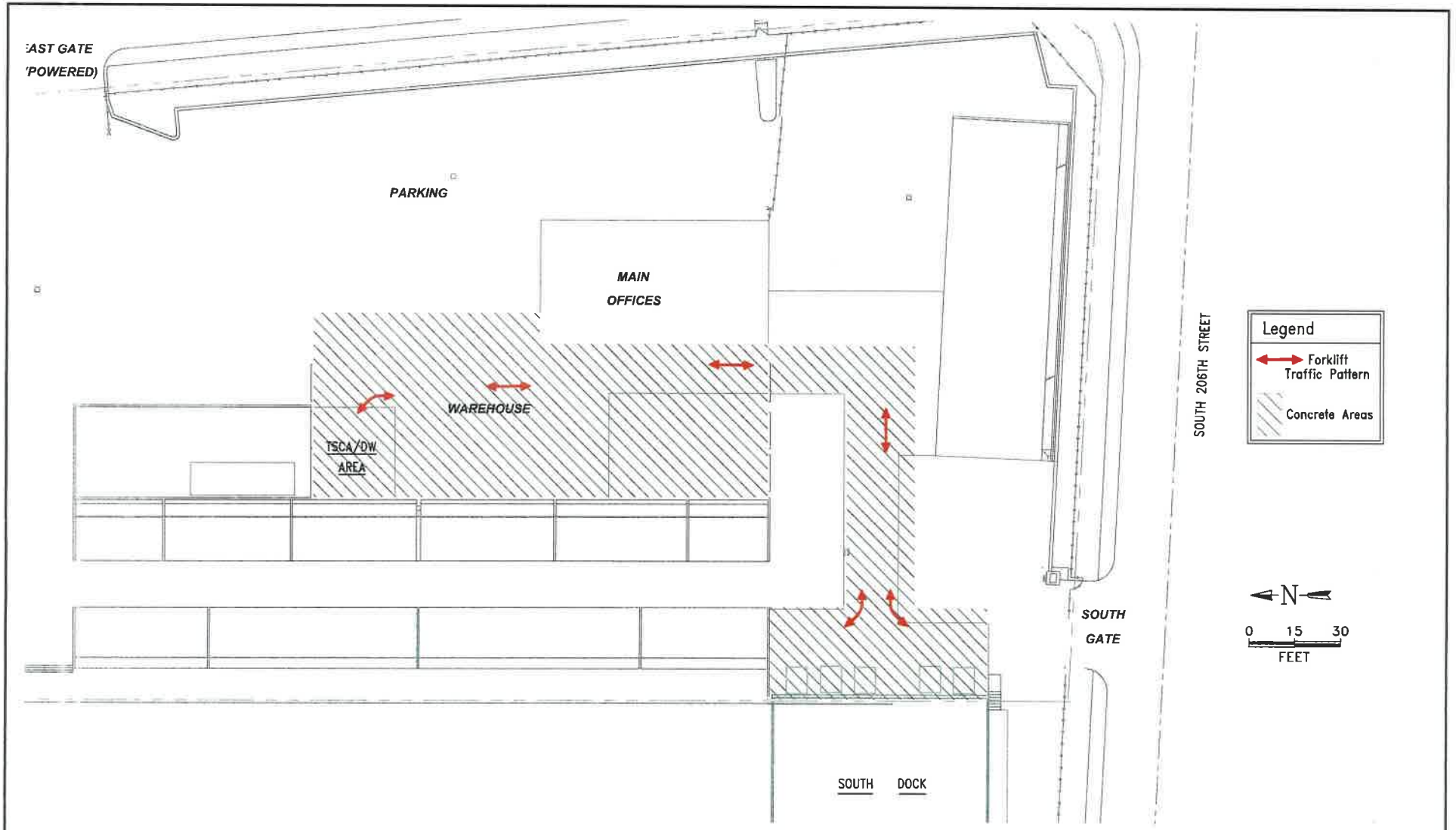


Stericycle

TITLE:
Facility Traffic Patterns, Signs, and Paving

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: D1-15	
DATE: 8/6/15	REV.:		

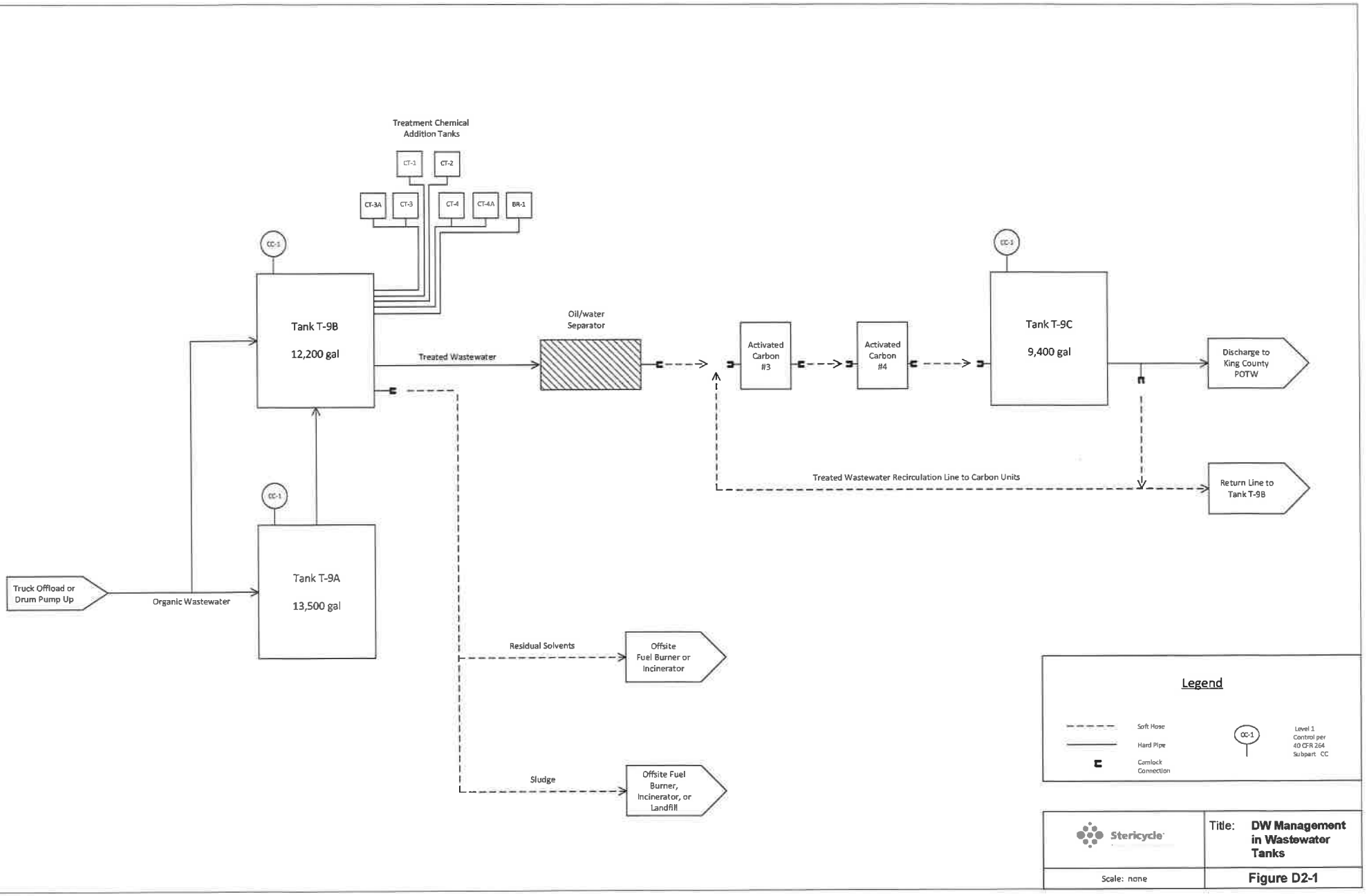


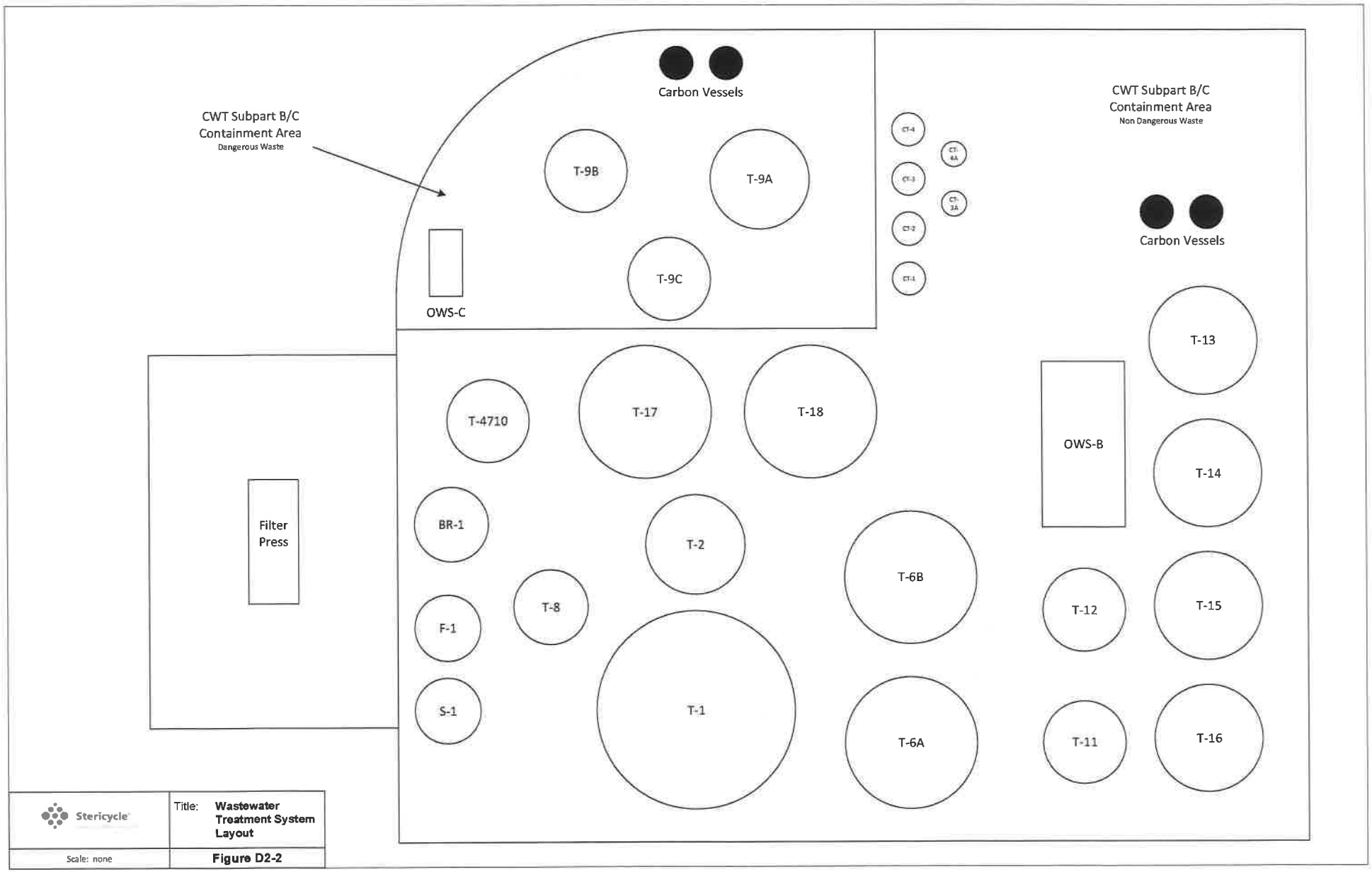
Stericycle

TITLE:
DW Forklift Traffic Patterns on Concrete Areas

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: D1-16	
DATE: 8/6/15	REV.:		


Treatment Chemical Addition Tanks
CT-1
CT-2
CT-3A
CT-3
CT-4
CT-4A
BR-1
CC-1
Tank T-9B
12,200 gal
Oil/water Separator
Treated Wastewater
Activated Carbon #3
Activated Carbon #4
Tank T-9C
9,400 gal
Discharge to King County POTW
Treated Wastewater Recirculation Line to Carbon Units
Return Line to Tank T-9B
Tank T-9A
13,500 gal
Truck Offload or Drum Pump Up
Organic Wastewater
Residual Solvents
Offsite Fuel Burner or Incinerator
Sludge
Offsite Fuel Burner, Incinerator, or Landfill
Legend
Soft Hose
Hard Pipe
Camlock Connection
CC-1
Level 1 Control per 40 CFR 264 Subpart CC
Stericycle
Title: DW Management in Wastewater Tanks
Scale: none
Figure D2-1

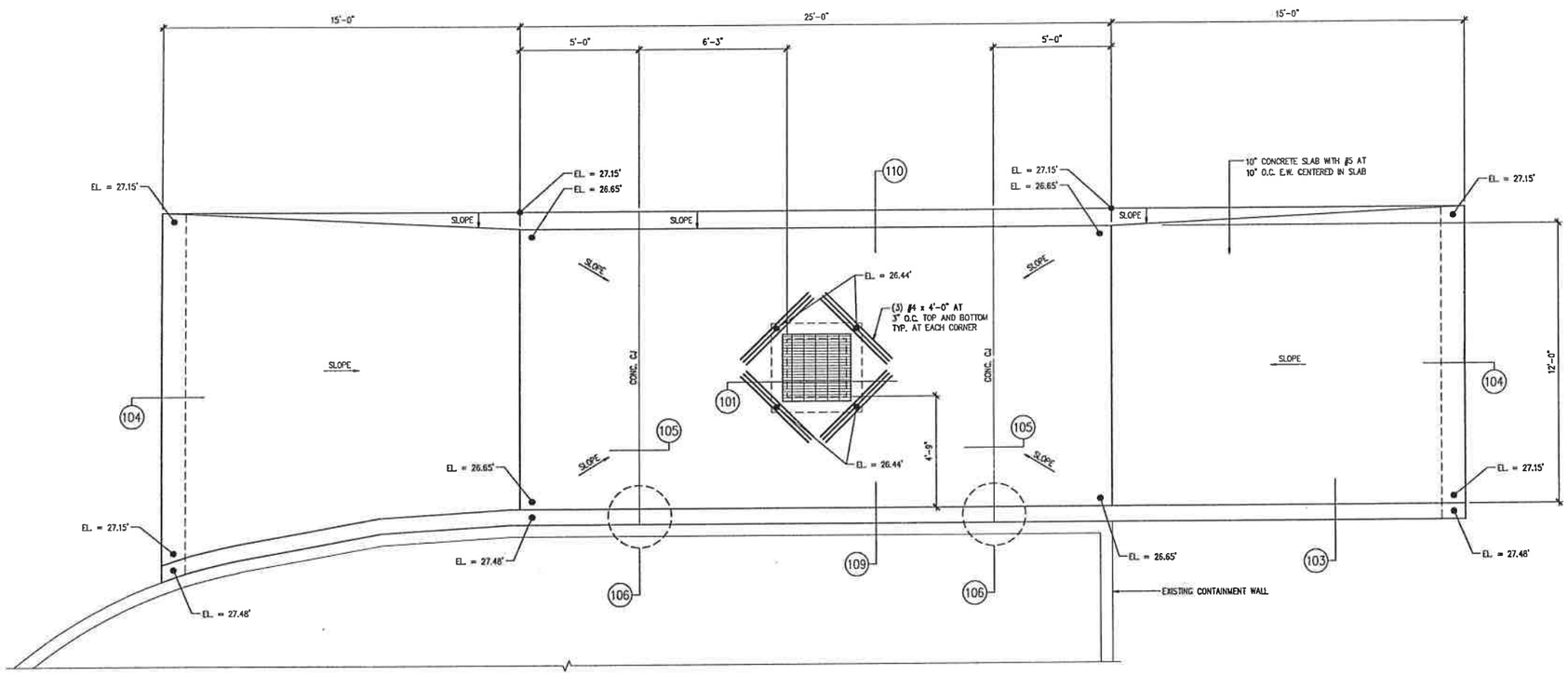

CWT Subpart B/C
Containment Area
Dangerous Waste
Carbon Vessels
T-9B
T-9A
T-9C
OWS-C
CT-4
CT-4A
CT-3
CT-3A
CT-2
CT-1
CWT Subpart B/C
Containment Area
Non Dangerous Waste
Carbon Vessels
T-13
T-14
T-15
T-16
OWS-B
T-12
T-11
T-4710
T-17
T-18
Filter
Press
BR-1
T-2
T-8
F-1
S-1
T-1
T-6B
T-6A
Stericycle
Title: Wastewater Treatment System Layout
Scale: none
Figure D2-2

APPENDIX D-1

ENGINEERING DESIGNS

LEGEND:

- STEEL BAR GRATING PER DETAILS.
- DIRECTION OF SLOPE IN SLAB.
- EL. = 27.15' — SPOT ELEVATION OF SLAB.



A NORTH BULK LIQUID LOAD/UNLOAD AREA PLAN
SCALE: 3/8" = 1'-0"

THESE RECORD PLANS AND THE INFORMATION SHOWN ACCURATELY REFLECT EXISTING FIELD CONDITION AS OF _____ (DATE SIGNED).

BY: _____

PERMIT #: _____

THESE PLANS ARE APPROVED FOR CONFORMANCE WITH THE CITY OF KENT ENGINEERING DIVISION'S REQUIREMENTS.

APPROVED BY: _____

DATE APPROVED: _____

REVISIONS

APPROVALS

DESIGNED MEB
DRAWN BJJ
CHECKED BKL
DATE 07/20/10
SCALE AS NOTED

SEAL

PREPARED BY

SITTS & HILL ENGINEERS, INC.
CIVIL • STRUCTURAL • SURVEYING
4615 CENTER STREET | TACOMA, WA. 98409
PHONE: (253) 474-9449 | FAX: (253) 474-9153
http://www.sitts-hill-engineers.com/

PREPARED FOR

BURLINGTON ENVIRONMENTAL SERVICES, LLC
18000 72ND AVE SOUTH, SUITE 217
KENT, WA 98032

PROJECT

NORTH BULK LIQUID LOADING
20245 77TH AVE SOUTH KENT, WA 98032

SHEET TITLE

FOUNDATION PLAN

SHEET NO.

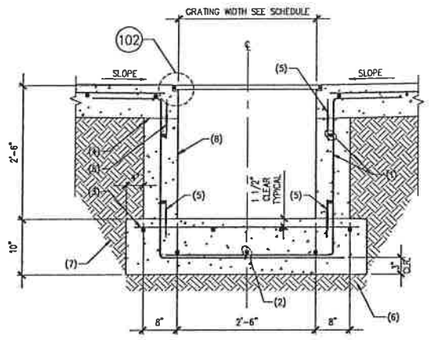
C4.1

PROJECT NO.

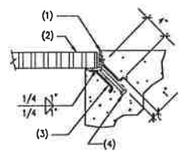
14,731

K:\14000\14731\Drawings\14731-C4.1.dwg last edited 07/20/10 10:10am by mwhite

NOTES:
1. #4 AT 12" O.C.
2. #5 AT 12" O.C.
3. #4 AT 12" O.C. EACH WAY
4. ROUGHEN-UP SURFACE, TYP. AT JOINTS
5. 6" "NO-BULB" RIBBED WATER STOP, TYPICAL
6. COMPACT SUBGRADE TO 95% OF MAXIMUM DENSITY PER ASTM D-1557.
7. COMPACTED FILL AS REQUIRED. COMPACT SUBGRADE TO 95% OF MAXIMUM DENSITY PER ASTM D-1557.
8. SUMP COATING PER GSN, TYPICAL



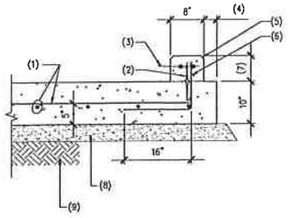
101 SUMP SECTION
SCALE: N.T.S.



NOTES:
1. SEE SCHEDULE FOR STEEL ANGLE
2. STEEL GRATING
3. 1" X 1/4" STRAPS AT 1'-6" CENTERS (STAGGERED) MAY BE SUBSTITUTED FOR CONCRETE ANCHORS (STUDS)
4. 3/8" X 5 1/2" HEADED CONCRETE ANCHORS (STUDS) AT 1'-6" CENTERS, AUTOMATICALLY END WELDED WITH STUD WELDING TOOL

STEEL GRATING AND STEEL SEAT ANGLE SCHEDULE				
MARK	NOMINAL WIDTH OR (TOE/TOE STEEL L)	BEARING BAR DEPTH X THICKNESS	GRATING WIDTH	SEAT ANGLE SIZE (STEEL)
G-1	2'-6"	2 1/2" x 1/4"	2'-10 3/4"	L 3" x 3" x 3/8"

102 SEAT ANGLE DETAIL
SCALE: N.T.S.



NOTES:
1. CONCRETE SLAB REINFORCING
2. 6" "NO-BULB" RIBBED WATER STOP
3. (2) #4 CONT.
4. 4" UNO
5. 3/4" CHAMFER (TYPICAL)
6. #5 DOWELS TO LAP SLAB REINFORCING LENGTH VARIES WITH HEIGHT OF CURB WALL
7. HEIGHT VARIES (SEE PLAN)
8. 6" MIN. COMPACTED DEPTH CRUSHED AGGREGATE BASE COURSE
9. COMPACT SUBGRADE TO 95% OF MAXIMUM DENSITY PER ASTM D-1557.

103 CONCRETE CURB AT SLAB
SCALE: N.T.S.

THESE RECORD PLANS AND THE INFORMATION SHOWN ACCURATELY REFLECT EXISTING FIELD CONDITION AS OF

_____(DATE SIGNED)

BY: _____

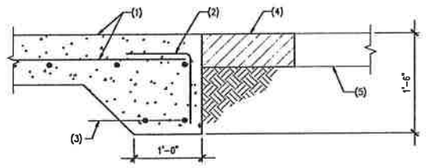
PERMIT #_____

THESE PLANS ARE APPROVED FOR CONFORMANCE WITH THE CITY OF KENT ENGINEERING DIVISION'S REQUIREMENTS.

APPROVED BY:_____

DATE APPROVED:_____

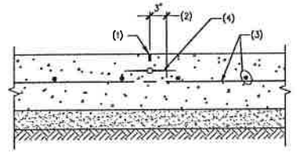
NOTES:
1. CONCRETE SLAB AND REINFORCING
2. #5 BARS TO LAP SLAB REINFORCING
3. (2) #4 BARS CONT.
4. REPAIR ASPHALT PAVING PER PLANS
5. EXISTING ASPHALT PAVEMENT



104 CONCRETE FOOTING
SCALE: N.T.S.

NOTES:
1. 3/8" x 1 1/4" DEEP SAW CUT JOINT. SEAL WITH SIKAFLEX-1-A OR EQUIVALENT
2. TERMINATE 2 OUT OF 3 BARS FROM FACE OF JOINT (TERMINATE EVERY TOP BAR FOR DOUBLE MAT REINFORCING)
3. SLAB REINFORCING
4. WATER STOP

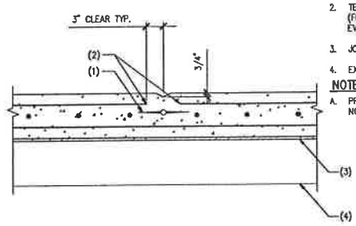
NOTES:
A. PROVIDE CONTRACTION JOINTS AS NOTED ON PLAN VIEW



105 SLAB CONTRACTION JOINT
SCALE: N.T.S.

NOTES:
1. WATER STOP
2. TERMINATE INSIDE BARS ONLY. (FOR WALLS >12", TERMINATE EVERY OTHER HORIZONTAL BAR)
3. JOINT FILLER
4. EXISTING CONCRETE WALL

NOTES:
A. PROVIDE CONTRACTION JOINTS AS NOTED ON PLAN VIEWS



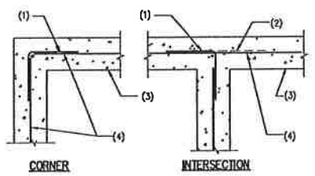
106 WALL CONTRACTION JOINT
SCALE: N.T.S.

	CLASS "B" LAP SPLICE LENGTH (IN INCHES)							
	f'c=2,500 PSI		f'c=3,000 PSI		f'c=4,000 PSI		f'c=5,000 PSI	
	REG	TOP	REG	TOP	REG	TOP	REG	TOP
#3	24	32	22	28	20	26	18	22
#4	32	42	30	38	26	34	24	30
#5	40	52	36	48	32	42	28	36
#6	48	62	44	56	38	50	34	44
#7	70	90	64	82	54	72	50	64
#8	78	102	72	94	62	82	56	72
#9	88	116	82	106	70	92	64	82
#10	100	130	92	118	80	102	72	92
#11	110	144	102	132	88	114	78	102

NOTES:
A. TOP BARS ARE ANY HORIZONTAL BARS PLACED SO THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.
B. UNLESS NOTED OTHERWISE, LAP SPLICES IN CONCRETE BEAMS, SLABS, WALLS, AND FOOTINGS SHALL BE CLASS "B" TENSION LAP SPLICES.
C. CONTACT STRUCTURAL ENGINEER IF CENTER-TO-CENTER SPACING OF REINFORCEMENT IS LESS THAN (3) BAR DIAMETERS (<3DB).
D. LAP SPLICES BASED ON: FY = 60 KSI.

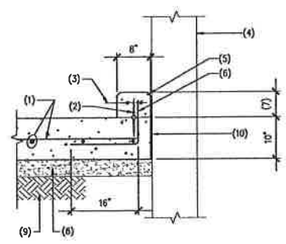
107 LAP SPLICE SCHEDULE FOR REINFORCING IN CONCRETE
SCALE: N.T.S.

NOTES:
1. CORNER BARS SAME SIZE AND SPACING AS HORIZ. REINFORCING LAP PER G.S.N. (24" MINIMUM)
2. ALTERNATE BENDS
3. CONCRETE FOOTING, STEM OR WALL
4. REINFORCING PER PLANS AND/OR DETAILS



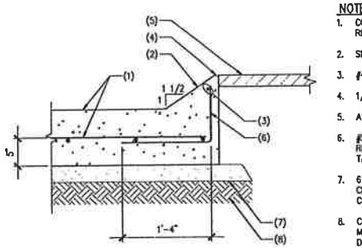
TYPICAL CORNER
108 REINFORCING IN CONCRETE FOOTING, STEM OR WALL
SCALE: N.T.S.

NOTES:
1. CONCRETE SLAB REINFORCING
2. 6" "NO-BULB" RIBBED WATER STOP
3. (2) #4 CONT.
4. EXISTING CONCRETE WALL
5. 3/4" CHAMFER (TYPICAL)
6. #5 DOWELS TO LAP SLAB REINFORCING LENGTH VARIES WITH HEIGHT OF CURB WALL
7. HEIGHT VARIES (SEE PLAN)
8. 6" MIN. COMPACTED DEPTH CRUSHED AGGREGATE BASE COURSE
9. COMPACT SUBGRADE TO 95% OF MAXIMUM DENSITY PER ASTM D-1557.
10. 1/2" EXPANSION JOINT FILLER



109 CONCRETE CURB AT EXISTING WALL
SCALE: N.T.S.

NOTES:
1. CONCRETE SLAB AND REINFORCING
2. SLOPED CONCRETE CURB
3. #4 BAR CONT.
4. 1/2" RADIUS MIN.
5. ASPHALT PAVEMENT
6. #5 DOWELS TO LAP SLAB REINFORCING WHEN CURB IS TALLER THAN 4"
7. 6" MIN. COMPACTED DEPTH CRUSHED AGGREGATE BASE COURSE
8. COMPACT SUBGRADE TO 95% OF MAXIMUM DENSITY PER ASTM D-1557.



110 ROLLED CONCRETE CURB AT SLAB
SCALE: N.T.S.

APPROVALS / REVISIONS

DESIGNED	MEB
DRAWN	BJJ
CHECKED	BRL
DATE	07/20/10
SCALE	AS NOTED

SEAL: REGISTERED PROFESSIONAL ENGINEER BRIAN R. LESSLEY EXPIRATION 09/17/10 STATE OF WASHINGTON

PREPARED BY
SITTS & HILL ENGINEERS, INC.
CIVIL • STRUCTURAL • SURVEYING
4818 CENTER STREET | TACOMA, WA. 98409
PHONE: (253) 474-9449 | FAX: (253) 474-9763
http://www.sitts-hill-engineers.com/

PREPARED FOR
BURLINGTON ENVIRONMENTAL SERVICES, LLC
18000 72ND AVE. SOUTH, SUITE 217
KENT, WA 98032

PROJECT
NORTH BULK LIQUID LOADING
20245 77TH AVE SOUTH KENT, WA 98032

SHEET TITLE
FOUNDATION DETAILS

SHEET NO.
C4.2

PROJECT NO.
14,731

V:\14731\14731\Drawings\14731dtl-2.dwg last edited 07/20/10 10:30am by mwarne

SOLD TO:	SHIP TO:
PHILLIPS SERVICES **20245 77TH AVE S** **KENT, WA 98032**	**Tank T-9A**

NOTE:

PRODUCT: WASTEWATER S.G. <= 1.1

USAGE NOTICE

Tank is for non-pressure, non-vacuum use and is intended for stationary installation only. Misuse of this tank could result in hazardous conditions.

DESIGN CHANGES

Customer requested design changes after the design has been completed will incur additional costs. and may affect delivery date.
No design changes are allowed after production has begun.

CUSTOMER APPROVAL

All of the submittal documents must be signed by the authorized customer representative and the appropriate approval box must be checked.

PROPRIETARY NOTICE

These drawings and the information contained herein are proprietary to Busby Marine & Tank Inc. and can not be reproduced or disclosed in whole or in part, nor used for any design or manufacturing purposes, unless authorized in writing by Busby Marine & Tank Inc.

NOTICE:

Tank will be invoiced 30 days after its completion or upon delivery if sooner. Storage fees will also start to accrue 30 days after scheduled delivery. If tank was not completed on time storage fees will not start accruing until 60 days after completion (For details see our standard terms and conditions)

☐ **APPROVED**

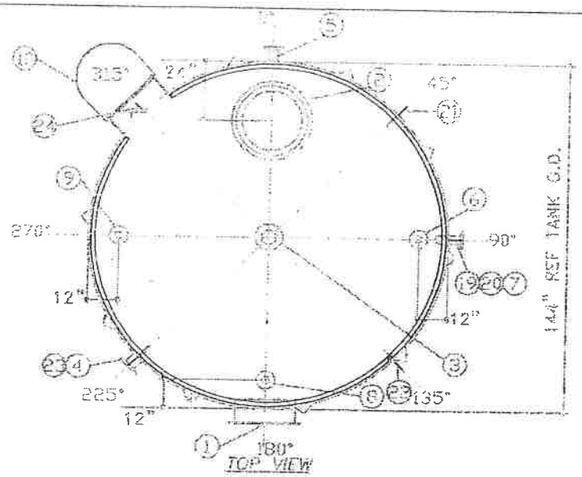
☐ **APPROVED WITH NOTATIONS INDICATED**

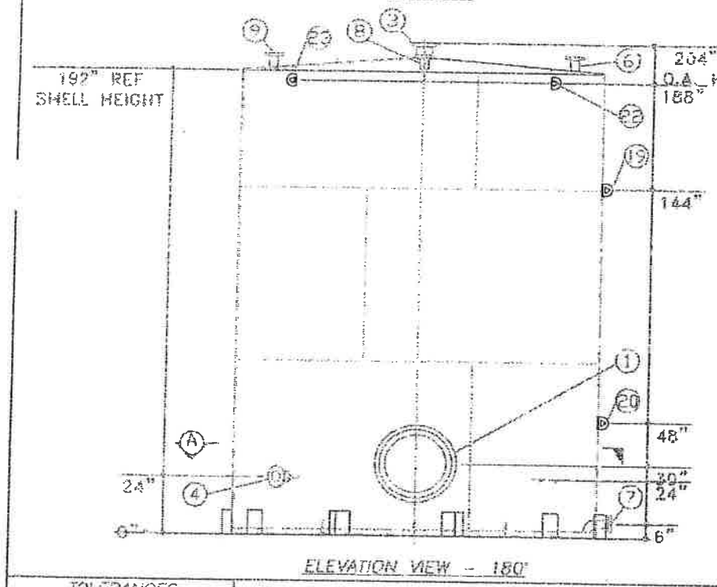
☐ **NOT APPROVED - RESUBMIT** **AUTHORIZED CUSTOMER SIGNATURE** **TITLE** **DATE**

BUSBY MARINE AND TANK, INC.
TACOMA (253) 383-5000
FAX (253) 593-3742
BUSBY MARINE & TANK INC.
1840 MARINE VIEW DRIVE
TACOMA, WA 98422

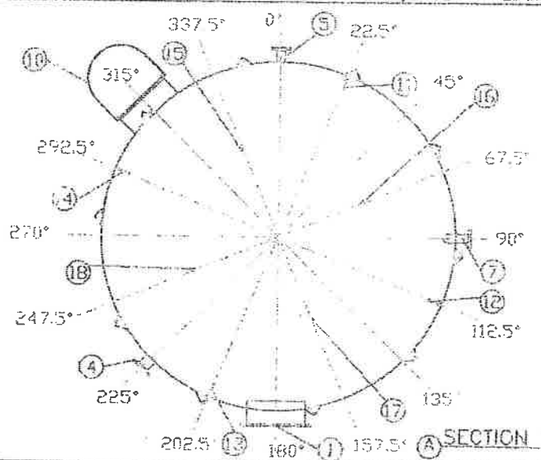
COPYRIGHT 2003 BUSBY MARINE & TANK INC.

Busby Engineering Rep	Customer Representative	Customer Purchase Order	Sheet
AH	STEVE DRUMHELLER	69359	1
JOB ID No. 329201	Company Name PHILLIPS SERVICES		Of
Engineering File No. 6A017	Project Description 13,500 GALLON VERTICAL TANK		-





ELEVATION VIEW - 180°



SECTION VIEW

BILL OF MATERIAL

ITM	ORIENT	ELEVATION	NAME	DESCRIPTION	MAT'L	PART No.	NOTES
1	180°	30"	MANWAY	24" MANWAY W/ 3/8" LID	–	–	SEE DTL SHT
2	0	TOP	MANWAY	20" MANWAY W/ 1/4" LID	–	–	SEE DTL SHT
3	CENTER	TOP	NOZZLE	8" 150# RF SLIP ON FLANGE	BI	–	MOUNT, COAT
4	225°	24"	NOZZLE	3" 150# RF SLIP ON FLANGE	BI	–	MOUNT, COAT
5	0°	5"	NOZZLE	3" 150# RF SLIP ON FLANGE	BI	–	MOUNT, COAT
6	90°	TOP	NOZZLE	3" 150# RF SLIP ON FLANGE	BI	–	MOUNT, COAT
7	90°	6"	NOZZLE	6" 150# RF SLIP ON FLANGE W/ WELD ELBOW	BI	–	MOUNT, COAT
8	180°	TOP	NOZZLE	3" 150# RF SLIP ON FLANGE	BI	–	MOUNT, COAT
9	270°	TOP	NOZZLE	3" 150# RF SLIP ON FLANGE	BI	–	MOUNT, COAT
10	315°	–	LADDER	OSHA CAGED LADDER W/ HANDRAIL	–	–	MOUNT, COAT
11	22.5°	24"	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
12	112.5°	24"	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
13	202.5°	24"	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
14	292.5°	24"	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
15	337.5°	BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
16	67.5°	BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
17	157.5°	BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
18	247.5°	BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	–	MOUNT, COAT
19	90°	144"	LIFT LUG	PHOENIX MEDUIM SERIES 2-899-MILL	A36	–	MOUNT, COAT
20	90°	48"	LIFT LUG	PHOENIX MEDUIM SERIES 2-899-MILL	A36	–	MOUNT, COAT
21	45°	188"	LIFT EAR	PHOENIX MEDUIM SERIES 2-899-MILL	A36	–	MOUNT, COAT
22	135°	188"	LIFT EAR	PHOENIX MEDUIM SERIES 2-899-MILL	A36	–	MOUNT, COAT
23	225°	188"	LIFT EAR	PHOENIX MEDUIM SERIES 2-899-MILL	A36	–	MOUNT, COAT
24	315°	188"	LIFT EAR	PHOENIX MEDUIM SERIES 2-899-MILL	A36	–	MOUNT, COAT

NOTE
1. ALL MANHOLES & TANK OPENINGS TO BE LEVEL AND PLUMB
2. TOP HANDRAIL & LADDER NOT SHOWN IN ELEVATION VIEW FOR CLARITY.

TOLERANCES	
TANK	
CAPACITY	-0% / +10
OVERALL DIA	-0" / +1"
OVERALL HEIGHT	-0" / + 2"
OTHER DIMENSIONS	-1/4" / +1/4"

BUSBY Marine Tank Inc.

NON-UL
HOLDDOWNS ARE SEISMIC RATED
SINGLE WALL TANK
VERTICAL TANK

VERTICAL - 13,500 GALLON

BUSBY PART No. BM13500N1VX | QTY: 1

(T-48)

STEEL: ASTM A36
TANK
TOP: 5/16"
SHELL: 5/16"
BOTTOM: 5/16"

COATING:
EXTERIOR ACE 3A COATING
SP-6 GRIT BLAST
3A COLOR WHOLE WHITE OR EQUAL
1 CT EPOXY PRIMER 3.0-5.0 MILS
1 CT POLYURETHANE 2.0-3.0 MILS
TOTAL 5.0-9.0 MILS

INTERIOR
BARE STEEL

SPECIAL INSTRUCTIONS
PLUG TIGHT
WRENCH PLUG TIGHT WITH PIPE DOPE ON THREADS AND TESTED LEAK FREE.
MANWAY GASKETS ARE TEFLON

APPROXIMATE SHIPPING WEIGHT:
14,500 LBS.

TANK VENT CAPACITY
13,419 PRIMARY

JOB ID No.	PURCHASE ORDER No.	DWG. FILE No.
32920	69359	6A017

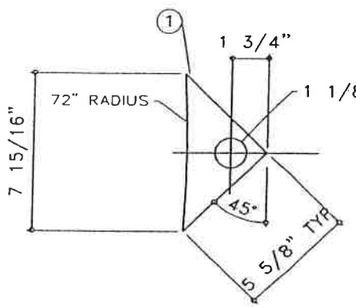
01-30-06

DRW BY	AH
REV No.	1 -
SHEET	2
OF	

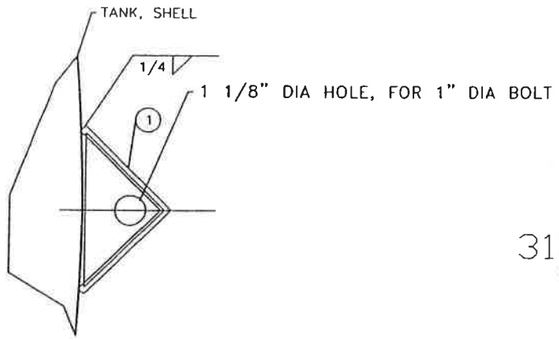
BILL OF MATERIAL

ITEM	QTY	NAME	DESCRIPTION	MATL	PART No	NOTES
1	–	CAP	1/2 PLATE X 5 5/8" X 5 5/8" LONG	A36	–	MOUNT, COAT
2	–	ANGLE	L6 X 6 X 3/8 X 14" LONG	A36	–	MOUNT, COAT

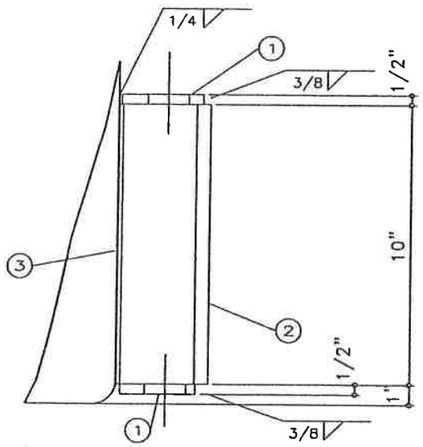
NOTE
1. COAT SEISMIC HOLD DOWN SAME AS TANK
2. USE HILTI ADHESIVE SET BOLTS OR EQUIVALENT



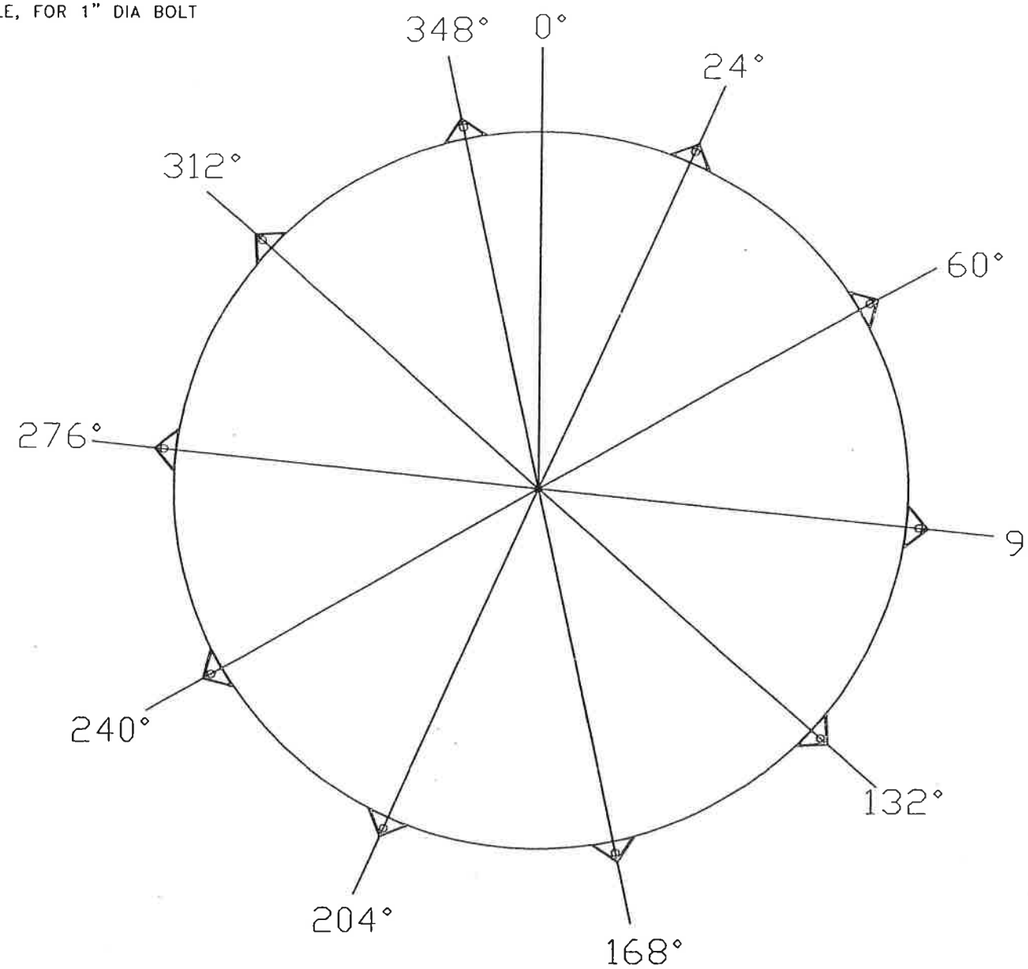
HOLDDOWN CAP – DETAIL



TOP VIEW



ELEVATION – SIDE VIEW



HOLDDOWN LOCATIONS

BUSBY MARINE AND TANK, INC.
1840 MARINE VIEW DRIVE
TACOMA, WA 98422

JOB ID No.	329201
PURCHASE ORDER No.	69359
ENGG. FILE No.	6A017

TOLERANCES HOLDDOWN	
OVERALL LENGTH	–0" / +1/8"
OVERALL WIDTH	–0" / +1/8"
OVERALL HEIGHT	–0" / +1/8"
OTHER DIMENSIONS	–0" / +1/8"

QUANTITY: 1

PART NAME: HOLDDOWN – DETAIL FOR 13,500 GALLON TANK (144" DIA.)

BUSBY PART No.: BM13500N1VX

(1:24)

No.	DRAWING / REVISION	DRAWN BY	CHECKED BY
1	1ST SUBMITTAL	–	–
–	–	–	–
–	–	–	–
–	–	–	–

01-31-06

SHEET 3 OF

SOLD TO:	SHIP TO:
PSC	Tank T-9B

NOTE:

PRODUCT: -

USAGE NOTICE

Tank is for non-pressure, non-vacuum use and is intended for stationary installation only. Misuse of this tank could result in hazardous conditions.

DESIGN CHANGES

Customer requested design changes after the design has been completed will incur additional costs. and may affect delivery date.
No design changes are allowed after production has begun.

CUSTOMER APPROVAL

All of the submittal documents must be signed by the authorized customer representative and the appropriate approval box must be checked.

PROPRIETARY NOTICE

These drawings and the information contained herein are proprietary to Busby Marine & Tank Inc. and can not be reproduced or disclosed in whole or in part, nor used for any design or manufacturing purposes, unless authorized in writing by Busby Marine & Tank Inc.

NOTICE:

Tank will be invoiced 30 days after its completion or upon delivery if sooner. Storage fees will also start to accrue 30 days after scheduled delivery. If tank was not completed on time storage fees will not start accruing until 60 days after completion (For details see our standard terms and conditions)

☐ APPROVED

☐ APPROVED WITH NOTATIONS INDICATED

☐ NOT APPROVED - RESUBMIT

AUTHORIZED CUSTOMER SIGNATURE | TITLE | DATE

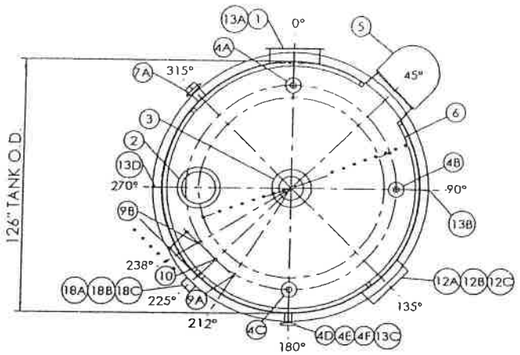
BUSBY MARINE AND TANK, INC.

TACOMA (253) 383-5000
FAX (253) 593-3742

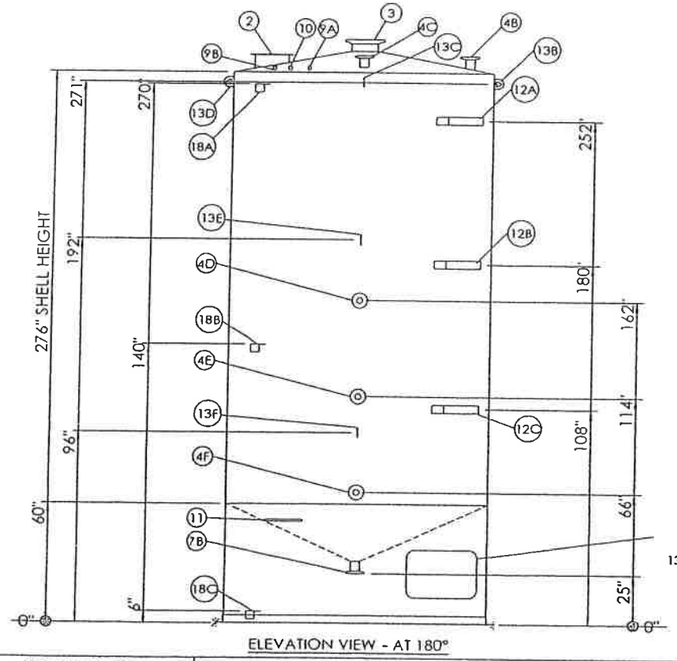
BUSBY MARINE & TANK INC.
1840 MARINE VIEW DRIVE
TACOMA, WA 98422

COPYRIGHT 2003 BUSBY MARINE & TANK INC.

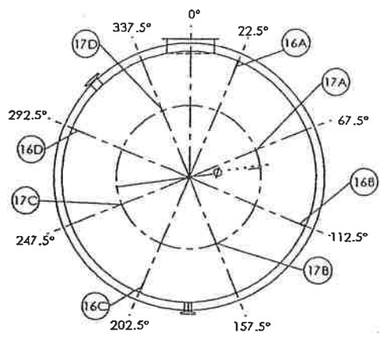
Busby Engineering Rep	Customer Representative	Customer Purchase Order	Sheet
AH	STEVE DRUMHELLER	71310	-
JOB ID No. 335701	Company Name PSC		Of
Engineering File No. 6C016	Project Description 11,500 GALLON VERTICAL TANK		-



TOP VIEW



ELEVATION VIEW - AT 180°



SECTION VIEW - A
ANODE LOCATIONS

BILL OF MATERIAL

ITEM	ORIENT	ELEVATION	NAME	DESCRIPTION	MATL	PART No.	NOTES
1	0°	90"	MANHOLE	24" DOUBLE BOLT MANHOLE	A36	-	SEE DTL SHT
2	270°	TOP	MANHOLE	16" SINGLE BOLT MANHOLE	A36	-	SEE DTL SHT
3	CENTER	TOP	NOZZLE	12" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
4A	0°	TOP	NOZZLE	3" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
4B	90°	TOP	NOZZLE	3" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
4C	180°	TOP	NOZZLE	3" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
4D	180°	162"	NOZZLE	3" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
4E	180°	114"	NOZZLE	3" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
4F	180°	66"	NOZZLE	3" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
5	45°	SIDE	LADDER	OSHA CAGED LADDER - OSHA YELLOW	-	-	SEE DTL SHT
6	CENTER	TOP	HANDRAIL	HANDRAIL FOR 120" DIA. TANK - OSHA YELLOW	-	-	SEE DTL SHT
7A	315°	66"	NOZZLE	4" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
7B	CENTER	25"	NOZZLE	4" NOZZLE W/ 150# RF SLIP ON FLANGE	BI	-	MOUNT, COAT
8	-	-	-	-	-	-	-
9A	212°	TOP	NIPPLE	1 1/4" SCH 40 THREADED ON END	-	805-502	MOUNT, COAT
9B	238°	TOP	NIPPLE	1 1/4" SCH 40 THREADED ON END	A36	805-502	MOUNT, COAT
10	225°	TOP	COUPLING	1" COUPLING	A36	GLPC1	MOUNT, COAT
11	225°	INSIDE BOTTOM	ANCHOR BAR	ANCHOR BAR ASSEMBLY	A36	JA3540-3	-
12A	135°	252"	BRACKET	4" FB X 1/8" X 40" LONG	A36	-	SEE DTL SHT
12B	135°	180"	BRACKET	4" FB X 1/8" X 40" LONG	A36	-	SEE DTL SHT
12C	135°	108"	BRACKET	4" FB X 1/8" X 40" LONG	A36	-	SEE DTL SHT

NOTE
1. ALL MANHOLES & TANK OPENINGS TO BE LEVEL AND PLUMB
2. TOP HANDRAIL & LADDER NOT SHOWN IN ELEVATION VIEW FOR CLARITY.

TOLERANCES
TANK
CAPACITY -0% / +10
OVERALL DIA -0" / +1"
OVERALL HEIGHT -0" / +2"
OTHER DIMENSIONS -1/4" / +1/4"

NON-UL
HOLDDOWNS ARE SEISMIC RATED
SINGLE WALL TANK
VERTICAL TANK

STEEL: ASTM A36
TANK
TOP: 5/16" PLATE
SHELL: 5/16" PLATE
BOTTOM: 5/16" PLATE

COATING:
"R" EXTERIOR COATING, ACE 1A
RED SHOP COAT 1-3 MILS

EXTERIOR ACE 3A COATING:
SP-6 GRIT BLAST
3A COLOR: WH01 WHITE OR EQUAL
1 CT TN-66 3.0 -5.0 MILS
1 CT TN-73 2.0 -3.0 MILS
TDFT 5.0 -8.0 MILS

INTERIOR:
BARE STEEL

SPECIAL INSTRUCTIONS
PLUG TIGHT
WRENCH PLUG TIGHT WITH PIPE DOPE ON THREADS AND TESTED LEAK FREE.
MANHOLE GASKETS ARE TEFLON

APPROXIMATE SHIPPING WEIGHT:
13,000 LBS.

TANK VENT CAPACITY
392,000 PRIMARY

BUSBY MARINE & TANK, INC.

VERTICAL-11,500 GALLON
T-9B

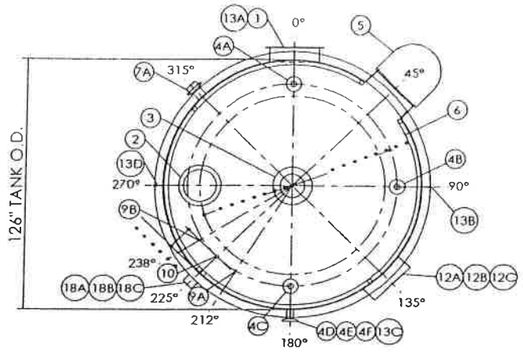
BUSBY PART No. BM11500N1VX | QTY: 1

(1:60)

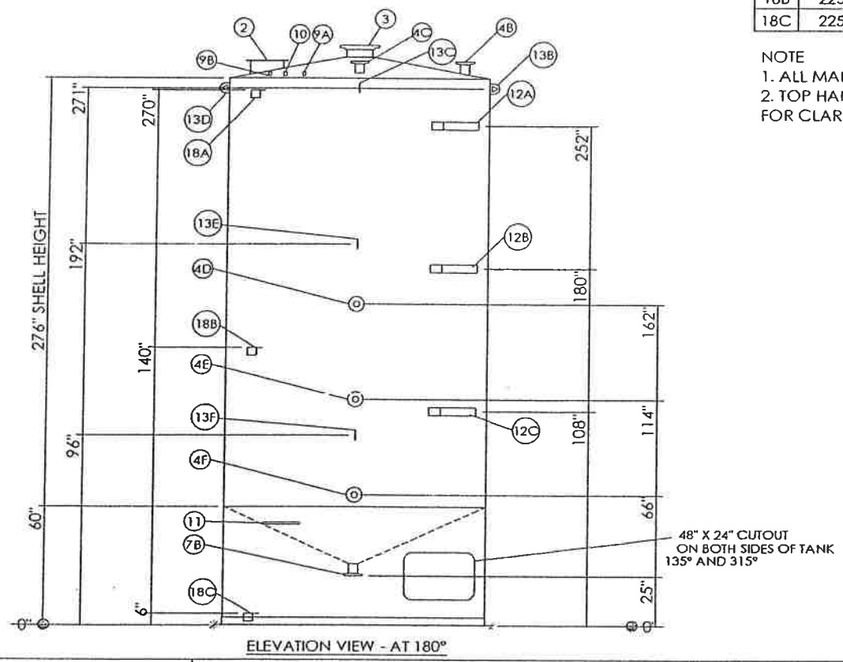
JOB ID No. 335701 | DBS No. 71310 | ENG. FILE No. 6C016
03-16-06

DRW BY AH
REV No 1
SHEET 2 OF

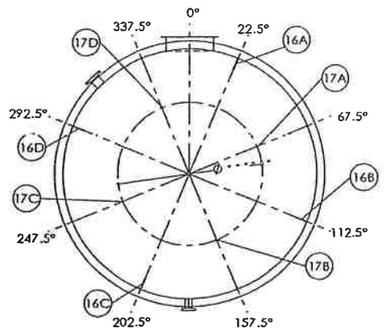
©TYP 2003 BUSBY MARINE & TANK, INC.



TOP VIEW



ELEVATION VIEW - AT 180°



SECTION VIEW - A
ANODE LOCATIONS

BILL OF MATERIAL

ITEM	ORIENT	ELEVATION	NAME	DESCRIPTION	MATL	PART No	NOTES
13A	0°	TOP	LIFT EAR	-	-	PH2-899	MOUNT, COAT
13B	90°	TOP	LIFT EAR	-	-	PH2-899	MOUNT, COAT
13C	180°	TOP	LIFT EAR	-	-	PH2-899	MOUNT, COAT
13D	135°	TOP	LIFT EAR	-	-	PH2-899	MOUNT, COAT
13E	135°	96"	LIFT LUG	-	-	PH2-899	MOUNT, COAT
13E	135°	162"	LIFT LUG	-	-	PH2-899	MOUNT, COAT
16A	22.5°	84"	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
16B	112.5°	84"	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
16C	202.5°	84"	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
16D	292.5°	84"	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
17A	67.5°	INSIDE BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
17B	157.5°	INSIDE BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
17C	247.5°	INSIDE BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
17D	337.5°	INSIDE BOTTOM	ANODE	5/8" X 6" SS ANODE STUDS	SS	-	-
18A	225°	270"	BRACKET	GAUGE BOARD BRACKET	A36	509-826	-
18B	225°	140"	BRACKET	INTERMEDIATE GAUGE BOARD BRACKET	A36	9399-18000	-
18C	225°	6"	BRACKET	GAUGE BOARD BRACKET	A36	509-826	-

NOTE
1. ALL MANHOLES & TANK OPENINGS TO BE LEVEL AND PLUMB
2. TOP HANDRAIL & LADDER NOT SHOWN IN ELEVATION VIEW FOR CLARITY.

TOLERANCES
TANK
CAPACITY -0% / +10
OVERALL DIA -0" / +1"
OVERALL HEIGHT -0" / + 2"
OTHER DIMENSIONS -1/4" / +1/4"

BUSBY MARINE AND TANK, INC.

COPYRIGHT 2003 BUSBY MARINE & TANK INC.

NON-UL
HOLDDOWNS ARE SEISMIC RATED
SINGLE WALL TANK
VERTICAL TANK

VERTICAL - 11,500 GALLON
T-9B

BUSBY PART No. BM11500N1VX | QTY: 1

(1:60)

STEEL: ASTM A36
TANK
TOP: 5/16" PLATE
SHELL: 5/16" PLATE
BOTTOM: 5/16" PLATE

COATING:
EXTERIOR :
SP-6 GRIT BLAST
3A COLOR: WH01 WHITE OR EQUAL
1 CT TN-66 3.0 -5.0 MILS
1 CT TN-73 2.0 -3.0 MILS
TDFT 5.0 -8.0 MILS

INTERIOR:
BARE STEEL

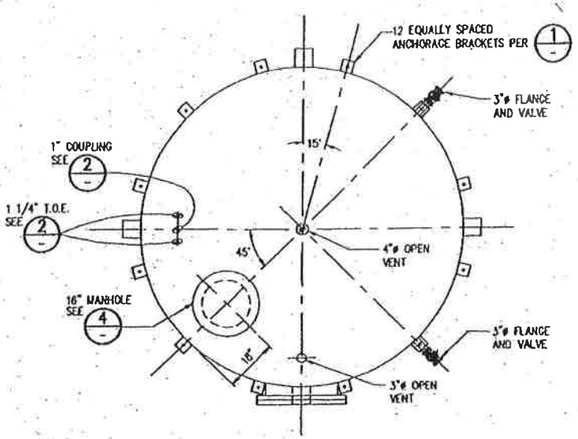
SPECIAL INSTRUCTIONS
PLUG TIGHT
WRENCH PLUG TIGHT WITH PIPE DOPE ON THREADS AND TESTED LEAK FREE.
MANHOLE GASKETS ARE TEFLON

APPROXIMATE SHIPPING WEIGHT:
13,000 LBS.

TANK VENT CAPACITY
392,000 PRIMARY

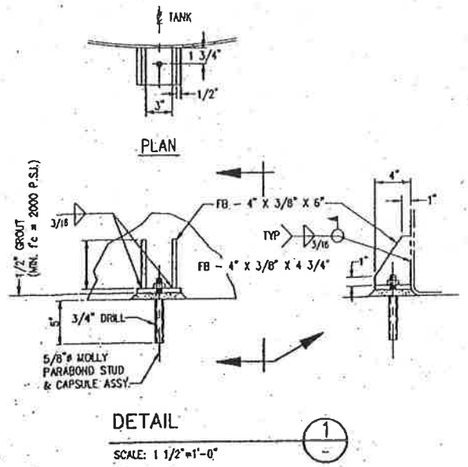
JOB ID No. 335701 | DBS No. 71310 | ENG. FILE No 6C016
03-01-06

DRW BY AH
REV No 1
SHEET 3 OF



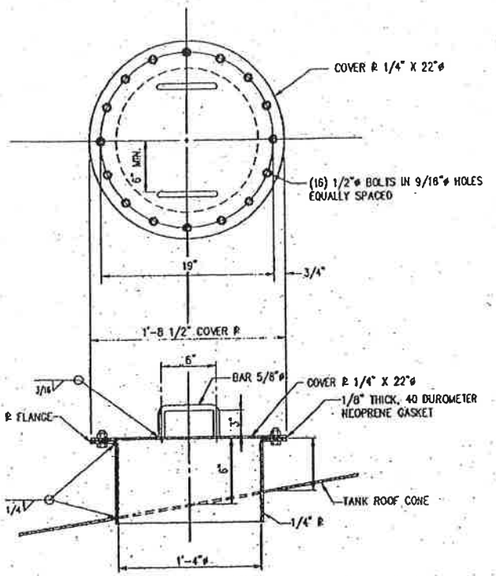
PLAN VIEW

SCALE: 1/2"=1'-0"



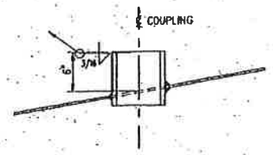
DETAIL 1

SCALE: 1 1/2"=1'-0"



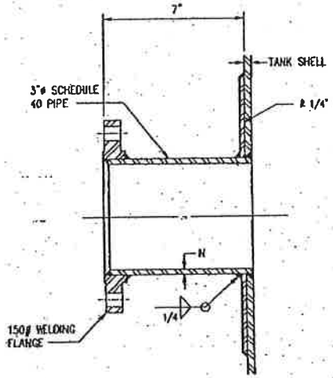
DETAIL 4

SCALE: 3/4"=1'-0"



DETAIL 2

SCALE: 3/4"=1'-0"

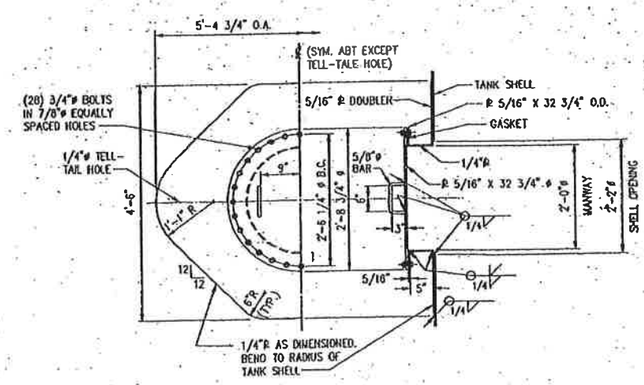


DETAIL 5

SCALE: NONE

ELEVATION

SCALE: 1/2"=1'-0"



DETAIL 3

SCALE: 3/4"=1'-0"

STRUCTURAL NOTES

1. ALL STRUCTURAL STEEL AND PLATE SHALL COMPLY WITH ATSM A36 UNLESS OTHERWISE NOTED.
2. ALL WELDING SHALL COMPLY WITH AWS D1.1.
3. DESIGN LOADS:
   CONTENTS: LIQUID, SPECIFIC GRAVITY = 1.8
   SNOW: 25 PSF
   WIND: UBC, 80 MPH, EXPOSURE C
   SEISMIC: UBC, ZONE 3
   PRESSURE: ATMOSPHERIC

GENERAL NOTES

1. EXISTING DIMENSION PROVIDED FOR REFERENCE ONLY. FIELD VERIFY PRIOR TO FABRICATING NEW MATERIALS.
2. PROVIDE CORROSION PROTECTION IN ACCORDANCE WITH OWNERS INSTRUCTIONS.

RECORD DRAWING

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. THE ENGINEER HAS NOT VERIFIED THE ACCURACY OF THIS INFORMATION AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

REV. NO.	DATE	AUTHORIZATION	DESCRIPTION
B	3-1-93		RECORD DRAWING ON CAD
A	12/28/89		DELETED REQUIREMENT FOR NEW EMERGENCY VENT
1	12/28/89	P.O. 28047	INITIAL RELEASE

EISI
consulting engineers
1800 West Emerson Place
Suite 200
Seattle, Washington 98119

DOUGLAS L. CONDIT STATE OF WASHINGTON (16092) REGISTERED PROFESSIONAL ENGINEER

EXPIRES

BURLINGTON ENVIRONMENTAL INC.

TANK T-9C

DESIGNED D.L.C.	DRAWN L.B.W.	CHECKED	APPVD.
SCALE 1=1	WORKSHEET NO. 20019		SHEET 1 or 1
DATE			

APPENDIX D-2

MANUFACTURER'S DATA

APPENDIX D-2

MANUFACTURER'S DATA

TECHNICAL BULLETIN
APRIL 1990

SEMSTONE® 245

High Performance Coating

DESCRIPTION AND USES:

SEMSTONE 245 is a high performance specialty coating for concrete. Its unique formulation makes it suitable for constant immersion service in chlorinated solvents, such as:

- Methylene chloride
- Ethylene dichloride
- Trichloroethylene

In addition, SEMSTONE 245 offers excellent resistance to a very broad range of other hazardous and corrosive chemicals including benzene, phenol, ketones, alcohols and chromic acid, as well as such commonly encountered items as 98% sulfuric acid and 50% caustic. This makes it the preferred choice for protecting hazardous waste handling facilities and other areas that will regularly see exposure to a wide variety of difficult chemicals.

Other features include:

- Very rapid cure, providing quick turnaround of projects.
- Can be applied at temperatures as low as 35°F.
- Can be applied over damp concrete.

PACKAGING/COVERAGE:

SEMSTONE 245 is available in 1 gallon, 3 gallon and 25 gallon units. Each unit consists of premeasured Part A and Part B components. A bagged Part C thixotropic agent is added for work on vertical surfaces.

Application thickness may vary from 25 mils to 125 mils, depending on expected service conditions (i.e., chemical exposure, temperature, traffic load and other mechanical abuse, immersion service vs. splash-spill, etc.). Consult Sentry Polymers for specific thickness recommendations.

In addition, coverage rates will be effected by the condition of surface being coated (degraded vs. smooth, steel vs. concrete, etc.).

To figure THEORETICAL coverage per gallon, divide desired mil thickness into 1,604. (For example, theoretical coverage for a 60 mil thickness is: 1,604 divided by 60 = 26.73 square feet per gallon.)

For practical coverage, make necessary allowances for condition of the substrate, working conditions, waste, spillage, etc.

Sentry POLYMERS

P. O. BOX 2076A
5500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
800-231-2544

TYPICAL PROPERTIES:

Solids, by Volume _____ 100%
Color _____ Buff (Selected other colors optional)
Weight per Mixed Gallon _____ 10 lbs.

Cure Times (Approximate):

Temperature	Foot Traffic	Chemical Service**
35°F	24 hrs.	7 days
55°F	8 hrs.	48 hrs.
80°F	4 hrs.	24 hrs.

**For immersion service in chlorinated solvents, the coating must be postcured at 150°F for 12 hours.

RELATED AND ANCILLARY PRODUCTS:

SEMSTONE 140 Epoxy Floor Topping
SEMSTONE 140-CT Epoxy Floor Coating - Cold Temperature Formulation
SEMSTONE 140-S Epoxy Coating and Lining
SEMSTONE 300 Epoxy Polymer Concrete
SEMSTONE 500 Epoxy Putty
SEM-CRETE Rapid Hardening Underlayment Mortar

Refer to separate technical bulletin on each products for its uses, application instructions, etc.

STORAGE AND SHELF LIFE:

Keep SEMSTONE 245 components tightly sealed in their original containers until ready for use. Store unopened at 50°F - 90°F, out of direct sunlight. At least 24 hours immediately prior to use, store all components (A, B, C, and aggregate) at 80°F - 90°F, to facilitate handling.

Properly stored, SEMSTONE 245 has a minimum shelf life of one year. Refer to batch number on label for date of manufacture.

CHEMICAL RESISTANCE GUIDE

This guide is intended as an aid in determining the potential usefulness of SEMSTONE 245 as a protective barrier against chemical exposure. Each application should be evaluated according to its particular circumstances and conditions.

KEY: 1 = Suitable for constant immersion
2 = Suitable for shorter term containment and continual spillage
3 = Suitable for intermittent spills when followed promptly with water flushing
NR = Not recommended
C = Consult Sentry Polymers
* = This chemical will attack the silica aggregate in the system. When the system is applied, be especially careful that all aggregate is totally encapsulated with SEMSTONE 245.
** = For constant immersion service, coating must be postcured 12 hours at 150°F.
*** = Coating may show some staining or color change when exposed to this chemical.

	RATING
Acetic Acid, 10%	1
Acetic Acid, 30%	2
Acetic Acid, Glacial	3
Acetone	1
Acrylic Acid, up to 25 %	2
Acrylonitrile	2
Adipic Acid	2
Alum (Aluminum Potassium Sulfate)	1
Aluminum Chloride	1
Aluminum Fluoride	1*
Aluminum Hydroxide	1
Aluminum Nitrate	1
Aluminum Sulfate	1
Ammonia	2
Ammonium Bisulfite	1
Ammonium Chloride	1
Ammonium Hydroxide	1
Ammonium Nitrate	1
Ammonium Sulfate	1
n-Amyl Alcohol	1
Aniline	1
Barium Chloride	1
Barium Hydroxide	1
Barium Sulfate	1
Barium Sulfide	1
Benzene	1
Benzene Sulfonic Acid	1
Benzoic Acid	1
Black Liquor, Pulp Mill	1
Bleach	C
Boric Acid	1
Brine	1
Bromide, Liquid	NR
Bromide Gas (Dry & Wet)	3
Butyl Acetate	1
Butyl Acrylate	1
n-Butyl Alcohol	1
Butyl Cellosolve Solvent	1
n-Butyric Acid	2
Cadmium Chloride	1
Calcium Chloride	1
Calcium Hydroxide	1
Calcium Hypochlorite	C
Calcium Nitrate	1
Calcium Sulfate	1
Calcium Sulfite	1
Carbon Dioxide Gas	1
Carbon Dissulfide	2
Carbon Tetrachloride	1**
Chlorine Dioxide	2
Chlorine Gas (Dry & Wet)	3
Chlorine Water	2
Chlorobenzene	1
Chloroform	1**
Chromic Acid, 25%	1***
Chromic Acid, 50%	2***
Copper Nitrate	1
Copper Sulfate	1
Corn Oil	1
Crude Oil, Sour	1
Crude Oil, Sweet	1
Cupric Ammonium Chloride	1

	RATING
Cyclohexane	2
Cyclohexanol	2
Cyclohexanone	2
Diesel Fuel	1
Diethyl Benzene	1
Dimethyl Aniline	1
Epichlorohydrin	1
Ethyl Acetate	1
Ethyl Acrylate	1
Ethyl Alcohol	1
Ethyl Benzene	1
Ethyl Chloride	1**
Ethylene Dichloride (EDC)	1**
Ethylene Glycol	1
Fatty Acids	1
Ferric Chloride	1***
Ferric Nitrate	1
Ferric Sulfate	1
Ferrous Chloride	1
Fluosilicic Acid	1*
Formaldehyde	1
Formic Acid	2
Fuel Oil	1
Gasoline	1
Glycerine	1
Heptane	1
Hexane	1
Hydrobromic Acid	2
Hydrochloric Acid, 15%	1
Hydrochloric Acid, 37%	1***
Hydrofluoric Acid	1*
Hydrogen Peroxide	2
Hydrogen Sulfide	1
Isopropyl Alcohol	1
Jet Fuel	1
Kerosene	1
Lactic Acid	2
Lauryl Chloride	1
Lead Acetate	1
Linseed Oil	1
Lithium Bromide	1
Lithium Chloride	1
Lithium Hypochlorite	C
Lithium Hydroxide	1
Magnesium Bisulfite	1
Magnesium Carbonate	1
Magnesium Chloride	1
Magnesium Hydroxide	1
Magnesium Sulfate	1
Maleic Acid	2
Mercuric Chloride	1
Mercurous Chloride	1
Methanol	1
Methyl Chloride	2
Methylene Chloride	1**
Methyl Ethyl Ketone	1
Methyl Methacrylate	1
Mineral Spirits	1
Monochloroacetic Acid	2
Monoethanolamine	1
Muriatic Acid	1
Naphtha	1

	RATING
Naphthalene	1
Nitric Acid, 5%	2***
Nitric Acid, 30%	3***
Nitric Acid, 50%	NR
Nitrobenzene	1
n-Octyl Alcohol	1
Oils	1
Oleic Acid	2
Oleum	2***
Oxalic Acid	2
Perchloroethylene	1
Perchloric Acid	2
Phenol	2
Phosphoric Acid, 50%	1
Phosphoric Acid, 85%	1
Phosphorous Acid	2
Potassium Carbonate	1
Potassium Chloride	1
Potassium Dichromate	2
Potassium Hydroxide	1
Potassium Nitrate	1
Propionic Acid	2
Silver Nitrate	1***
Skydrol	1
Sodium Acetate	1
Sodium Bicarbonate	1
Sodium Bisulfate	1
Sodium Bisulfite	1
Sodium Carbonate	1
Sodium Chloride	1
Sodium Chlorite	2
Sodium Hydroxide, 10%	1
Sodium Hydroxide, 50%	1
Sodium Hypochlorite	C
Sodium Sulfate	1
Sodium Sulfide	1
Stannic Chloride	1
Stannous Chloride	1
Stearic Acid	1
Styrene	1
Sugar/Sucrose	1
Sulfur Dioxide	1
Sulfuric Acid,10%	1
Sulfuric Acid, 50%	1
Sulfuric Acid, 98%	1***
Tall Oil	1
Tannic Acid	1
Tartaric Acid	1
Tetrahydrofuran	3
Toluene	1
Toluene Sulfonic Acid	1
Trichloracetic Acid	2
Trichloroethane	1
Trichloroethylene	1**
Trisodium Phosphate	1
Urea	1
Water, Deionized	1
Water, Demineralized	1
Water, Distilled	1
Xylene	1
Zinc Chloride	1
Zinc Sulfate	1

APPLICATION GUIDELINES

IMPORTANT NOTES

1. Work on vertical surfaces requires the addition of Part C thixotrope.

2. For manual applications, use only 1 gallon and 3 gallon units. The mixed material has a very short pot life, so plan your work accordingly.

TEMPERATURE CONSIDERATIONS

1. Throughout the application process, the temperature of the surface to be coated should be 35°F - 95°F.

2. Below 75°F, the components will thicken noticeably, making manual applications extremely difficult.

3. When coating steel, halt application if the temperature falls within 5°F of the dew point. (This is not necessary when coating concrete.)

4. Bubbles may appear in the SEMSTONE 245 coating if it is applied over concrete in direct sunlight, or when temperatures are rising. This is due to the expansion of air and/or moisture trapped in the concrete. It is especially true of air entrained concrete.

   For best results, shade the work area and apply SEMSTONE 245 when temperatures are falling.

5. Store all materials (components A, B, C and aggregate) at 80°F - 90°F for at least 24 hours before use, to facilitate handling.

SURFACE PREPARATION - GENERAL

1. Surfaces must be free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of SEMSTONE 245.

2. For the initial coat, concrete surfaces can be damp.

   However, for recoats, all surfaces must be dry.

SURFACE PREPARATION OF CONCRETE

1. New concrete generally should be cured a minimum of 28 days.

   NOTE: Check with Sentry Polymers for recommendations regarding concrete cured less than 28 days.

2. Concrete must be structurally sound and must not contain any accelerators or curing compounds.

3. Remove all oil and grease.

4. Remove all surface laitance and expose sound concrete. We recommend abrasive blasting to do this.

   However, other methods, such as acid etching and neutralizing, may be used.

5. In general, any existing coating should be completely removed.

   In certain instances, this may not be necessary, but consult with Sentry Polymers first.

   Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates and mid-floor termination points. Handle them as per Sentry's Construction Details.

7. Honeycombs or any form voids in vertical surfaces must be filled.

   Above 50°F, use SEMSTONE 140 with Part C thixotrope and aggregate added.

   Below 50°F, use SEMSTONE 140-CT with Part C aggregate added.

8. If the concrete is damp:

   a. Flush thoroughly with clear water. Steam or hot water is recommended, if available.

   b. Remove all standing water.

SURFACE PREPARATION OF STEEL (NON-IMMERSION SERVICE ONLY)

1. Abrasive blast steel surfaces to a near white metal finish with 1 - 2 mil anchor profile. (Ref. SSPC-SP-10)

2. All outside corners must be ground smooth and rounded.

3. Round all inside corners to a minimum 1/2" radius with SEMSTONE 500 Epoxy Putty.

MASKING

Mask surfaces that are not to be coated. This material is difficult to remove, once applied.

APPLICATION EQUIPMENT

1. For spraying, use only a specially equipped plural component rig. Specifications are as follows:

   Graco King Hydracat (or equivalent); 28:1 pump; 2.3 GPM, 4:1 mix ratio; inlet air pressure on pump set at 75-120 psi.

   Two 15 gallon heated hopper tanks. Set heater at 95°F.

   In-line heater on resin outlet, set at 110° F.

   High pressure solvent pump.

   Insulated hoses, 3/8 in. ID, maximum length of 100 ft.

   Graco Silver Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inches.

   No filters or internal screens.

2. For manual applications:

   a. Floors - preferred method is to spread with serrated squeegee, then backroll.

   As a second choice, trowel or brush could be used.

   b. Walls - use roller or brush.

MIXING AND APPLICATION

1. The components must be individually agitated immediately prior to use:

   Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

   Part B - Stir each Part B component to a uniform color in its individual container.

2. For work on vertical surfaces, add Part C.

   Part C comes in premeasured bags.

   For a one gallon unit and three gallon units, add one premeasured bag to each Part A.

   For 25 gallon units, add one premeasured bag to each bucket of Part A and each bucket of Part B. (NOTE-There are 4 buckets of Part A and one bucket of Part B in a 25-gallon unit.)

   Using a Jiffy type mixer, blend the Part C in until it is evenly dispersed, (about 1 - 2 minutes).

   NOTE: Adding Part C darkens the color of SEMSTONE 245 somewhat.

3. Skip this step if you are spraying.

   If mixing for application by hand:

   Pour Part A into a clean mixing container of adequate capacity.

   Add Part B.

   Mix thoroughly for two minutes using a Jiffy type mixer.

   The pot life of the mixed material will be about 15 minutes at 80°F. So, use immediately. For work on floors, etc., we suggest that you immediately dump the mixed material onto the surface and spread it.

NOTE: The premeasured quantities of each component have been carefully set. Any variation in these premeasured ratios will adversely effect performance. So, mix only complete units. If any of the components are spilled, discard the batch.

Material should be applied in even coats.

If spraying, use multidirectional passes to insure positive coverage and a proper film build.

If you notice a marbling or streaking effect while spraying, stop immediately. The spray equipment is not mixing the material properly or the mix ratios are incorrect. Check your equipment.

This marbled or streaked material will not cure properly and must be removed. Scrape the material off and then solvent wash the area with MEK or toluene. Alternately, abrasive blasting may be used to remove the material. In either case the end result is to have a non-sticky surface to recoat.

5. Adding aggregate:

   a. Horizontal surfaces

      To obtain a thicker coating and/or a nonskid finish, aggregate may be broadcast into the coating before it begins to set.

      Since SEMSTONE 245 sets quickly, you must plan the work carefully. One worker should apply the coating, and another should follow immediately, broadcasting the aggregate. However, keep the work separated. Do not allow aggregate to be broadcast ahead of the applicator.

      Broadcast aggregate until dry layer is achieved.

      Allow the coating to cure.

      Remove the excess aggregate.

      Use only clean, dry, bagged and well graded 20/40 mesh silica or quartz sand containing not less than 97.5% silicon dioxide. Aggregate may be either round or angular.

      When broadcasting aggregate in a large or congested area, it may be desirable for workers to wear spiked shoes to enable them to walk out onto the coating without disturbing it.

      An optional topcoat of SEMSTONE 245 may be applied to protect the aggregate and obtain a more cleanable surface. The topcoat should be of neat material applied at a cover rate of 150 - 160 sq. ft. per gallon. The surface must be kept dry and free of contamination prior to applying this topcoat.

   b. Vertical surfaces

      Refer to Sentry's supplemental guidelines for adding Part C and sand.

6. Prepare surfaces for intercoat adhesion as follows:

   a. Allow SEMSTONE 245 to cure until jelled before recoating.

   b. If the surface has cured firm to the touch, but less than 24 hours, it must be washed with soap and water, rinsed and dried before recoating.

   c. Surfaces cured beyond 24 hours must be washed with soap and water, rinsed, dried and lightly sanded or abrasive blasted.

   d. Important: While SEMSTONE 245 can be applied over damp concrete, for recoating, the surface must be dry.

7. Post-curing for immersion service in chlorinated solvents:

   The coating must be postcured if it will be used for continuous immersion service in chlorinated solvents.

   Tarp the coated area and heat it at 150°F for at least 12 hours.

8. Spark Testing Steel

   Spark testing is recommended for coated steel in immersion service.

   $$\text{Voltage setting} = 1250 \times \sqrt{\text{Coating Thickness (in mils)}}$$

9. If work is interrupted, and at the end of the day, terminate the coating in a straight line.

CLEANUP

Clean all tools and equipment with Xylene, MEK or toluene.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Both the mixed product and its separate A and B components can be extremely irritating to skin, eyes and the respiratory system.

Avoid contact with eyes and skin; do not ingest or inhale.

When spraying in a confined area, wear a fresh air hood and make provision for forced ventilation.

At all other times, wear a NIOSH approved respirator suitable for organic vapors when working with this product or its components.

When working with SEMSTONE 245, always wear chemical goggles, rubber gloves, and appropriate work clothing.

Prolonged or repeated exposure to the unreacted Part A and Part B components of SEMSTONE 245 may cause skin irritation or allergic reactions.

Refer to material safety data sheets regarding individual components.

NOTES:

TECHNICAL BULLETIN
February 1988

SEMSTONE® 145

Sprayable Hybrid Floor Topping

DESCRIPTION AND USES:

Featuring enhanced chemical resistance, Sentry's hybrid systems are specially formulated to withstand some of industry's most aggressive chemicals, including 98% sulfuric acid, as well as many organic chemicals and organic solvents.

SEMSTONE 145 is Sentry's high performance hybrid floor topping system for concrete. Self-priming and semi-leveling, it will typically be aggregate filled and spray applied to yield a highly serviceable floor for areas subject to extremely severe chemical exposure.

SEMSTONE 145 is a two component system that possesses the following characteristics in common with all members of Sentry's 145 family of products:

- excellent resistance to:
  - 98% sulfuric acid, many organics and other harsh chemicals;
  - thermal shock;
  - wear and impact.
- superior bonding qualities;
- high cohesive strength, coupled with the flexibility necessary to resist cracking;
- low permeability;
- low odor;
- 100 % solids.

Example uses include: process slabs, tank farm floors, chemical loading and unloading areas, spill containment areas, and waste proof coating for secondary containment systems

PACKAGING/COVERAGE:

SEMSTONE 145 is available in 1 gallon and 5 gallon units. Each unit consists of a premeasured Part A component and a premeasured Part B component.

Coverage rates are effected by the condition of the surface being coated. The following are theoretical coverage rates:

32 sq. ft. per gallon at 50 mils.
12.8 sq. ft. per gallon at 125 mils.

Coverage can be increased by up to 100% when extended with silica aggregate. (See paragraph 3 of the application guidelines under MIXING AND APPLICATION.)

Application thickness depends upon expected service conditions. Consult Sentry Polymers or your local representative for specific recommendations.

Sentry POLYMERS
P. O. BOX 2076A
5500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
713-393-1666 (HOUSTON)
800-231-2544 (EXCEPT TX & AK)

TYPICAL PROPERTIES – WET:

Solids, by Volume	100%
Weight per Mixed Gallon	9.3 lbs
Pot Life @ 75°F	45 - 60 minutes
	(significantly less at elevated temperatures)
Cure Time @ 75°F:	
Foot Traffic	12 hrs.
Light Vehicular Traffic	24 hrs.
Chemical Service	36 hrs.
Primer	Not Required
Nonflammable	

TYPICAL PROPERTIES – CURED:

Color		Light Gray (selected other colors available)
Hardness	ASTM D - 2240 Shore D	70 - 75
Compressive Strength	ASTM C - 579	14,000 psi
Tensile Strength	ASTM D - 638	5,000 psi
Tensile Elongation	ASTM D - 638	6%
Flexural Strength	ASTM D - 790	11,000 psi
Abrasion Resistance	ASTM D - 1044	56 mg
		(CS17 wheels)
Water Vapor Transmission	ASTM E - 96	
	WVT	0.0120 grain per hr ft²
	Permeability	0.0042 perm. -in.

RELATED AND ANCILLARY PRODUCTS:

SEMSTONE 145 - S Hybrid Coating and Lining
SEMSTONE 300 Epoxy Polymer Concrete
SEMSTONE 500 Epoxy Putty
SEM-CRETE Rapid Hardening Underlayment Mortar
SEMSTONE Scrim

Refer to separate technical bulletin on each product for uses, application instructions, etc.

STORAGE AND SHELF LIFE:

Keep SEMSTONE 145 components tightly sealed in their original containers until ready for use. Store at 50° - 75°F, out of direct sunlight. Properly stored, SEMSTONE 145 has a minimum shelf life of one year.

Refer to batch number on label for date of manufacture.

CHEMICAL RESISTANCE GUIDE

This guide is intended as an aid in determining the potential usefulness of SEMSTONE 145 as a protective barrier against chemical exposure. Each application should be evaluated according to its particular circumstances and conditions.

KEY: 1 = Suitable for constant immersion
2 = Suitable for shorter term containment and continual spillage
3 = Suitable for intermittent spills when followed promptly with water flushing
NR = Not recommended
C = Consult Sentry Polymers

	RATING		RATING		RATING
Acetic Acid, 10%	2	Corn Oil	1	Naphthalene	1
Acetic Acid, 30%	3	Crude Oil, Sour	1	Nitric Acid, 5%	3
Acetic Acid, Glacial	3	Crude Oil, Sweet	1	Nitric Acid, 30%	NR
Acetone	2	Cyclohexane	2	Nitric Acid, 50%	NR
Acrylic Acid, up to 25%	2	Cyclohexanol	2	Nitric Acid/Sulfuric Acid	NR
Acrylonitrile	NR	Cyclohexanone	2	Nitrobenzene	3
Alum		Dichlorobenzene	2	n-Octyl Alcohol	1
(Aluminum Potassium Sulfate)	1	Diesel Fuel	1	Oils	1
Aluminum Chloride	1	Diethyl Benzene	3	Oleum	3
Aluminum Fluoride	1	Ethyl Alcohol	2	Oleic Acid	3
Aluminum Hydroxide	1	Ethyl Benzene	3	Oxalic Acid	2
Aluminum Nitrate	1	Ethyl Chloride	3	Perchloroethylene	2
Aluminum Sulfate	1	Ethylene Dichloride	3	Perchloric Acid	3
Ammonia	2	Ethylene Glycol	1	Phenol	3
Ammonium Bisulfite	1	Fatty Acids	1	Phosphoric Acid, 50%	1
Ammonium Chloride	1	Ferric Chloride	1	Phosphoric Acid, 85%	2
Ammonium Hydroxide	1	Ferric Nitrate	1	Phosphorous Acid	3
Ammonium Nitrate	1	Ferric Sulfate	1	Potassium Carbonate	1
Ammonium Sulfate	1	Ferrous Chloride	1	Potassium Chloride	1
n-Amyl Alcohol	2	Fluosilicic Acid	2,C	Potassium Dichromate	2
Aniline	NR	Formaldehyde	1	Potassium Hydroxide	1
Barium Chloride	1	Formic Acid	3	Potassium Nitrate	1
Barium Hydroxide	1	Fuel Oil	1	Propionic Acid	2
Barium Sulfate	1	Gasoline	1	Silver Nitrate	1
Barium Sulfide	1	Glycerine	1	Sodium Acetate	1
Benzene	1	Heptane	1	Sodium Bicarbonate	1
Benzene Sulfonic Acid	1	Hexane	1	Sodium Bisulfate	1
Benzoic Acid	1	Hydrobromic Acid	2	Sodium Bisulfite	1
Black Liquor, Pulp Mill	1	Hydrochloric Acid, 15%	1	Sodium Carbonate	1
Bleach Liquor, Pulp Mill	-	Hydrochloric Acid, 37%	1	Sodium Chloride	1
Boric Acid	1	Hydrofluoric Acid	C	Sodium Chlorite	3
Brine	1	Hydrogen Peroxide	2	Sodium Hydroxide, 10%	1
Bromine, Liquid	NR	Hydrogen Sulfide	1	Sodium Hydroxide, 50%	1
Bromine Gas (Dry & Wet)	NR	Isopropyl Alcohol	1	Sodium Hypochlorite	2,C
n-Butyl Alcohol	2	Jet Fuel	1	Sodium Sulfate	1
Butyl Cellosolve Solvent	2	Kerosene	1	Sodium Sulfide	1
n-Butyric Acid	3	Lactic Acid	2	Stannic Chloride	1
Cadmium Chloride	1	Lauryl Chloride	1	Stannous Chloride	1
Calcium Chloride	1	Lead Acetate	1	Stearic Acid	1
Calcium Hydroxide	1	Linseed Oil	2	Styrene	2
Calcium Hypochlorite	2,C	Lithium Bromide	1	Sugar/Sucrose	1
Calcium Nitrate	1	Lithium Chloride	1	Sulfur Dioxide	1
Calcium Sulfate	1	Lithium Hypochlorite	2,C	Sulfuric Acid, 10%	1
Calcium Sulfite	1	Lithium Hydroxide	1	Sulfuric Acid, 50%	1
Carbon Dioxide Gas	1	Magnesium Bisulfite	1	Sulfuric Acid, 98%	1
Carbon Dissulfide	3	Magnesium Carbonate	1	Tall Oil	1
Carbon Tetrachloride	2	Magnesium Chloride	1	Tannic Acid	1
Chlorine Dioxide	3	Magnesium Hydroxide	1	Tartaric Acid	1
Chlorine Gas (Dry & Wet)	3	Magnesium Sulfate	1	Toluene	1
Chlorine Water	2	Maleic Acid	2	Toluene Sulfonic Acid	1
Chlorobenzene	1	Mercuric Chloride	1	Trichloracetic Acid	2
Chloroform	2	Mercurous Chloride	1	Trichloroethylene	2
Chromic Acid, 15%	C	Methyl Alcohol	2	Trisodium Phosphate	1
Chromic Acid, 50%	2	Methyl Chloride	3	Urea	1
Citric Acid	1	Methylene Chloride	NR	Water, Deionized	1
Copper Chloride	1	Methyl Ethyl Ketone	2	Water, Demineralized	1
Copper Cyanide	1	Mineral Spirits	1	Water, Distilled	1
Copper Nitrate	1	Monochloroacetic Acid	3	Xylene	1
Copper Sulfate	1	Muriatic Acid	1	Zinc Chloride	1
		Naphtha	1	Zinc Sulfate	1

APPLICATION GUIDELINES

TEMPERATURE CONSIDERATIONS

1. The temperature of the surface to be coated, and the ambient air temperature should be at least 50° F while applying SEMSTONE 145 and while it cures.

   In general, we recommend against applying SEMSTONE 145 if the temperature is expected to drop below 50°F.

   If you wish to attempt to apply SEMSTONE 145 in cooler temperatures, tarp and heat the area to be coated to create and maintain the requisite 50°F or above conditions.

2. Twenty-four hours before application, all materials (components A and B, aggregate, etc.) should be stored at a 70° - 85°F, to facilitate handling.

SURFACE PREPARATION - GENERAL

Surfaces must be dry and free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of SEMSTONE 145.

SURFACE PREPARATION OF CONCRETE

1. New concrete generally should be cured a minimum of 28 days.

   NOTE: Check with Sentry Polymers for recommendations regarding concrete cured less than 28 days.

2. Concrete must be structurally sound and must not contain any accelerators or curing compounds.

3. Remove all oil and grease.

4. Remove all surface laitance and expose sound concrete.

   We recommend abrasive blasting to do this. However, other methods, such as acid etching and neutralizing, may be used.

5. In general, any existing coating should be completely removed.

   In certain instances this may not be necessary, but consult with Sentry Polymers first.

   Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates and mid-floor termination points. Handle them as per Sentry's Construction Details Sheet No. 87-1.

7. Degraded concrete on horizontal surfaces should be restored using SEMSTONE 300 Epoxy Polymer Concrete or SEM-CRETE.

8. Fill all honeycombs, form voids, etc. in vertical surfaces using SEMSTONE 500 Epoxy Putty or SEM-CRETE.

SURFACE PREPARATION OF INCIDENTAL STEEL

Equipment base plates, etc. to be coated along with the concrete should be abrasive blasted to a near white metal finish with a 1 - 2 mil anchor profile. (Ref.SSPC-SP-10)

MASKING

Mask surfaces that are not to be coated. This material is difficult to remove, once applied.

APPLICATION EQUIPMENT

1. SEMSTONE 145 may be applied using a spray rig, notched trowel, brush or roller.

2. Spraying Aggregate Filled Material

   We recommend the use of a peristaltic spray rig, such as the Carrousel Pump by Quik Spray, Port Clinton, Ohio.

   DO NOT use a plural component or a single component airless rig with aggregate filled material.

Set up the peristaltic rig with a 1 inch ID, 15 foot long material line and a 3 foot pole spray gun.

Prewet the hoses by pumping a small amount of mixed SEMSTONE 145 (see paragraphs 1 and 2 under MIXING AND APPLICATION) without aggregate through the lines and pole gun; about 1/2 gallon should be sufficient.

3. Spraying Material Without Aggregate

We recommend the use of a plural component or single component airless rig when the material will be sprayed without aggregate. The peristaltic rig can also be used.

Plural Component Airless Spray Equipment (Graco Bulldog Hydra-Cat or equal).

Set equipment at a 4 to 1 volumetric mix ratio. Use a Graco Silver Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inch.

Single Component Airless Spray Equipment (Graco "King" 45 to 1 Hydro Spray Pump, or equal); set up as follows:

No screens, filters or surge tank.

Spray hose should be 1/2" or 3/4" ID, and a maximum of 50 feet in length.

Use Graco Golden Mastic Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inch.

Inlet air pressure should be a minimum of 100 psi. Recommended operating pressure is 60 - 100 psi.

4. Always use spray equipment in accordance with manufacturer's instructions.

5. Care of Spray Rig Hoses

Take care to prevent the mixed material from setting up in your hoses. For best results, keep your hoses as short as possible, purge them immediately if work is interrupted, keep them out of direct sunlight and insulated from hot surfaces.

MIXING AND APPLICATION

1. The components must be individually agitated immediately prior to use.

   Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

   Part B - Stir each Part B component to a uniform color in its individual container.

2. If using a plural component spray rig, skip this step. Otherwise, do this:

   Pour the entire contents of Part B into the container holding Part A, and mix thoroughly for two minutes with a Jiffy type mixer.

   The pot life of the mixture will be approximately 45-60 minutes @ 75°F; significantly less time at elevated temperatures.

   The longer the material is in the bucket after mixing, the shorter its pot life will be. Therefore, use immediately.

3. SEMSTONE 145 may be extended by adding silica sand. This can provide a more economical floor topping and is also useful when coating rough or mildly eroded concrete.

   a. Do not add sand to SEMSTONE 145 unless your coating thickness will be at least 75 mils.

   b. Use only clean, dry, bagged 20/40 mesh round silica sand.

   c. Pour half the mixed SEMSTONE 145 into another clean, 5 gallon bucket.

   d. Slowly add sand to each bucket while blending with a Jiffy type mixer. Do both buckets right away.

   e. You may add up to 3 parts, by weight, of sand to 1 part, by weight, of SEMSTONE 145.

   At 3 to 1 you get a mixture of grout-like consistency.

   At 2 to 1, you will obtain a still fluid mixture and extend coverage by 100%. This is the optimum mixture for spray applications.

f. The mixture may be sprayed or applied by notched trowel.

If spraying, work the pole gun in a circular motion to achieve an even coating thickness.

4. When working a large or congested area, it may be desirable for applicator to wear spiked shoes.

5. To obtain a nonskid surface, broadcast your grit media onto the coated surface before the coating jells.

6. SEMSTONE 145 is semi-leveling. When used on an area that has a pitch or slope, you will need a 2 to 1 silica sand mixture (see paragraph 3 above) in order to keep the material from sliding.

7. To coat vertical surfaces, we generally recommend our SEMSTONE 145-S Hybrid Coating and Lining system.

However, for convenience, and when service conditions are not rigorous, SEMSTONE 145 may be used to coat short verticals, such as curbs. Multiple coats will probably be required to obtain a coating free of pin holes. We recommend a minimum of three coats. Allow each coat to cure tack free before applying the next coat. Prepare the surface between coats in accordance with paragraph 8.

DO NOT USE AGGREGATE ON VERTICAL SURFACES.

8. Prepare surfaces for intercoat adhesion as follows:

a. Allow SEMSTONE 145 to cure until jelled before recoating.

b. If the surface cures firm to the touch, but less than 24 hours, it must be washed with soap and water, rinsed and dried before recoating.

c. Surfaces cured beyond 24 hours must be washed with soap and water, rinsed, dried and lightly sanded or abrasive blasted.

9. If work is interrupted, and at the end of the day, terminate the coating in a straight line.

10. As it cures, SEMSTONE 145 will sometimes develop a thin, oily film on its surface.

This film may be easily removed by washing with soap and water.

CLEANUP

Before it jells, SEMSTONE 145 may be cleaned from tools and equipment using hot, soapy water.

After SEMSTONE 145 jells, Xylene or MEK will be required. Chlorinated solvents may be used if flammable solvents are not allowed.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Avoid contact with eyes and skin; do not ingest or inhale.

When working with SEMSTONE 145, always wear chemical goggles, rubber gloves, and appropriate work clothing.

When spraying in a confined area, also wear a fresh air hood and make provision for forced ventilation.

When spraying in an open area, an organic mist respirator can replace the fresh air hood.

Prolonged or repeated exposure to SEMSTONE 145 may cause skin irritation or allergic reactions.

Refer to material safety data sheets regarding individual components.

NOTES:

TECHNICAL BULLETIN
February 1988

SEMSTONE 145-S

Sprayable Hybrid Coating & Lining

DESCRIPTION AND USES:

Featuring enhanced chemical resistance, Sentry's hybrid systems are specially formulated to withstand some of industry's most aggressive chemicals, including 98% sulfuric acid, as well as many organic chemicals and organic solvents.

SEMSTONE 145-S is Sentry's high performance hybrid coating and lining system for concrete and steel.

It is our principal hybrid system for protecting vertical surfaces and for reinforced applications on horizontal as well as vertical surfaces. Typically spray applied, its ultra high build characteristic allows a thickness of up to 80 mils to be achieved on a vertical surface in a single spray application.

SEMSTONE 145-S is a two component system that possesses the following characteristics in common with all members of Sentry's 145 family of products:

- excellent resistance to:
  - 98% sulfuric acid, many organics and other harsh chemicals;
  - thermal shock;
  - wear and impact.
- superior bonding qualities;
- high cohesive strength, coupled with the flexibility necessary to resist cracking;
- low permeability;
- low odor;
- 100 % solids.

Example uses include:

CONCRETE: Process slabs, holding tanks, sumps, chemical loading and unloading areas, spill containment areas, and waste proof coating for secondary containment systems.

STEEL: Tanks and vats, structural steel.

PACKAGING/COVERAGE:

SEMSTONE 145-S is available in 1 gallon, 5 gallon and 25 gallon units. Each unit consists of a premeasured Part A component and a premeasured Part B component.

Coverage rates are effected by the condition of the surface being coated. The following are theoretical coverage rates: 32 sq. ft. per gallon at 50 mils; 12.8 sq. ft. per gallon at 125 mils.

Application thickness depends upon expected service conditions. Consult Sentry Polymers or your local representative for specific recommendations.

Sentry POLYMERS
P. O. BOX 2076A
8500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
713-393-1666 (HOUSTON)
800-231-2544 (EXCEPT TX & AK)

TYPICAL PROPERTIES – WET:

Solids, by Volume	100%
Weight per Mixed Gallon	9.3 lbs
Pot Life @ 75°F	45 - 60 minutes
	(significantly loss at elevated temperatures)
Cure Time @ 75°F:	
Foot Traffic	12 hrs.
Light Vehicular Traffic	24 hrs.
Chemical Service	36 hrs.
Primer Requirement:	
Concrete	SEMSTONE 110
Steel	None Required
Nonflammable	

TYPICAL PROPERTIES – CURED:

Color	Light Gray (selected other colors available)	
Hardness	ASTM D - 2240 Shore D	70 - 75
Compressive Strength	ASTM C - 579	14,000 psi
Tensile Strength	ASTM D - 638	5,000 psi
Tensile Elongation	ASTM D - 638	6%
Flexural Strength	ASTM D - 790	11,000 psi
Abrasion Resistance	ASTM D - 1044	56 mg
		(CS17 wheels)
Water Vapor Transmission	ASTM E - 96	
	WVT	0.0120 grain per hr ft²
	Permeability	0.0042 perm. -in.

RELATED AND ANCILLARY PRODUCTS:

SEMSTONE 145 Hybrid Floor Topping
SEMSTONE 110 Primer
SEMSTONE 300 Epoxy Polymer Concrete
SEMSTONE 500 Epoxy Putty
SEM-CRETE Rapid Hardening Underlayment Mortar
SEMSTONE Scrim

Refer to separate technical bulletin on each product for uses, application instructions, etc.

STORAGE AND SHELF LIFE:

Keep SEMSTONE 145-S components tightly sealed in their original containers until ready for use. Store at 50° - 75°F, out of direct sunlight.

For applications on vertical surfaces, use within two months of date of manufacture. SEMSTONE 145-S otherwise has a minimum shelf life of one year, properly stored.

Refer to batch number on label for date of manufacture.

CHEMICAL RESISTANCE GUIDE

This guide is intended as an aid in determining the potential usefulness of SEMSTONE 145-S as a protective barrier against chemical exposure. Each application should be evaluated according to its particular circumstances and conditions.

KEY: 1 = Suitable for constant immersion
2 = Suitable for shorter term containment and continual spillage
3 = Suitable for intermittent spills when followed promptly with water flushing
NR = Not recommended
C = Consult Sentry Polymers

	RATING		RATING		RATING
Acetic Acid, 10%	2	Corn Oil	1	Naphthalene	1
Acetic Acid, 30%	3	Crude Oil, Sour	1	Nitric Acid, 5%	3
Acetic Acid, Glacial	3	Crude Oil, Sweet	1	Nitric Acid, 30%	NR
Acetone	2	Cyclohexane	2	Nitric Acid, 50%	NR
Acrylic Acid, up to 25%	2	Cyclohexanol	2	Nitric Acid/Sulfuric Acid	NR
Acrylonitrile	NR	Cyclohexanone	2	Nitrobenzene	3
Alum		Dichlorobenzene	2	n-Octyl Alcohol	1
(Aluminum Potassium Sulfate)	1	Diesel Fuel	1	Oils	1
Aluminum Chloride	1	Diethyl Benzene	3	Oleum	3
Aluminum Fluoride	1	Ethyl Alcohol	2	Oleic Acid	3
Aluminum Hydroxide	1	Ethyl Benzene	3	Oxalic Acid	2
Aluminum Nitrate	1	Ethyl Chloride	3	Perchloroethylene	2
Aluminum Sulfate	1	Ethylene Dichloride	3	Perchloric Acid	3
Ammonia	2	Ethylene Glycol	1	Phenol	3
Ammonium Bisulfite	1	Fatty Acids	1	Phosphoric Acid, 50%	1
Ammonium Chloride	1	Ferric Chloride	1	Phosphoric Acid, 85%	2
Ammonium Hydroxide	1	Ferric Nitrate	1	Phosphorous Acid	3
Ammonium Nitrate	1	Ferric Sulfate	1	Potassium Carbonate	1
Ammonium Sulfate	1	Ferrous Chloride	1	Potassium Chloride	1
n-Amyl Alcohol	2	Fluosilicic Acid	2,C	Potassium Dichromate	2
Aniline	NR	Formaldehyde	1	Potassium Hydroxide	1
Barium Chloride	1	Formic Acid	3	Potassium Nitrate	1
Barium Hydroxide	1	Fuel Oil	1	Propionic Acid	2
Barium Sulfate	1	Gasoline	1	Silver Nitrate	1
Barium Sulfide	1	Glycerine	1	Sodium Acetate	1
Benzene	1	Heptane	1	Sodium Bicarbonate	1
Benzene Sulfonic Acid	1	Hexane	1	Sodium Bisulfate	1
Benzoic Acid	1	Hydrobromic Acid	2	Sodium Bisulfite	1
Black Liquor, Pulp Mill	1	Hydrochloric Acid, 15%	1	Sodium Carbonate	1
Bleach Liquor, Pulp Mill	-	Hydrochloric Acid, 37%	1	Sodium Chloride	1
Boric Acid	1	Hydrofluoric Acid	C	Sodium Chlorite	3
Brine	1	Hydrogen Peroxide	2	Sodium Hydroxide, 10%	1
Bromine, Liquid	NR	Hydrogen Sulfide	1	Sodium Hydroxide, 50%	1
Bromine Gas (Dry & Wet)	NR	Isopropyl Alcohol	1	Sodium Hypochlorite	2.C
n-Butyl Alcohol	2	Jet Fuel	1	Sodium Sulfate	1
Butyl Cellosolve Solvent	2	Kerosene	1	Sodium Sulfide	1
n-Butyric Acid	3	Lactic Acid	2	Stannic Chloride	1
Cadmium Chloride	1	Lauryl Chloride	1	Stannous Chloride	1
Calcium Chloride	1	Lead Acetate	1	Stearic Acid	1
Calcium Hydroxide	1	Linseed Oil	2	Styrene	2
Calcium Hypochlorite	2.C	Lithium Bromide	1	Sugar/Sucrose	1
Calcium Nitrate	1	Lithium Chloride	1	Sulfur Dioxide	1
Calcium Sulfate	1	Lithium Hypochlorite	2.C	Sulfuric Acid, 10%	1
Calcium Sulfite	1	Lithium Hydroxide	1	Sulfuric Acid, 50%	1
Carbon Dioxide Gas	1	Magnesium Bisulfite	1	Sulfuric Acid, 98%	1
Carbon Dissulfide	3	Magnesium Carbonate	1	Tall Oil	1
Carbon Tetrachloride	2	Magnesium Cloride	1	Tannic Acid	1
Chlorine Dioxide	3	Magnesium Hydroxide	1	Tartaric Acid	1
Chlorine Gas (Dry & Wet)	3	Magnesium Sulfate	1	Toluene	1
Chlorine Water	2	Maleic Acid	2	Toluene Sulfonic Acid	1
Chlorobenzene	1	Mercuric Chloride	1	Trichloracetic Acid	2
Chloroform	2	Mercurous Chloride	1	Trichloroethylene	2
Chromic Acid, 15%	C	Methyl Alcohol	2	Trisodium Phosphate	1
Chromic Acid, 50%	2	Methyl Chloride	3	Urea	1
Citric Acid	1	Methylene Chloride	NR	Water, Deionized	1
Copper Chloride	1	Methyl Ethyl Ketone	2	Water, Demineralized	1
Copper Cyanide	1	Mineral Spirits	1	Water, Distilled	1
Copper Nitrate	1	Monochloroacetic Acid	3	Xylene	1
Copper Sulfate	1	Muriatic Acid	1	Zinc Chloride	1
		Naphtha	1	Zinc Sulfate	1

APPLICATION GUIDELINES

IMPORTANT NOTE

For applications on vertical surfaces, use SEMSTONE 145-S within two months of its date of manufacture.

TEMPERATURE CONSIDERATIONS

1. The temperature of the surface to be coated, and the ambient air temperature should be at least 50° F while applying SEMSTONE 145-S and while it cures.

   In general, we recommend against applying SEMSTONE 145-S if the temperature is expected to drop below 50°F.

   If you wish to attempt to apply SEMSTONE 145-S in cooler temperatures, tarp and heat the area to be coated to create and maintain the requisite 50°F or above conditions.

   Twenty-four hours before application, all materials (components A and B, primer, scrim, etc.) should be stored at a 70° - 85°F. to facilitate handling.

SURFACE PREPARATION - GENERAL

Surfaces must be dry and free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of either primer or SEMSTONE 145-S.

SURFACE PREPARATION OF CONCRETE

1. New concrete should be cured a minimum of 28 days.

   NOTE: Check with Sentry Polymers for recommendations regarding concrete cured less than 28 days.

2. Concrete must be structurally sound and must not contain any accelerators or curing compounds.

3. Remove all oil and grease.

   Remove all surface laitance and expose sound concrete.

   We recommend abrasive blasting to do this. However, other methods, such as acid etching and neutralizing, may be used.

5. In general, any existing coating should be completely removed.

   In certain instances this may not be necessary, but consult with Sentry Polymers first.

   Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates and mid-floor termination points. Handle them as per Sentry's Construction Details Sheet No. 87-1.

7. Degraded concrete on horizontal surfaces should be restored using SEMSTONE 300 Epoxy Polymer Concrete or SEM-CRETE.

8. Fill all honeycombs, form voids, etc. in vertical surfaces using SEMSTONE 500 Epoxy Putty or SEM-CRETE.

SURFACE PREPARATION OF STEEL

1. Steel in Immersion Service

   a. Abrasive blast steel surfaces to white metal finish with a 1 1/2 - 2 mil anchor profile. (Ref. SSPC-SP-5)

   b. All welds should be continuous and should be ground to remove all sharp edges, laps, undercuts and other surface irregularities. Relatively smooth, ripple finished welds are acceptable.

   c. Round all inside corners to a minimum 1/2" radius with SEMSTONE 500 Epoxy Putty.

2. Steel in Non - Immersion Service

   a. Abrasive blast steel surfaces to a near white metal finish with 1 - 2 mil anchor profile. (Ref. SSPC-SP-10)

b. All outside corners must be ground smooth and rounded.

MASKING

Mask surfaces that are not to be coated. These materials are difficult to remove, once applied.

PRIMING

1. Concrete

   a. Concrete surfaces must be primed using SEMSTONE 110 primer.

      Mix and apply SEMSTONE 110 primer in accordance with instructions found in the SEMSTONE 110 Technical Bulletin.

   b. On horizontal surfaces, it is not necessary to wait for the primer to cure before topping with SEMSTONE 145-S.

   c. On vertical surfaces, allow the primer to set until firm to the touch before topping with SEMSTONE 145-S, to prevent sagging of the top coat.

   d. Take precautions to prevent the primed surface from becoming contaminated.

   e. Should the primed surface become contaminated, wash it with soap and water, rinse it and dry it before proceeding.

   f. If primer cures beyond 36 hours, it will be necessary to lightly abrasive blast and reprime.

2. Steel - priming not required.

APPLICATION EQUIPMENT

1. SEMSTONE 145-S may be applied using a spray rig, brush or roller.

2. Plural Component Airless Spray Equipment (Graco Bulldog Hydra-Cat or equal):

   Set equipment at a 4 to 1 volumetric mix ratio. Use a Graco Silver Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inch.

   SEMSTONE 145-S is available in 25 gallon units for use with plural component equipment.

3. Single Component Airless Spray Equipment (Graco "King" 45 to 1 Hydro Spray Pump, or equal); set up as follows:

   No screens, filters or surge tank.

   Spray hose should be 1/2" or 3/4" ID, and a maximum of 50 feet in length.

   Use Graco Golden Mastic Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inch.

   Inlet air pressure should be a minimum of 100 psi. Recommended operating pressure is 60 - 100 psi.

4. Always use spray equipment in accordance with manufacturer's instructions.

5. Care of Spray Rig Hoses

   Take care to prevent the mixed material from setting up in your hoses. For best results, keep your hoses as short as possible, purge them immediately if work is interrupted, keep them out of direct sunlight and insulated from hot surfaces.

6. Brush or Roller

   For horizontal concrete surfaces, use a long nap roller.

   For vertical concrete surfaces and for steel, use a medium nap roller.

MIXING AND APPLICATION

1. The components must be individually agitated immediately prior to use:

   Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

   Part B - Stir each Part B component to a uniform color in its individual container.

If you are using plural component equipment, skip this step. Otherwise, do this:

Pour the entire contents of Part B into the container holding Part A and mix thoroughly for two minutes using a Jiffy type mixer. The pot life of the mixture will be approximately 45 - 60 minutes at 75°F; significantly less time at elevated temperatures. The longer the material is in the bucket after mixing, the shorter its pot life will be. Therefore, use immeidately.

3. Material should be applied in even coats.

   If spraying, use multidirectional passes to insure positive coverage and a proper film build.

   In any case, remove all irregularities.

4. Coating Thickness in Unreinforced Applications:

   a. Horizontal Surfaces

      The entire desired thickness may be put down on horizontal surfaces in a single coat.

   b. Vertical Surfaces

      Up to 80 mils thickness may be applied to vertical surfaces in a single coat.

5. For reinforced applications:

   a. Apply a 50 mil tack coat of SEMSTONE 145-S over the prepared surface.

   b. Imbed one layer of SEMSTONE Scrim into the tack coat while it is still wet.

      In vertical applications, secure scrim at the top to prevent it from sliding.

   c. Overlap the scrim 1 inch at seams, and apply a liberal coat SEMSTONE 145-S between the overlapping layers of scrim.

   d. Use flat trowels or squeegees to press the scrim into the tack coat and work out all wrinkles.

   e. Apply a final coat of SEMSTONE 145-S over the top of the scrim to approximately 75 mils thickness.

   f. Plan your work so all steps are completed the same day. Do not leave scrim exposed overnight, as it may absorb moisture.

6. Spark Testing Steel

   Spark testing is recommended for coated steel in immersion service. Set voltage at 100 - 150 volts per mil of coating thickness.

7. When working in large or congested areas, it may be desirable for applicator to wear spiked shoes.

8. To obtain a non-skid surface, broadcast a sharp dry silica sand, crushed walnut shells or other grit media onto the surface of the SEMSTONE 140-S coating before it jells.

9. Prepare surfaces for intercoat adhesion as follows:

   a. Allow SEMSTONE 145-S to cure until jelled before recoating.

   b. If the surface has cured firm to the touch, but less than 24 hours, it must be washed with soap and water, rinsed and dried before recoating.

   c. Surfaces cured beyond 24 hours must be washed with soap and water, rinsed, dried and lightly sanded or abrasive blasted.

10. If work is interrupted, and at the end of the day, terminate the coating in a straight line.

12. As it cures, SEMSTONE 145-S will sometimes develop a thin, oily film on its surface.

    This film may be easily removed by washing with soap and water.

CLEANUP

Before it jells, SEMSTONE 145-S may be cleaned from tools and equipment using hot, soapy water.

After SEMSTONE 145-S jells, Xylene or MEK will be required. Chlorinated solvents may be used if flammable solvents are not allowed.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Avoid contact with eyes and skin; do not ingest or inhale.

When working with SEMSTONE 145-S, always wear chemical goggles, rubber gloves, and appropriate work clothing.

When spraying in a confined area, also wear a fresh air hood and make provision for forced ventilation.

When spraying in an open area, an organic mist respirator can replace the fresh air hood.

Prolonged or repeated exposure to SEMSTONE 145-S may cause skin irritation or allergic reactions.

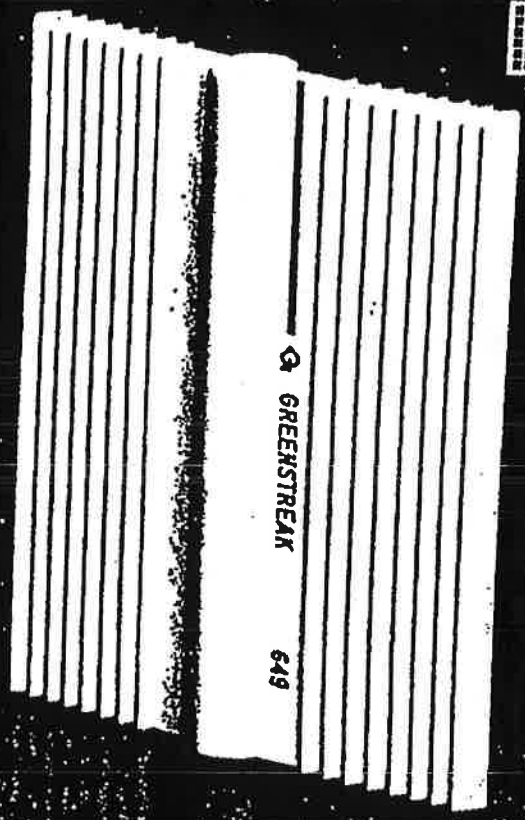
Refer to material safety data sheets regarding individual components.

NOTES:

3.6/GR
3 co
GR
1986

WATERSTOPS

FOR
CONCRETE
CONSTRUCTION



800-325-9504

GREENSTREAK

WATERSTOPS

GREENSTREAK

MR MANUFACTURER

PERFORMANCE

Greenstreak Plastic Products Company, P.O. Box 7139, St. Louis, MO 63177, has been a major manufacturer of products for the concrete construction industry for the past 30 years. Greenstreak combines its engineering knowledge, craftsmanship, and experience in plastics with a knowledge of general and architectural concrete construction. Greenstreak products are distributed both nationally and internationally through Concrete Accessory and Forming Dealers. Greenstreak, headquartered in St. Louis, is a member of the C.S.I., A.S.C.C., A.C.I., and S.P.I.

OTHER PRODUCTS

- Masonry Control Joints
- Circular Isolation Joint Formers
- Control Joint Formers
- Expansion Board Cap
- Chamfer Strips
- Transverse Joint Formers
- Hoppers
- Elephant Trunk
- Split Tubing
- Architectural Form Liners
- Splicing Irons
- Rustication Strips

PP

PRODUCT PRESENTATION

Greenstreak Waterstop consists of extruded plastic made only from virgin raw materials. No reprocessed or reclaimed materials are ever used. These products are unaffected by the normal range of concrete or concrete additives and are highly resistant to alkalis, acids, oxygen, ozone and waterborne chemicals and with great inherent elasticity and abrasion resistance. They are suitable for any above- or below-grade construction - including exposure to sea water, chlorinated water, caustic soda, sodium chloride, sodium carbonate, sulphuric acid, tributyl phosphate and even diesel oil.

These plastic products will not discolor concrete nor produce electrolytic action with adjacent metal structures or reinforcing bars. They will maintain their superior physical properties of strength, stretch and hardness indefinately and will perform over a wide temperature range of −35°F to +175°F (−37°C to +79°C).

PERFORMANCE TESTED BY INDEPENDENT LABORATORY

Tests made by an independent testing laboratory indicate that GREENSTREAK Waterstop material exceeds the performance described in the following standards:

Bureau of Reclamation
Canadian General Standards Board 41-GP-35M
CH2 M-HILL
Corps of Engineers CRD-C572-74
Department of Agriculture - Soil Conservation
Federal Std. 601
Montgomery Engineering
Ontario Hydro Std. M-264-75
Tennessee Valley Authority Spec. PF1026
Those of various states' Highway and/or Public Works Departments

Note: Hydrostatic pressure tests are available upon request.

PHYSICAL PROPERTIES

Property	Test Method	Avg. Value
Tensile Strength (finished waterstop)	ASTM D-638	2020 psi
Ultimate Elongation (finished waterstop)	ASTM D-638	370
Specific Gravity	ASTM D-792	1.3
Stiffness in Flexure	ASTM D-747	1620 psi
Tear Resistance	ASTM D-624	371 lbs./in.
Hardness, Shore A/10	ASTM D-2240	84
Volatile Loss	ASTM D-1203	0.34%
Ozone Resistance	ASTM D-1149	passed
Low Temperature Brittleness @ −35°F	ASTM D-746	passed
Water Absorption - MAX.	ASTM 570	0.15%
Tensile Strength after accelerated extraction	CRD-C-572	2070 psi
Elongation after accelerated extraction	CRD-C-572	330%
Effect on Alkali after 7 days weight hardness	CRD-C-572	passed +0.05% +1

WATERSTOP SELECTION CRITERIA

TYPE	APPLICATION	PG.
Serrated	Used in construction joints where movement is not expected.	3,4
Serrated with Center Bulb	Used in expansion joints where movement is expected. Larger sizes can accommodate greater transverse and shear movements. Most versatile can be used in any type joint.	4,5
Dumbbell	Used in construction joints where very little or no movement is expected or in expansion joints of 1" or less in width.	5
Dumbbell with Center Bulb	Used in expansion joints where movement is expected. Wide range of transverse, longitudinal and shear movements can be accommodated.	5
Splits	Designed to eliminate split formwork.	5
Labyrinth	Used in vertical or horizontal construction joints depending upon the water pressures involved.	5,6
Tear Web	Used in joints where a great deal of movement is anticipated. Tear web allows for proper placement of waterstop. Upon movement, tear web fails and substantial mechanical deformation of center bulb takes place prior to material elongation.	6
Base Seals	Used at the bottom of slabs on grade or walls that get back filled to prevent vertical seepage of water into joints. Also insures more accurate placement of the waterstop.	6
Special	There are times when unique configurations are called for in designing. Greenstreak and your local distributor are available to assist in any of your special design needs.	6

See short form specification back page.

GUARANTEE/WARRANTY

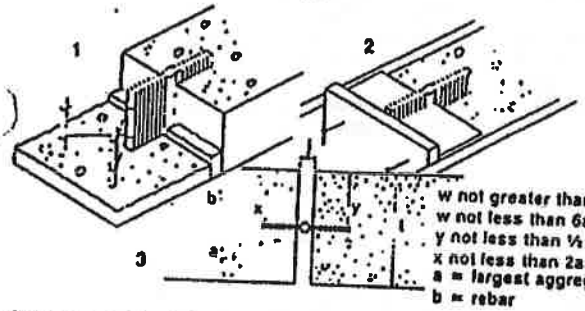
Greenstreak Plastic Products Division of Western Textile Products Company warrants that this product will be free from defects and will perform as represented in writing provided the application of the product and the concrete construction practices used are in accordance with the manufacturer's recommendations and application and installation instructions.

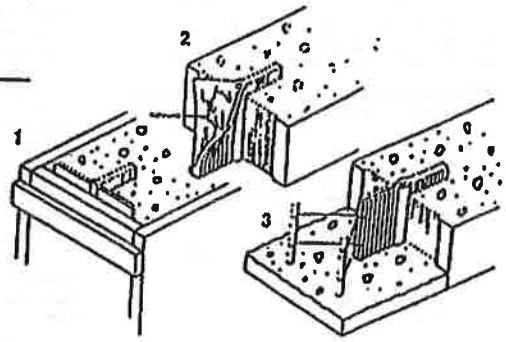
Greenstreak Plastic Products will refund the purchase price of any product proven defective but shall in no way be liable for indirect, consequential, special or resultant damages whether due to breach of warranty or negligence.

Greenstreak Plastic Products makes no guarantee or warranty express of implied, including, without limitation, warranties of fitness or merchantability, with respect to this product.

WATERSTOP INSTALLATION AND SPLIT FORM USAGE

- Uncoil waterstop several days before installation for ease in placement.
- Center waterstop in the pour.
- Use hog rings and wire tie as required to hold waterstop in place.
- Make first pour.
- All joints of waterstop must be welded for profile continuity and not overlapped.





- Use serrated or dumbbell split with center bulb.
- Spread and nail split flange to bulkhead.
- Make first pour.
- Join split flange by hog rings and adhesive. Wire tie to adjacent reinforcing rods.

CAT. NO. 600 Hog Rings
CAT. NO. 601 Pliers
CAT. NO. 602 Split Form Adhesive

Waterstop Installation Guide and Split-Form Elimination Guidelines are available free upon request to all architects, engineers, specifiers, and distributors. Ask for our complete 3-ring binder in CSI specification format. See short form specification on back page.

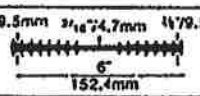
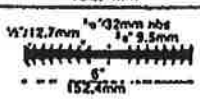
SERRATED

STYLE	SHAPE WT.	HEAD PRESS.	STANDARD
781	.39 lbs./ft.	65' (19.8m)	3/16"/4.7mm, 4", 101.6mm
782	.62 lbs./ft.	100' (30.5m)	3/16"/4.7mm, 6", 152.4mm
MONTGOMERY ENGRG.			
783	1.30 lbs./ft.	125' (38.1m)	½"/9.5mm, ¼" 6.3mm, 6", 152.4mm
786	2.07 lbs./ft.	150' (45.8m)	¼"/6.3mm, ½"/9.5mm, 9", 228.6mm

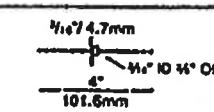
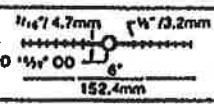
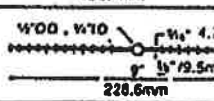
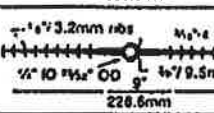
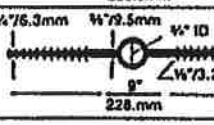
SPECIAL	HEAD PRESS.	SHAPE WT.	STYLE
3/16"/4.7mm, 9", 228.6mm	150' (45.8m)	1.22 lbs./ft.	785
½"/3.2mm ribs, ½"/9.5mm, 9", 228.6mm	150'(45.8m)	2.37 lbs./ft.	646
MONTGOMERY ENGRG.			
½"/12.7mm, ½"/9.5mm, 9", 228.6mm	150' (45.8m)	2.40 lbs./ft.	773
½"/12.7mm, ½"/9.5mm, 6", 152.4mm	125' (38.1m)	1.40 lbs./ft.	784
3/16"/4.7mm, ½"/3.2mm, 3/16"/4.7mm, 6", 152.4mm		.85 lbs./ft.	694

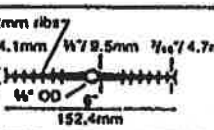
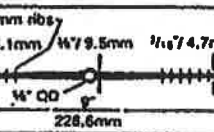
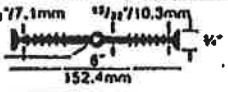
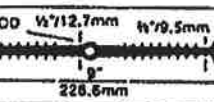
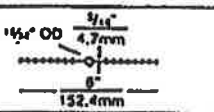
WATERSTOPS

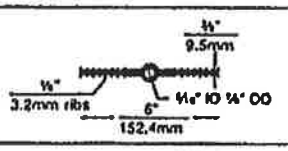
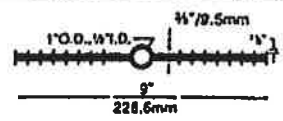
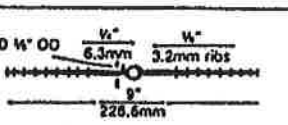
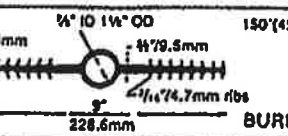
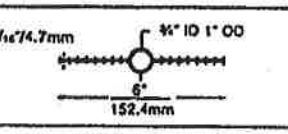
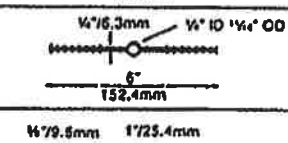
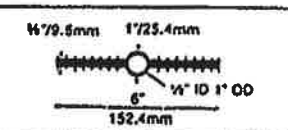
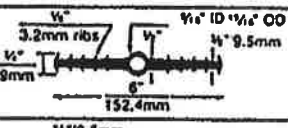
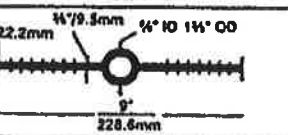
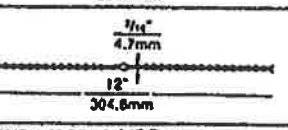
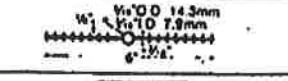
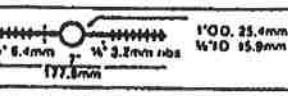
GREENSTREAK

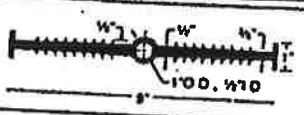
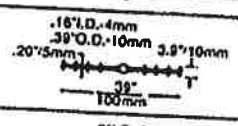
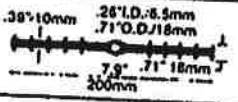
695	1.52 lbs./ft.	
580	1.97 lbs./ft.	

SERRATED WITH CENTER BULB

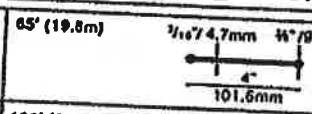
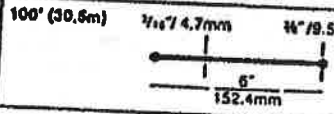
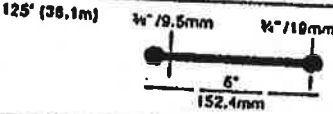
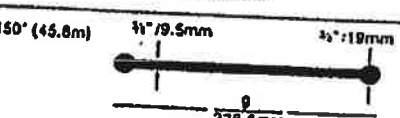
STYLE	SHAPE WT.	HEAD PRESS. STANDARD
701	.40 lbs./ft.	
703	.76 lbs./ft.	
705	1.22 lbs./ft.	
707	1.19 lbs./ft.	
709	1.66 lbs./ft.	
718	2.28 lbs./ft.	

STYLE	SHAPE WT.	SPECIAL
736	1.41 lbs./ft.	
MONTGOMERY ENGRG.		
745	2.36 lbs./ft.	
MONTGOMERY ENGRG.		
788	1.80 lbs./ft.	
ONTARIO HYDRO		
778	3.10 lbs./ft.	
ONTARIO HYDRO		
779	.66 lbs./ft.	
CH2 M-HILL		

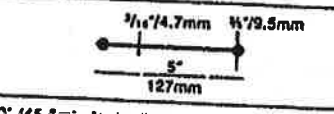
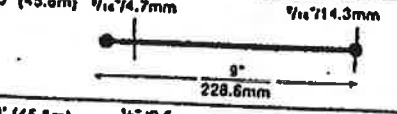
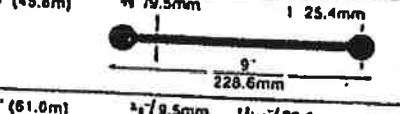
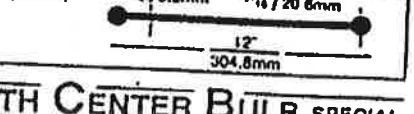
SHAPE WT.	STYLE	
1.66 lbs./ft.	732	
CH2 M-HILL		
2.55 lbs./ft.	735	
CH2 M-HILL		
1.76 lbs./ft.	708	
9" MASS.		
2.60 lbs./ft.	696	
BUREAU OF RECLAMATION		
.98 lbs./ft.	780	
.94 lbs./ft.	704	
1.56 lbs./ft.	717	
1.60 lbs./ft.	706	
2.50 lbs./ft.	738	
1.61 lbs./ft.	711	
4.36 lbs./ft.	712	
.68 lbs./ft.	647	
NEW YORK TYPE A		
1.28 lbs./ft.	649	
NEW YORK TYPE B		

710	2.58 lbs./ft.	
643	.59 lbs./ft.	
644	1.44 lbs./ft.	
645	2.16 lbs./ft.	

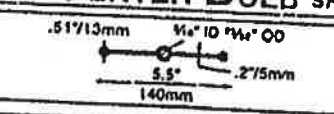
DUMBBELL STANDARD

STYLE	SHAPE WT.	
741	.47 lbs./ft.	
746	.71 lbs./ft.	
748	1.53 lbs./ft.	
751	2.18 lbs./ft.	
747	1.14 lbs./ft.	

DUMBBELL SPECIAL

STYLE	SHAPE WT.	HEAD PRESS.
744	.63 lbs./ft.	
750	1.18 lbs./ft.	
752	2.55 lbs./ft.	
755	2.99 lbs./ft.	

DUMBBELL WITH CENTER BULB SPECIAL

640	.92 lbs./ft.	

	1.15 lbs./ft.	641
	1.52 lbs./ft.	642
	1.41 lbs./ft.	757
	3.03 lbs./ft.	753
	3.70 lbs./ft.	754

SPLITS STANDARD HEAD PRESS.

	SHAPE WT.	STYLE
	.50 lbs./ft.	721
	.79 lbs./ft.	723
	1.54 lbs./ft.	724
	2.25 lbs./ft.	727

SPECIAL HEAD PRESS.

	SHAPE WT.	STYLE
	1.49 lbs./ft.	759
	2.20 lbs./ft.	760

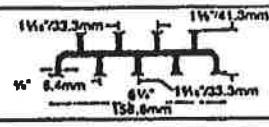
LABYRINTH SPECIAL

	SHAPE WT.	STYLE
	.68 lbs./ft.	789 B-2
	1.24 lbs./ft.	790 B-3

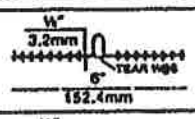
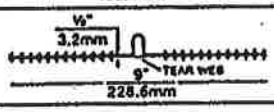
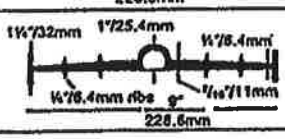
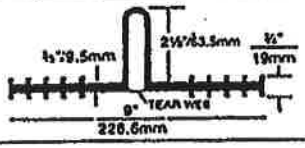
WATERSTOPS

GREENSTREAK

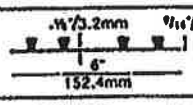
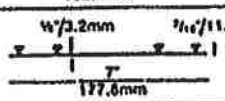
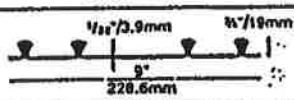
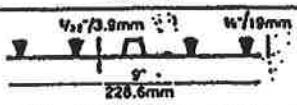
LABYRINTH

STYLE	SHAPE WT.	
830 C-4	7.81 lbs./ft.	

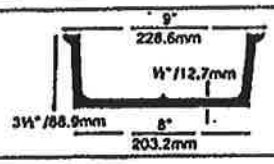
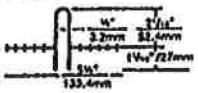
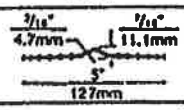
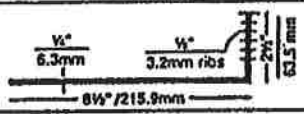
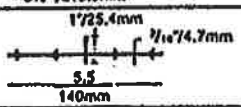
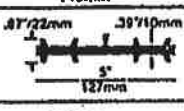
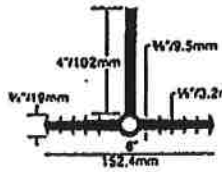
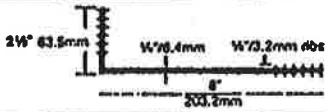
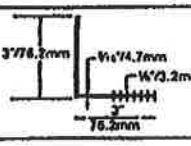
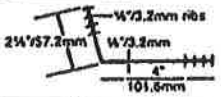
TEAR WEB SPECIAL

STYLE		
698	.84 lbs./ft.	
699	1.00 lbs./ft.	
728	2.41 lbs./ft.	
700	3.78 lbs./ft.	
DEPT. OF SOILS		

BASE SEALS SPECIAL

STYLE	SHAPE WT.	
776	.63 lbs./ft.	
NEW YORK TYPE D		
774	.79 lbs./ft.	
771	1.53 lbs./ft.	
772	1.65 lbs./ft.	
648	1.16 lbs./ft.	
NEW YORK TYPE E		

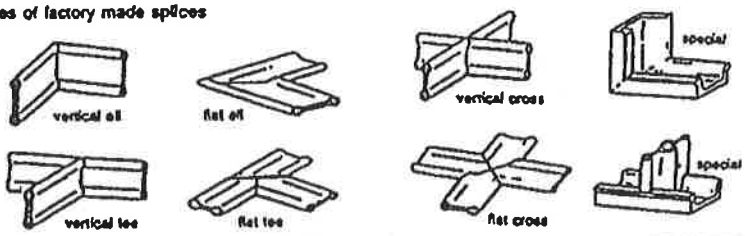
SPECIAL

SHAPE WT.	STYLE	
4.64 lbs./ft.	775	
1.07 lbs./ft.	792	
WI-2 CALIF.		
.64 lbs./ft.	729	
5" MASS.		
1.78 lbs./ft.	769	
11" MASS.		
.64 lbs./ft.	761	
1.51 lbs./ft.	762	
2.92 lbs./ft.	606	
1.61 lbs./ft.	650	
NEW YORK TYPE CA		
.76 lbs./ft.	655	
.64 lbs./ft.	765	

FACTORY MADE SPLICES

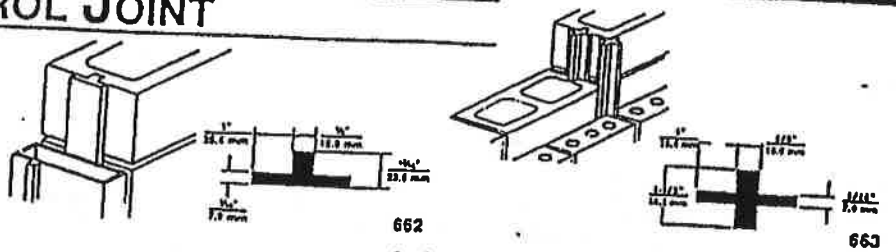
- Eliminates intricate field splicing.
- Permits faster waterstop installations.
- Insures correct splicing in critical areas.
- Eliminates guesswork.
- Only straight butt joint splices are made in field.

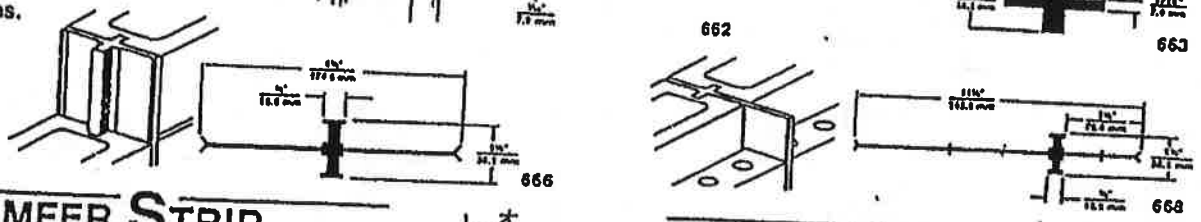
examples of factory made splices



MASONRY CONTROL JOINT

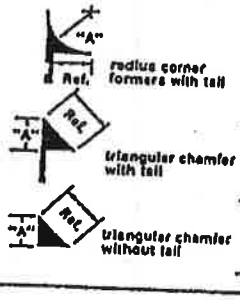
- Controls location of cracking.
- Maintains appearance.
- Provides vertical stress relieving joint while maintaining adequate shear strength for lateral wall stability.
- Used every 20-30 feet.
- 4 ft. lengths.



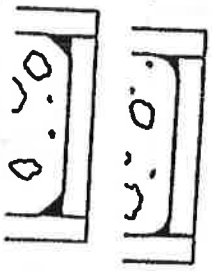


CHAMFER STRIP

- Smooth angled corner or rounded corner to rectangular columns or beams.
- 10 ft. lengths standard.
- 4-10 reuses.
- No rubbing, stoning, finishing required.
- Order by "A" dimension only.



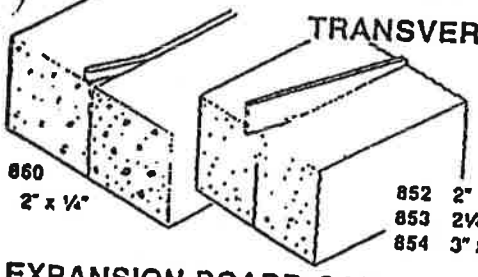
Cat. No.	"A"	Ref.
602	½"	½"
603	¾"	1⅛"
604	1"	1½"
605	1½"	1⅞"
611	½"	11/16"
612	¾"	1 5/16"
613	1"	1 15/16"
614	1½"	2⅝"
621	½"	11/16"
622	¾"	1 5/16"
623	1"	1 15/16"
624	1½"	2⅝"



JOINT FORMERS

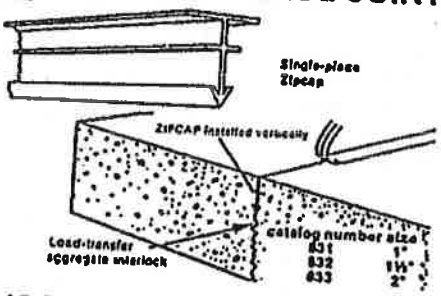
QUICK-VOID-CONTROL JOINT

TRANSVERSE-CONTROL JOINT

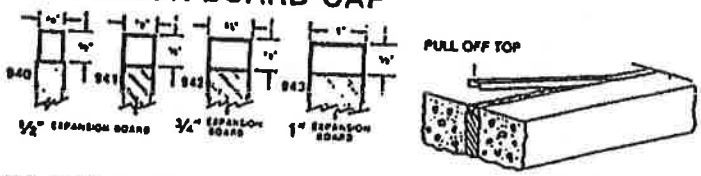


- Eliminates saw cutting.
- Lightweight plastic.
- Easy to install.
- Easy way to form control joints or voids for later sealing.
- Eliminates joint clean-up.

ZIPCAP-CONTROL JOINT

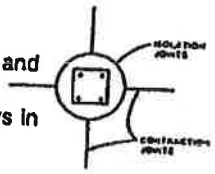


EXPANSION BOARD CAP



CIRCULAR ISOLATION JOIT FORMER

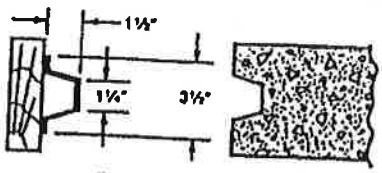
- Isolate floor slab from column.
- Eliminates corner stress cracks.
- Eliminates forming, form stripping, and separate pours.
- Joint former used as form and stays in the joint.
- Light and easy to install.



PLASTIC KEYWAY-CONSTRUCTION JOINT

CAT. NO. 521 SIZE 3½" x 10'

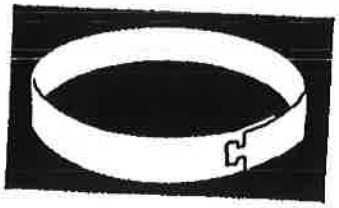
- 10 ft. lengths standard.
- Reusable.
- Light, impact resistant plastic.
- Nail/staple to form board.



SPECIFY DIAMETER

24", 30", 36" and 48"

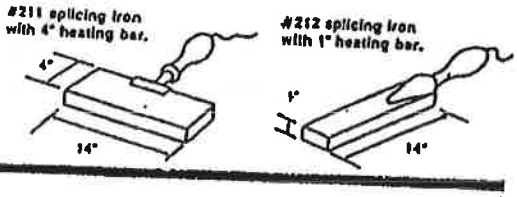
HEIGHT	
404	406
4" Height	6" Height
405	408
5" Height	8" Height



FIELD SPLICING IRONS

Easy to use for straight butt joint field splicing.

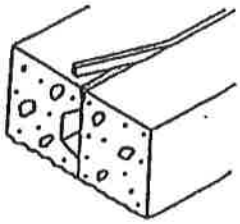
- Accommodates small and large size waterstops.
- Teflon pad prevents sticking.
- Lightweight, easy to use.
- Thermostatically controlled.
- 110 VAC



JOINT FORMERS

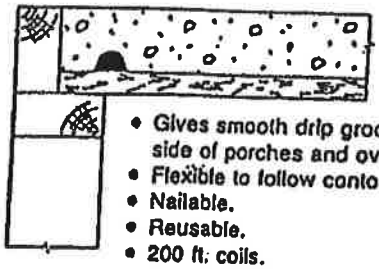
SCREED CAP

- Snapping action easy to install.
- Removable cap is reusable.
- Removable cap yields straight void ready for sealing.





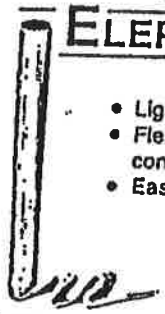
DRIP STRIP





- Gives smooth drip groove on underside of porches and overhangs.
- Flexible to follow contours.
- Nailable.
- Reusable.
- 200 ft. coils.

ELEPHANT TRUNK

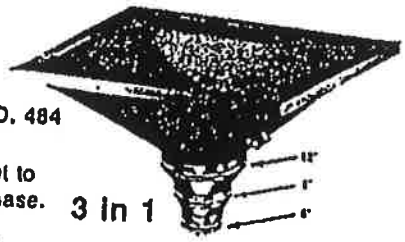


- Lightweight but strong.
- Flexibility allows use under awkward conditions.
- Easily cut to desired length at job site.

681 6" diameter
682 8" diameter
683 12" diameter

HOPPERS

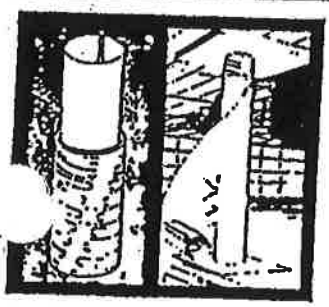
- Lightweight built in hand hold
- Easy to clean
- 36" Square hoppers.
- Mulipie uses. CAT. NO. 484
- 3 sizes in one.
- Minimum distributor inventory, cut to desired diameter at time of purchase.



NEW SPIRAL STOP

COLUMN TUBE LINER

HIGH IMPACT PLASTIC



SPECIFY MATTE OR GLOSS AND LENGTH

CAT. NO.

395	12" DIA.
396	16" DIA.
397	20" DIA.
398	24" DIA.
399	30" DIA.

Just Set In Place, Pour and Strip!

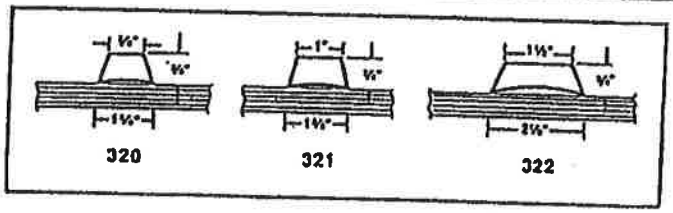
Finally! Greenstreak combines the superior curing time and smooth finish of conventional forms with the economy and lightweight, ease of handling of strippable fibre tubes. The new Spiral Stop Column Tube Liner. The fast, economical way to achieve a smooth architectural finish for round concrete columns.

- SMOOTH ARCHITECTURAL FINISH–
- COLUMN PROTECTION–
- SUPERIOR CONSTRUCTION–
- LABOR & COST SAVINGS–
- SIMPLE TO USE–
- SIMPLIFIES STRIPPING–
- FAST DELIVERY–

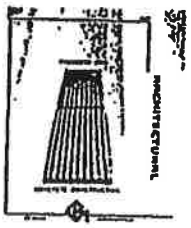
WATERSTOP SPECIFICATION

All waterstops spelled out in these specifications and/or as shown on the engineering drawings for all expansion and contraction joints shall be Greenstreak white PVC waterstop, as manufactured by Greenstreak, St. Louis, Missouri. The waterstop shall be Greenstreak No.____, ____ inches in width, ____ inches in web thickness.

RUSTICATION STRIP



- Creates bold reveals
- Enhances appearance of exposed concrete
- Use vertically or horizontally
- Nails to form
- 10' Standard lengths
- Many reuses
- No form release needed
- No leakage at form



ARCHITECTURAL CONCRETE WITH FORM LINERS:

See our catalog on FORM LINERS FOR ARCHITECTURAL CONCRETE in Section 3.5 of your Sweets Catalog file. We have a broad line of standard patterns from which to choose a design suited to your structure or we can manufacture special form liners to meet your specific design requirements.

WATERSTOPS

PRINTED IN U.S.A. . 1986

GREENSTREAK PLASTIC PRODUCTS COMPANY
P.O. BOX 7139, ST. LOUIS, MISSOURI 63177 (314) 225-9400 800-325-9504

TABLE 12.2. Chemical Resistance of PVC

Chemical	Concentration	Unplasticized PVC 68 °F 20 °C	Unplasticized PVC 140 °F 60 °C	Plasticized PVC 68 °F 20 °C	Plasticized PVC 140 °F 60 °C
Acetaldehyde	40% aq sol.	✓	X*		X*
Acetic acid	100%	X	X	X*	X*
	10% aq sol.	✓	✓	✓	
	60% aq sol.	✓	✓	✓	?
	Glacial	?	X	X	X
Acetic Anhydride		X	X	X*	X*
Acetone	Traces	X	X	X	X
	100%	X	X	X	X
Acetonitrile			X*		X*
Acetophenone		X*	X*	X*	X*
Adipic acid		✓	?		
Aliphatic Hydrocarbons		✓	✓		
Allyl Alcohol		?	X	X*	X*
Allyl Chloride		X	X	X*	X*
Aluminium Chloride		✓	✓	✓	✓
Aluminum Fluoride		✓*	✓*	✓*	
Aluminum Hydroxide		✓*	✓*	✓*	
Aluminum Nitrate		✓	✓	✓*	✓*

Source: Imperial Chemical Industries, Ltd.

✓ Satisfactory.

? Some attack or absorption.
The material may be considered for use when alternative materials are unsatisfactory and where limited life is acceptable. When PVC is to be used with such chemicals full-scale trials under realistic conditions are particularly necessary.

X Unsatisfactory.
So rated because of decomposition, solution, swelling, loss of ductility etc. of the samples tested.

* Rating assumed on the basis of resistance to other chemicals with similar composition.

30/37

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 68°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 68°F 20°C	Plasticized PVC 140°F 60°C
Aluminium Oxalate		✓*	✓*	✓*	✓*
Aluminium Oxychloride		✓	✓	✓*	...
Aluminium Sulphate		✓	✓	✓*	✓*
Ammonia	0.00 S.G., aq sol.	✓	✓		
	Dry Gas	✓	✓		
	Liquid	?	X*	X*	X*
Ammonium Bicarbonate		✓*	✓*	✓*	✓*
Ammonium Bifluoride		✓	✓	✓*	✓*
Ammonium Chloride		✓	✓	✓	✓
Ammonium Fluoride		✓	?	✓*	
Ammonium Hydrosulphide		✓	✓	✓*	
Ammonium Hydroxide		✓	✓	✓	
Ammonium Metaphosphate		✓	✓	✓*	✓*
Ammonium Nitrate		✓	✓	✓*	✓*
Ammonium Oxalate		✓*	✓*	✓*	✓*
Ammonium Persulphate		✓	✓	✓*	✓*
Ammonium Phosphate		✓*	✓*	✓*	✓*
Ammonium Sulphate		✓	✓	✓	✓
Ammonium Sulphide		✓	✓	✓	X
Ammonium Thiocyanate		✓	✓	✓*	✓*
Amyl Acetate		X	X	X*	X*
Amyl Alcohol		✓*		✓	
Amyl Chloride		X	X	X*	X*
Aniline		X	X	X	X
Aniline Hydrochloride		X	X	X*	X*
Aniline Sulphate		✓*	✓*	✓*	
Anthraquinone		✓			

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticised PVC 60°F 20°C	Unplasticised PVC 140°F 60°C	Plasticised PVC 60°F 20°C	Plasticised PVC 140°F 60°C
Anthraquinone Sulphonic Acid		✓	✓		
Antimony Chloride		✓	✓*	✓*	✓*
Aqua Regia	Dilute	✓	✓		
	Conc.	✓	X		
Barium Carbonate		✓*	✓*	✓*	✓*
Barium Chloride		✓*	✓*	✓*	✓*
Barium Hydroxide		✓	✓	✓*	
Barium Sulphate		✓*	✓*	✓*	✓*
Barium Sulphide		✓	✓	✓	✓
Benzaldehyde	Traces	X	X	X*	X*
	100%	X*	X	X*	X*
Benzene		X	X	X	X
Benzoic Acid		?	X		X*
Benzoyl Chloride		X*	X*	X*	X*
Benzyl Acetate			X*		X*
Benzyl Alcohol		X*	X*	X*	X*
Bismuth Carbonate		✓	✓	✓*	✓*
Borax		✓	✓	✓*	
Boric Acid		✓	✓	✓*	
Boron Trifluoride		✓			
Bromine	Traces, gas	?	X*	X*	X*
	100% (dry gas)	X*	X*	X*	X*
	Liquid	X	X	X*	X*
Butadiene		✓	✓		
Butane		✓	✓		
Butanediol		X	X	X*	X*
Butyl Acetate		X	X	X*	X*

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 68°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 68°F 20°C	Plasticized PVC 140°F 60°C
Butyl Alcohol		✓	?	✓	
Butyl Chloride		X*	X*	X*	X*
Butyl Phenol		✓	X		
Butyraldehyde		X*	X*	X*	X*
Butyric Acid	20% aq sol.	✓	✓*	✓*	
	Conc.	X	X	X*	X*
Calcium Carbonate		✓	✓	✓*	✓*
Calcium Chlorate		✓	✓	✓*	✓*
Calcium Chloride	Aq. sol.	✓	✓	✓	✓
	20% in methyl alcohol	✓			X*
Calcium Hydroxide		✓	✓	✓*	
Calcium Hypochlorite		✓	✓	✓	
Calcium Nitrate		✓	✓	✓*	✓*
Calcium Phosphate		✓*	✓*	✓*	✓*
Calcium Sulphate		✓	✓	✓*	✓*
Carbon Disulphide		?	X*	X	X
Carbonic Acid		✓	✓	✓	✓*
Carbon Tetrachloride		?	X	X	X
Castor Oil		✓*		✓	
Cetyl Alcohol		✓*	✓*	✓*	✓*
Chloroacetic Acid		✓	?		X*
Chloral Hydrate				X*	X*
Chloric Acid		✓			
Chlorine	10% (dry gas)	✓			
	100% (dry gas)	✓	?		
	10% (moist gas)	?			
Chlorine Trifluoride		X*	X*	X*	X*

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 68°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 68°F 20°C	Plasticized PVC 140°F 60°C
Chlorine Water	Sat. sol.	?	X*	?	X*
Chlorobenzene		X	X	X	X
Chloroform		X	X	X*	X*
Chlorosulphonic Acid		?		X*	X*
Chrome Alum		✓	✓	✓*	✓*
Chromic Acid	Plating sol.	✓	✓	X	X
Citric Acid		✓	✓	✓	
Copper Chloride		✓*	✓*	✓*	✓*
Copper Cyanide		✓*	✓*	✓	✓
Copper Fluoride		✓	✓	✓*	✓*
Copper Nitrate		✓*	✓*	✓*	✓*
Copper Sulphate		✓	✓	✓*	✓*
Creosote				X	X
Cresols		?	X	X	X
Cresylic Acids			X*	X*	X*
Crotonaldehyde		X	X	X*	X*
Cupric Chloride		✓	✓	✓	✓
Cupric Fluoride		✓	✓	✓*	
Cupric Nitrate		✓*	✓*	✓*	✓*
Cupric Sulphate		✓	✓	✓	✓
Cyclohexanol		X	X	X*	X*
Cyclohexanone		X	X	X*	X*
Detergents, Synthetic	All Conc.	✓*	✓*	✓*	
Diamyl Ether		X*	X*	X*	X*
Dibutyl Phthalate		X*	X*	X*	X*
Dichlorodifluoromethane		✓			
Dichloroethylene		X*	X*	X*	X*

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 60°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 60°F 20°C	Plasticized PVC 140°F 60°C
Dichlorobenzene		X*	X*	X*	X*
Diethylene Glycol		✓*	✓*	✓*	
Diethyl Ether		X	X	X	X
Diethyl Ketone		X*	X*	X*	X*
Dimethylaniline		✓	✓		
Dimethylcarbinol		✓	✓	✓	
Dioctyl Phthalate		X*	X*	X*	X*
Dioxane		X*	X*	X	X
Disodium Phosphate		✓*	✓*	✓	✓
Ethane		✓*			
Ether		X	X	X	X
Ethyl Acetate		X	X	X*	X*
Ethyl Acrylate		X	X	X*	X*
Ethyl Alcohol	40% w/w in water	✓	?	✓	
	100%	✓	?	✓*	
Ethyl Butyrate		X*	X*	X*	X*
Ethyl Chloride		X	X	X*	X*
Ethyl Ether		X	X	X	X
Ethyl Formate		X*	X*	X*	X*
Ethyl Lactate		X*	X*	X*	X*
Ethyl Sulphate		✓*			
Ethylene Bromide		X	X	X*	X*
Ethylene Chlorhydrin		X	X		
Ethylene Chloride		X	X	X*	X*
Ethylene Dibromide		X*	X*	X*	X*
Ethylene Dichloride		X	X	X*	X*
Ethylene Glycol		✓	✓	✓	
Ethylene Oxide		X	X	X*	X*
Ferric Chloride		✓	✓	✓	✓

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticised PVC 60°F 20°C	Unplasticised PVC 140°F 60°C	Plasticised PVC 60°F 20°C	Plasticised PVC 140°F 60°C
Ferric Nitrate		✓	✓	✓*	✓*
Ferric Sulphate		✓	✓	✓	✓
Ferrous Ammonium Citrate		✓*	✓*	✓*	✓*
Ferrous Chloride		✓*	✓*	✓*	✓*
Ferrous Sulphate		✓*	✓*	✓*	✓*
Fluorine		X	X	X*	X*
Fluosilicic Acid		✓	✓		
Formaldehyde	40% w/w in water	✓	✓	✓	
Formic Acid	3% aq sol.	✓			
	10% aq sol.	✓			
	25% aq sol.	✓			
	50% aq sol.	✓	?		X*
	100%	✓	X	X*	X*
Furfural		X	X	X*	X*
Furfuryl Alcohol		X*		X*	
Gallic Acid		✓*	✓*	✓	
Glacial Acetic Acid		?	X	X	X
Glycerine		✓	✓	✓*	
Glycerol Monobenzyl Ether		X*	X*	X*	X*
Glycolic Acid		✓	✓		
Hexane		✓*			
Hexyl Alcohol		✓	✓	✓*	
Hydrobromic Acid	50% aq sol.	✓	✓	✓	✓
	100%	✓	✓*	✓*	✓*
Hydrochloric Acid	10% aq sol.	✓	✓	✓	✓
	22% aq sol.	✓	✓	✓	✓
	Conc.	✓	✓	✓	?
Hydrocyanic Acid		✓	✓		

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 68°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 68°F 60°C	Plasticized PVC 140°F 60°C
Hydrofluoric Acid	4% aq sol.	✓		✓	✓
	40% aq sol.	✓	?	✓	
	60% aq sol.	?	X*	X	X
	Conc.	X*	X*	X	X
Hydrogene Bromide	Anydrous	✓*	✓*	✓*	
Hydrogen Chloride	Anhydrous	✓*	✓*	✓*	
Hydrogen Fluoride	Anhydrous	✓*	✓*	✓*	
Hydrogen Peroxide	3% (10 vol.)	✓	✓	✓	
	12% (40 vol.)	✓	✓	✓	
	30% (100 vol.)	✓	✓	✓	
	90% and above	✓		✓	
Hydrogen Phosphide		✓	✓	✓*	✓*
Hydrogen Sulphite		✓	✓	✓	
Hydroquinone		✓*	✓*	✓	
Hydroxylamine Sulphate		✓	✓		
Hypochlorous Acid		?	X*	?	X*
Iodine	Sol* in potassium iodide	X	X	X*	X*
Isophorone		X	X	X*	X*
Isopropyl Alcohol		✓	✓	✓	
Lactic Acid	10% aq sol.	✓	✓	✓	
	100%	X	X	X*	X*
Lead Acetate		✓	✓	✓*	✓*
Lead Arsenate		✓*	✓	✓*	✓*
Lead Nitrate		✓*	✓*	✓*	✓
Lead Tetraethyl		✓	✓	✓*	
Linoleic Acid		✓	✓		
Linseed Oil		✓	✓		
Magnesium Carbonate		✓	✓	✓*	✓*

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticised PVC 68°F 20°C	Unplasticised PVC 140°F 60°C	Plasticised PVC 68°F 20°C	Plasticised PVC 140°F 60°C
Magnesium Chloride		✓	✓	✓•	✓•
Magnesium Hydroxide		✓	✓	✓•	✓•
Magnesium Nitrate		✓	✓	✓•	✓•
Magnesium Sulphate		✓	✓	✓•	✓•
Maleic Acid	25% aq sol.	✓			
	50% aq sol.	✓			
	Conc.	✓	?		X•
Malic Acid		✓		✓	
Maganese Sulphate		✓•	✓•	✓•	✓•
Mercuric Chloride		X	X	X•	X•
Mercuric Cyanide		✓	✓	✓•	✓•
Mercurous Nitrate		✓	✓	✓•	✓•
Mesityl Oxide		X	X	X•	X•
Metallic Soaps (water soluble)		✓•	✓•	✓•	
Methyl Acetate		X•	X•	X	X
Methyl Alcohol	6% aq sol.	✓	✓•	✓	✓
	100%	✓	?	?	
Methyl Bromide		X•	X•	X•	X•
Methyl Chloride		X	X	X•	X•
Methyl Cyclohexanone		X	X	X•	X•
Methyl Ethyl Ketone		X	X	X•	X•
Methyl Isobutyl Ketone		X•	X•	X•	X•
Methyl Methacrylate		X	X	X•	X•
Methyl Sulphate		✓	?		X•
Methyl Sulphonic Acid		✓	?		
Methyl Sulphuric Acid	50% aq sol.	✓	✓		
	60% aq sol.	✓	✓		

34/37

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 68°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 68°F 20°C	Plasticized PVC 140°F 60°C
	75% aq sol.	✓	✓		
	90% aq sol.	✓	✓		
Methylene Chloride		X	X	X	X
Mineral Oils		✓	✓	✓	X
Mixed Acids (Sulphuric/nitric)	Various proportions	?	X		X*
Monochlorbenzene		X*	X*	X	X
Naphtha		✓	✓		
Naphthalene		X	X	X*	X*
Nickel Chloride		✓	✓	✓*	✓*
Nickel Nitrate		✓	✓	✓*	✓*
Nickel Sulphate		✓	✓	✓*	✓*
Nitric Acid	5% aq sol.	✓		✓	✓
	10% aq sol.	✓	?	✓	
	25% aq sol.	✓	?	✓	
	50% aq sol.	✓	?	✓	?
	70% aq sol.		?	?	X*
	95% aq sol.	X	X	X*	X*
Nitrobenzene		X	X	X	X
Nitropropane				X	X
Nitrous Fumes	Moist	?	X		X*
Octane		✓*			
Octyl Alcohol		✓*		✓*	
Oleic Acid		✓	✓	✓	
Oxalic Acid		✓	✓	✓	
Palmitic Acid		✓	✓	✓*	
Pentane		✓*			
Perchloric Acid		✓	?		X*

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 60°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 60°F 20°C	Plasticized PVC 140°F 60°C
Petroleum Ether				X	X
Phenol		✓	?		X*
Phenylcarbinol		X*	X*	X	X*
Phenylhydrazine		X	X	X*	X*
Phenylhydrazine Hydrochloride		?	X		X
Phosgene	Gas	✓			
	Liquid	?			
Phosphates		✓*	✓*	✓*	✓*
Phosphoric Acid	20% aq sol.	✓	✓	✓	✓
	30% aq sol.	✓	✓	✓	✓
	50% aq sol.	✓	✓		
	95% aq sol.	✓	✓		
Phosphoric Anhydride		✓	✓*	✓*	
Phosphorus		✓	?		
Phosphorus Pentoxide		✓	✓*	✓*	
Phosporus Trichloride		X	X	X*	X*
Photographic Developers		✓	✓	✓*	✓*
Photographic Emulsions		✓	✓	✓*	✓*
Photographic Fixing Sol**		✓*	✓*	✓*	✓*
Phthalic Anhydride		✓*	✓*	✓*	✓*
Picric Acid	1% w/w in water	✓	✓*	✓*	✓*
	10% w/w in alcohol	✓*	✓*	✓*	
Polyglycol Ethers		X*	X*	X*	X*
Potassium Acid Sulphate		✓*	✓*	✓	✓
Potassium Bicarbonate		✓	✓	✓*	✓*
Potassium Bichromate		✓	✓	✓*	

35/37

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 60°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 60°F 20°C	Plasticized PVC 140°F 60°C
Potassium Bisulphite		✓*	✓*	✓	✓*
Potassium Borate		✓	✓	✓*	✓*
Potassium Bromate		✓	✓	✓*	✓*
Potassium Bromide		✓	✓	✓*	✓*
Potassium Carbonate		✓	✓	✓*	✓*
Potassium Chlorate		✓	✓	✓*	✓*
Potassium Chloride		✓	✓	✓	✓
Potassium Chromate		✓	✓	✓*	✓*
Potassium Cuprocyanide		✓*	✓*	✓	✓
Potassium Cyanide		✓	✓	✓	✓
Potassium Dichromate		✓	✓	✓	✓
Potassium Ferrocyanide		✓	✓	✓*	✓*
Potassium Fluoride		✓	✓	✓*	✓*
Potassium Hydroxide	1% aq sol.	✓	✓	✓	✓
	10% aq sol.	✓	✓	✓	✓
	Conc.	✓	✓	✓	X
Potassium Hypochlorite		✓*	✓*	✓	
Potassium Nitrate		✓	✓	✓*	✓*
Potassium Perborate		✓	✓	✓*	✓*
Potassium Perchlorite		✓	✓	✓*	
Potassium Permanganate		✓	✓	✓*	
Potassium Persulphate		✓	✓	✓*	✓*
Potassium Phosphate		✓*	✓*	✓*	✓*
Potassium Sulphate		✓	✓	✓*	✓*
Potassium Sulphide		✓*	✓*	✓	✓
Potassium Thiosulphate		✓*	✓*	✓	✓
Propane		✓			
Propargyl Alcohol		✓	✓	✓	

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticised PVC 60 °F 20 °C	Unplasticised PVC 140 °F 60 °C	Plasticised PVC 60 °F 20 °C	Plasticised PVC 140 °F 60 °C
Propylene Dichloride		X	X	X*	X*
Propylene Glycol		✓*	✓*	✓*	
Propylene Oxide		X*	X*	X*	X*
Salicylic Acid		✓	✓		
Selenic Acid		X	X		
Silver Acetate		✓*	✓*	✓*	✓*
Silver Cyanide		✓	✓	✓*	✓*
Silver Nitrate		✓	✓		
Sodium Acetate		✓	✓	✓*	
Sodium Acid Sulphate		✓*	✓*	✓	✓
Sodium Benzoate		✓	?	✓*	X*
Sodium Bicarbonate		✓	✓	✓*	
Sodium Bisulfate		✓	✓	✓*	✓*
Sodium Bisulphite		✓	✓	✓	
Sodium Borate		✓*	✓*	✓*	
Sodium Bromide		✓	✓	✓*	✓*
Sodium Carbonate		✓	✓	✓*	
Sodium Chlorate		✓	✓	✓*	✓*
Sodium Chloride		✓	✓	✓	✓
Sodium Cyanide		✓*	✓*	✓	✓
Sodium Fluoride		✓	✓	✓*	
Sodium Hydroxide	1% aq sol.	✓	✓	✓	
	10% aq sol.	✓	✓	✓	?
	40% aq sol.	✓	✓	✓	X
	Conc.	✓	✓	✓	X
Sodium Hypochlorite	15% Cl	✓	✓	✓	?
Sodium Hyposulphate		✓*	✓*	✓*	✓*
Sodium Metaphosphate		✓*	✓*	✓*	✓*

36/37

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 68°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 68°F 20°C	Plasticized PVC 140°F 60°C
Sodium Nitrate		✓	✓	✓*	✓*
Sodium Nitrite		✓	✓	✓*	✓*
Sodium Perborate		✓*	✓*	✓*	
Sodium Peroxide		✓*	✓*	✓*	✓*
Sodium Phosphate		✓*	✓*	✓*	✓*
Sodium Silicate		✓*	✓*	✓*	✓*
Sodium Sulphate		✓	✓	✓*	✓*
Sodium Sulphide	25% aq sol.	✓	✓	✓	✓
	Conc.	✓	✓	✓	✓
Sodium Sulphite		✓	✓		
Sodium Tetraborate		✓	✓	✓*	
Sodium Thiosulphate		✓*	✓*	✓	✓
Stannic Chloride		✓	✓	✓	✓
Stannous Chloride		✓	✓	✓	✓
Stearic Acid		✓	✓	✓*	✓*
Sulphur	Colloidal	✓	✓		
Sulphur Dioxide	Dry	✓	✓	✓*	✓*
	Moist	✓	?		X*
	Liquid	?	X		X*
Sulphuric Acid	10% aq sol.	✓	✓	✓	✓
	20% aq sol.	✓	✓	✓	✓
	30% aq sol.	✓	✓	✓	✓
	40% aq sol.	✓	✓	✓	✓
	45% aq sol.	✓	✓	✓	✓
	50% aq sol.	✓	✓	✓	?
	55% aq sol.	✓	✓		?
	60% aq sol.	✓	✓	?	?
	70% aq sol.	✓	✓	?	

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticised PVC 60°F 20°C	Unplasticised PVC 140°F 60°C	Plasticised PVC 60°F 20°C	Plasticised PVC 140°F 60°C
	80% aq sol.	✓	✓	?	
	90% aq sol.	✓	?		
	95% aq sol.	✓	?		
	98% aq sol.	?	?	X	X
	Fuming	X*	X*	X	X
Sulphurous Acid	10% aq sol.	✓	✓	✓	
	30% aq sol.	✓	✓	✓	
Sulphur Trioxide		✓	✓		
Tannic Acid		✓	✓	✓	
Tanning Extracts		✓	✓*	✓*	
Tartaric Acid		✓	✓	✓	
Tetra Ethyl Lead		✓	✓	✓*	
Tetrahydrofuran		X	X	X*	X*
Tetrahydronaphthalene			X	X	X
Tetralin			X	X	X
Thionyl Chloride		X			
Toluene		X	X	X*	X*
Tributyl Phosphate		X	X	X*	X*
Trichloracetic Acid					X*
Trichloroethane		X*	X*	X*	X*
Trichoroethylene		X	X	X	X
Trichlorobenzene		X*	X*	X*	X*
Tricresyl Phosphate		X*	X*	X*	X*
Triethanolamine		✓	✓	✓	✓
Triethylene Glycol		✓*	✓*	✓*	
Trimethylamine		✓	✓		
Trimethylpropane		✓	?		
Trisodium Phosphate		✓	✓	✓	✓

TABLE 12.2 (continued)

Chemical	Concentration	Unplasticized PVC 68°F 20°C	Unplasticized PVC 140°F 60°C	Plasticized PVC 68°F 20°C	Plasticized PVC 140°F 60°C
Turpentine		✓	✓		
Urea		✓	✓	✓*	
Vinegar		✓	✓	✓*	
Vinyl Acetate		X	X	X*	X*
Water		✓	✓	✓	✓
Xylene		X*	X*	X*	X*
Xylenol			X*	X*	X*
Zinc Chloride		✓	✓	✓*	✓*
Zinc Sulphide		✓	✓	✓	✓

REFERENCES

1. U. S. Patents 3,200,009 and 2,576,749.
2. Hartman, J. V., "Foams from Vinyl Dry Blend Powders," paper presented at SPE ANTEC, Akron (Oct. 27, 1965).
3. Johnson, R. E., and Pallas, V. R., "Articles and Coatings from PVC Powder," *SPE J.* 57 (Jan. 1966).
4. Antifinger, C. J., "Vinyl Chloride-Acrylic Polymers as Exterior Coatings," Paper presented at SPE RETEC, Cherry Hill, N. J., (April 28, 1966).
5. "Europe Leads the Way in 100% PVC Fibers," *Chem. Eng. News*, 36 (March 13, 1967).
6. "Fabric from Fiber in One Pass," *Mod. Plastics* 94 (Dec. 1966).
7. "How Ford Moves Ahead in Fabrics," *Mod. Plastics* 91 (Dec. 1966).
8. Detwiler, E. B., "Synthetic Polymers and the Federal Food, Drug, and Cosmetic Act," *SPE J.* 61 (Jan. 1965).
9. U. S. Patents 3,293,094 and 3,293,108.

BIBLIOGRAPHY

Brighton, C. A., "Toxicity Problems Associated with the Use of Plastics Materials in Food Packaging," *Brit. Plastics* 37, No. 8, 440 (Aug. 1964).

Buhmann, G., and Grill, K., "Interrelated Characteristics of Various Types of PVC for Cable Insulation," *Kunststoffe* 51, 21 (Jan. 1961).

Cohen, S., "Stabilization of Vinyl Asbestos Flooring Compounds, *SPE VIPAC Newsletter* 2, No. 1, 21 (Sept. 1965).

TECHNICAL BULLETIN
September 1991

SEMSTONE® 140-SL

Epoxy Self-Leveling Floor Coating

DESCRIPTION AND USES:

SEMSTONE 140-SL is a self-priming, self-leveling epoxy floor coating system for light manufacturing and process areas, production area labs, aisleways and similar flooring applications.

It can be optionally aggregate filled to economically extend its coverage.

SEMSTONE 140-SL is a two component system that possesses the following characteristics in common with all members of Sentry's 140 family of products:

- excellent resistance to:
  - chemical attack;
  - thermal shock;
  - wear and impact.
- superior bonding qualities;
- high cohesive strength, coupled with the flexibility necessary to resist cracking;
- low permeability;
- low odor;
- 100% solids.

PACKAGING/COVERAGE:

SEMSTONE 140-SL is available in 1 gallon, 5 gallon and 25 gallon units. Each unit consists of a premeasured Part A component and a premeasured Part B component.

Application thickness may vary from 30 mils to 160 mils, depending on expected service conditions (i.e., chemical exposure, temperature, traffic load and other mechanical abuse, immersion service vs. splash-spill, etc.). Consult Sentry Polymers for specific thickness recommendations.

In addition, coverage rates will be effected by the condition of surface being coated (degraded vs. smooth, steel vs. concrete, etc.).

To figure THEORETICAL coverage per gallon divide desired mil thickness into 1,604. (For example, theoretical coverage for a 60 mil thickness is: 1,604 divided by 60 = 26.73 square feet per gallon.)

For practical coverage, make necessary allowances for condition of the substrate, working conditions, waste, spillage, etc.

Sentry POLYMERS INC.
P. O. BOX 2076A
5500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
800-231-2544

TYPICAL PROPERTIES – WET:

Solids, by Volume	100%
Weight per Mixed Gallon	9.3 lbs
Pot Life @ 75°F	45 - 60 minutes
	(significantly less at elevated temperatures)
Cure Time @ 75°F:	
Foot Traffic	12 hrs.
Light Vehicular Traffic	24 hrs.
Chemical Service	36 hrs.
Primer	Not Required
Nonflammable	

TYPICAL PROPERTIES – CURED:

Color		Gray or Black
Hardness	ASTM D - 2240 Shore D	70 - 75
Compressive Strength	ASTM C - 579	14,000 psi
Tensile Strength	ASTM D - 638	5,000 psi
Tensile Elongation	ASTM D - 638	8%
Flexural Strength	ASTM D - 790	11,000 psi
Flexural Modulus of Elasticity	ASTM C - 722	Complies with Epoxy Type B
Abrasion Resistance	ASTM D - 1044	56 mg (CS17 wheels)
Water Vapor Transmission	ASTM E - 96	
	WVT	0.0120 grain per hr ft²
	Permeability	0.0042 perm. -in.

RELATED AND ANCILLARY PRODUCTS:

SEMSTONE 140 Epoxy Floor Topping
SEMSTONE 140 - S Epoxy Coating and Lining
SEMSTONE 140 - CT Epoxy Floor Coating - Cold Temperature Formulation
SEMSTONE 300 Epoxy Polymer Concrete
SEMSTONE 500 Epoxy Putty
SEM-CRETE Rapid Hardening Underlayment Mortar
SEMSTONE Scrim

Refer to separate technical bulletin on each product for uses, application instructions, etc.

STORAGE AND SHELF LIFE:

Keep SEMSTONE 140-SL components tightly sealed in their original containers until ready for use. Store at 50° - 75°F, out of direct sunlight. Properly stored, SEMSTONE 140-SL has a minimum shelf life of one year.

Refer to batch number on label for date of manufacture.

CHEMICAL RESISTANCE GUIDE

This guide is intended as an aid in determining the potential usefulness of SEMSTONE 140-SL as a protective barrier against chemical exposure. Each application should be evaluated according to its particular circumstances and conditions.

KEY: 1 = Suitable for constant immersion
2 = Suitable for shorter term containment and continual spillage
3 = Suitable for intermittent spills when followed promptly with water flushing
NR = Not recommended
C = Consult Sentry Polymers

	RATING
Acetic Acid, 10%	2
Acetic Acid, 30%	3
Acetic Acid, Glacial	3
Acetone	NR
Acrylic Acid, up to 25%	NR
Acrylonitrile	NR
Alum (Aluminum Potassium Sulfate)	1
Aluminum Chloride	1
Aluminum Fluoride	1
Aluminum Hydroxide	1
Aluminum Nitrate	1
Aluminum Sulfate	1
Ammonia	2
Ammonium Bisulfite	1
Ammonium Chloride	1
Ammonium Hydroxide	1
Ammonium Nitrate	1
Ammonium Sulfate	1
n-Amyl Alcohol	NR
Aniline	NR
Barium Chloride	1
Barium Hydroxide	1
Barium Sulfate	1
Barium Sulfide	1
Benzene	2
Benzene Sulfonic Acid	1
Benzoic Acid	1
Black Liquor, Pulp Mill	1
Bleach Liquor, Pulp Mill	-
Boric Acid	1
Brine	1
Bromine, Liquid	NR
Bromine Gas (Dry & Wet)	NR
n-Butyl Alcohol	2
Butyl Cellosolve Solvent	3
n-Butyric Acid	NR
Cadmium Chloride	1
Calcium Chloride	1
Calcium Hydroxide	1
Calcium Hypochlorite	2.C
Calcium Nitrate	1
Calcium Sulfate	1
Calcium Sulfite	1
Carbon Dioxide Gas	1
Carbon Disulfide	NR
Carbon Tetrachloride	NR
Chlorine Dioxide	3
Chlorine Gas (Dry & Wet)	3
Chlorine Water	2
Chlorobenzene	NR
Chloroform	NR
Chromic Acid, 15%	3
Chromic Acid, 50%	3
Citric Acid	1
Copper Chloride	1
Copper Cyanide	1
Copper Nitrate	1
Copper Sulfate	1
Corn Oil	1

	RATING
Crude Oil, Sour	1
Crude Oil, Sweet	1
Cyclohexane	3
Cyclohexanol	3
Cyclohexanone	3
Dichlorobenzene	NR
Diesel Fuel	1
Diethyl Benzene	NR
Ethyl Alcohol	2
Ethyl Benzene	NR
Ethyl Chloride	NR
Ethylene Dichloride	NR
Ethylene Glycol	1
Fatty Acids	1
Ferric Chloride	1
Ferric Nitrate	1
Ferric Sulfate	1
Ferrous Chloride	1
Fluosilicic Acid	2.C
Formaldehyde	1
Formic Acid	3
Fuel Oil	1
Gasoline	1
Glycerine	1
Heptane	1
Hexane	1
Hydrobromic Acid	2
Hydrochloric Acid, 15%	1
Hydrochloric Acid, 37%	2
Hydrofluoric Acid	2.C
Hydrogen Peroxide	2
Hydrogen Sulfide	1
Isopropyl Alcohol	1
Jet Fuel	1
Kerosene	1
Lactic Acid	2
Lauryl Chloride	1
Lead Acetate	1
Linseed Oil	2
Lithium Bromide	1
Lithium Chloride	1
Lithium Hypochlorite	2.C
Lithium Hydroxide	1
Magnesium Bisulfite	1
Magnesium Carbonate	1
Magnesium Hydroxide	1
Magnesium Sulfate	1
Maleic Acid	2
Mercuric Chloride	1
Mercurous Chloride	1
Methyl Alcohol	2
Methyl Chloride	NR
Methylene Chloride	NR
Methyl Ethyl Ketone	NR
Mineral Spirits	2
Monochloroacetic Acid	3
Muriatic Acid	1
Naphtha	1
Naphthalene	1
Nitric Acid, 5%	3

	RATING
Nitric Acid, 30%	NR
Nitric Acid, 50%	NR
Nitric Acid/Sulfuric Acid	NR
Nitrobenzene	NR
n-Octyl Alcohol	1
Oils	1
Oleum	NR
Oleic Acid	3
Oxalic Acid	3
Perchloroethylene	3
Perchloric Acid	NR
Phenol	NR
Phosphoric Acid, 50%	1
Phosphoric Acid, 85%	2
Phosphorous Acid	3
Potassium Carbonate	1
Potassium Chloride	1
Potassium Dichromate	2
Potassium Hydroxide	1
Potassium Nitrate	1
Propionic Acid	2
Silver Nitrate	1
Sodium Acetate	1
Sodium Bicarbonate	1
Sodium Bisulfate	1
Sodium Bisulfite	1
Sodium Carbonate	1
Sodium Chloride	1
Sodium Chlorite	NR
Sodium Hydroxide, 10%	1
Sodium Hydroxide, 50%	1
Sodium Hypochlorite	2.C
Sodium Sulfate	1
Sodium Sulfide	1
Stannic Chloride	1
Stannous Chloride	1
Stearic Acid	1
Styrene	3
Sugar/Sucrose	1
Sulfur Dioxide	2
Sulfuric Acid, 10%	1
Sulfuric Acid, 50%	1
Sulfuric Acid, 98%	NR
Tall Oil	2
Tannic Acid	1
Tartaric Acid	1
Toluene	2
Toluene Sulfonic Acid	1
Trichloracetic Acid	3
Trichloroethylene	3
Trisodium Phosphate	1
Urea	1
Water, Deionized	1
Water, Demineralized	1
Water, Distilled	1
Xylene	2
Zinc Chloride	1
Zinc Sulfate	1

APPLICATION GUIDELINES

ATURE CONSIDERATIONS

ne temperature of the surface to be coated, and the ambient air temperature should be at least 50° F while applying SEMSTONE 140-SL and while it cures.

In general, we recommend against applying SEMSTONE 140-SL if the temperature is expected to drop below 50°F. Instead, use SEMSTONE 140-CT.

Twenty-four hours before application, all materials (components A and B, aggregate, etc.) should be stored at a 70° - 85°F, to facilitate handling.

RFACE PREPARATION - GENERAL

Surfaces must be dry and free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of SEMSTONE 140-SL.

RFACE PREPARATION OF CONCRETE

lew concrete generally should be cured a minimum days.

NOTE: Check with Sentry Polymers for recommendations regarding concrete cured less than 28 days. .

Concrete must be structurally sound and must not contain any accelerators or curing compounds.

Remove all oil and grease.

Remove all surface laitance and expose sound concrete.

We recommend abrasive blasting to do this. However, other methods, such as acid etching and neutralizing, may be used.

In general, any existing coating should be completely removed.

In certain instances this may not be necessary, but consult with Sentry Polymers first.

Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates and mid-floor termination points. Handle them as per Sentry's Construction Detail Sheets.

7. Degraded concrete on horizontal surfaces should be restored using SEMSTONE 300 Epoxy Polymer Concrete or SEM-CRETE.

8. Fill all honeycombs, form voids, etc. in vertical surfaces using SEMSTONE 500 Epoxy Putty or SEM-CRETE.

SURFACE PREPARATION OF INCIDENTAL STEEL

Equipment base plates, etc. to be coated along with the concrete should be abrasive blasted to a near white metal finish with a 1 - 2 mil anchor profile. (Ref.SSPC-SP-10)

MASKING

Mask surfaces that are not to be coated. This material is difficult to remove, once applied.

APPLICATION EQUIPMENT

1. SEMSTONE 140-SL may be applied using a spray rig, notched trowel, serrated squeegee or long nap roller.

2. Spraying Aggregate Filled Material

   We recommend the use of a peristaltic spray rig, such as the Carrousel Pump by Quik Spray, Port Clinton, Ohio.

   DO NOT use a plural component or a single component airless rig with aggregate filled material.

   Set up the peristaltic rig with a 1 inch ID, 15 foot long material line and a 3 foot pole spray gun.

Prewet the hoses by pumping a small amount of mixed SEMSTONE 140-SL (see paragraphs 1 and 2 under MIXING AND APPLICATION) without aggregate through the lines and pole gun; about 1/2 gallon should be sufficient.

3. Spraying Material Without Aggregate

We recommend the use of a single component airless rig when the material will be sprayed without aggregate. The peristaltic rig can also be used.

Single Component Airless Spray Equipment (Graco "King" 45 to 1 Hydro Spray Pump, or equal); set up as follows:

No screens, filters or surge tank.

Spray hose should be 1/2" or 3/4" ID, and a maximum of 50 feet in length.

Use Graco Golden Mastic Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inch.

Inlet air pressure should be a minimum of 100 psi. Recommended operating pressure is 60 - 100 psi.

4. Always use spray equipment in accordance with manufacturer's instructions.

5. Care of Spray Rig Hoses

Take care to prevent the mixed material from setting up in your hoses. For best results, keep your hoses as short as possible, purge them immediately if work is interrupted, keep them out of direct sunlight and insulated from hot surfaces.

MIXING AND APPLICATION

1. The components must be individually agitated immediately prior to use.

Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

Part B - Stir each Part B component to a uniform color in its individual container.

2. If using a plural component spray rig, skip this step. Otherwise, do this:

Pour the entire contents of Part B into the container holding Part A, and mix thoroughly for two minutes using a Jiffy type mixer.

The pot life of the mixture will be approximately 45-60 minutes @ 75°F; significantly less time at elevated temperatures.

The longer the material is in the bucket after mixing, the shorter its pot life will be. So, use it immediately.

3. SEMSTONE 140-SL may be extended by adding silica sand. This can provide a more economical floor topping and is also useful when coating rough or mildly eroded concrete.

a. Do not add sand to SEMSTONE 140-SL unless your coating thickness will be at least 75 mils.

b. Use only clean, dry, bagged 20/40 mesh round silica sand.

c. Pour half the mixed SEMSTONE 140-SL into another clean, 5 gallon bucket.

d. Slowly add sand to each bucket while blending with a Jiffy type mixer. Do both buckets right away.

e. You may add up to 3 parts, by weight, of sand to 1 part, by weight, of SEMSTONE 140-SL.

At 3 to 1 you get a mixture of grout-like consistency.

At 2 to 1, you will obtain a still fluid mixture and extend coverage by 100%. This is the optimum mixture for spray applications.

f. The mixture may be sprayed or applied by notched trowel.

When spraying SEMSTONE 140-SL filled with aggregate, work the pole gun in a circular motion to achieve an even coating thickness.

4. When working a large or congested area, it may be desirable for applicator to wear spiked shoes.

p obtain a nonskid surface:

a. Allow the initial coat to cure 8 hours.

b. Wash the initial coat with soap and water, rinse it thoroughly with clear water, and dry it.

c. Apply a thin second coat.

d. Before this second coat reaches its initial set, broadcast your grit media onto the surface.

6. SEMSTONE 140-SL is self-leveling. When used on an area that has a pitch or slope, use a 2 to 1 silica sand mixture (see 3 paragraph above) in order to keep the material from sliding.

7. To coat vertical surfaces, we generally recommend our SEMSTONE 140-S Epoxy Coating and Lining system.

However, for convenience, and when service conditions are not rigorous, SEMSTONE 140-SL may be used to coat short verticals, such as curbs. Multiple coats will probably be required to obtain a coating free of pin holes. We recommend a minimum of three coats. Allow each coat to cure tack free before applying the next coat. Prepare the surface between coats in accordance with paragraph 8.

DO NOT USE AGGREGATE ON VERTICAL SURFACES.

8. Prepare surfaces for intercoat adhesion as follows:

a. Allow SEMSTONE 140-SL to cure until jelled before recoating.

b. If the surface cures firm to the touch, but less than 24 hours, it must be washed with soap and water, rinsed and dried before recoating.

c. Surfaces cured beyond 24 hours must be washed with soap and water, rinsed, dried and lightly sanded or abrasive blasted.

9. If work is interrupted, and at the end of the day, terminate the coating in a straight line.

CLEANUP

Before it jells, SEMSTONE 140-SL may be cleaned from tools and equipment using hot, soapy water.

After SEMSTONE 140-SL jells, Xylene or MEK will be required. Chlorinated solvents may be used if flammable solvents are not allowed.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Avoid contact with eyes and skin; do not ingest or inhale.

When working with SEMSTONE 140-SL, always wear chemical goggles, rubber gloves, and appropriate work clothing.

When spraying in a confined area, also wear a fresh air hood and make provision for forced ventilation.

When spraying in an open area, an organic mist respirator can replace the fresh air hood.

Prolonged or repeated exposure to SEMSTONE 140-SL may cause skin irritation or allergic reactions.

Refer to material safety data sheets regarding individual components.

1 YEAR LIMITED WARRANTY

For one year following sale, SENTRY POLYMERS, INC., Freeport, Texas ("SENTRY") will replace any of its products that do not conform to its manufacturing standards or, at its sole discretion, refund the proportionate sales price applicable to the nonconforming goods. Replacement product will be supplied at no charge, and FOB SENTRY'S facilities.

Information and suggestions supplied by SENTRY, whether in its published literature or otherwise, including samples, are believed to be accurate and reliable and are furnished in good faith. Such information and suggestions are supplied without charge and their use, and the use of SENTRY products is beyond SENTRY'S control. SENTRY'S products, information and suggestions are intended for USERS possessing skill and know-how in the industry. USERS are responsible, at their sole discretion and risk, to satisfy themselves regarding the suitability of SENTRY'S products, information and suggestions for their particular circumstances.

SENTRY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING ITS PRODUCTS, INFORMATION AND SUGGESTIONS AND DISCLAIMS ALL WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This limited warranty will be rendered null and void by any one or more of the following: SENTRY is not paid timely and in full at Freeport, Texas, for all goods and services sold by SENTRY for use on the applicable project; USER does not cooperate with SENTRY'S reasonable investigations regarding the alleged nonconforming product; the product has been misused, abused or improperly maintained.

The provisions of this warranty supersede any provisions to the contrary in any of USER'S forms or documents or otherwise unless such contrary provisions are specifically acknowledged and agreed to in writing by SENTRY after receipt by SENTRY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF PERSONAL INJURY, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

SENTRY POLYMERS, INC.
P. O. BOX 2076
5500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
800-231-2544

TECHNICAL BULLETIN
May 1992

SEMSTONE® 140-CT

Epoxy Coating-Cold Temperature Formulation

DESCRIPTION AND USES

SEMSTONE 140-CT is a self-priming, self-leveling epoxy floor coating system that produces a high gloss finish and is specially formulated to be applied at temperatures down to 35 °F. Its special formulation also allows it to be applied over damp concrete. It can be optionally aggregate filled to economically extend its coverage.

SEMSTONE 140-CT is a two component system that possesses the following characteristics in common with all members of Sentry's 140 family of products:

- excellent resistance to chemical attack, thermal shock, and wear and impact.
- superior bonding qualities;
- high cohesive strength, coupled with the flexibility necessary to resist cracking;
- low permeability;
- low odor;
- 100% solids.

SEMSTONE 140-CT is used to protect concrete surfaces exposed to corrosive chemical environments when application at cold temperatures is required. It may also be used at higher temperatures when very rapid curing is needed. Example uses include: winter projects, cold room coatings, quick cure topping applications, quick cure repair grout.

PACKAGING/COVERAGE

SEMSTONE 140-CT is available in 1 gallon and 5 gallon units. Each unit consists of a premeasured Part A component and a premeasured Part B component. A bagged Part C thixotropic agent is available for work on vertical surfaces.

Application thickness may vary from 30 mils to 150 mils, depending on expected service conditions (i.e., chemical exposure, temperature, traffic load and other mechanical abuse, immersion service vs. splash-spill, etc.). Consult Sentry Polymers for specific thickness recommendations.

In addition, coverage rates will be effected by the condition of the surface being coated (degraded vs. smooth, steel vs. concrete, etc.).

To figure THEORETICAL coverage per gallon, divide desired mil thickness into 1,604. (For example, theoretical coverage for a 60 mil thickness is: 1,604 divided by 60 = 26.73 square feet per gallon).

For practical coverage, make necessary allowances for condition of the substrate, working conditions, waste, spillage, etc.

Sentry POLYMERS, INC.
P.O. BOX 2076
5500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
800-231-2544

TYPICAL PROPERTIES - WET:

Solids, by Volume	100%
Weight per Mixed Gallon	9.3 lbs
Pot Life at 35°F	30-40 minutes
	(significantly less at elevated temperatures)

Cure Time at 35°F:

Foot Traffic	8 hrs
Light Vehicular Traffic	16 hrs
Chemical Service	36 hrs
Primer	Not Required
Nonflammable	

TYPICAL PROPERTIES - CURED:

Color		Light Gray (selected other colors available)
Hardness	ASTM D 2240 Shore D	70-75
Compressive Strength	ASTM C 579	14,000 psi
Tensile Strength	ASTM D 638	5,000 psi
Tensile Elongation	ASTM D 638	.6%
Flexural Strength	ASTM D 790	11,000 psi
Flexural Modulus of Elasticity	ASTM C 722	Complies with Epoxy Type B
Abrasion Resistance	ASTM D 1044	56 mg
		(CS17 wheels)
Water Vapor Transmission	ASTM E 96	
	WT	0.0120 grain per hr ft^2
	Permeability	0.0042 perm.-in

RELATED AND ANCILLARY PRODUCTS:

SEMSTONE 110 Primer
SEMSTONE 140 Epoxy Floor Topping
SEMSTONE 140-S Epoxy Coating and Lining
SEMSTONE 140-SL Epoxy Self-Leveling Coating
SEM-CRETE Rapid Hardening Underlayment Mortar
SEMSTONE Scrim

Refer to separate technical bulletin on each product for uses, application instructions, etc.

STORAGE AND SHELF LIFE:

Keep SEMSTONE 140-CT components tightly sealed in their original containers until ready for use. Store unopened at 35°F-75°F, out of direct sunlight. Properly stored, SEMSTONE 140-CT has a minimum shelf life of one year.

Refer to batch number on label for date of manufacture.

APPLICATION GUIDELINES IMPORTANT NOTE

1. This material has a short pot life. Plan your application accordingly.

2. Bubbles may appear in the SEMSTONE 140-CT coating if it is applied over concrete in direct sunlight, or when temperatures are rising. This is due to the expansion of air and/or moisture trapped in the concrete. It is especially true of air entrained concrete. For best results, shade the work area and apply SEMSTONE 140-CT when the temperature of the concrete (or other substrate) is falling. A surface thermometer should be used to frequently monitor the temperature of the substrate.

3. Twenty-four hours before application, all materials (components A and B, aggregate, etc.) should be stored at 65°F-75°F, to facilitate handling.

SURFACE PREPARATION - GENERAL

1. Surfaces must be free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of SEMSTONE 140-CT.

2. For the initial coat, the concrete can be damp. However, for recoats, all surfaces must be dry.

SURFACE PREPARATION OF CONCRETE

1. New concrete generally should be cured a minimum of 28 days.

   NOTE: Check with Sentry Polymers for recommendations regarding concrete cured less than 28 days.

2. Concrete must be structurally sound and must not contain any accelerators or curing compounds.

3. Remove all oil and grease.

4. Remove all surface laitance and expose sound concrete. We recommend abrasive blasting to do this. However, other methods, such as acid etching and neutralizing, may be used.

5. In general, any existing coating should be completely removed. In certain instances this may not be necessary, but consult with Sentry Polymers first. Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates and mid-floor termination points. Handle them according to Sentry Polymers' Construction Details.

7. Honeycombs or any form voids in vertical surfaces must be filled.

8. If the concrete is wet:

   a. Flush thoroughly with clear water. Steam or hot water is recommended, if available.

   b. Remove all standing water and surface moisture.

SURFACE PREPARATION OF INCIDENTAL STEEL

Equipment base plates, etc. to be coated along with the concrete should be abrasive blasted to a near white metal finish with 1 - 2 mil anchor profile. (Ref. SSPC-SP-10)

MASKING

Mask surfaces that are not to be coated. This material is difficult to remove, once applied.

APPLICATION EQUIPMENT

SEMSTONE 140-CT may be applied using a notched trowel, serrated squeegee, or roller.

MIXING AND APPLICATION

1. The components must be individually agitated immediately prior to use.

   Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

Part B - Stir each Part B component to a uniform color in its individual container.

Pour the entire contents of Part B into the container holding Part A, and mix thoroughly for two minutes using a Jiffy type mixer.

3. The pot life of the mixture will be approximately 30-40 minutes at 35 °F; significantly less time at elevated temperatures.

   The longer the material is in the bucket after mixing, the shorter its pot life will be. Therefore, immediately pour the entire contents of mixed material onto the prepared surface and spread to desired thickness using a notched trowel, serrated squeegee, or long nap roller.

4. When working a large or congested area, it may be desirable for applicator to wear spiked shoes.

5. SEMSTONE 140-CT may be extended by adding silica sand. This is especially useful when coating rough or mildly eroded concrete.

   a. Use only clean, dry, bagged 20/40 mesh round silica sand.

   b. Pour half the mixed SEMSTONE 140-CT into another clean 5 gallon bucket.

   c. Slowly add sand to each bucket while blending with a Jiffy type mixer. Do both buckets immediately.

   d. You may add up to 3 parts, by weight, of sand to 1 part, by weight, of SEMSTONE 140-CT. At a 3 to 1 ratio you will obtain a mixture of grout-like consistency. At a 2 to 1 ratio you will obtain a still fluid mixture and extend coverage by 100%.

6. SEMSTONE 140-CT is self-leveling. When used on an area that has a pitch or slope, use a 2 to 1 silica sand mixture (see paragraph 5 above) in order to keep the material from sliding.

7. SEMSTONE 140-CT may tend to run off vertical surfaces. Coating vertical surfaces will require the addition of Part C. Part C will darken the color of SEMSTONE 140-CT. If this is unacceptable, use fumed silica instead. Prepare the surface between coats in accordance with paragraph 9.

8. To obtain a nonskid surface:

   a. Allow the initial coat to cure 8 hours.

   b. Wash the initial coat with soap and water, rinse it thoroughly with clear water, and dry it.

   c. Apply a thin second coat.

   d. Before the second coat reaches its initial set, broadcast your grit media onto the surface.

9. Prepare surfaces for intercoat adhesion as follows:

   a. Allow SEMSTONE 140-CT to cure until gelled before recoating.

   b. If the surface cures firm to the touch, but less than 24 hours, it must be washed with soap and water, rinsed and dried before recoating.

   c. Surfaces cured beyond 24 hours must be washed with soap and water, rinsed, dried and lightly sanded or abrasive blasted.

   d. IMPORTANT: While SEMSTONE 140-CT can be applied over damp concrete, for recoating, the surface must be dry.

CLEANUP

Clean all tools and equipment with xylene or MEK. Chlorinated solvents may be used if flammable solvents are not allowed.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Avoid contact with eyes and skin; do not ingest or inhale.

When working with SEMSTONE 140-CT, always wear chemical goggles, rubber gloves, and appropriate work clothing.

When working in a confined area, make provision for forced ventilation.

Prolonged or repeated exposure to the unreacted Part A and Part B components of SEMSTONE 140-CT may cause skin irritation or allergic reactions.

Refer to material safety data sheets regarding individual components.

NOTES

1 YEAR LIMITED WARRANTY

For one year following sale, SENTRY POLYMERS, INC., Freeport, Texas ("SENTRY") will replace any of its products that do not conform to its manufacturing standards or, at its sole discretion, refund the proportionate sales price applicable to the nonconforming goods. Replacement product will be supplied at no charge, and FOB SENTRY's facilities.

Information and suggestions supplied by SENTRY, whether in its published literature or otherwise, including samples, are believed to be accurate and reliable and are furnished in good faith. Such information and suggestions are supplied without charge and their use, and the use of SENTRY products, is beyond SENTRY'S control. SENTRY'S products, information and suggestions are intended for USERS possessing skill and know-how in the industry. USERS are responsible, at their sole discretion and risk, to satisfy themselves regarding the suitability of SENTRY'S products, information and suggestions for their particular circumstances.

SENTRY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING ITS PRODUCTS, INFORMATION AND SUGGESTIONS AND DISCLAIMS ALL WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This limited warranty will be rendered null and void by any one or more of the following: SENTRY is not paid timely and in full at Freeport, Texas, for all goods and services sold by SENTRY for use on the applicable project; USER does not cooperate with SENTRY'S reasonable investigations regarding the alleged nonconforming product; the product has been misused, abused or improperly maintained.

The provisions of this warranty supersede any provisions to the contrary in any of USER's forms or documents or otherwise unless such contrary provisions are specifically acknowledged and agreed to in writing by SENTRY after receipt by SENTRY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF PERSONAL INJURY, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

TECHNICAL BULLETIN
June 1992

SEMSTONE® 140-S

Sprayable Epoxy Coating & Lining

DESCRIPTION AND USES:

SEMSTONE 140-S is Sentry's primary epoxy coating and lining system for concrete and steel.

It is our principal epoxy system for protecting vertical surfaces and for reinforced applications on horizontal as well as vertical surfaces. Typically spray applied, its ultra high build characteristic allows a thickness of up to 100 mils to be achieved on a vertical surface in a single spray application.

SEMSTONE 140-S is a two component system that possesses the following characteristics in common with all members of Sentry's 140 family of products:

- excellent resistance to chemical attack, thermal shock, wear and impact;
- superior bonding qualities;
- high cohesive strength, coupled with the flexibility necessary to resist cracking;
- low permeability;
- low odor;
- 100% solids.

Example uses include:

CONCRETE: process slabs, holding tanks, sumps, chemical loading and unloading areas, spill containment areas, waste proof coating for secondary containment systems.

STEEL: tanks and vats, structural steel.

PACKAGING/COVERAGE:

SEMSTONE 140-S is available in 1 gallon, 5 gallon and 25 gallon units. Each unit consists of a premeasured Part A component and a premeasured Part B component.

Application thickness may vary from 30 mils to 160 mils, depending on expected service conditions (i.e., chemical exposure, temperature, traffic load and other mechanical abuse, immersion service vs. splash-spill, etc.). Consult Sentry Polymers for specific thickness recommendations.

In addition, coverage rates will be effected by the condition of surface being coated (degraded vs. smooth, steel vs. concrete, etc.).

To figure THEORETICAL coverage per gallon divide desired mil thickness into 1,604. (For example, theoretical coverage for a 60 mil thickness is: 1,604 divided by 60 = 26.73 square feet per gallon.)

For practical coverage, make necessary allowances for condition of the substrate, working conditions, waste, spillage, etc.

Sentry POLYMERS INC.
P. O. BOX 2076
8500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
800-231-2544

TYPICAL PROPERTIES – WET:

Solids, by Volume	100%
Weight per Mixed Gallon	9.3 lbs
Pot Life @ 75°F	45 - 60 minutes (significantly less at elevated temperatures)
Cure Time @ 75°F:	
Foot Traffic	12 hrs.
Light Vehicular Traffic	24 hrs.
Chemical Service	36 hrs.
Primer Requirement:	
Concrete	SEMSTONE 110
Steel	None Required
Nonflammable	

TYPICAL PROPERTIES – CURED:

Color		Light Gray (selected other colors available)
Hardness	ASTM D - 2240 Shore D	70 - 75
Compressive Strength	ASTM C - 579	14,000 psi
Tensile Strength	ASTM D - 638	5,000 psi
Tensile Elongation	ASTM D - 638	8%
Flexural Strength	ASTM D - 790	11,000 psi
Flexural Modulus of Elasticity	ASTM C - 722	Complies with Epoxy Type B
Abrasion Resistance	ASTM D - 1044	56 mg (CS17 wheels)
Water Vapor Transmission	ASTM E - 96	
	WVT	0.0120 grain per hr ft²
	Permeability	0.0042 perm. -in.

RELATED AND ANCILLARY PRODUCTS:

SEMSTONE 110 Primer
SEMSTONE 140 Epoxy Topping
SEMSTONE 140 - CT Epoxy Coating - Cold Temperature Formulation
SEMSTONE 300 Epoxy Polymer Concrete
SEM-CRETE Rapid Hardening Underlayment Mortar
SEMSTONE Scrim

Refer to separate technical bulletin on each product for uses, application instructions, etc.

STORAGE AND SHELF LIFE:

Keep SEMSTONE 140-S components tightly sealed in their original containers until ready for use. Store at 50° - 75°F, out of direct sunlight.

For applications on vertical surfaces, use within two months of date of manufacture. SEMSTONE 140-S otherwise has a minimum shelf life of one year, properly stored.

Refer to batch number on label for date of manufacture.

APPLICATION GUIDELINES

IMPORTANT NOTE

For applications on vertical surfaces, use SEMSTONE 140-S within two months of its date of manufacture.

TEMPERATURE CONSIDERATIONS

1. The temperature of the surface to be coated, and the ambient air temperature should be at least 50° F while applying SEMSTONE 140-S and while it cures.

   In general, we recommend against applying SEMSTONE 140-S if the temperature is expected to drop below 50°F.

   If you wish to attempt to apply SEMSTONE 140-S in cooler temperatures, tarp and heat the area to be coated to create and maintain the requisite 50°F or above conditions.

2. Halt application if the temperature falls within 5°F of the dew point.

3. Bubbles may appear in the SEMSTONE 140-S coating if it is applied over concrete in direct sunlight, or when temperatures are rising. This is due to the expansion of air and/or moisture trapped in the concrete. It is especially true of air entrained concrete.

   For best results, shade the work area and apply SEMSTONE 140-S when the temperature of the concrete (or other substrate) is falling.

   A surface thermometer should be used to frequently monitor the temperature of the substrate.

4. Twenty-four hours before application, all materials (components A and B, aggregate, etc.) should be stored at 70°F - 85°F, to facilitate handling.

SURFACE PREPARATION - GENERAL

Surfaces must be dry and free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of either primer or SEMSTONE 140-S.

SURFACE PREPARATION OF CONCRETE

1. New concrete should be cured a minimum of 28 days.

   NOTE: Check with Sentry Polymers for recommendations regarding concrete cured less than 28 days.

2. Concrete must be structurally sound and must not contain any accelerators or curing compounds.

3. Remove all oil and grease.

4. Remove all surface laitance and expose sound concrete.

   We recommend abrasive blasting to do this. However, other methods, such as acid etching and neutralizing, may be used.

5. In general, any existing coating should be completely removed.

   In certain instances this may not be necessary, but consult with Sentry Polymers first.

   Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates and mid-floor termination points. Handle them as per Sentry's Construction Details.

7. Degraded concrete on horizontal surfaces should be restored using SEMSTONE 300 Epoxy Polymer Concrete or SEM-CRETE.

8. Honeycombs or any form voids in vertical surfaces must be filled. Use a putty made by adding Part C thixotrope and sand to either SEMSTONE 110 Primer or SEMSTONE 140. (See supplemental guidelines.)

SURFACE PREPARATION OF STEEL

1. Steel in Immersion Service

a. Abrasive blast steel surfaces to white metal finish with a 1 1/2 - 2 mil anchor profile. (Ref. SSPC-SP-5)

b. All welds should be continuous and should be ground to remove all sharp edges, laps, under cuts and other surface irregularities. Relatively smooth, ripple finished welds are acceptable.

c. Round all inside corners to a minimum 1/2" radius using a putty made of SEMSTONE 110 Primer with Part C thixotrope added. (See guidelines in separate Technical Bulletin for SEMSTONE 110.)

2. Steel in Non - Immersion Service

a. Abrasive blast steel surfaces to a near white metal finish with 1 - 2 mil anchor profile. (Ref. SSPC-SP-10)

b. All outside corners must be ground smooth and rounded.

MASKING

Mask surfaces that are not to be coated. These materials are difficult to remove, once applied.

MIXING

1. Concrete

a. Concrete surfaces must be primed using SEMSTONE 110 primer.

Mix and apply SEMSTONE 110 primer in accordance with instructions found in the SEMSTONE 110 Technical Bulletin.

b. On horizontal surfaces, it is not necessary to wait for the primer to cure before topping with SEMSTONE 140-S.

c. On vertical surfaces, allow the primer to set until firm to the touch before topping with SEMSTONE 140-S, to prevent sagging of the top coat.

d. Take precautions to prevent the primed surface from becoming contaminated.

e. Should the primed surface become contaminated, you will need to wash the surface with soap and water, rinse it and dry it before proceeding.

f. If primer cures beyond 36 hours, it will be necessary to lightly abrasive blast and reprime.

2. Steel - priming not required.

APPLICATION EQUIPMENT

1. SEMSTONE 140-S may be applied using a spray rig, brush or roller.

2. Plural Component Airless Spray Equipment (Graco Bulldog Hydra-Cat or equal):

Set equipment at a 4 to 1 volumetric mix ratio. Use a Graco Silver Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inch.

SEMSTONE 140-S is available in 25 gallon units for use with plural component equipment.

3. Single Component Airless Spray Equipment (Graco "King" 45 to 1 Hydro Spray Pump, or equal); set up as follows:

No screens, filters or surge tank.

Spray hose should be 1/2" or 3/4" ID, and a maximum of 50 feet in length.

Use Graco Golden Mastic Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041 inch.

Inlet air pressure should be a minimum of 100 psi. Recommended operating pressure is 60 - 100 psi.

4. Always use spray equipment in accordance with manufacturer's instructions.

5. Care of Spray Rig Hoses

Take care to prevent the mixed material from setting up in your hoses. For best results, keep your hoses as short as possible, purge them immediately if work is interrupted, keep them out of direct sunlight and insulated from hot surfaces.

6. Brush or Roller

For horizontal concrete surfaces, use a long nap roller.

For vertical concrete surfaces and for steel, use a medium nap roller.

MIXING AND APPLICATION

1. The components must be individually agitated immediately prior to use:

   Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

   Part B - Stir each Part B component to a uniform color in its individual container.

2. If you are using plural component equipment, skip this step. Otherwise, do this:

   Pour the entire contents of Part B into the container holding Part A and mix thoroughly for two minutes using a Jiffy type mixer. The pot life of the mixture will be approximately 45 - 60 minutes at 75°F; significantly less time at elevated temperatures.

   The longer the material is in the bucket after mixing, the shorter its pot life will be. Therefore, use immediately.

3. Material should be applied in even coats.

   If spraying, use multidirectional passes to ensure positive coverage and a proper film build.

   In any case, remove all irregularities.

4. Coating Thickness in Unreinforced Applications:

   a. Horizontal Surfaces

   The entire desired thickness may be put down on horizontal surfaces in a single coat.

   b. Vertical Surfaces

   Up to 100 mils thickness may be applied to vertical surfaces in a single coat.

5. For reinforced applications:

   a. Apply a 50 mil tack coat of SEMSTONE 140-S over the prepared surface.

   b. Imbed one layer of SEMSTONE Scrim into the tack coat while it is still wet.

   c. Overlap the scrim 1 inch at seams, and apply a liberal coat of SEMSTONE 140-S between the overlapping layers of scrim.

   d. Use flat trowels or squeegees to press the scrim into the tack coat and work out all wrinkles.

   e. Apply a final coat of SEMSTONE 140-S over the top of the scrim to approximately 75 mils thickness.

   f. Plan your work so all steps are completed the same day. Do not leave scrim exposed overnight, as it may absorb moisture.

6. Spark Testing Steel

   Spark testing is recommended for coated steel in immersion service.

   $$\text{Voltage setting} = 1250 \times \sqrt{\text{Coating Thickness (in mils)}}$$

7. When working a large or congested area, it may be desirable for applicator to wear spiked shoes.

8. To obtain a non-skid surface, broadcast a sharp dry silica sand, crushed walnut shells or other grit media onto the surface of the SEMSTONE 140-S coating before it gels.

9. Prepare surfaces for intercoat adhesion as follows:

   a. Allow SEMSTONE 140-S to cure until gelled before recoating.

   b. If the surface has cured firm to the touch, but less than 24 hours, it must be washed with soap and water, rinsed and dried before recoating.

   c. Surfaces cured beyond 24 hours must be washed with soap and water, rinsed, dried and lightly sanded or abrasive blasted.

10. If work is interrupted, and at the end of the day, terminate the coating in a straight line.

As it cures, SEMSTONE 140-S will sometimes develop a thin, oily film on its surface.

This film may be easily removed by washing with soap and water.

CLEANUP

Before it gels, SEMSTONE 140-S may be cleaned from tools and equipment using hot, soapy water.

After SEMSTONE 140-S gels, xylene or MEK will be required. Chlorinated solvents may be used if flammable solvents are not allowed.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Avoid contact with eyes and skin; do not ingest or inhale.

When working with SEMSTONE 140-S, always wear chemical goggles, rubber gloves, and appropriate work clothing.

When spraying in a confined area, also wear a fresh air hood and make provision for forced ventilation.

When spraying in an open area, a NIOSH approved respirator suitable for organic vapors can replace the fresh air hood.

Prolonged or repeated exposure to the unreacted Part A and Part B components of SEMSTONE 140-S may cause skin irritation or allergic reactions.

Refer to material safety data sheets regarding individual components.

---

1 YEAR LIMITED WARRANTY

e year following sale, SENTRY POLYMERS, INC., Freeport, Texas ("SENTRY") will replace any of its products that do not conform to its acturing standards or, at its sole discretion, refund the proportionate sales price applicable to the nonconforming goods. Replacement product will be supplied at no charge, and FOB SENTRY'S facilities.

Information and suggestions supplied by SENTRY, whether in its published literature or otherwise, including samples, are believed to be accurate and reliable and are furnished in good faith. Such information and suggestions are supplied without charge and their use, and the use of SENTRY products is beyond SENTRY'S control. SENTRY'S products, information and suggestions are intended for USERS possessing skill and know-how in the industry. USERS are responsible, at their sole discretion and risk, to satisfy themselves regarding the suitability of SENTRY'S products, information and suggestions for their particular circumstances.

SENTRY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING ITS PRODUCTS, INFORMATION AND SUGGESTIONS AND DISCLAIMS ALL WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This limited warranty will be rendered null and void by any one or more of the following: SENTRY is not paid timely and in full at Freeport, Texas, for all goods and services sold by SENTRY for use on the applicable project; USER does not cooperate with SENTRY'S reasonable investigations regarding the alleged nonconforming product; the product has been misused, abused or improperly maintained.

The provisions of this warranty supersede any provisions to the contrary in any of USER'S forms or documents or otherwise unless such contrary provisions are specifically acknowledged and agreed to in writing by SENTRY after receipt by SENTRY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF PERSONAL INJURY, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

TECHNICAL BULLETIN
July 1992

SEMSTONE® 805

Flexible Novolac Epoxy Polymer Coating

DESCRIPTION AND USES:

SEMSTONE 805 is a 100% solids, low odor, flexibilized novolac epoxy. It is used for coating concrete and as a chemical resistant seal for expansion joints and other points of movement in concrete construction.

SEMSTONE 805, as packaged, is a self-leveling material. However, it may be used as a high build coating system by the addition of a third component, Part C, which is a non-silica thixotrop. The product may be applied by airless spray, notched trowel, squeegee, brush or roller. To make a trowel/caulk grade or putty, add 2 bags of Part C.

SEMSTONE 805 provides an abrasion, chemical and water resistant coating that exhibits good flexibility allowing it to accommodate crack movement. Concrete slabs with severe cracking problems, as well as all construction and expansion joints, should be treated using SEMSTONE 805 reinforced with SEMSTONE 805 Coating Fabric. Refer to appropriate construction details.

SEMSTONE 805 is ideal for use as a secondary containment coating.

PACKAGING/COVERAGE:

SEMSTONE 805 is available in 1 gallon and 2 gallon units. Each unit consists of premeasured Part A and Part B components. A bagged Part C thixotropic agent is ordered separately for work on vertical surfaces.

Application thickness may vary from 40 mils to 125 mils, depending on expected service conditions.

In addition, coverage will be effected by condition of surface being coated (degraded vs. smooth, steel vs. concrete, etc.)

To figure THEORETICAL coverage per gallon, divide desired mil thickness into 1604. The result will be the number of square feet per gallon.

Sentry POLYMERS, INC.
P.O. BOX 2076
5500 E. HWY 332
FREEPORT, TX 77541
409-233-0312
800-231-2544

TYPICAL PROPERTIES

Tensile Strength	ASTMD-638	500 - 700 psi
Tensile Elongation	ASTMD-638	100%
Hardness Shore A		55 - 60
Pot Life		30 - 45 mins @ 75°F
Set Time		36 - 48 hrs @ 75°F
Color		Gray (Optional Black & Tile Red)

RELATED AND ANCILLARY PRODUCTS

SEMSTONE 110 Damp Proof Epoxy Primer
SEMSTONE 110-P/S Primer
SEMSTONE 140-S Epoxy Coating/Lining
SEMSTONE 140-CT Epoxy Coating Cold Temperature Formulation
SEM-CRETE Rapid Hardening Underlayment Mortar
SEMSTONE 805 Coating Fabric
SEMSTONE 805 Joint Fabric

Refer to separate technical bulletins on each product for uses, application instructions, etc.

STORAGE AND SHELF LIFE

Keep SEMSTONE 805 components tightly sealed in their original containers until ready for use. Store at 50 - 85°F, out of direct sunlight. The optimum temperature for material workability is 75 - 85°F. Properly stored, SEMSTONE 805 has a minimum shelf life of one year.

Refer to batch number on label for date of manufacture.

For detailed chemical resistance refer to the Master Chemical Resistance Guide.

APPLICATION GUIDELINES

TEMPERATURE CONSIDERATIONS

1. The temperature of the surface to be coated, and the ambient air temperature should be at least 50°F during installation and curing.

2. Twenty-four hours before application, all materials (components A, B, and C, etc.) should be stored at 75 - 85°F to facilitate handling.

SURFACE PREPARATION - GENERAL

Surfaces must be dry and free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to each application of SEMSTONE 805.

SURFACE PREPARATION OF CONCRETE

1. New concrete generally should be cured a minimum of 28 days.

   NOTE: Check with Sentry Polymers, Inc.

for recommendations regarding concrete cured less than 28 days.

2. Concrete must be structurally sound and must not contain any accelerators or curing compounds.

3. Remove all oil and grease.

4. Remove all surface laitance and expose sound concrete. We recommend abrasive blasting to do this. Other methods, such as acid etching and neutralizing, may also be used. Consult Sentry Polymers, Inc. before using these methods.

5. In general, any existing coating should be completely removed. In certain instances this may not be necessary, but consult with Sentry Polymers, Inc. first. Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates, mid-floor termination points, etc. Handle them according to Sentry's Construction Details.

7. Degraded concrete on horizontal surfaces should be restored by using SEMSTONE 805 or SEMSTONE 140 bulked out with aggregate 2:1 by weight and Part C, or use SEM-CRETE.

8. Fill all honeycombs, form voids, etc. in vertical surfaces using SEMSTONE 805, or SEMSTONE 140 bulked out with aggregate 2:1 by weight and Part C.

9. Treat all cracks according to Sentry's Construction Details.

SURFACE PREPARATION OF OTHER SEMSTONE COATINGS

1. Soap and water wash the surface of the cured coating.

2. Roughen the surface by sanding or abrasive blasting.

3. Remove dust and debris.

SURFACE PREPARATION OF INCIDENTAL STEEL

Equipment base plates, pipe stands, etc. to be coated along with the concrete should be abrasive blasted to a near white metal finish with a 1 - 2 mil anchor profile. (Ref. SSPC-SP-10)

MASKING

Mask surfaces that are not to be coated. SEMSTONE 805 is difficult to remove once applied.

DEALING WITH BUBBLING AND PINHOLING

Bubbling and pinholing are commonly encountered problems when applying coatings over concrete.

The predominant causes of these problems are:

A. "Outgassing" of the concrete;

B. Inadequate surface preparation;

C. Air whipped into the coating during mixing;

D. Inadequate concrete cure and moisture.

Dealing with these causes should minimize, and in many cases eliminate, the problems of bubbling and pinholing.

Outgassing

Concrete is a very porous material. As it warms during the day it expels air, or "outgasses." A coating applied while the concrete is outgassing likely will develop bubbles and pinholes.

To avoid this, the first coat, usually SEMSTONE 110-P/S Primer should be applied when the temperature of the concrete is falling. Usually this is from late afternoon on

into the night. Stop applying the material well before dawn, so it has time to set up firm to the touch before outgassing begins. This may be anywhere from one to six hours, depending upon the weather conditions. In addition, it is a good idea to shade the work area from direct sunlight.

Surface Preparation

A rough or irregular surface profile of the concrete can allow little pockets of air to be trapped beneath the coating and thus create another source of bubbles and pinholes.

A properly prepared concrete surface should be tightly finished with a texture similar to medium grit sandpaper, and should be free of ridges, depressions, and other irregularities. All bug holes and form voids must be opened and filled.

Excess Air

A third source of bubbles and pinholes is air whipped into the coating during the mixing process. To minimize this problem:

1. Use a Jiffy type mixer, not a regular paddle mixer;
2. Mix at low speed; and,
3. Do not repeatedly lift the mixer out of the material during the mixing.

Moisture

Another source of bubbles and pinholes is moisture contamination of resin, hardener, aggregates, or the reinforcing fabrics.

Store all materials in a dry storage area to avoid this problem.

APPLICATION EQUIPMENT

1. SEMSTONE 805 may be applied using a spray rig, notched trowel, brush or roller.
2. SPRAYING SEMSTONE 805 (with or without Part C):

   We recommend the use of a single component airless rig for spraying SEMSTONE 805.

   A single component airless spray rig equivalent to the Graco King 45 to 1 Hydro Spray Pump, set up as follows:

   No screens, filters, or surge tank.

   Spray hose should be 3/8" to 1/2" ID, and a maximum of 50 feet in length.

   Use Graco 220-961 Flet Gun, or equivalent, equipped with a reversible, self-cleaning tip, orifice size .035 - .041".

   Inlet air pressure should be a minimum of 100 psi. Recommended operating pressure is 60 - 100 psi.
3. Always use spray equipment in accordance with manufacturer's instructions.
4. Care of spray rig hoses.

   Take care to prevent the mixed material from setting up in your hoses. For best results, keep hoses as short as possible, purge them immediately if work is interrupted, keep them out of direct sunlight and insulated from hot surfaces.

MIXING

1. The component must be individually agitated immediately prior to use.

   Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

   Part B - Stir each Part B component to a uniform color in its individual container.
2. Pour the entire contents of Part B into the container holding Part A and mix thoroughly for two minutes using a Jiffy type mixer.

If using Part C for vertical surface application, add the pre-measured bag of Part C slowly to the mixed resins and hardeners and blend until the Part C has been evenly dispersed. The amount of Part C may be adjusted to meet job requirements.

The pot life of the mixture will be approximately 30 - 45 minutes @ 75°F; significantly less time at elevated temperatures.

The longer the material is in the bucket after mixing, the shorter its pot life will be. Use it immediately.

APPLICATION INSTRUCTIONS

Instructions For Unreinforced Coating Applications

1. Before proceeding, read paragraphs titled "Dealing with Bubbling and Pinholing" above.
2. All surfaces to receive the SEMSTONE 805 coating must be primed with SEMSTONE 110-P/S Primer prior to applying coating.
3. When the primer has dryed, apply the SEMSTONE 805 using your preferred application tools.
4. If work is interrupted, or at the end of the day, terminate the coating in a straight line.
5. After the SEMSTONE coating system has cured, it is advisable to wash the surface with hot soapy water and rinse thoroughly with clean water.

Instructions For Reinforced Coating Application

1. All surfaces to receive the Reinforced SEMSTONE 805 coating must be primed with SEMSTONE 110-P/S Primer prior to applying coating.
2. When the primer has cured tack free apply SEMSTONE 805 to a minimum of 40 - 50 mils thick using your preferred application tools.
3. Immediately embed a layer of SEMSTONE 805 Coating Fabric into the wet base coat. Use a short napped felt roller to work the fabric into the wet material until the entire surface is saturated with SEMSTONE 805. Work the short napped roller starting from the center of the fabric and roll to the outer edges to saturate coating fabric and work out trapped air. The fabric should lay flat without wrinkles. Overlap seams a minimum of 2". Apply a liberal coat of SEMSTONE 805 between overlapped seams.
4. If work is interrupted, or at the end of the day, terminate the coating in a straight line.
5. After the SEMSTONE coating/lining system has cured, it is advisable to wash the surface with hot soapy water and rinse thoroughly with clean water.

Instructions For Use In Construction and Expansion Joints

Sentry Polymers, Inc. has construction detail figures for the treatment of construction and expansion joints. Refer to these construction detail figures for actual installation of the type of joint treatment you require.

SEMSTONE 805 as packaged (Part A & Part B) is a pourable self-leveling material. To make SEMSTONE 805 a caulk of trowel grade joint sealant, add 2 bags of Part C.

CLEANUP

Remove all masking tape from items masked for protection during installation.

Before it gels, SEMSTONE 805 may be

cleaned from tools and equipment using hot, soapy water. After SEMSTONE 805 gels, xylene or MEK will be required. Chlorinated solvents may be used if flammable solvents are not allowed.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Avoid contact with eyes and skin; do not ingest or inhale.

When working with SEMSTONE 805, always wear chemical goggles, rubber gloves, and appropriate work clothing.

When spraying in a confined area, also wear a fresh air hood and make provision for forced ventilation. When spraying in a confined area, an organic mist respirator can replace the fresh air hood.

Prolonged or repeated exposure to SEMSTONE 805 may cause skin irritation or allergic reactions.

Refer to Material Safety Data Sheets regarding individual components.

NOTES

1 YEAR LIMITED WARRANTY

For one year following sale, SENTRY POLYMERS, INC., Freeport, Texas ("SENTRY") will replace any of its products that do not conform to its manufacturing standards or, at its sole discretion, refund the proportionate sales price applicable to the nonconforming goods. Replacement product will be supplied at no charge, and FOB SENTRY's facilities.

Information and suggestions supplied by SENTRY, whether in its published literature or otherwise, including samples, are believed to be accurate and reliable and are furnished in good faith. Such information and suggestions are supplied without charge and their use, and the use of SENTRY products, is beyond SENTRY'S control. SENTRY'S products, information and suggestions are intended for USERS possessing skill and know-how in the industry. USERS are responsible, at their sole discretion and risk, to satisfy themselves regarding the suitability of SENTRY'S products, information and suggestions for their particular circumstances.

SENTRY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING ITS PRODUCTS, INFORMATION AND SUGGESTIONS AND DISCLAIMS ALL WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This limited warranty will be rendered null and void by any one or more of the following: SENTRY is not paid timely and in full at Freeport, Texas, for all goods and services sold by SENTRY for use on the applicable project; USER does not cooperate with SENTRY'S reasonable investigations regarding the alleged nonconforming product; the product has been misused, abused or improperly maintained.

The provisions of this warranty supersede any provisions to the contrary in any of USER's forms or documents or otherwise unless such contrary provisions are specifically acknowledged and agreed to in writing by SENTRY after receipt by SENTRY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF PERSONAL INJURY, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

SEMSTONE 110

SEMSTONE 110-P/S

TECHNICAL BULLETIN
November 1992

SEMSTONE® 110

Damp Proof Epoxy Primer

DESCRIPTION AND USES:

SEMSTONE 110 Primer is a two part epoxy that exhibits superior adhesion to concrete and steel. SEMSTONE 110 Primer is used under many of the SEMSTONE surfacing materials. SEMSTONE 110 Primer may also be used as a sealant over concrete to prevent dusting and spalling due to freeze-thaw cycles.

PACKAGING/COVERAGE:

SEMSTONE 110 is packaged in 3 quart, and 1 1/2 gallon units. A 3 quart unit will cover approximately 100 square feet over smooth concrete.

TYPICAL PROPERTIES:

Mixing ratio	2 parts A to 1 part B by volume
Mixed usable pot life @ 75° F.	60 minutes
Solids by volume	100%
Weight per mixed gallon	9 lbs
Flash point	non-flammable
Dry to touch time	6-8 hours @ 80° F
Color - mixed	Semi-clear

APPLICATION INFORMATION:

1. All concrete surfaces must be structurally sound.
2. Concrete surfaces must be free of oil and grease.
3. Concrete must be acid-etched or abrasive blasted to remove laitance and surface contaminants and to expose sound concrete.
4. For best results, concrete should be dry, however, SEMSTONE 110 Primer will cure and bond to damp concrete surfaces.
5. Incidental steel must be abrasive blasted to near white metal (SP-10). In immersion service, abrasive blast to white metal (SP-5).
6. Mix Part A resin with Part B hardener until uniform in color and consistency. Apply to prepared surface using paint rollers or by brush.
7. Top coating - refer to top coat product bulletin for specific top coating instructions.

SAFETY:

As with all epoxy based material, care should be taken while handling and working with this material. Wear rubber gloves, long sleeves, and chemical goggles.

Sentry POLYMERS, INC.
P.O. BOX 2076 409-233-0312
5500 E. HWY 332 800-231-2544
FREEPORT, TX 77541

NOTES

1 YEAR LIMITED WARRANTY

For one year following sale, SENTRY POLYMERS, INC., Freeport, Texas ("SENTRY") will replace any of its products that do not conform to its manufacturing standards or, at its sole discretion, refund the proportionate sales price applicable to the nonconforming goods. Replacement product will be supplied at no charge, and FOB SENTRY's facilities.

Information and suggestions supplied by SENTRY, whether in its published literature or otherwise, including samples, are believed to be accurate and reliable and are furnished in good faith. Such information and suggestions are supplied without charge and their use, and the use of SENTRY products, is beyond SENTRY'S control. SENTRY'S products, information and suggestions are intended for USERS possessing skill and know-how in the industry. USERS are responsible, at their sole discretion and risk, to satisfy themselves regarding the suitability of SENTRY'S products, information and suggestions for their particular circumstances.

SENTRY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING ITS PRODUCTS, INFORMATION AND SUGGESTIONS AND DISCLAIMS ALL WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This limited warranty will be rendered null and void by any one or more of the following: SENTRY is not paid timely and in full at Freeport, Texas, for all goods and services sold by SENTRY for use on the applicable project; USER does not cooperate with SENTRY'S reasonable investigations regarding the alleged nonconforming product; the product has been misused, abused or improperly maintained.

The provisions of this warranty supersede any provisions to the contrary in any of USER's forms or documents or otherwise unless such contrary provisions are specifically acknowledged and agreed to in writing by SENTRY after receipt by SENTRY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF PERSONAL INJURY, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

TECHNICAL BULLETIN
July 1992

SEMSTONE® 110-P/S

Epoxy Penetrating Primer/Sealer

DESCRIPTION AND USES:

Semstone 110-P/S is a two component epoxy primer and sealer for concrete. It is economical with high coverage rates, easy to apply, fast curing, and may be applied at temperatures as low as 40°F.

Priming with SEMSTONE 110-P/S is a recommended option with most SEMSTONE epoxy and novolac systems.

SEMSTONE 110-P/S penetrates into the concrete and seals the surface. This significantly reduces the chance that pinholes and other troublesome defects may form in a SEMSTONE protective coating subsequently applied over the concrete. Further, the schedule for applying the SEMSTONE protective topcoat becomes more flexible; topcoating isn't restricted to falling temperature conditions.

Other benefits of using SEMSTONE 110-P/S include a strong mechanical bond between the primer and the substrate and increased tensile strength at the surface of the concrete. Increased tensile strength improves the resistance of the concrete to thermal cycling and thermal shock.

PACKAGING/COVERAGE:

Semstone 110-P/S is available in 1 gallon and 20 gallon units. Each unit consists of a premeasured Part A component and a premeasured Part B component.

THEORETICAL COVERAGE rates over dense, smooth concrete are:

1st coat – 250 sq. ft./gallon
2nd coat – 375 sq. ft./gallon

For practical coverage, make necessary allowances for condition of concrete (porous vs. dense, degraded vs. smooth), working conditions, waste, spillage, etc.

Sentry POLYMERS, INC.
P. O. BOX 2076
5500 E. HWY 332 409-233-0312
FREEPORT, TX 77541 800-231-2544

TYPICAL PROPERTIES:

Solids, by Volume _____ 80%
Color _____ Semi-Clear

Pot Life, Cure Time and Topcoat Time:

Temperature	Pot Life	Cure Time	Maximum Topcoat Time
40°F	30 min.	12 hrs.	10 days
75°F	20 min.	2 hrs.	7 days
95°F	10 min.	1 hr.	3 days

STORAGE AND SHELF LIFE:

Keep SEMSTONE 110-P/S components tightly sealed in their original containers until ready for use. Store at 50-75°F, out of direct sunlight. Part A is FLAMMABLE. Store away from open flame or ignition sources. Properly stored, SEMSTONE 110-P/S has a minimum shelf life of one year.

Refer to batch number on label for date of manufacture.

APPLICATION GUIDELINES

IMPORTANT NOTES

1. SEMSTONE 110-P/S has a very short pot life. Plan your work accordingly.
2. Do not mix sand, fibers, or any other fillers into SEMSTONE 110-P/S.

TEMPERATURE CONSIDERATIONS

1. Use a surface thermometer to continually monitor the temperature of the concrete substrate.
2. Throughout the application and curing process, the temperature of the concrete substrate should be at least 40°F.
3. For best results in sealing the concrete, shade the work area and apply SEMSTONE 110-P/S when the temperature of the concrete substrate is falling. The cooler the concrete, the more important this is.
4. Halt application if the substrate temperature falls within 5°F of the dew point.
5. If the ambient temperature at the jobsite is above 85°F, make provisions to keep the Part A and Part B components cool until just prior to mixing. (For example, keep them in an ice water bath.) This will help maintain a longer pot life in hot weather.
6. For ease of mixing and handling, store SEMSTONE 110-P/S at 65°F to 75°F for 24-48 hours immediately prior to use.

SURFACE PREPARATION - GENERAL

The concrete substrate must be dry and free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of SEMSTONE 110-P/S.

SURFACE PREPARATION OF CONCRETE

1. New concrete generally should be cured a minimum of 28 days.

   NOTE: Check with Sentry Polymers for recommendations regarding concrete cured less than 28 days.

2. Concrete must be structurally sound and must not contain any accelerators or curing compounds.

3. Remove all oils and grease.

4. Remove all surface laitance and expose sound concrete. We recommend abrasive blasting to do this. Other methods, such as acid etching and neutralizing, may also be used.

5. In general, any existing coating should be completely removed. In certain instances this may not be necessary, but consult with Sentry Polymers first.

   Always remove coatings which have failed due to lack of adhesion or thermal shock.

6. Locate all expansion joints, control joints, floor drains, equipment base plates, mid-floor termination points, etc. Handle them according to Sentry's Construction Details.

SURFACE PREPARATION OF INCIDENTAL STEEL

Steel surfaces must be abrasive blasted to a near white metal finish with a 2.5-3.0 mil anchor profile. (Ref. SSPC-SP 10)

MASKING

Mask surfaces that are not to be coated. This material is difficult to remove, once applied.

APPLICATION EQUIPMENT

SEMSTONE 110-P/S may be applied with a medium or long nap roller or a hard bristle brush.

MIXING AND APPLICATION

1. The mixing ratio of SEMSTONE 110-P/S Part A with Part B is 3:1, by volume. For example, mix 3 quarts of Part A with one quart of Part B, to yield one gallon of SEMSTONE 110-P/S.

2. The 1 gallon and 20 gallon units of SEMSTONE 110-P/S come with the Part A and B components premeasured in the proper ratio. However, it is acceptable to mix less than an entire unit, so long as the 3:1 ratio is observed. Be sure to tightly reseal the unused portions in their original containers to avoid contamination.

3. DO NOT ADD ANY SOLVENTS, THINNERS, OR OTHER FOREIGN MATERIALS TO SEMSTONE 110-P/S.

4. For mixing, use a clean, dry container free of any foreign material.

5. Pour the proper proportions of Part A and B into the mixing container. Blend them together thoroughly using a Jiffy type mixer until a smooth, even consistency is achieved (usually 1-2 minutes).

6. This material has a short pot life; use it immediately. Do not mix more at one time than can be applied within the pot life (see TYPICAL PROPERTIES).

7. Apply SEMSTONE 110-P/S over the substrate in a thin, even coat. Do not allow it to puddle.

   On vertical surfaces, it is important to work the primer into the concrete with your brush or roller.

8. To obtain desired coverage rates, it may be helpful to mark off the approximate area to be primed by the quantity mixed.

9. Curing, Topcoating, Repriming:

   a. Take precautions to prevent the primed substrate from becoming contaminated prior to topping or repriming.

   b. Allow SEMSTONE 110-P/S to cure. (See TYPICAL PROPERTIES for cure times.)

   c. Top with the specified SEMSTONE protective system (SEMSTONE 140, 245, 805, etc.) within the maximum topcoat time (see TYPICAL PROPERTIES).

      If the SEMSTONE 110-P/S cures beyond the indicated maximum topcoat time, you will need to reprime before topping.

   d. Vertical surfaces will typically require two coats of primer to seal the concrete. Floors and other horizontal surfaces are typically sealed in one coat. However, it is critical that you carefully and thoroughly inspect the primed concrete for

proper seal before topping with a SEMSTONE protective coating. It is much more cost effective to apply an additional coat of primer than to repair pinholes that show up in the topcoat because the concrete wasn't completely sealed.

CLEANUP

Before it gels, SEMSTONE 110-P/S may be cleaned from tools and equipment using hot, soapy water.

After SEMSTONE 110-P/S gels, xylene or MEK will be required.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Avoid contact with eyes and skin; do not ingest or inhale.

When working with SEMSTONE 110-P/S, always wear chemical goggles, rubber gloves, and appropriate work clothing.

Prolonged or repeated exposure to the unreacted Part A and Part B components of SEMSTONE 110-P/S may cause skin irritation or allergic reactions.

Due to the solvent present in SEMSTONE 110-P/S, forced ventilation is required during application. A NIOSH approved air supply hood is required in confined areas or areas with stagnant air.

Part A is FLAMMABLE. No smoking signs should be posted in and around the work area. Fire extinguishers should be on hand in the work area.

Refer to Material Safety Data Sheets regarding individual components and for information on methods for disposal.

1 YEAR LIMITED WARRANTY

For one year following sale, SENTRY POLYMERS, INC., Freeport, Texas ("SENTRY") will replace any of its products that do not conform to its manufacturing standards or, at its sole discretion, refund the proportionate sales price applicable to the nonconforming goods. Replacement product will be supplied at no charge, and FOB SENTRY'S facilities.

Information and suggestions supplied by SENTRY, whether in its published literature or otherwise, including samples, are believed to be accurate and reliable and are furnished in good faith. Such information and suggestions are supplied without charge and their use, and the use of SENTRY products is beyond SENTRY'S control. SENTRY'S products, information and suggestions are intended for USERS possessing skill and know-how in the industry. USERS are responsible, at their sole discretion and risk, to satisfy themselves regarding the suitability of SENTRY'S products, information and suggestions for their particular circumstances.

SENTRY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING ITS PRODUCTS, INFORMATION AND SUGGESTIONS AND DISCLAIMS ALL WARRANTIES INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

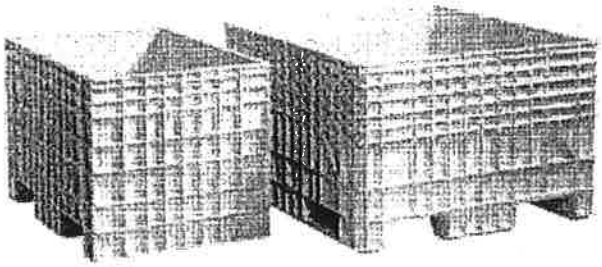
This limited warranty will be rendered null and void by any one or more of the following: SENTRY is not paid timely and in full at Freeport, Texas, for all goods and services sold by SENTRY for use on the applicable project; USER does not cooperate with SENTRY'S reasonable investigations regarding the alleged nonconforming product; the product has been misused, abused or improperly maintained.

The provisions of this warranty supersede any provisions to the contrary in any of USER'S forms or documents or otherwise unless such contrary provisions are specifically acknowledged and agreed to in writing by SENTRY after receipt by SENTRY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF PERSONAL INJURY, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Fixed-Wall Pallet Container

Big Box

Big Box Fixed-Wall Pallet Containers are available in two standard footprints, 42" x 29" and 48" x 44". Applications for the Big Box range from the handling of small parts to large finished goods. Plus, the solid, seamless construction offers a watertight interior, perfect for holding pellets, powders and a variety of materials. Lids for the Big Box PC4844 feature a smooth, slightly domed top, which sheds water easily.



BF42292800

This compact Big Box container is designed for air freight and is ideal for rapid handling and efficient cubing of air cargo holds. It does double duty for storing or conveying small batches of material or parts.

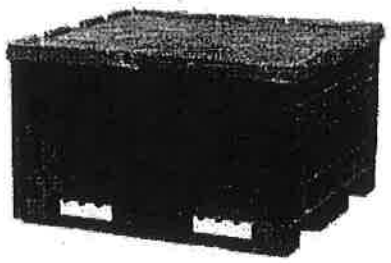
Standard Colors: Grey/Black/White (FDA)
Optional Opening: Drain Plug

BF48442900

The PC4844 is designed with strong sidewalls, durable corners and beveled fork straps for easy pallet jack and fork-lift handling. It is one truly consistent long-term performer.

Standard Colors: Grey/Black/White (FDA)
Optional Opening: Drain Plug





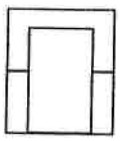


BF4229 & BF4844 SPECIFICATIONS

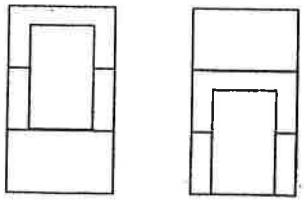
	PC4229	PC4844	LID: LS422904^^	LID: LS484403	LID: LS484404^^
OUTSIDE DIMENSIONS* inch (mm)					
LENGTH	41.6 (1057)	47.9 (1217)	42.5 (1080)	48.9 (1242)	48.4 (1229)
WIDTH	28.8 (732)	43.8 (1113)	29.7 (754)	44.8 (1138)	44.5 (1130)
HEIGHT	27.8 (706)	29.2 (742)	3.2 (81)	2.8 (71)	4.0 (102)
HEIGHT NESTED	27.5 (699)	28.7 (729)	-	-	-
FOOT INTERLOCK	0.3 (8)	0.5 (13)	-	-	-
INSIDE DIMENSIONS* inch (mm)					
LENGTH	39.4 (1001)	45.6 (1158)	42.0 (1067)	48.6 (1234)	47.9 (1217)
WIDTH	26.6 (676)	42.0 (1067)	29.1 (739)	44.5 (1130)	44.0 (1118)
HEIGHT	22.7 (577)	23.9 (607)	2.8 (71)	1.7 (43)	2.8 (71)
FILL LINE	22.4 (569)	23.4 (594)	-	-	-
DOME HEIGHT††	n/a	0.8 (20)	-	-	-
HEIGHT STACKED* inch (mm)	82.8 (2103) 3 high	87.6 (2225) 3 high	-	-	-
FORK OPENINGS inch (mm)					
HEIGHT long side	3.9 (99)	3.0 (76)	-	-	-
WIDTH long side	10.5 (267)	11.6 (295)	-	-	-
HEIGHT short side	n/a	4.1 (105)	-	-	-
WIDTH short side	n/a	11.2 (284)	-	-	-
TARE WEIGHT** lbs (kg)	70.4 (31.9)	95.0 (43.1)	15.3 (6.9)	20.9 (9.5)	26.6 (12.1)
PROJECTED FOOTING AREA ft² (m²)	8.3 (0.8)	14.6 (1.4)	-	-	-
CONTAINER CAPACITY*** lbs (kg)	900 (400)	1200 (544)	-	-	-
MAX. STATIC VERTICAL LOAD*** lbs (kg)	5400 (2449)	7200 (3266)	-	-	-
MAX. LOADED STACK***					
STATIC	6 high	6 high	-	-	-
DYNAMIC	4 high	3 high	-	-	-
VOLUME ft³ (m³)					
EXTERNAL VOLUME	19.3 (0.5)	35.5 (1.0)	-	-	-
INTERNAL VOLUME	13.8 (0.4)	26.5 (0.8)	-	-	-
INTERNAL VOLUME TO FILL LINE	13.6 (0.4)	25.9 (0.7)	-	-	-
APPROX. RETURN RATIO	1:1	1.5:1 nested	-	-	-
TRUCKLOAD QUANTITY nested/upright					
45 FT TRAILER	-/114	98/72	-	-	-
48 FT TRAILER	-/117	100/72	-	-	-
53 FT TRAILER	-/132	112/84	-	-	-
SEA CONTAINER CAPACITY nested/upright					
20 FT	-/48	35/24	-	-	-
40 FT	-/99	75/54	-	-	-
40 FT HIGH CUBE	-/99	75/54	-	-	-
FUNCTIONAL TEMPERATURE	-20°F to 120°F (-29°C to 49°C)				

*, ** and *** : see page 38 for specification disclaimers
^^ Available with optional O-ring seal for watertight closure
LS = Structural Foam HDPE

PC4844 Empty Nesting example:

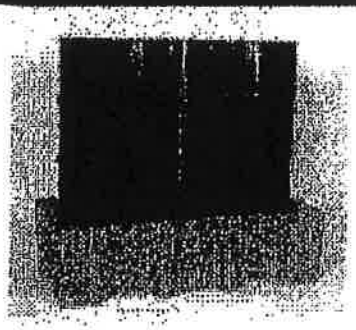


PC4844 Empty Stacking examples:

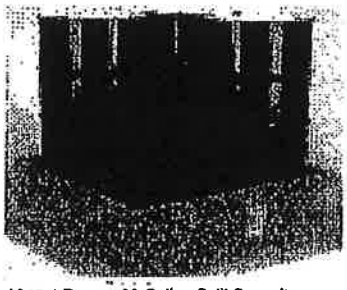


INCREASING YOUR PRODUCTIVITY
DACO
MATERIAL HANDLING & PACKAGING SOLUTIONS
www.DACOcorp.com
800-345-3226
BUCKHORN

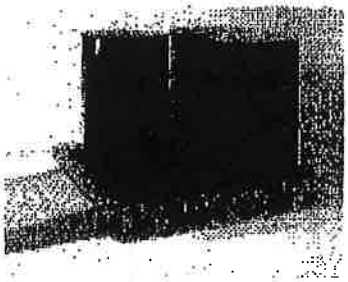
SPILL CONTAINMENT



1620 2 Drum - 66 Gallon Spill Capacity
51" x 26¾" x 15"



1640 4 Drum - 90 Gallon Spill Capacity
51½" x 51½" x 18½"



1646 4 Drum Nestable - 66 Gallon Spill Capacity
58¾" x 58¾" x 7¾" Shown w/1689



1612 Single Drum Containment Unit
w/optional 1698 Dolly with 3" rubber castors
65 Gallon Spill Capacity

SPCC COMPLIANT

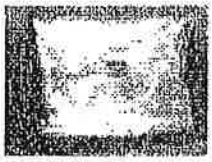
Spill Containment Pallets

Eagle makes four forkliftable pallets for the containment of hazardous spills. These models include the 1620 2 drum pallet with a 66 gallon spill capacity, the 1640 4 drum pallet with an 90 gallon secondary spill capacity, the 1645 low profile 4 drum pallet with a 66 gallon secondary spill capacity and the 1646 Nestable 4 drum pallet with a 66 gallon secondary spill capacity. All pallets feature:

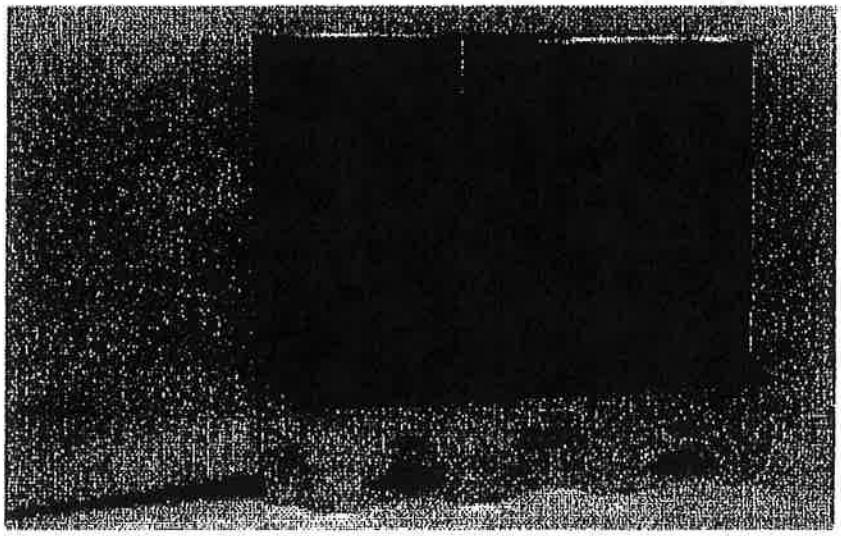
- Polyethylene construction for excellent chemical resistance
- Grating with 1¾" square opening that removes easily for cleaning
- Forkliftable design with ¾" drain plug
- Model 1645 and 1646 are compatible with our Model 1689 ramp
- Meet EPA requirements for secondary spill containment of hazardous materials (40 CFR 264.175)

The 1612 is a single drum containment unit that is ideal for use as a spill containment unit, a mobile pumping station or waste collection station. With the addition of the 1698 drum dolly you can easily move the drum for dispensing or collection.

Model	Item	Dimensions	Weight	Load Capacity
1612	Single Drum Unit	31" x 33"	30 lbs.	-
1640	4 Drum Pallet Unit	51½" x 51½" x 18½"	88 lbs.	4,000 lbs.
1646	4 Drum Nestable Pallet	58¾" x 58¾" x 7¾"	65 lbs.	6,000 lbs.
1698	Single Drum Containment Dolly	27⅝" x 7"	30 lbs.	1,000 lbs.

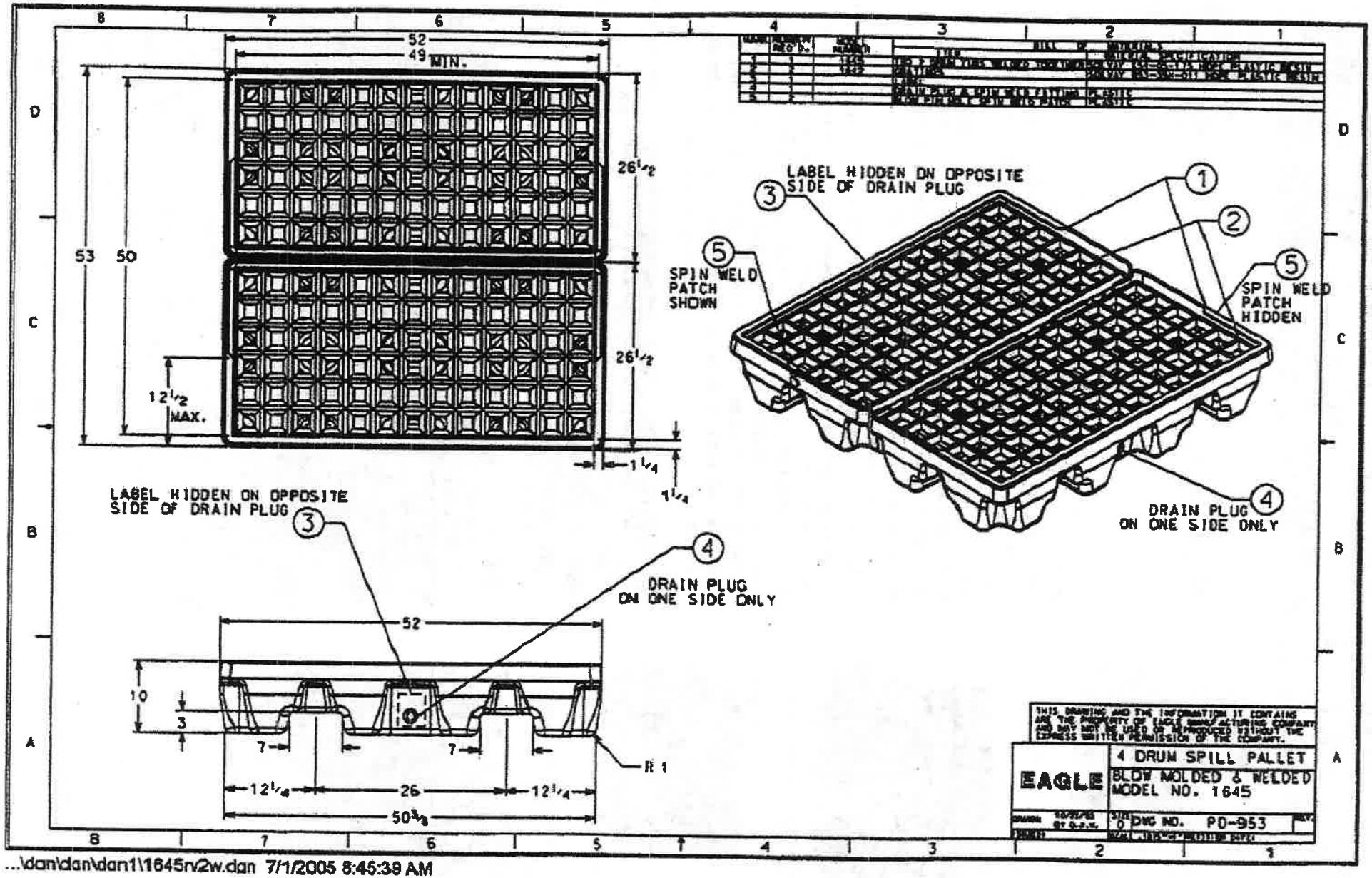


1644 Pallet Tarp
54" x 54" x 40"



1689 Poly Ramp
45⅜" x 32" x 8"

1645 4 Drum - 66 Gallon Spill Capacity
51½" x 51½" x 10"



...\dan\dan\dan1\1645rv2w.dan 7/1/2005 8:45:39 AM

APPENDIX D-2

Addendum A

DW WASTEWATER CONTAINMENT AREA UPGRADES AND MAINTENANCE PLAN

PSC KENT FACILITY
Dangerous Wastewater Containment Area Upgrades and Maintenance Plan

PSC proposes to upgrade the existing wastewater treatment containment area with the following interim measures. First, all defects noted in the Dangerous Wastewater Containment Area Inspection/Evaluation (dated April 2008) will be repaired as described below. Then, all concrete and steel sump surfaces will be prepped and coated with a Ceilcote Novolac (or equivalent manufacturer) chemically-resistant Epoxy system as detailed below. All construction joints will be sawcut and sealed with chemically-resistant elastomeric sealant per the attached Detail. Finally, the interface between the berm walls and containment floor around the perimeter of the area will be sealed with a bead of the same chemically-resistant elastomeric.

Starting about one month after completion of the coating work, the area will again be put on a 6-month engineering inspection program to ensure that the condition of the coating system is monitored and any defects repaired in a timely manner.

Advance Work

1. Take preliminary photos.
2. Remove all surplus/obsolete piping, conduit, brackets, unistrut from walls and area.
3. Grind all obsolete or unused anchor bolts, pipe stanchion remnants, or other metal protrusions down to at or below surrounding concrete.
4. Patch large spalls on walls and floor with cement grout or Rezi-Weld 1000 Construction epoxy.
5. Pressure wash all surfaces, spot treat oil-stained areas with caustic soap, and rinse thoroughly.
6. Remove any accumulated solids from bottom of sump. Remove iron sump grating.

Coating Procedures (Mfgr. Spec Sheets attached)

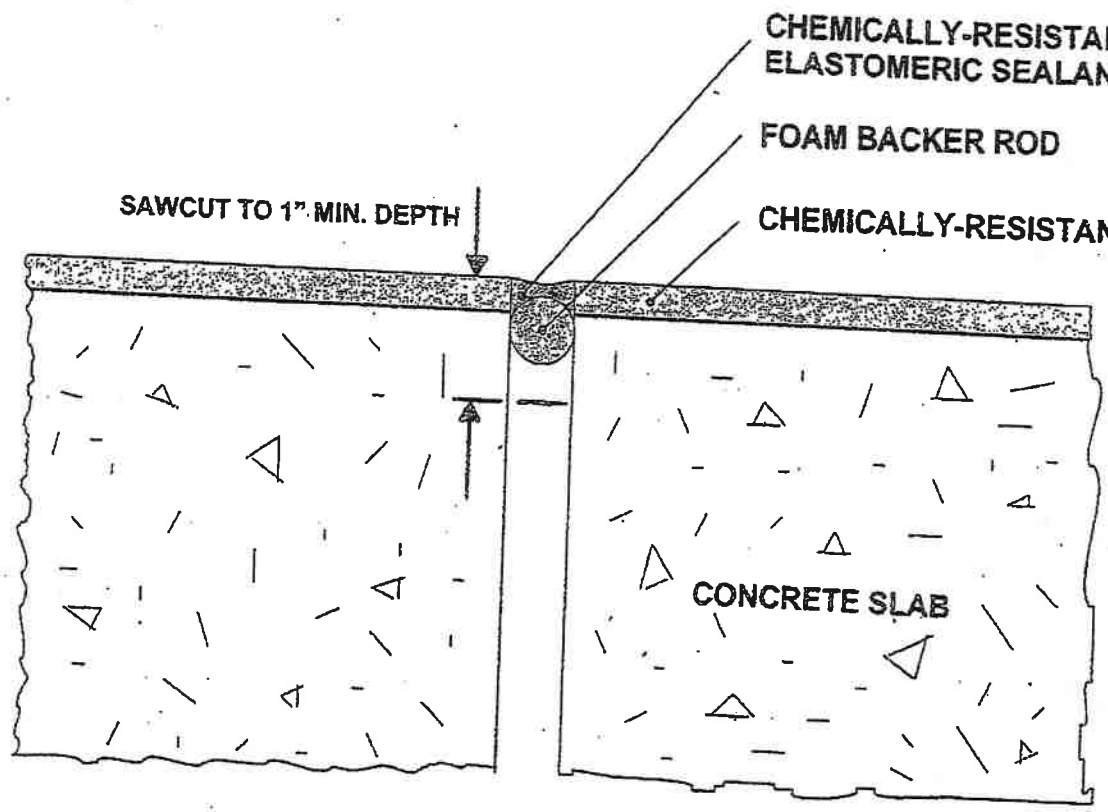
1. Sandblast wall and floor slabs and sump with medium coarse grit abrasive.
2. Sweep and vacuum thoroughly to remove all sand and laitance.
3. Install markers for all construction joints to make location easier after coating work.
4. Mix and apply Ceilcote Series 690 (or equivalent) Oil & Moisture Tolerant Primer to all surfaces to be coated as per manufacturers specifications.
5. Allow primer to cure for approximately 5-6 hours, until surface is no longer tacky.
6. Thoroughly mix one kit (Parts A and B) of Ceilcote SF Corocrete (or equivalent) epoxy flooring. For walls and vertical surfaces and sump, apply mixed epoxy as-is with rollers and brushes. For floors and horizontal surfaces, add aggregate to epoxy per manufacturers specifications and mix thoroughly. Then apply epoxy/aggregate mixture to primed work areas using steel trowels and/or rubber squeegees. Work material onto concrete surface and smooth with trowels. Fill any low spots and maintain slope towards main sump for drainage.
7. Allow to cure overnight.
8. Remove any rough spots, lumps, bubbles, or protrusions with abrasive grinder and/or sander. Vacuum as necessary.
9. Mix and apply Ceilcote Series 662 Flakeline Novolac Epoxy (or equivalent) to all concrete and sump surfaces and allow to cure as per manufacturers specifications.

Sealant Installation Procedures (Mfgr. Spec Sheets, Detail attached)

1. Locate all construction joints using previously installed markers.
2. Sawcut construction joints to a depth of at least 1". Remove all loose laitance.
3. Install foam backer rod to a depth such that the resulting thickness of the top sealant is within manufacturers specifications. If necessary, fill below the backer rod with sand to achieve the proper depth and support the backer rod.
4. Fill the joint with Sikaflex (or equivalent) chemically-resistant elastomeric epoxy.
5. Apply Sikaflex (or equivalent) chemically-resistant elastomeric epoxy around perimeter interface of containment floor and walls, and smooth into joint with finger and/or radiused tool. Allow to cure per manufacturers specifications before chemical exposure.

Finishing Procedures

1. Replace sump iron grating with FRP.
2. Take finished photos.



PSC CWT-C AREA C.U.M.P.			
JOINT TREATMENT EXPANSION/ISOLATION JOINT			
DETAIL			
SCALE: 3/4 IN. = 1 IN.	DATE: 5/08	DRAWING NO.:	DRAWN BY: TOM

CEILCOTE
CORROSION CONTROL

Technical Data Sheet

2.30T

CEILCOTE® 662 Flakeline

Flake Reinforced 100% Solids, Epoxy Novolac Coating

Description

CEILCOTE 662 Flakeline is a 100% solids, glass flake filled, epoxy novolac system with excellent resistance to a wide range of acids, and alkali solutions. It resists most weak organic acids, most mineral acids, most salts and strong caustics. The coating system consists of a primer and two topcoats, with a nominal dry film thickness of 30 to 40 mils. It can be applied on concrete and metal surfaces with proper surface preparation.

Typical Uses

- Tanks
- Trenches, pits
- Vaults, dikes
- Floors
- FGD duct

Advantages

- Excellent chemical resistance to sulfuric acid
- Superior Permeation Resistance
- 100% solids, low odor
- Reinforced with laminar glass flakes

Chemical Resistance

Information on the chemical resistance properties will be furnished on request.

Substrate

Refer to Ceilcote steel specification CPT-2.

Surface Preparation

Metal - For immersion or intermittent splash and spillage conditions, abrasive blast to "White Metal" in accordance with Steel Structures Painting Council Specifications **SP-5 or NACE Specification #1**. For fumes and dry environments, abrasive blast to "Near White" in accordance with **SP-10 or NACE #2**. A minimum surface profile of 3.0 mils is required.

Concrete – Abrasive blasting or scarification to remove laitance and surface contaminants is recommended. Concrete must be thoroughly cured, free of oils, curing solutions and mold release agents, dust and must be dry at time of application. Use ASTM D 4263 (plastic sheet test method) to ensure concrete is moisture free. If moisture is detected, re-test until dry. Alternately test per ASTM 1869 for maximum 3 lbs./24hrs., 1000 sq.ft.

Application

CEILCOTE 662 Flakeline consists of a two-component primer and a two-component topcoat (two coats normally recommended)

Mixing Ratio

	By Weight	By Volume
CEILCOTE 680 Primer*		
680 Primer Resin	100	3
#9 Hardener	30	1
CEILCOTE 662 Flakeline		
662 Flakeline Resin	100	2
#16 Hardener	49	1

*Use 680M Primer for high temperature applications. See Technical Data Sheet for Ceilcote 680M Primer.

Priming:

Prime steel or concrete surfaces with 2 to 5 wet mils of CEILCOTE 680 or 680M Primer. Use CEILCOTE 680 or 680M PRIMER with the addition of CEILCOTE C#1 Powder (5.2lbs per 4 gal unit) when spark testing (High voltage holiday testing) will be conducted on concrete.

Application:

Mechanically premix CEILCOTE 662 Flakeline resin individually prior to adding hardener. After initial mixing, add hardener to CEILCOTE 662 resin and mix three to five additional minutes.

Base Coat:

Apply CEILCOTE 662 Flakeline resin and hardener at 16 to 25 mils WFT to yield 15 to 24 mils DFT, target of 18 mils DFT. Allow to harden.

Topcoat:

Apply CEILCOTE 662 resin and hardener at 16 to 25 mils WFT to yield 15 to 24 mils DFT, target of 18 mils DFT.

Application Equipment:

- **Conventional Spray**
  For equipment recommendation, please reference Installation Procedure for CEILCOTE 662 Flakeline.
- **Air Assisted Airless or Airless Spray**
  For equipment recommendation refer to Installation Procedure for CEILCOTE 662 Flakeline (Special Catalyst Spray Equipment section).
- **Brush or Roller**
  Generally requires additional applications to obtain the recommended millage. Use medium nap (3/8") mohair rollers and medium stiff natural bristle brushes.

Handling Properties

Working Time

Temp.	680/680M Primer	662 Flakeline
50°F (10°C)	90 min.	80 min.
70°F (21°C)	40 min.	40 min.
90°F (32°C)	20 min.	20 min.

Recoat

Temp.	680/680M Primer	662 Flakeline
50°F (10°C)	9 hrs	12 hrs
70°F (21°C)	5 hrs	6 hrs
90°F (32°C)	3 hrs	3 hrs

Time to Place in Service

Temp	
50°F (10°C)	10 days
70°F (21°C)	5 days
90°F (32°C)	3 days

Coverage

680 or 680M Primer (Concrete) approx. 150 - 200 ft^2/gal
(Steel) approx. 275 - 325 ft^2/gal
(With C-1 Powder) approx. 140 - 160 ft^2/gal
662 Flakeline basecoat approx. 65 - 75 ft^2/gal
662 Flakeline topcoat approx. 65 - 75 ft^2/gal

Packaging

The following standard packages are available:

CEILCOTE 680 Primer 1, 4, 40 gal unit
CEILOCTE 680M Primer 1.3, 6 gal unit
CEILCOTE 662 Flakeline 1, 5 gal unit

Storage

Store in a cool, dry and covered location away from fire hazards and direct sunlight. Minimum shelf lives at 70°F (21°C) for products indicated below:

CEILCOTE 680 or 680M Primer 18 months
CEILCOTE 662 Flakeline 18 months

Higher temperatures will shorten the shelf life of these products. The packing drums are to be kept tightly sealed and are to be resealed each time materials have been removed. All liquid products are to be stored in a frost-free place.

Safety

Store in cool, dry area [50°- 90° F (10° - 32° C)] away from direct sunlight, flame or other hazards.

CEILCOTE 662 Flakeline contains epoxy resins and polyamine catalyst. The product's components have been formulated to optimize physical characteristics such as filling capacity, abrasion, moisture and chemical resistance while minimizing hazardous physical and health factors encountered during application. A concerted effort is made to be aware of the latest chemical toxicological information and to apply this knowledge in a responsible manner to insure product safety.

During application of CEILCOTE 662 Flakeline materials, always wear gloves and appropriate work clothing to minimize contact. Ventilation is required with special consideration for enclosed or confined areas. Air movement must be designed to insure turnover at all locations in work area and adjacent areas to avoid buildup of heavy vapors. Use caution when handling flammable liquids, eliminate sources of ignition from work area and containers with residues.

Observe safe storage practices by separating resins from hardeners, by keeping solvents in a cool area, free of sources of ignitions.

Product Material Safety Data Sheets are available and should be consulted when handling products. These products are for industrial and professional use only; application directions must be followed.

Maintenance

Periodically inspect the applied material and repair localized areas as needed. Consult your CEILCOTE representative for additional information.

For industrial and professional use only

The technical data furnished herein is true and accurate to the best of our knowledge. Prior publications shall become invalid upon the release of this issue. However, no guarantee of accuracy is given or implied. CEILCOTE assumes no responsibility for any loss or damage resulting from the handling or use of the products by the buyer. Seller warrants only that the products to be delivered will conform to CEILCOTE's manufacturing standards. In no event shall CEILCOTE be responsible for consequential damages of any such breach of warranty including, but not limited to, the Buyer's loss of material or profits, increased expense of operation, down-time or reconstruction of the work, and, in no event shall the CEILCOTE obligation under this warranty exceed the price of the defective material.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY OR OBLIGATION, EXPRESSED OR IMPLIED, AND NO LIABILITY IS ASSUMED BY CEILCOTE, EXCEPT AS IS EXPRESSLY STATED ABOVE.

Statements concerning the use of products are not to be construed as recommending the infringement of any patent, and no liability for infringement arising out of such use is assumed by CEILCOTE.

Technical and Physical Data

	Test Standard	Unit	Value
Density - mixed		lbs/gal	10.3
Color			Off White or Gray
Viscosity - mixed		cps	6000
Tensile Strength	ASTM D 678	Psi (MPa)	4500 (31)
Temperature Resistance - fumes	Dry non-condensing	°F (°C)	300 (149)
Shelf Life		Months	18
Solids content		% by volume	100
Flash Point		°F (°C)	200°F (93°C)

CEILCOTE Corrosion Control / SGL ACOTEC, Inc.
6611 West Snowville Road, Brecksville, Ohio 44141
Phone: (877) 234 5268 Fax: (440) 717 7466 / Web Site: www.ceilcotecc.com

CEILCOTE CORROSION CONTROL

SGL CARBON GROUP Corrosion Protection

Technical Data Sheet

3.16T

CEILCOTE® SF Corocrete

Heavy Duty Industrial Epoxy Flooring

Description
The CEILCOTE SF Corocrete system is a 100% solids, solvent free, specialized chemical resistant polymer formulation, designed for use as a long-lasting floor system. It provides a tough, durable surface for high traffic areas.

CEILCOTE SF Corocrete system protects industrial floors from the abuses of traffic or spillage from a wide range of chemicals and harsh cleaning operations. It has been designed for hand or power trowel, broadcast or slurry broadcast application.

Typical Uses
- Process floors
- Loading/unloading areas
- Heavy (steel wheel) traffic areas

Advantages
- Good chemical resistance
- Fast production rates
- Ease of application
- Low odor
- 100% solids
- Hand or power troweled, broadcast or slurry broadcast
- Impact and abrasion resistant
- Moisture tolerant cure

Color
Light Gray, Medium Gray, Dark Gray, Beige, Tile Red and Clear

Chemical Resistance
Information on the chemical resistance properties will be furnished on request.

Substrate
Refer to Ceilcote concrete specification CPT-1.

Surface Preparation
Concrete – Abrasive blasting or scarification to remove laitance and surface contaminants is recommended. Concrete must be thoroughly cured, free of oils, curing solutions and mold release agents, dust and must be dry at time of application. Use ASTM D 4263 (plastic sheet test method) to ensure concrete is moisture free. If moisture is detected, re-test until dry.

Application
The flooring system consists of a primer, a troweled or broadcast base coat, multiple grout coats and an optional topcoat.

Mixing Ratio	By Volume
CEILCOTE 680 Primer*	
680 Primer Resin	3
#9 Hardener	1
CEILCOTE SF Corocrete**	
SF Corocrete Resin	4
SF Corocrete Hardener	1
Corocrete Aggregate	2 bags/1.2 gal
Ceilcote 664 Ceilgard***	
664 Ceilgard Resin	2
#15 Hardener	1

When dry priming is required use CEILCOTE 680 Primer or CEILCOTE SF Corocrete Clear. Dry priming is required for extremely porous concrete, where potential contamination of prepared concrete by process liquids is possible or when applied in direct sunlight. Other Ceilcote epoxy primers may be used depending on surface or environmental conditions. Consult Ceilcote. To wet prime, use CEILCOTE SF Corocrete resin and hardener.

****For use as body and grout coats only.***

*****Can use CEILCOTE SF HV Corocrete, CEILCOTE Corocrete Sealer or CEILCOTE 600 Flakeline as an alternate Top Coat. See individual technical data sheets.***

Placement
1. Mechanically premix CEILCOTE SF Corocrete components individually prior to blending together. After initial mixing, add CEILCOTE SF Corocrete Hardener to CEILCOTE SF Corocrete Resin liquid and mix for three to five additional minutes.
2. Pour contents into a paddle-type mortar mixer (5 Horsepower is recommended).
3. Add 2 (50 lb. bags) of S #15 aggregate to the mixer while engaged. When broadcasting use 40 to 60 mesh, locally sourced sand at approximately ½ lb per ft^2 per lift.
4. After the last bag of aggregate is added, mix at least 30 to 60 seconds more or until all dry pockets are wet out.
5. Discharge into a sturdy wheelbarrow.
6. Apply mixture to freshly primed surface while the primer is still wet.
7. Trowel to desired thickness using a good quality finishing trowel. Allow to cure.
8. Apply 1 to 2 coats of grout coat as needed. Allow to cure.
9. If a smooth finish is desired apply Top Coat (10 to 12 mils per coat).***

Note: May also be broadcast or slurry broadcast applied. See Installation Procedure.

Thinning
None required. Do not thin

Handling Properties
All times are approximate
Working Time

	680 Primer	SF Corocrete	664 Ceilgard
50°F (10°C)	60 min.	4 hrs.	95 min.
70°F (21°C)	45 min.	1 hr.	35 min.
90°F (32°C)	20 min.	30 min	15 min.

Recoat

	680 Primer	SF Corocrete	664 Ceilgard
50°F (10°C)	5 hrs	10 hrs	20 hrs
70°F (21°C)	2 hrs	5 hrs	16 hrs
90°F (32°C)	1 hrs	3 hrs	8 hrs

Time to Place in Service

	Traffic	Traffic w/LTC	Cure Time
50°F (10°C)	2 days.	36 hrs	10 days
70°F (21°C)	12 hrs.	10 hrs	5 days
90°F (32°C)	6 hrs	5 hrs	72 hrs

To speed cure (approximately 20%) use 2-4 fluid oz of LTC Accelerator per gal of 680 Primer, SF Corocrete or 664 Ceilgard

Coverage

680 Primer	150-200 ft^2/gal (3.7-4.9 m^2/liter)
SF Corocrete	
As Primer	150-200 ft^2/gal (3.7-4.9 m^2/liter)
Troweled @ ¼"	40-45 ft^2/gal (.98-1.1 m^2/liter)
Broadcast @ 1/16	80-100 ft^2/gal (1.9-2.4 m^2/liter)
1st grout coat	100 ft^2/gal (2.4 m^2/liter)
2nd grout coat	150 ft^2/gal (3.7 m^2/liter)
664 Ceilgard	140-160 ft^2/gal (3.4-3.9m^2/liter)

Packaging
The following standard packages are available:

CEILCOTE 680 Primer	1, 4, 40 gal units
CEILCOTE SF Corocrete	2.25, 6.25, 25, 36, 68 gal units
CEILCOTE 664 Ceilgard	1, 3 15 & 90 gal units
Corocrete Aggregate	50 lb. bag

Storage
Store in a cool, dry and covered location away from fire hazards and direct sunlight. Minimum shelf life at 70°F (21°C) for products indicated below:

CEILCOTE 680 Primer	18 months
CEILCOTE SF Corocrete	18 months
CEILCOTE 664 Ceilgard	18 months
Corocrete Aggregate	indefinite if kept dry

The packing drums are to be kept tightly sealed and are to be resealed each time materials have been removed. All liquid products are to be stored in a frost-free place. Low temperatures may effect ease of application.

Safety
Store in cool, dry area [50°- 90° F (10° - 32° C)] away from direct sunlight, flame or other hazards. CEILCOTE SF Corocrete contains epoxy resins and a polyamine catalyst. The product's components have been formulated to optimize physical characteristics such as filling capacity, abrasion, moisture and chemical resistance while minimizing hazardous physical and health factors encountered during application. A concerted effort is made to be aware of the latest chemical toxicological information and to apply this knowledge in a responsible manner to insure product safety.

During application of CEILCOTE SF Corocrete materials, always wear gloves and appropriate work clothing to minimize contact. Ventilation is required with special consideration for enclosed or confined areas. Air movement must be designed to insure turnover at all locations in work area and adjacent areas to avoid buildup of heavy vapors. Use caution when handling flammable liquids, eliminate sources of ignition from work area and containers with residues.

Observe safe storage practices by separating resins from hardeners, by keeping solvents in a cool area, free of sources of ignitions.

Product Material Safety Data Sheets are available and should be consulted when handling products. These products are for industrial and professional use only; application directions must be followed.

Maintenance
Periodically inspect the applied material and repair localized areas as needed. Consult your CEILCOTE representative for additional information.

For industrial and professional use only
The technical data furnished herein is true and accurate to the best of our knowledge. Prior publications shall become invalid upon the release of this issue. However, no guarantee of accuracy is given or implied. CEILCOTE assumes no responsibility for any loss or damage resulting from the handling or use of the products by the buyer. Seller warrants only that the products to be delivered will conform to CEILCOTE's manufacturing standards. In no event shall CEILCOTE be responsible for consequential damages of any such breach of warranty including, but not limited to, the Buyer's loss of material or profits, increased expense of operation, down-time or reconstruction of the work, and, in no event shall the CEILCOTE obligation under this warranty exceed the price of the defective material.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY OR OBLIGATION, EXPRESSED OR IMPLIED, AND NO LIABILITY IS ASSUMED BY CEILCOTE, EXCEPT AS IS EXPRESSLY STATED ABOVE.

Statements concerning the use of products are not to be construed as recommending the infringement of any patent, and no liability for infringement arising out of such use is assumed by CEILCOTE.

Technical and Physical Data

	Test Standard	Unit	Value
Generic Type			Epoxy
Viscosity - mixed	ASTM D 2393	cps	500 @ 77 °F
Compressive Strength Filled Broadcast	ASTM C 579-75	psi)	 11,000-11,500 10,000-11,000
Tensile Strength	ASTM C 307-77	psi (MPa)	2,000 - 2,600 (14 - 18)
Tensile Elongation (binder only)	ASTM D 638	%	1.8
Impact Resistance	ASTM D 5420	psi (mm/kg)	>240 (>2,760)
Absorption	ASTM C 413-80	%	.056
Flexural Strength	ASTM C 580-74	psi (MPa)	3,500 - 5,500 (20 - 34)
Flexural Modulus	ASTM C 580-74	psi (GPa)	2.0 - 2.5 x 10^6 (27 - 33)
Shrinkage	ASTM D 2566-79	in/in	.0007
Density	ASTM D 792-66	lbs/ft^3 (kg/m^3)	187 (3,000)
Coefficient of Expansion	ASTM C 531	in/in/F	1.88 x 10^{-5}
Service Temperature Limits	Occasional Splash/Spill/Rinse Frequent Splash/Spill/Rinse	°F (°C)	250 (121) 170 (77)
Tabor Abrasion	ASTM D-4060, CS 17 wheels, 1000 gm, 1000 cycles	mg	150
Volatile Organic Compounds	EPA Method 24	lbs/gal (g/l)	0.578 (69.33)
Flash Point 680 Primer Resin #9 Hardener SF Resin SF Hardener 664 Ceilgard Resin #15 Hardener	Pensky-Martens Closed Cup	°F (°C)	 205 (95) 228 (109) 200 (93) 191 (88) >200 (>93..3) >200 (>93..3)

SGL ACOTEC, INC./Ceilcote Division
6611 West Snowville Road, Brecksville, Ohio 44141
Phone: (877) 234 5268 Fax: (440) 717 7466/ Web Site: www.ceilcotecc.com

CEILCOTE CORROSION CONTROL

SGL CARBON GROUP Corrosion Protection

Technical Data Sheet

CEILCOTE® 690 Primer

Oil & Moisture Tolerant Epoxy Primer

4.21T

Description
Ceilcote 690 Primer is a low vicosity, 100% solids epoxy resin system with a unique curing agent. This primer is based on technology that results in tolerance for surface oils and moisture.

Typical Uses
- Can be used on concrete or steel
- Used on damp concrete surfaces
- Used on oil saturated surfaces
- Primer or Sealer

Advantages
- Good chemical resistance
- 100% solids
- Moisture tolerance
- Bonds to oily or moisture saturated surfaces

Chemical Resistance
Resistant to synthetic and mineral lubricants, most acids, alkalis and solvents. Specific information on the chemical resistance properties will be furnished on request.

Substrate
The substrate must be free from any standing water or oil contaminants and any other contaminants.

Surface Preparation
Concrete:
Abrasive blasting or scarification to remove laitance and surface contaminants is desired. Concrete must be thoroughly cured, free of curing solutions or mold release agents, dust and must be dry at time of application when ever possible. Refer to ASTM D-4263. Remove as much as oil as possible prior to application of the primer. Please note that although CEILCOTE 690X Primer has excellent bond to oil and moisture saturated concrete, contamination does reduce bonding properties.

Application
CEILCOTE 690X Primer is a two-component compound consisting of resin and hardener.

Pour 690X Primer resin and hardener into a clean pail. Stir well for 2 minutes or longer and scrape the sides and bottom of pail to assure that a uniform blend is attained. A jiffy type mechanical mixer operated at low speed is recommended for best results.

Mixing Ratio

	By Weight	By Volume
CEILCOTE 690 Primer		
690 Primer Resin	100	2
690 Primer Hardener	44	1

Handling Properties
Working Time

Temperature	
50°F (10° C)	2 hrs
70°F (21° C)	1 hr
90°F (32° C)	30 min

Time to Re-coat

Temperature	
50°F (10° C)	16 hrs
70°F (21° C)	8 hrs
90°F (32° C)	4 hrs

Coverage

Concrete*	150-200 ft^2/gallon
Steel	250-325 ft^2/gallon
With the addition of Ceilcote C#1	140-160 ft^2/gallon

*Coverage may vary depending on density of concrete.

Packaging
The following standard packages are available

CEILCOTE 690 Primer	1, 3 & 15 gal Unit

Storage
Store in a cool, dry and covered location away from fire hazards and direct sunlight. Minimum shelf life at 70° F (21° C).

CEILCOTE 690 Primer	18 months

Higher temperature will shorten the shelf life of these products. The packing drums are to be kept tightly sealed and are to be resealed each time materials have been removed. All liquid products are to be stored in a frost-free place.

Safety
Store in cool, dry area [50°- 90° F (10° - 32° C)] away from direct sunlight, flame or other hazards.

CEILCOTE 690 Primer contains epoxy resins and polyamine catalyst. The product's components have been

CEILCOTE 690 Primer contains epoxy resins and polyamine catalyst. The product's components have been formulated to optimize physical characteristics such as strength and chemical resistance while minimizing hazardous physical and health factors encountered during application. A concerted effort is made to be aware of the latest chemical toxicological information and to apply this knowledge in a responsible manner to ensure product safety.

During application of CEILCOTE 690 Primer materials, always wear gloves and appropriate work clothing to minimize contact. Ventilation is required with special consideration for enclosed or confined areas. Air movement must be designed to insure turnover at all locations in work area and adjacent areas to avoid buildup of heavy vapors. Use caution when handling flammable liquids, eliminate sources of ignition from work area and containers with residues. Observe safe storage practices by separating resins from hardeners, by keeping solvents in a cool area, free of sources of ignition.

Product Material Safety Data Sheets are available and should be consulted when handling products. These products are for industrial and professional use only; application directions must be followed.

Maintenance
Periodically inspect the applied material and repair localized areas as needed. Consult your CEILCOTE representative for additional information.

For industrial and professional use only
The technical data furnished herein is true and accurate to the best of our knowledge. Prior publications shall become invalid upon the release of this issue. However, no guarantee of accuracy is given or implied. CEILCOTE assumes no responsibility for any loss or damage resulting from the handling or use of the products by the buyer. Seller warrants only that the products to be delivered will conform to CEILCOTE's manufacturing standards. In no event shall CEILCOTE be responsible for consequential damages of any such breach of warranty including, but not limited to, the Buyer's loss of material or profits, increased expense of operation, down-time or reconstruction of the work, and, in no event shall the CEILCOTE obligation under this warranty exceed the price of the defective material.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY OR OBLIGATION, EXPRESSED OR IMPLIED, AND NO LIABILITY IS ASSUMED BY CEILCOTE, EXCEPT AS IS EXPRESSLY STATED ABOVE.

Statements concerning the use of products are not to be construed as recommending the infringement of any patent, and no liability for infringement arising out of such use is assumed by CEILCOTE.

Technical and Physical Data

	Test standard	Unit	Value
Generic Type			Epoxy
Density - mixed	ASTM D 1475	lbs/gal	9
Color			Amber
Viscosity - mixed	ASTM D 2196	cps	1000
Adhesion to Concrete	ASTM D4512	psi	>300
Adhesion to Oily Concrete*[1]	ASTM D4512	psi	>300
Adhesion to Damp Concrete*[2]	ASTM D4512	psi	>300
Hardness	Shore D		75-80
Temperature Resistance			250°
Shelf Life			18 months
Solids content			.100%
Flash Point			>100° C

*[1] 24 hr soak with SAE 30 Detergent Motor Oil
*[2] 24 hr soak with Tap Water

CEILCOTE, a Division of SGL ACOTEC, Inc.
6611 West Snowville Road, Brecksville, Ohio 44141
Phone: (877) 234 5268 Fax: (440) 717 7466/ Web Site: www.ceilcotecc.com

PRODUCT DATA

W. R. MEADOWS. SEALTIGHT

CSI Code: 03930

NO. 390

APRIL 2004
(Supersedes May 2003)

REZI-WELD™ 1000

Multi-Purpose Construction Epoxy

DESCRIPTION

REZI-WELD 1000 is a medium viscosity, two-component, construction grade structural epoxy adhesive. It is moisture insensitive and resistant to many chemicals. High modulus, high strength REZI-WELD 1000 is color coded to assure proper mixing, self-leveling and easy to apply.

As a neat mix, REZI-WELD 1000 is used to bond hardened concrete to fresh or hardened concrete. It can also be used to bond metals and other materials to hardened concrete. REZI-WELD 1000 is also used to secure metal anchors, bolts, rebars and dowels in concrete.

Mixed with sand or aggregates, REZI-WELD 1000 may be used to patch spalls or defects in concrete. A thin film coating sprinkled with sand or grit, becomes a durable, non-skid interior topping.

FEATURES AND BENEFITS

- Offers high-modulus, high-strength and self-leveling characteristics
- Resists many industrial chemicals and is moisture insensitive
- Easy-to-apply...may be sprayed
- Furnished in unique, color-coded, unitized, pre-measured packaging to assure proper mixing...eliminates mishandling and mismatching components
- May be extended with sand or aggregates to patch minor spalls and defects in concrete
- Provides a non-skid interior topping when sprinkled with sand or grit

SPECIFICATIONS

ASTM C 881, Type I, II, IV & V, Grade 2, Classes B & C
AASHTO M 235, Type I, II, IV & V, Grade 2, Classes B & C
Various Departments of Transportation Approvals

PACKAGING

1 Quart (.95 Liter) Unit
1 Gallon (3.79 Liter) Unit
2 Gallon (7.58 Liter) Unit
10 Gallon (37.9 Liter) Unit

STORAGE: 65° F-95° F (18° C-35° C)

COVERAGE: 1 gal. neat yields 231 cubic inches

FOR INDUSTRIAL AND PROFESSIONAL USE ONLY

APPLICATION

Surface Preparation... Mechanically abrade all surfaces to be bonded. All surfaces to be bonded must be free of standing water and completely clean of dirt, rust, curing compounds, grease, oil, paint and unsound materials which would prevent a solid bond. Vacuum or blow dust away with oil-free, compressed air. Smooth surfaces require sanding or other mechanical abrasion. Exposed steel surfaces should be sandblasted and vacuumed clean; if not possible, degrease the surface and use sandpaper or a wire brush to reveal continuous, bright metal.

Mixing... Condition all components to 60-85°F for 24 hours prior to use. Use the double-boiler method or store material in a warm room, prior to application. Pre-mix each component. Mechanically mix at slow speed (600-900rpm) using a drill and Jiffy® Blade or drum mixer for 3 minutes or until completely mixed while scraping the sides to ensure complete blending of components. The mixed product should be uniform gray in color and not show streaks. Avoid air entrapment. Mix only very small quantities by hand for a minimum of 3 minutes or until sufficiently blended together using the supplied stirring stick. Scrape sides of the container to ensure complete blending of the components. Mix only the amount of epoxy that can be applied within the product's potlife. Potlife will decrease as the ambient temperature and/or mass size increases.

BONDING FRESH CONCRETE TO HARDENED CONCRETE OR HARDENED CONCRETE TO HARDENED CONCRETE... Use a stiff masonry brush or airless spray equipment to apply a layer of mixed epoxy to concrete surfaces. Application rate should be 85-100 square feet per gallon (20 mils). Place fresh or hardened concrete to mixed REZI-WELD 1000 prior to epoxy adhesive becoming tack-free. If REZI-WELD 1000 becomes tack-free prior to application of fresh or hardened concrete, consult a W. R. MEADOWS representative. NOTE: Cured concrete is defined as concrete that has achieved a minimum 80 percent of designed compressive strength.

CONTINUED ON REVERSE SIDE...

W.R. MEADOWS, INC.
P.O. Box 338 • HAMPSHIRE, IL 60140-0338
Phone: 847/214-2100 • Fax: 847/683-4544
1-800-342-5976
www.wrmeadows.com

HAMPSHIRE, IL / CARTERSVILLE, GA
YORK, PA / FORT WORTH, TX / BENICIA, CA
POMONA, CA / GOODYEAR, AZ / MILTON, ONT.

OTHER BONDING...To bond metal to concrete, a[illegible] a layer of the adhesive at 85-100 square feet per g[illegible] (20 mils) to the prepared surfaces and join im[illegible]diately. Clamping pressure beyond what will hold parts in place is not necessary.

AGGREGATES FOR EPOXY-RESIN MORTARS... Combine clean, dry aggregates to freshly mixed epoxy in ratio of one part epoxy to one to four parts of dry, clean graded aggregate by volume. A rotary drum mixer with a stationary paddle is recommended for blending aggregates and epoxy. Apply a thin coating of aggregate-free epoxy to the prepared surface as a primer. Patch thickness should not exceed 2" (50.8mm) per lift.

METAL ANCHORS IN PREFORMED HOLES IN CONCRETE... Preformed holes should be approx. ¼" (6.35mm) larger in diameter than the anchor bolt diameter. The depth of the hole should be 10-15 times the bolt diameter. Fill the hole from the bottom up, about half way, with mixed epoxy and place the bolt, dowel or rebar. Top off with more epoxy and finish. All anchoring or doweling configurations must be approved or designed by an engineer.

INTERIOR NON-SKID TOPPING... Apply mixed epoxy at a rate not to exceed 80 square feet per gallon. Spread sand thinly over wet epoxy and embed the grains with a mohair roller. For heavy coverage, apply a layer of sand or grit over the epoxy and allow it to set. Blow excess sand away. NOTE: REZI-WELD 1000 IS NOT TO BE USED AS A FLOOR COVERING OR PROTECTIVE TREATMENT.

CL[illegible] P... Clean tools and equipment immediately with Toluene or Xylene. Clean equipment away from all ignition sources and avoid breathing vapors or allowing epoxy-containing solvent to contact skin. Should this material come in contact with the skin, wash thoroughly with soap and water, not solvent.

PRECAUTIONS

DO NOT DILUTE. Mix complete units only. Not recommended for use when the concrete temperature has been below 40°F (4°C) for the past 24 hours. Do not use to seal cracks under hydrostatic pressure. Do not warm epoxy over direct heat.

TECHNICAL DATA*

The following physical properties were determined at a 1:1 mix ratio of A:B by volume, cured at 77°F (25°C) & 50% RH

Test Method	Actual	Required per ASTM C 881-99, TYPE IV
Gel Time Per ASTM C 881-99[1]	37 minutes	Minimum 30 minutes
Viscosity Per ASTM D 2393 Mixed	3,500 cps	Maximum 10,000 cps
Compressive Strength Per ASTM D 695-96 @ 1 day @ 7 days[1]	 10,000 psi (70 MPa) 12,500 psi (79 MPa)	 Not Required Minimum 10,000 psi (70 MPa)
Compressive Modulus Per ASTM D 695-96[1] @ 7 Days	530,000 psi (3655 MPa)	Minimum 200,000 psi (1,400 MPa)
Slant Shear Bond Strength Per ASTM C 882[1], Moist Cured @ 2 days (Old to Old Concrete) @ 14 days (Old to Old Concrete) @ 14 days (New to Old Concrete)	 1,250 psi (8.6 MPa) 1,900 psi (13.1 MPa) 2,100 psi (14.5 MPa)	 Minimum 1,000 psi (7.0 MPa) Minimum 1,500 psi (10.0 MPa) Minimum 1,500 psi (10.0 MPa)
Tensile Strength Per ASTM D 638-98[1] @ 7 days	7,250 psi (51 MPa)	Minimum 7,000 psi (48 MPa)
Tensile Elongation Per ASTM D 638-98[1] @ 7 days	1.5%	Minimum 1%
Heat Deflection Temperature Per ASTM D 648-98[1] @ 7 days	135°F (57°C)	Minimum 120°F (50°C)
Linear Coefficient of Shrinkage Per ASTM D 2566[1] @ 7 days	0.002	Maximum 0.005
Water Absorption Per ASTM D 570-98[1] @ 7 Days	0.41% w/w	Maximum 1.0% w/w

Colors: Part A...White, Part B...Black
Mix ratio: 1:1 by volume
Pot life: 35-45 minutes at 77°F
Cure time: 7 days at 77°F
Shelf life: 1 year in unopened container

*All technical data is typical information, but may vary due to testing methods, conditions and operators.
[1]Independent reports are available upon request.

SAFETY AND TOXICITY

Unused epoxy will generate excessive heat, especially in large quantities. Unused epoxy should be mixed with dry sand in the container to help lower heat. Refer to Material Safety Data Sheet for complete health and safety information.

ADDITIONAL RESTORATION PRODUCTS FROM W. R. MEADOWS CAN ALSO BE FOUND BY VISITING OUR WEBSITE.

TO VERIFY MOST RECENT TECHNICAL DATA SHEET IS BEING USED, VISIT OUR WEBSITE: www.wrmeadows.com



LIMITED WARRANTY

"W. R. MEADOWS, INC. warrants at the time and place we make shipment, our material will be of good quality and will conform with our published specifications in force on the date of acceptance of the order." Read complete warranty. Copy furnished upon request.

Disclaimer

The information contained herein is included for illustrative purposes only, and to the best of our knowledge, is accurate and reliable. W. R. MEADOWS, INC. cannot however under any circumstances make any guarantee of results or assume any obligation or liability in connection with the use of this information. As W. R. MEADOWS, INC. has no [illegible]trol over the use to which others may put its product, it is recommended that the products be tested to determine if suitable for specific [illegible]lication and/or our information is valid in a particular circumstance. Responsibility remains with the architect or engineer, contractor owner for the design, application and proper installation of each product. Specifier and user shall determine the suitability of products spec[illegible] application and assume all responsibilities in connection therewith.

W. R. MEADOWS 2002

Product Data Sheet
Edition 1.11.2008
Identification no. 431
Sikaflex-1a



Sikaflex®-1a

One part polyurethane, elastomeric sealant/adhesive

Description
Sikaflex-1a is a premium-grade, high-performance, moisture-cured, 1-component, polyurethane-based, non-sag elastomeric sealant. Meets Federal specification TT-S-00230C, Type II, Class A. Meets ASTM C-920, Type S, Grade NS, Class 35, use T, NT, O, M, G, I; Canadian standard CAN/CGSB 19.13-M87.

Where to Use
- Designed for all types of joints where maximum depth of sealant will not exceed 1/2 in.
- Excellent for small joints and fillets, windows, door frames, reglets, flashing, common roofing detail applications, and many construction adhesive applications.
- Suitable for vertical and horizontal joints; readily placeable at 40°F.
- Has many applications as an elastic adhesive between materials with dissimilar coefficients of expansion.
- Submerged conditions, such as canal and reservoir joints.

Advantages
- Eliminates time, effort, and equipment for mixing, filling cartridges, pre-heating or thawing, and cleaning of equipment.
- Fast tack-free and final cure times.
- High elasticity - cures to a tough, durable, flexible consistency with exceptional cut and tear-resistance.
- Stress relaxation.
- Excellent adhesion - bonds to most construction materials without a primer.
- Excellent resistance to aging, weathering.
- Proven in tough climates around the world.
- NSF Registered, meets 1998 USDA guidelines.
- Odorless, non-staining.
- Jet fuel resistant.
- NSF Certified to NSF/ANSI Standard 61 for potable water contact.
- Urethane-based; suggested by EPA for radon reduction.
- Paintable with water-, oil- and rubber-based paints.
- Capable of ±35% joint movement.

Coverage
10.3 fl. oz. cartridge seals 12.4 lineal ft. of 1/2 x 1/4 in. joint. 20 fl. oz. uni-pac sausage seals 24 lineal ft. of 1/2 x 1/4 in. joint.

Packaging
Disposable 10.3 fl. oz., moisture-proof composite cartridges, 24/case; and uni-pac sausages, 20 fl. oz., 20/carton.

Typical Data *(Material and curing conditions @ 73°F (23°C) and 50% R.H.)*

Shelf Life

10.3 fl. oz. cartridges	15 months
20 fl. oz. uni-pac sausages	15 months
5 gallon pail	9 months
55 gallon drum	9 months

Storage Conditions Store at 40°-95°F (4°-35°C). Condition material to 65°-75°F before using.

Colors White, colonial white, aluminum gray, limestone, black, dark bronze, capitol tan. Special architectural colors on request.

Application Temperature 40° to 100°F. Sealant should be installed when joint is at mid-range of its anticipated movement.

Service Range -40° to 170°F

Curing Rate

Tack-free time	4 hours
Tack-free to touch	3 hours
Final cure	4 to 7 days

Tear Strength (ASTM D-624) 55 lb./in.

Shore A Hardness (ASTM D-2240) 21 day 40±5

Tensile Properties (ASTM D-412)

21 day	Tensile Stress		175 psi (1.21 MPa)
	Elongation at Break		550%
	Modulus of Elasticity	25%	35 psi (0.24 MPa)
		50%	60 psi (0.41 MPa)
		100%	85 psi (0.59 MPa)

Adhesion in Peel (TT-S-00230C, ASTM C 794)

Substrate	Peel Strength	Adhesion Loss
Concrete	20 lb.	0%
Aluminum	20 lb.	0%
Glass	20 lb.	0%

Weathering Resistance Excellent

Chemical Resistance Good resistance to water, diluted acids, and diluted alkalines. Consult Technical Service for specific data.

How to Use

Surface Preparation

Clean all surfaces. Joint walls must be sound, clean, dry, frost-free, and free of oil and grease. Curing compound residues and any other foreign matter must be thoroughly removed. Install bond breaker tape or backer rod to prevent bond at base of joint.

Linear Feet of Sealant per Gallon

Width \ Depth	Inches	¼	½	¾	1	1¼	1½
	¼	308.0					
	½	154.0	77.0				
	¾	102.7	51.3	34.2			
	1	77.0	38.5	25.7	19.3		
	1¼	61.6	30.8	20.5	15.4	12.3	
	1½	51.3	25.7	17.1	12.8	10.3	8.6

Priming

Priming is not usually necessary. Most substrates only require priming if testing indicates a need or where sealant will be subjected to water immersion after cure. Consult Sikaflex Primer Technical Data Sheet or Technical Service for additional information on priming.

Application

Recommended application temperatures: 40°-100°F. For cold weather application, condition units at approximately 70°F; remove prior to using.

For best performance, Sikaflex-1a should be gunned into joint when joint slot is at mid-point of its designed expansion and contraction.

Place nozzle of gun into bottom of the joint and fill entire joint. Keep the nozzle in the sealant, continue on with a steady flow of sealant preceding the nozzle to avoid air entrapment.

Avoid overlapping of sealant to eliminate entrapment of air. Tool sealant to ensure full contact with joint walls and remove air entrapment. Joint dimension should allow for 1/4 inch minimum and 1/2 inch maximum thickness for sealant. Proper design is 2:1 width to depth ratio.

For use in horizontal joints in traffic areas, the absolute minimum depth of the sealant is 1/2 in. and closed cell backer rod is recommended.

Limitations

- Allow 1-week cure at standard conditions when using Sikaflex-1a in total water immersion situations and prior to painting.
- When overcoating with water, oil and rubber based paints, compatibility and adhesion testing is essential.
- Avoid exposure to high levels of chlorine. (Maximum continuous level is 5 ppm of chlorine.)
- Maximum depth of sealant must not exceed 1/2 in.; minimum depth is 1/4 in.
- Maximum expansion and contraction should not exceed 25% of average joint width.
- Do not cure in the presence of curing silicone sealants.
- Avoid contact with alcohol and other solvent cleaners during cure.
- Do not apply when moisture-vapor-transmission condition exists from the substrate as this can cause bubbling within the sealant.
- Use opened cartridges and uni-pac sausages the same day.
- When applying sealant, avoid air-entrapment.
- Since system is moisture-cured, permit sufficient exposure to air.
- White color tends to yellow slightly when exposed to ultraviolet rays.
- Light colors can yellow if exposed to direct gas fired heating element.
- The ultimate performance of Sikaflex-1a depends on good joint design and proper application with joint surfaces properly prepared.
- The depth of sealant in horizontal joints subject to traffic is 1/2 in.
- Do not tool with detergent or soap solutions.
- Do not use in contact with bituminous/asphaltic materials.

Caution

Irritant

Keep away from open flames and high heat. Contains xylene; avoid breathing vapors. Use with adequate ventilation.

Combustible

Avoid skin and eye contact. Use of NIOSH approved organic vapor respirator, safe and chemical-resistant gloves recommended. Remove contaminated clothing and shoes.

First Aid

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes; contact physician. Wash clothing before re-use. Discard contaminated shoes.

Clean Up

Uncured material can be removed with approved solvent. Cured material can only be removed mechanically. For spillage, collect, absorb, and dispose of in accordance with current, applicable local, state, and federal regulations.

KEEP CONTAINER TIGHTLY CLOSED • KEEP OUT OF REACH OF CHILDREN • NOT FOR INTERNAL CONSUMPTION • FOR INDUSTRIAL USE ONLY

All information provided by Sika Corporation ("Sika") concerning Sika products, including but not limited to, any recommendations and advice relating to the application and use of Sika products, is given in good faith based on Sika's current experience and knowledge of its products when properly stored, handled and applied under normal conditions in accordance with Sika's instructions. In practice, the differences in materials, substrates, storage and handling conditions, actual site conditions and other factors outside of Sika's control are such that Sika assumes no liability for the provision of such information, advice, recommendations or instructions related to its products, nor shall any legal relationship be created by or arise from the provision of such information, advice, recommendations or instructions related to its products. The user of the Sika product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with the full application of the product(s). Sika reserves the right to change the properties of its products without notice. All sales of Sika product(s) are subject to its current terms and conditions of sale which are available at www.sikaseam.com or by calling 800-933-7452.

Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Technical Data Sheet, product label and Material Safety Data Sheet which are available online at www.sikaconstruction.com or by calling Sika's Technical Service Department at 800-933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instruction for each Sika product as set forth in the current Technical Data Sheet, product label and Material Safety Data Sheet prior to product use.

Sika warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Technical Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor. NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.



Visit our website at www.sikaconstruction.com 1-800-933-SIKA NATIONWIDE

Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.

Sika Corporation
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: 800-933-7452
Fax: 201-933-6225

Sika Canada Inc.
601 Delmar Avenue
Pointe Claire
Quebec H9R 4A9
Phone: 514-697-2610
Fax: 514-694-2792

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537

ISO 9000:2000

Sika and Sikaflex are registered trademarks. Made in USA. Printed in USA

Series No. 8540H

Conservation Breather Vent

End-of-Line Conservation Breather Vent

OBJECTIVE

The Protectoseal Series No. 8540H End-of-Line Conservation Breather Vent is intended for use where pressure and vacuum relief is required.

TECHNIQUE

Pallets in the vent housing allow intake of air and escape of vapors as the tank normally breathes in and out. Pallets open and close to permit only that intake or outlet relief necessary to remain within permissible working pressures and avoid damage to tank.

CONSTRUCTION

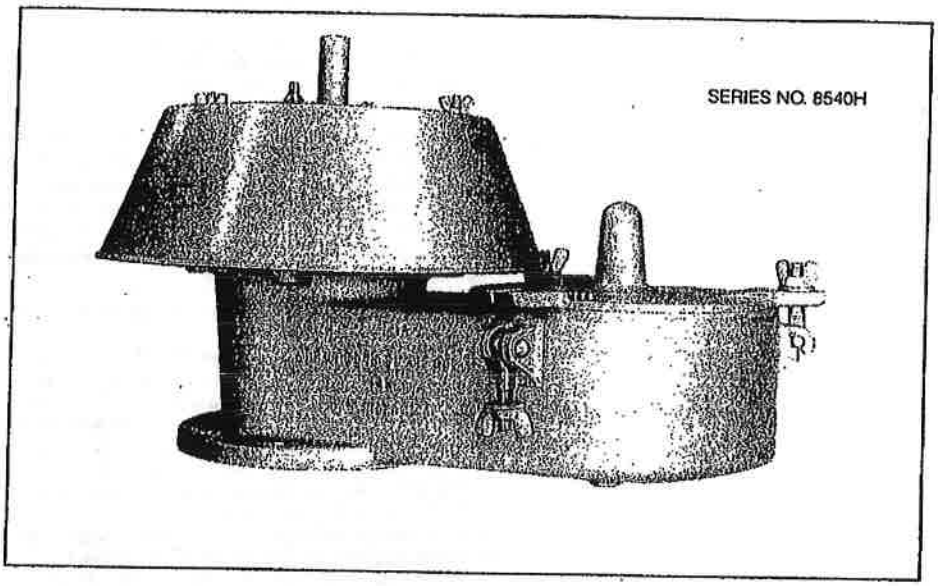
Standard: Lightweight low Copper content Aluminum housing, Aluminum pallets and Teflon® Air Cushion pallet diaphragms.

Custom: Ductile Iron housing, Stainless Steel pallet assemblies and painted steel weatherhood. Stainless Steel and other special metals or coatings to withstand the corrosive action of some vapors and atmospheric conditions are available on request.

SPECIAL FEATURES

Easy Inspection and Maintenance. Design and light weight of entire unit permits easy, convenient handling for inspection and maintenance.

Maintains Accurate Pressure Settings. Standard Aluminum pallet setting is ½ oz./sq. in. On 316 Stainless units, the standard setting is ¾ oz./sq. In. Units may be pressure loaded for use on blanketed tanks or other installations requiring higher settings.



Automatic Condensate Drainage. Self-draining housing body and drip rings keep condensate away from seating surfaces. Vent is protected from freezing, binding and clogging.

Air-Cushioned Seating. Patented and exclusive Protectoseal Air-Cushion seating for low evaporation losses. Teflon® is standard; rubber or metal-to-metal seating can be furnished on special request. The pallets have peripheral guiding and center stabilizing stem to insure proper alignment and tight seating.

Numerous Sizes Available. All sizes 2-inch thru 12-inch vents mate with standard flanged A.N.S.I. connections. Select the correct size vent to relieve the operating and thermal pressure buildups and provide adequate vacuum relief. Use chart on other side for ordering.

Quality Assurance. Each unit is factory tested for leakage and correct settings to meet Protectoseal's high standards prior to shipment.

MATERIALS OF CONSTRUCTION

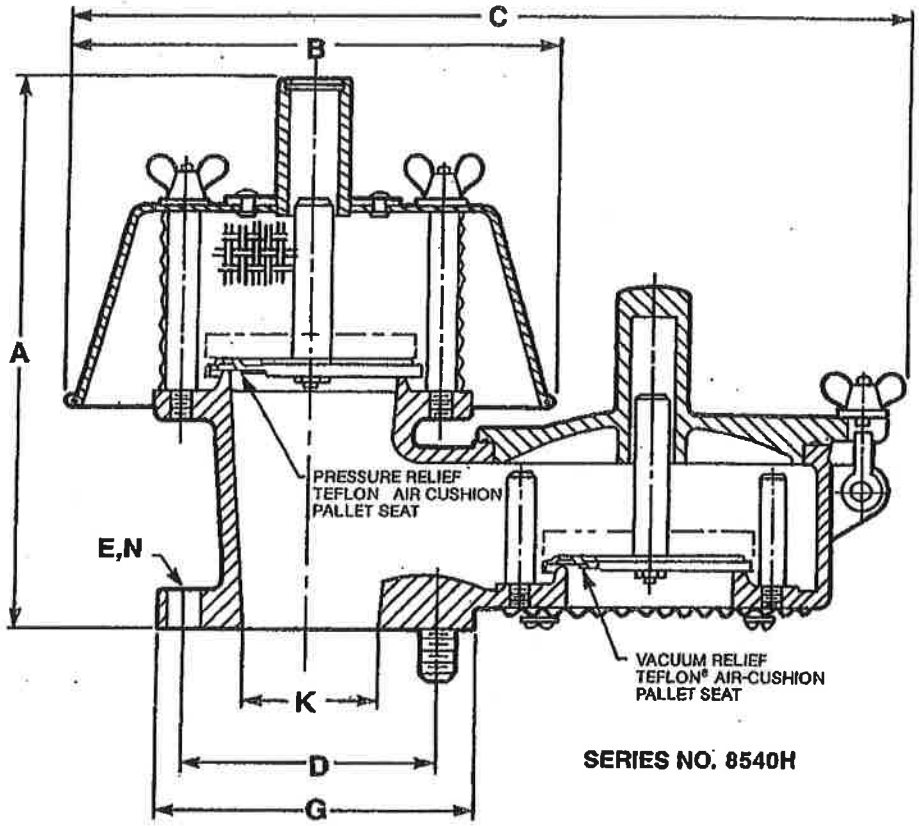
Series	Housing	Pallets*	Pallet Diaphragm
8540H	Aluminum 356	Aluminum	Teflon®
C8540H	Ductile Iron A536	316 Stainless Steel	Teflon®
F8540H	316 Stainless Steel	316 Stainless Steel	Teflon®
RE8540H	Aluminum 356	316 Stainless Steel	Teflon®

*On Ductile Iron and Aluminum vents, weights are Steel or Lead. On Stainless Steel vents, weights are Stainless Steel or Lead. Aluminum flanged to mate with 125# FF A.N.S.I. Ductile Iron and Stainless Steel flanged to mate with 150# RF A.N.S.I.

SPECIFICATIONS

Series No. 8540H
Conservation Breather Vent

SIDE VIEW



SERIES NO. 8540H

DIMENSIONS

Cat. No.	K Pipe Size	A Ht.	B Width	C Length	D B.C.	G Dia.	E Dia.	No. N Holes
			Standard Construction					
For Aluminum Housing and Pallets								
8542H	2"	14"	9½"	15½"	4¾"	6"	¾"	4
8543H	3"	16¾"	11½"	17½"	6"	7½"	¾"	4
8544H	4"	18½"	13"	20¼"	7½"	9"	¾"	8
8546H	6"	23⅛"	17"	26½"	9½"	11"	⅞"	8
8548H	8"	25"	19½"	31¼"	11¾"	13½"	⅞"	8
8550H	10"	27"	23¼"	37¼"	14¼"	16"	1"	12
8552H	12"	30½"	25½"	41"	17"	19"	1"	12

Add prefix "C" for Ductile Iron Housing with Stainless Steel pallets.
Add prefix "F" for Stainless Steel Housing and Stainless Steel Pallets.
Add prefix "RE" for Aluminum Housing with Stainless Steel Pallets.

Check with Sales Department for availability and scheduled delivery.

THE PROTECTOSEAL COMPANY
225 Foster Ave., Bensenville, IL 60106-1690
Fax: 1-708-595-8059 Tlx: 28-2549
Ph: 1-708-595-0800
SAFETY WITHOUT COMPROMISE

V-854012 © 1995 The Protectoseal Company PRINTED IN U.S.A.

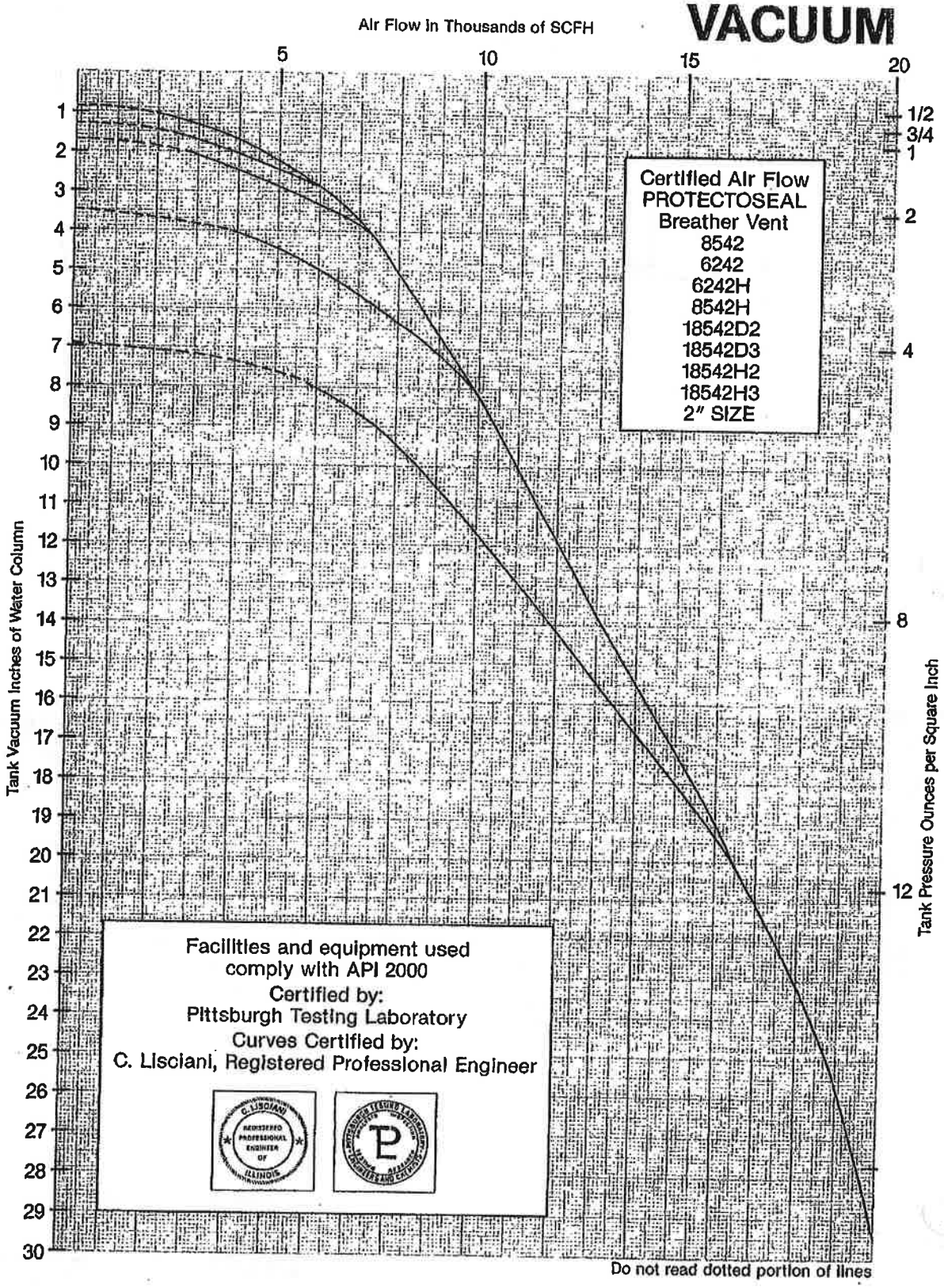
PROTECTOSEAL®
ISO 9001 CERTIFIED
SAFETY WITHOUT COMPROMISE

Series No. 8540

Conservation Breather Vent

Certified Air Flow Curves

VACUUM



The Protectoseal Company / 225 Foster Avenue, Bensenville, IL 60106-1690 / 1-630-595-0600, Fax 630-595-8059

© 1995 The Protectoseal Company

PT2.5MDV PRINTED IN U.S.A.

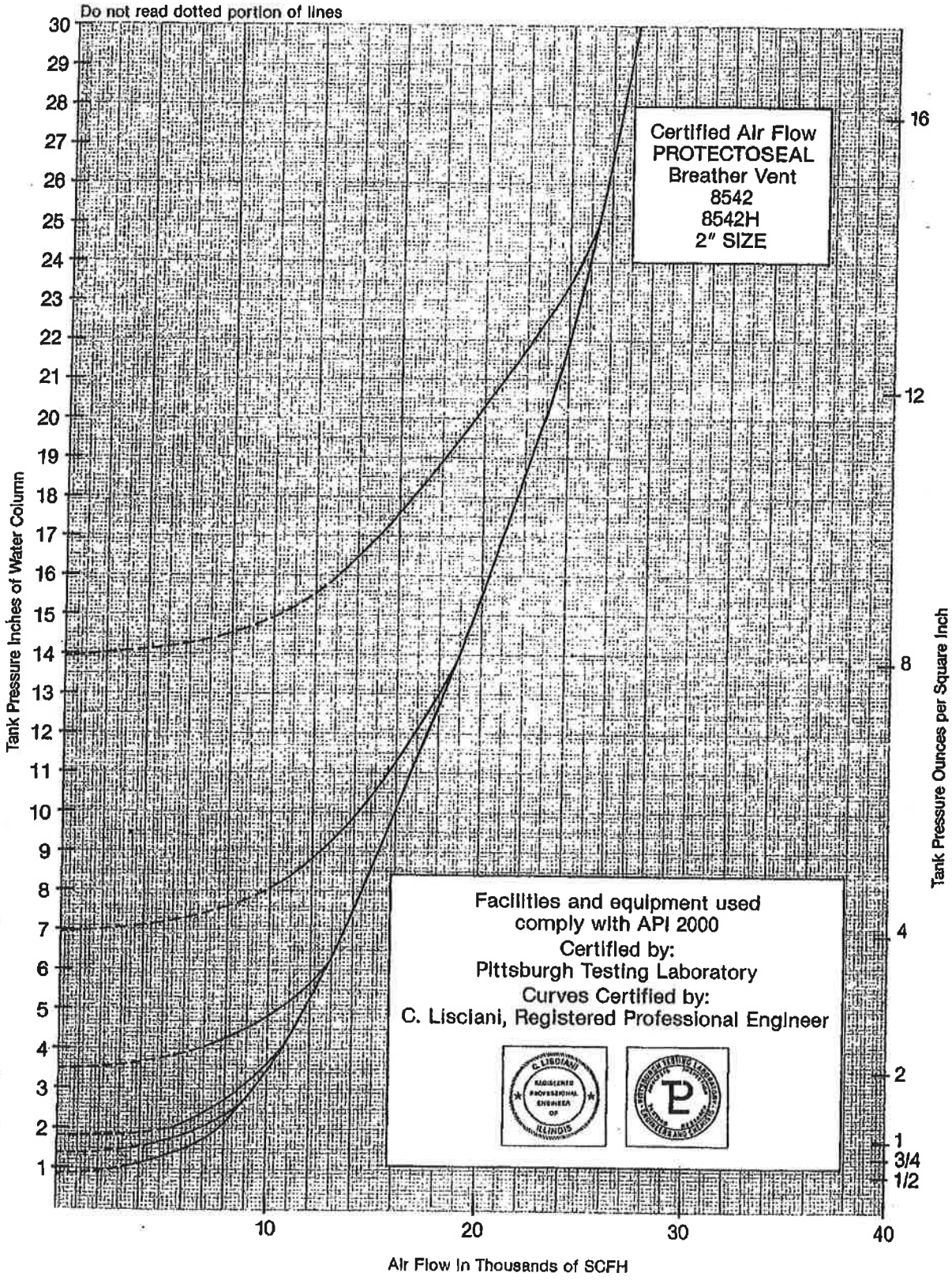
PROTECTOSEAL®
ISO 9001 CERTIFIED
SAFETY WITHOUT COMPROMISE

Series No. 8540

Conservation Breather Vent

Certified Air Flow Curves

PRESSURE



1 ...otectoseal Company / 225 Foster Avenue, Bensenville, IL 60106-1690 / 1-...-595-0800, Fax 630-595-8059

Protectoseal PRO-FLOW II Vent Sizing Program Date: 02/25/2009

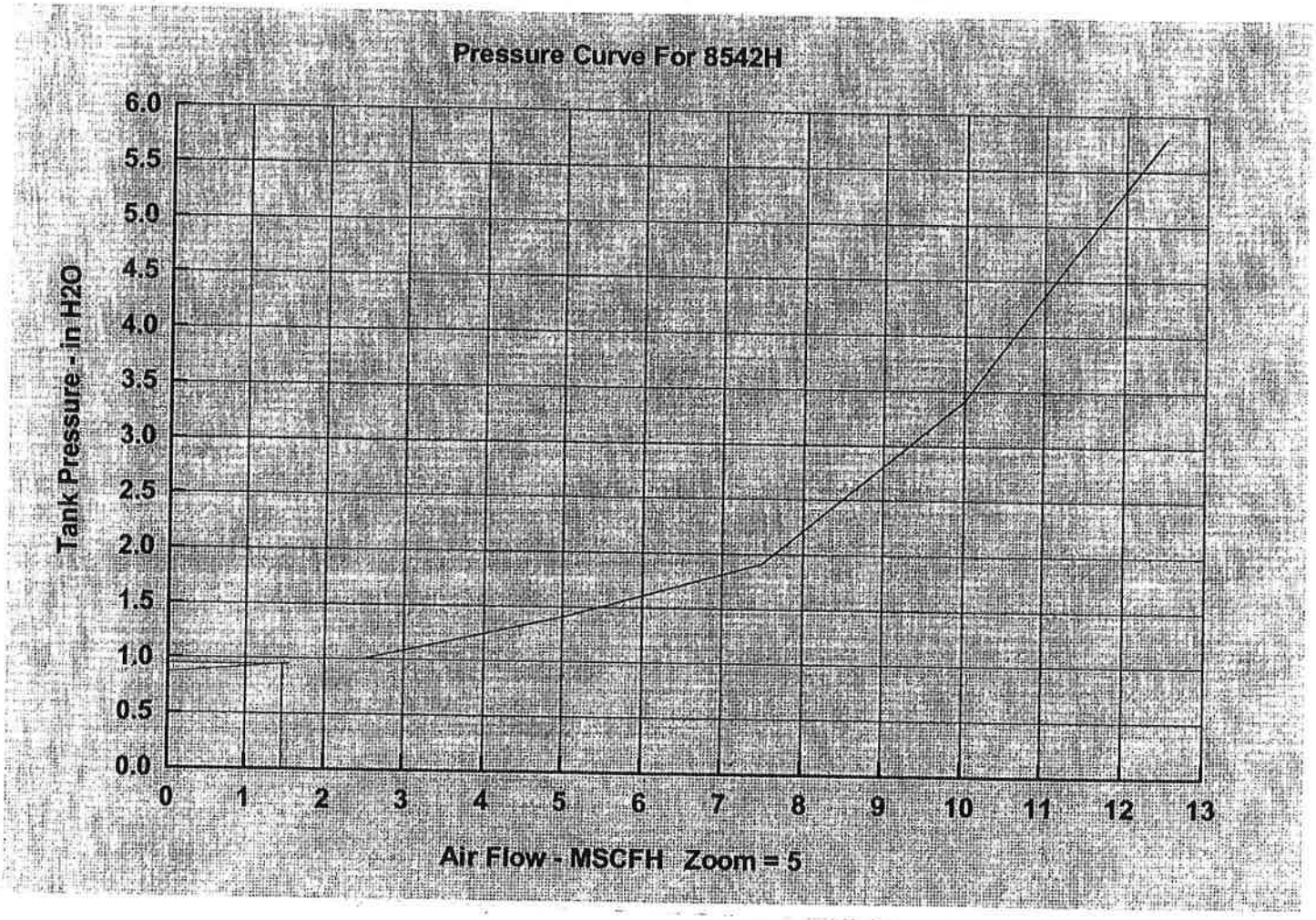
http://www.foxitsoftware.com For evaluation only.

Series: 8540 End-Of-line Conservation Breather Vent

PROTECTOSEAL MODEL: 8542H 2 Inch

Recommended vent based on the following user supplied data:

Tank Capacity	13,500	gal
Flash Point	120	Degrees F
PRESSURE PARAMETERS		
Max Fill Rate	150.000	gpm
Tank Design Pressure	8.000	in H2O
Pressure Set Point	0.865	in H2O
PRESSURE VENTING REQUIREMENTS		
Add FLow/Blanket Fail	0.000	MSCFH
Thermal	0.193	MSCFH
Filling	1.286	MSCFH
TOTAL	1.479	MSCFH
VENT OUTFLOW CHARACTERISTICS		
Pressure at Required Flow	0.947	in H2O
% Of Tank Design Pressure	11.8	



Tank T-9A Vent Pressure Curve

Protectoseal PRO-FLOW II Vent Sizing Program Date: 02/25/2009

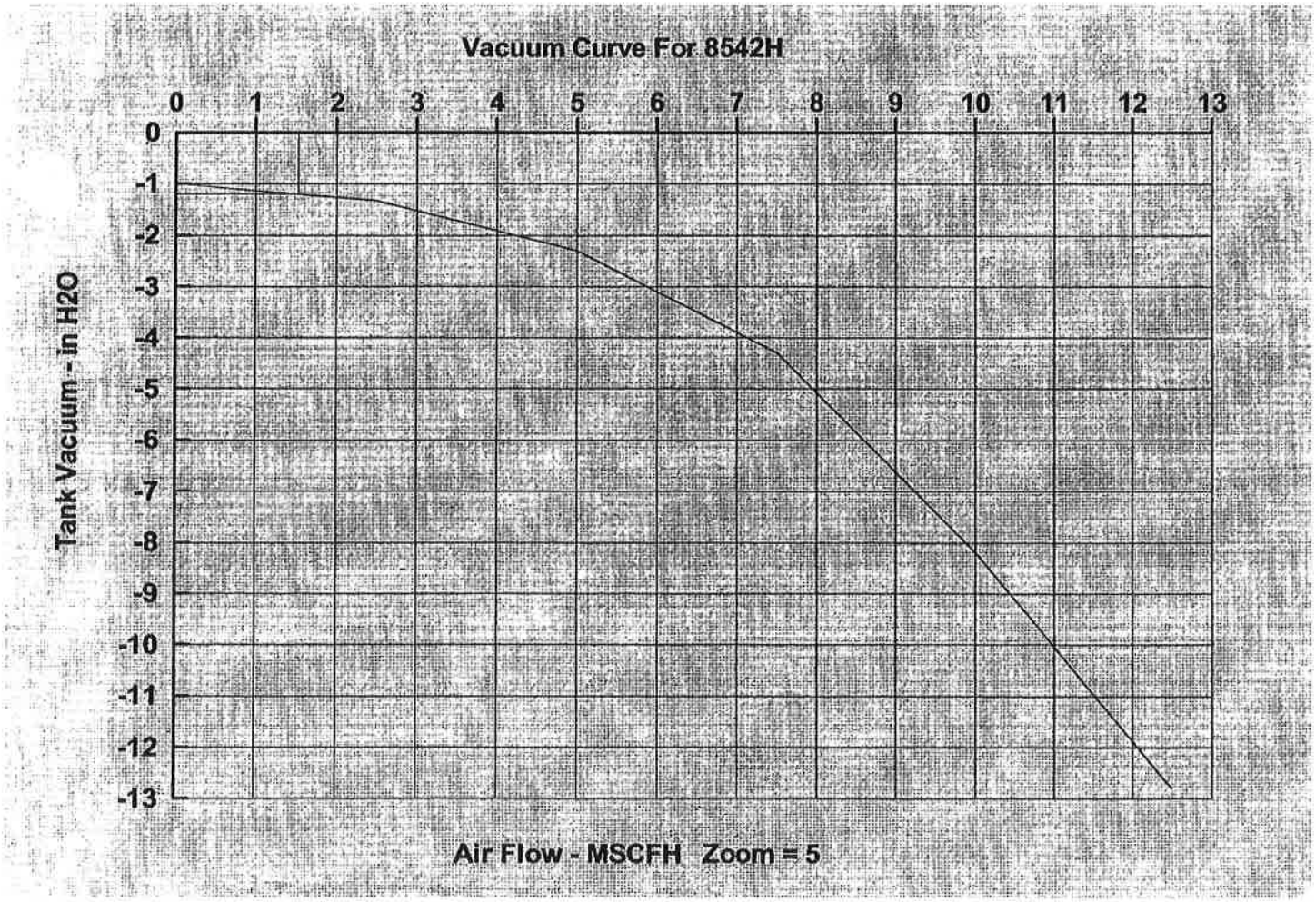
http://www.foxitsoftware.com For evaluation only.

Series: 8540 End-Of-line Conservation Breather Vent

PROTECTOSEAL MODEL: 8542H 2 Inch

Recommended vent based on the following user supplied data:

Tank Capacity	13,500	gal
Flash Point	120	Degrees F
VACUUM PARAMETERS		
Max Empty Rate	150.000	gpm
Tank Design Vacuum	4.000	in H2O
Vacuum Set Point	1.000	in H2O
VACUUM VENTING REQUIREMENTS		
Thermal	0.321	MSCFH
Emptying	1.200	MSCFH
TOTAL	1.521	MSCFH
VENT INFLOW CHARACTERISTICS		
Vacuum at Required Flow	1.200	in H2O
% Of Tank Design Vacuum	30.0	



Tank T-9A Vent Vacuum Curve

Protectoseal PRO-FLOW II Vent Sizing Program Date: 02/25/2009

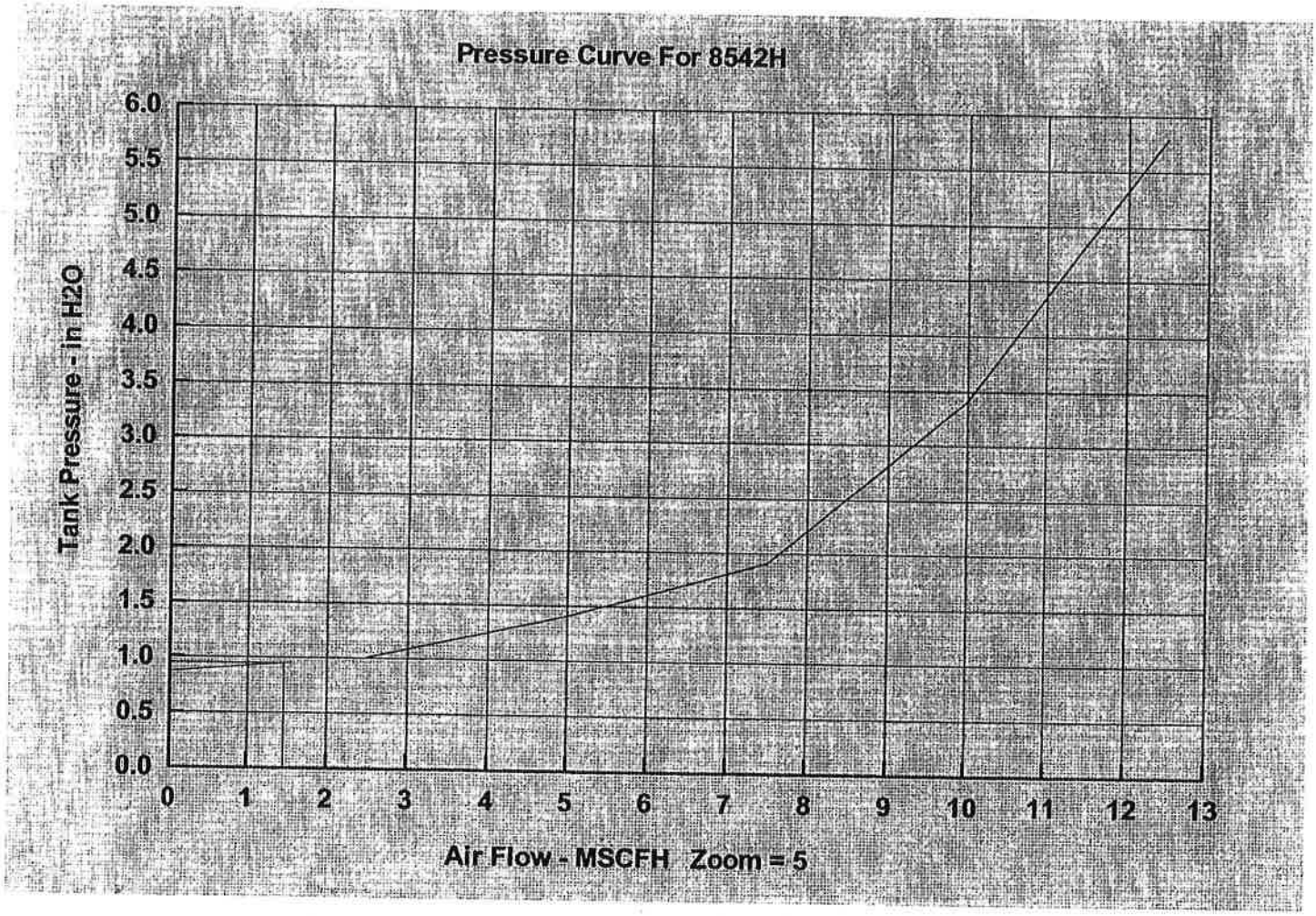
http://www.foxitsoftware.com For evaluation only.

Series: 8540 End-Of-line Conservation Breather Vent

PROTECTOSEAL MODEL: 8542H 2 Inch

Recommended vent based on the following user supplied data:

Tank Capacity	12,100	gal
Flash Point	120	Degrees F
PRESSURE PARAMETERS		
Max Fill Rate	150.000	gpm
Tank Design Pressure	8.000	in H2O
Pressure Set Point	0.865	in H2O
PRESSURE VENTING REQUIREMENTS		
Add FLow/Blanket Fail	0.000	MSCFH
Thermal	0.173	MSCFH
Filling	1.286	MSCFH
TOTAL	1.459	MSCFH
VENT OUTFLOW CHARACTERISTICS		
Pressure at Required Flow	0.946	in H2O
% Of Tank Design Pressure	11.8	



Tank T-9B Vent Pressure Curve

Protectoseal PRO-FLOW II Vent Sizing Program Date: 02/25/2009

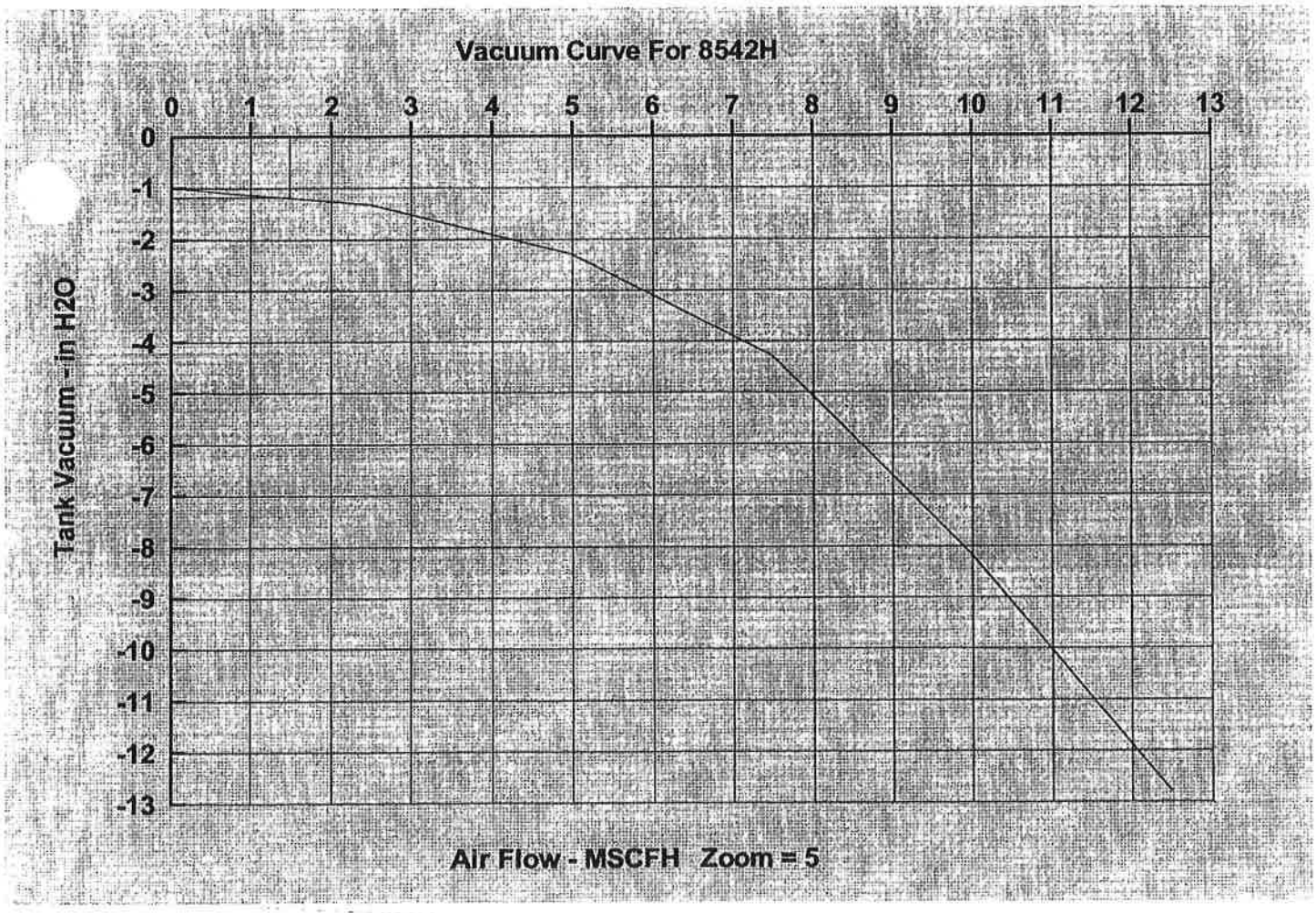
http://www.foxitsoftware.com For evaluation only.

Series: 8540 End-Of-line Conservation Breather Vent

PROTECTOSEAL MODEL: 8542H 2 Inch

Recommended vent based on the following user supplied data:

Tank Capacity	12,100	gal
Flash Point	120	Degrees F
VACUUM PARAMETERS		
Max Empty Rate	150.000	gpm
Tank Design Vacuum	4.000	in H2O
Vacuum Set Point	1.000	in H2O
VACUUM VENTING REQUIREMENTS		
Thermal	0.288	MSCFH
Emptying	1.200	MSCFH
TOTAL	1.488	MSCFH
VENT INFLOW CHARACTERISTICS		
Vacuum at Required Flow	1.196	in H2O
% Of Tank Design Vacuum	29.9	



Tank T-9B Vent Vacuum Curve

Protectoseal PRO-FLOW II Vent Sizing Program Date: 02/25/2009

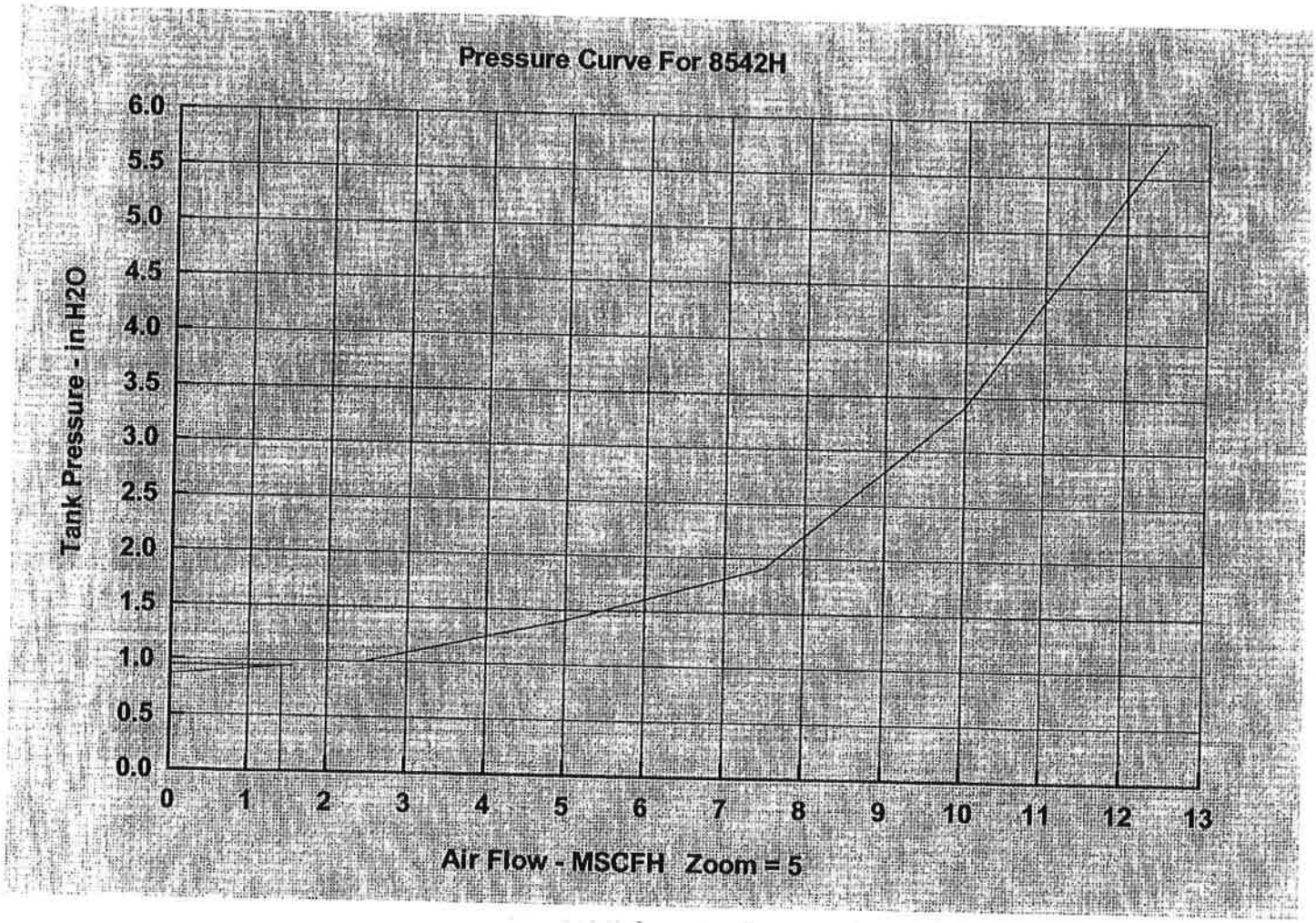
http://www.foxitsoftware.com For evaluation only.

Series: 8540 End-Of-line Conservation Breather Vent

PROTECTOSEAL MODEL: 8542H 2 Inch

Recommended vent based on the following user supplied data:

Tank Capacity	9,500	gal
Flash Point	120	Degrees F
PRESSURE PARAMETERS		
Max Fill Rate	150.000	gpm
Tank Design Pressure	8.000	in H2O
Pressure Set Point	0.865	in H2O
PRESSURE VENTING REQUIREMENTS		
Add FLow/Blanket Fail	0.000	MSCFH
Thermal	0.136	MSCFH
Filling	1.286	MSCFH
TOTAL	1.421	MSCFH
VENT OUTFLOW CHARACTERISTICS		
Pressure at Required Flow	0.944	in H2O
% Of Tank Design Pressure	11.8	



Tank T-9C Vent Pressure Curve

Protectoseal PRO-FLOW II Vent Sizing Program Date: 02/25/2009

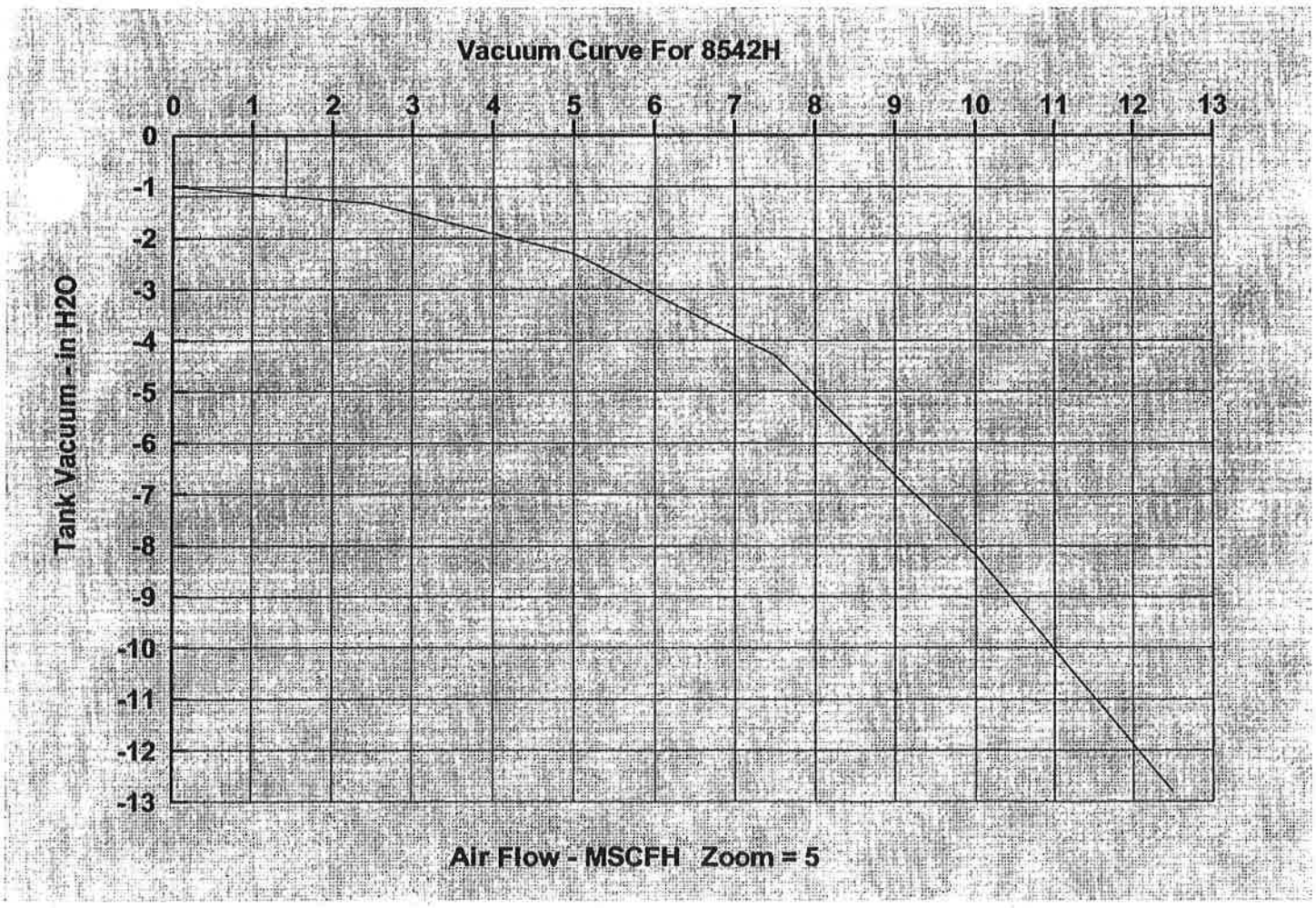
http://www.foxitsoftware.com For evaluation only.

Series: 8540 End-Of-line Conservation Breather Vent

PROTECTOSEAL MODEL: 8542H 2 Inch

Recommended vent based on the following user supplied data:

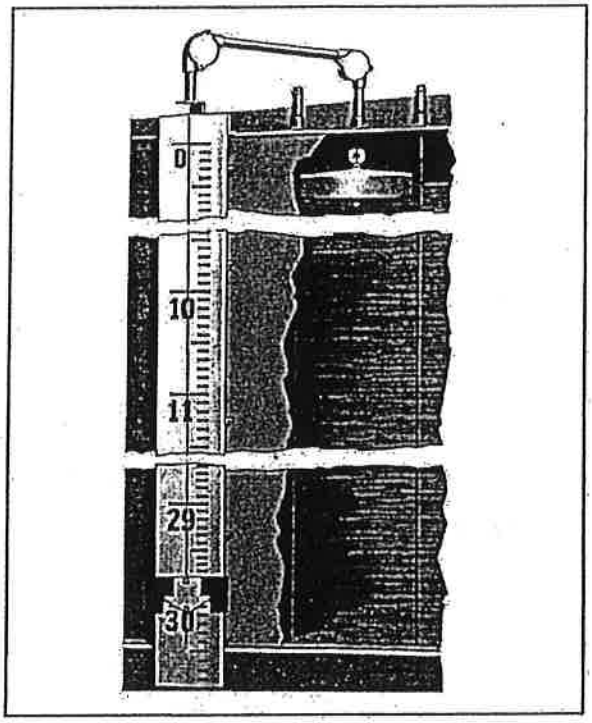
Tank Capacity	9,500	gal
Flash Point	120	Degrees F
VACUUM PARAMETERS		
Max Empty Rate	150.000	gpm
Tank Design Vacuum	4.000	in H2O
Vacuum Set Point	1.000	in H2O
VACUUM VENTING REQUIREMENTS		
Thermal	0.226	MSCFH
Emptying	1.200	MSCFH
TOTAL	1.426	MSCFH
VENT INFLOW CHARACTERISTICS		
Vacuum at Required Flow	1.188	in H2O
% Of Tank Design Vacuum	29.7	



Tank T-9C Vent Vacuum Curve

SHAND & JURS
PRODUCT DATA SHEET

92302/03
Liquid Level Indicators



- Low cost and simple installation
- Accurate to ± 1 inch
- Choice of standard materials to accommodate most installations
- Extremely visible numerals and graduations
- Durable and reliable construction materials on all moving parts
- Custom marking available

The Shand & Jurs Model 92302/03 Liquid Level Indicators

The Shand & Jurs Model 92302/03 Liquid Level Indicator is a reliable and inexpensive float actuated level gauging system. It is designed to provide reliable and virtually trouble-free service for installation not requiring accuracies better than ± 1 inch.

Shand & Jurs provides as standard, rugged aluminum or redwood indicator boards. 316 Stainless Steel boards and mounting hardware also available. Graduations are in feet and inches or meters and decimeters, large black numerals make readout highly visible from a distance. Half or third travel indicator boards are offered for special installations, such as underground tanks. Outage (reverse reading), volumetric and custom marked boards available.

To simplify ordering and installation, Shand & Jurs provides complete installation kits for redwood and aluminum indicator boards. Complete kit includes float, brackets, clamps, anchor bar, target, sheaves, guide wire spring assembly, guide wire and liquid seal when required.

The choice of material selection for kits permits installation in a variety of environmental conditions. To provide a vapor tight installation and protect the gauge board from corrosive tank vapors, a standard liquid seal is available.

Shand & Jurs also offers limit switches to actuate high and low level alarms, provide pump control or other signaling functions.

SHAND & JURS

PRODUCT DATA SHEET

92302/03

Liquid Level Indicators

SPECIFICATIONS:

Gauging Range:.....55 Feet or 16.8 Meters (Higher Available)
Operating Temperature:...-30° to 160°F
Type of Kit Class:.....Class A (Aluminum)
Class B (Nodular Iron)

MATERIALS OF CONSTRUCTION:

Indicator Board:.....Redwood or Aluminum, 316 SS optional
Float:.....316 SS
Brackets:.....Steel
Anchor Bar:.....Steel
Float Cable:.....Stainless Steel
Cable Clamp:.....Stainless Steel
Target:.....Steel

SHEAVE ASSEMBLY:

Housing and Cover:.....Cast Aluminum or Nodular Iron
Sheave:.....Delrin
Bearing:.....Teflon
Shaft:.....Stainless Steel

GUIDE WIRE SPRING ASSEMBLY:

Housing Assembly:.....Galvanized Steel
Spring:.....Steel
Guide Wire:.....Stainless Steel

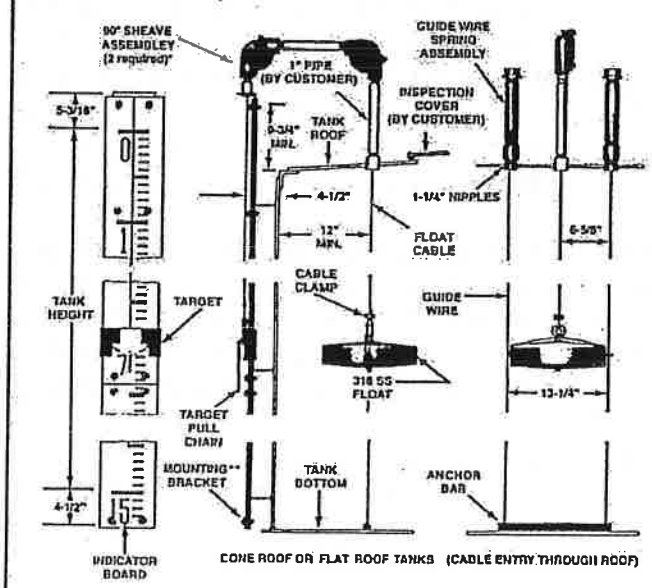
LIQUID SEAL: (Class A only):

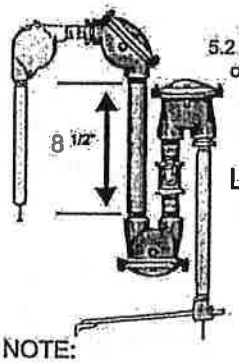
Housing & Cover:.....Cast Aluminum
Sheaves:.....Delrin
Pipe:.....Galvanized Steel
Bearing:.....Teflon
Shaft:.....Stainless Steel

LIQUID SEAL INSTALLATION:

Maximum tank pressure 5 oz./sq. in. for antifreeze or 4 oz./sq. in. for medium weight oil (0.8 Sp. Gr.)

For higher tank pressures, refer to Liquid Seal Model 93603.





Maximum Tank Pressure 5.2 oz./sq. in. for Ethyleneglycol or 3.9 oz/sq in. for Medium Weight Oil (0.8 SP. GR)

NOTE:

1. Specify Kit No. 1 (Class A or B) for redwood (without liquid seal).
2. Specify Kit No. 2 (Class A or B) for aluminum (without liquid seal).
3. Specify Kit No. 3 (Class A only) for redwood with liquid seal.***
4. Specify Kit No. 4 (Class A only) for aluminum with liquid seal.***

* 1 Required for Kit 3 & 4
** 2 Brackets supplied per tank height
***Liquid seal body available in PVC consult factory

All designs subject to change. Certified dimensions and specifications available upon request.

SHAND & JURS
an L&J Technologies Company
PDS92302/03-2C
5911 Butterfield Road, Hillside, Illinois 60162 Phone: (708) 236-6000 Fax: (708)236-6006
E-mail: sales@ljtechnologies.com http:\\www.ljtechnologies.com ISO 9001 Registered

SHAND & JURS
ORDERING GUIDE

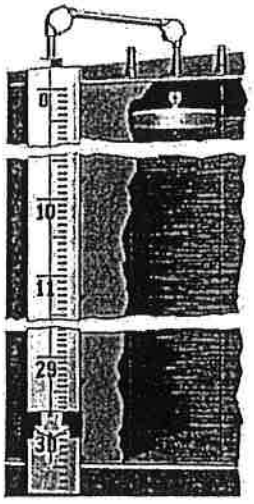
92302/03
Liquid Level Indicators

MODEL NUMBER SELECTION:

The model number will consist of a base number 92302 with a dash and two numbers which represent board material and calibration, followed by two numbers which represent tank height followed by another two numbers which represent installation kit selection.

92302 - AB CD EF

- AB: Material & Calibration
- CD: Tank Height
- EF: Installation Kit (No Kit = 00)



ORDERING INFORMATION

Specify:
1. Model 92302 Liquid Level Indicator
2. Type of Tank
3. Type of Kit Class
4. Type of Board Materials
5. Type of Graduation
6. Tank Height

* When placing order, please specify exact tank height as well as correct option numbers.
MODEL JB3704-1 Limit Switch must be ordered separately.

TABLE I (AB) - BOARD MATERIAL AND CALIBRATION*

Option #	Description
08	Wood Board - Foot/Inch Calibration
09	Wood Board - Metric/Decimeter Calibration
18	Aluminum Board - Foot/Inch Calibration
19	Aluminum Board - Metric/Decimeter Calibration

TABLE II - (CD) TANK HEIGHT - (boards with mounting hardware)

Table II Option #	Feet/Inches - WOOD Table I Opt. 08	Table II Option No.	Metric - WOOD Table I Opt. 09
03	5'0" - 7'3"	51	1.50 - 2.21 m
11	7'4" - 15'3"	52	2.22 - 4.65 m
19	15'4" - 23'3"	53	4.66 - 7.09 m
27	24'4" - 31'3"	54	7.10 - 9.53 m
35	31'4" - 39'3"	55	9.54 - 11.96 m
43	39'4" - 47'3"	56	11.97 - 14.40 m
50	47'4" - 55'3"	57	14.41 - 16.84 m
Table II Option #	**Feet/Inches - ALUM Table I Opt. 18**	**Table II Option No.**	**Metric - ALUM Table I Opt. 19**
03	5'0" - 7'3"	51	1.50 - 2.21 m
11	7'4" - 15'3"	52	2.22 - 4.65 m
19	15'4" - 23'3"	53	4.66 - 7.09 m
27	24'4" - 31'3"	54	7.10 - 9.53 m
35	31'4" - 39'3"	55	9.54 - 11.96 m
43	39'4" - 47'3"	56	11.97 - 14.40 m
50	47'4" - 55'3"	57	14.41 - 16.84 m

ACCESSORY KITS (EF)

KIT NO. 1 - CONE ROOF TANK (WOOD GAUGE BOARD)

DESCRIPTION	NO. REQ'D.	1A CAST AL. SHEAVE HSG.	1B NOD. IRON SHEAVE HSG.
SHEAVE ASSY. 1"-90	2	JB3561-1 (CA)	JB3561-2 (NI)
FLOAT-316SS	1	JB3010-21	JB3010-21
ANCHOR BAR	1	JA3540-3	JA3540-3
GUIDE WIRE SPR. ASSY	2	JB3486-11	JB3486-11
CABLE CLAMP	1	090142	090142
TARGET	1	9230-11360	9230-11360
BRACKET	*	509-836	509-836

*NUMBER OF BRACKETS IS DETERMINED BY TANK HEIGHT.

KIT NO. 2 - CONE ROOF TANK (METAL GAUGE BOARD)

DESCRIPTION	NO. REQ'D.	2A CAST AL. SHEAVE HSG.	2B NOD. IRON SHEAVE HSG.
SHEAVE ASSY. 1"-90	2	JB3561-1 (CA)	JB3561-2 (NI)
FLOAT - 316SS	1	JB3010-21	JB3010-21
ANCHOR BAR	1	JA3540-3	JA3540-3
GUIDE WIRE SPR. ASSY	2	JB3486-11	JB3486-11
CABLE CLAMP	1	090142	090142
TARGET	1	9230-11360	9230-11360
BRACKET	*	509-836	509-836
INTERMEDIATE SUPPORT	*	9399-18000	9399-18000

*NUMBER OF BRACKETS IS DETERMINED BY TANK HEIGHT.

KIT #'S 3 & 4 - CONE ROOF TANK WITH LIQUID SEAL

(FOR MAXIMUM TANK PRESSURE OF 4.35 OZ./SQ. IN.)

DESCRIPTION	NO. REQ'D.	KIT 3A WOOD BOARD	KIT 4A METAL BOARD
SHEAVE ASSY. 1"-90	1	JB3561-1 (CA)	JB3561-1 (CA)
FLOAT - 316SS	1	JB3010-21	JB3010-21
ANCHOR BAR	1	JA3540-3	JA3540-3
GUIDE WIRE SPR. ASSY	2	JB3486-11	JB3486-11
CABLE CLAMP	1	090142	090142
TARGET	1	9230-11360	9230-11360
BRACKET	*	509-836	509-836
INTERMEDIATE SUPPORT	*	———	9399-18000
LIQUID SEAL	1	JC3602-3	JC3602-3

*NUMBER OF BRACKETS IS DETERMINED BY TANK HEIGHT.

KIT #'S 5 & 6 - CONE ROOF TANK WITH PVC LIQUID SEAL, SHEAVE & UNGUIDED FLOAT

(FOR MAXIMUM TANK PRESSURE OF 4.35 OZ./SQ. IN.)

DESCRIPTION	NO. REQ'D.	KIT 5A WOOD BOARD	KIT 6A METAL BOARD
PVC SHEAVE ASSY. 1"-90	1	LA276-533	LA276-533
RAFT FLOAT - PVC	1	LB290-800	LB290-800
TFE CABLE CLAMP	1	LA270-1007	LA270-1007
TARGET	1	9230-11360	9230-11360
BRACKET	*	509-836	509-836
INTERMEDIATE SUPPORT	*	———	9399-18000
PVC LIQUID SEAL	1	LB277-543	LB277-543
1/16" TEFLON COATED CABLE	As Req'd	117-8	117-8

*NUMBER OF BRACKETS IS DETERMINED BY TANK HEIGHT.

5911 Butterfield Road, Hillside, Illinois 60162 Phone: (708) 236-6000 Fax: (708)236-6006
E-mail: sales@ljtechnologies.com http:\\www.ljtechnologies.com

SPECIAL ACCESSORY KIT SUBSTITUTIONS

A. FLOATS

DESCRIPTION	PART NUMBER
304 SS Float (11-3/4" DIA)	JB3010-7
Monel Float (11-3/4" DIA)	JB3010-4
304 ss Foamglass Float (9" x 12" x 3")	JC3000-1
Polyethylene float	9399-11250
Teflon coated float	LA290-674
* 304 SS (11-3/4" DIA)	JB3010-8

* For asphalt service only

B. SHEAVE ASSEMBLIES - 1 "NPT CONNECTIONS *

DESCRIPTION	PART NUMBER
All 316 SS	JB3561-4
Aluminum Housing/316ss Wheels	JB3561-5
Nodular Iron Housing/316ss Wheels	JB3561-6

* ALL STAINLESS STEEL WHEELS ARE TAPE/CABLE COMPATIBLE

C. ANCHOR BAR - 13-1/4"

DESCRIPTION	PART NUMBER
All 316 SS	JA3540-4

D. GUIDE WIRE SPRING ASSEMBLIES

(two per unit required)

DESCRIPTION	PART NUMBER
All 316 SS	93486-18
All 304 SS	93486-12

NOTE: FOR SPECIAL SYSTEM REQUIREMENTS, CONSULT FACTORY.

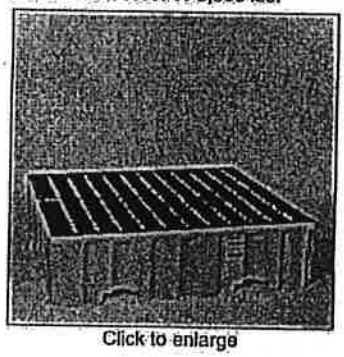
1640 Four Drum Spill Pallet

Model 1640
Four Drum Spill Pallet
High Performance Engineered Plastic High Density Polyethylene HDPE construction for excellent chemical resistance, the 1640 features a spill capacity of 120 gallons and a flat top grating which removes easily for cleaning. Forkliftable design with a 3/4" drain plug.

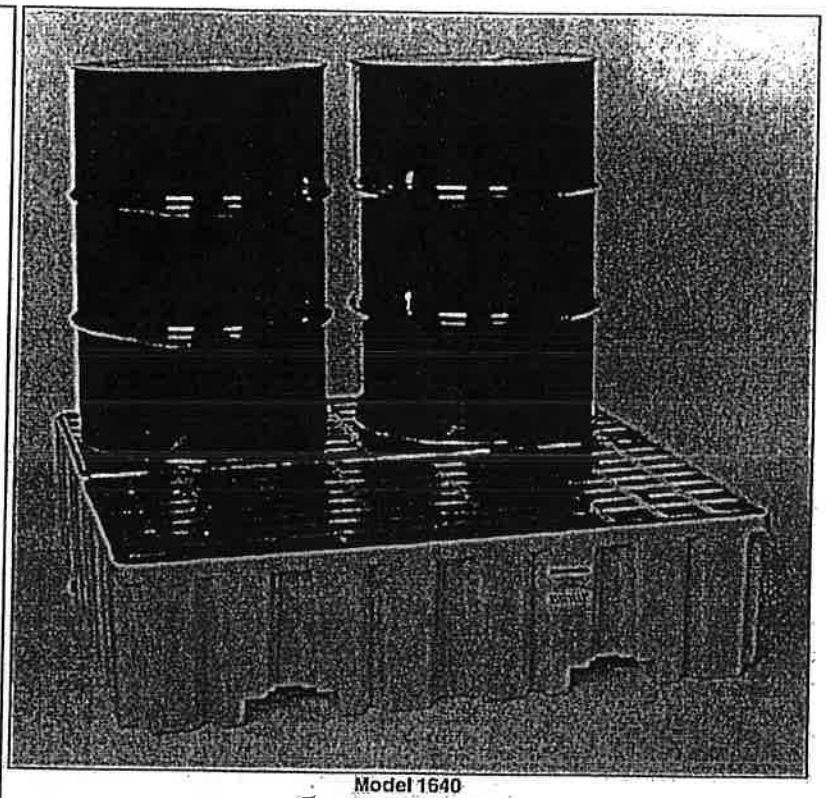
Meets EPA requirements for secondary spill containment of hazardous materials (40 CFR 264.175).

MODEL 1640 SPECIFICATIONS:

SPILL CAPACITY: 120 gallons
WEIGHT: 104 lbs.
DIMENSIONS: 52.4" x 51.5" x 13.75"
MAX LOAD CAPACITY: 8,000 lbs.



Click to enlarge



Model 1640
Four Drum Spill Pallet

Home • About Us • C.L.A.W.S. • PDF Product Literature • Contact Us
New Products • Safety Cans • Safety Cabinets • Spill Containment • Plastic Drums • Guards & Protectors • Cigarette Receptacles

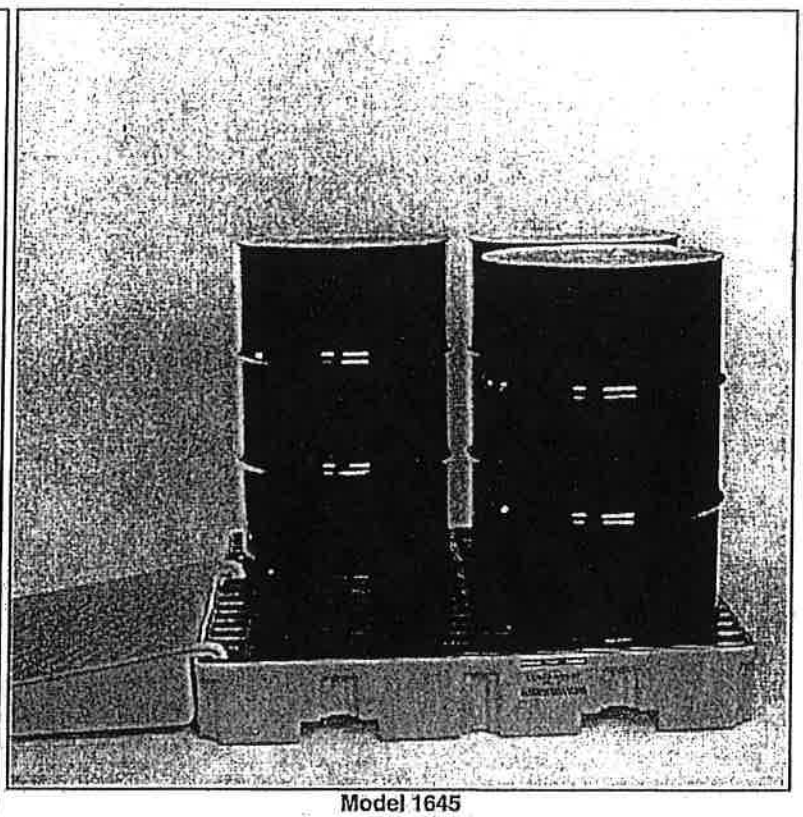
1645 Four Drum Low Profile Spill Containment Pallet

Model 1645
Low Profile Spill Containment Pallet
These 4-drum low profile spill containment pallets have a 66 gallon spill capacity. Constructed of polyethylene for superior strength and excellent chemical resistance. Each unit includes two patented Eagle poly gratings with 1.75" openings that remove easily for cleaning. Forkliftable design with .75" drain plug. Compatible with the optional 1689 ramp, as shown.

Meets EPA requirements for secondary spill containment of hazardous materials (40 CFR 264.175).

MODEL 1645 SPECIFICATIONS:

SPILL CAPACITY: 66 gallons
WEIGHT: 67 lbs.
DIMENSIONS: 51.5" x 51.5" x 8"
LOAD CAPACITY: 8,000 lbs.



Model 1645
4-Drum Low Profile
Spill Containment Pallet

Home • About Us • C.L.A.W.S. • PDF Product Literature • Contact Us
New Products • Safety Cans • Safety Cabinets • Spill Containment • Plastic Drums • Guards & Protectors • Cigarette Receptacles

APPENDIX D-2

Addendum A

DW WASTEWATER CONTAINMENT AREA UPGRADES AND MAINTENANCE PLAN

APPENDIX D-3

SECONDARY CONTAINMENT CALCULATIONS

APPENDIX D-3

SECONDARY CONTAINMENT CALCULATIONS

VOLUME CALCULATIONS

FOR

NORTH BULK LIQUID LOAD/UNLOAD AREA

BURLINGTON ENVIRONMENTAL, LLC - KENT FACILITY
20245 77TH AVENUE SOUTH
KENT, WASHINGTON 98032

PREPARED FOR

BURLINGTON ENVIRONMENTAL, LLC

18000 72ND AVENUE SOUTH, SUITE 217
KENT, WASHINGTON 98032



PREPARED BY

SITTS & HILL ENGINEERS INC.
2901 SO. 40TH
TACOMA, WASHINGTON 98409

September 20, 2010

(S & H Job Number 14,731)

SITTS & HILL ENGINEERS, INC.

Professional Engineers and Planners
4815 Center Street, Tacoma, WA 98409
Telephone (253) 474-9449
Fax (253) 474-0153

ROBERT J. DAHMEN, P.E.
BRENT K. LESLIE, P.E.
ROBERT N. ERB, P.L.S.
RANDALL C. HAYDON, P.L.S.
KATHY A. HARGRAVE, P.E.
LARRY G. LINDELL, P.E.

September 20, 2010

North Bulk Liquid Load/Unload Area
Burlington Environmental, LLC – Kent Facility
Sitts & Hill Job Number 14,731

Basis of Containment Area Volume Calculations

The required volume to be contained within the proposed area is based upon the following criteria.

1. Determine the volume of stormwater to be collected at the containment area (and any additional adjacent area(s) tributary to it) utilizing an accepted 25 year/24 hour rainfall event. According to King County storm data this event produces 3.54 inches of rainfall.

2. Determine ten percent of the maximum total storage drum volume intended for this area. The maximum total number for drums temporarily stored in this area is 20 fifty-five gallon drums, stacked one high.

3. Determine the volume of contained stormwater displaced by the 20 fifty-five gallon drums. We conservatively assumed a full 6 inch vertical containment height (based upon the design depth of the containment area) in lieu of the 3.54 inches collected during a 25 year.24 hour event.

The attached calculations demonstrate that the available volume of the proposed containment area shown on those drawings produced by Sitts & Hill Engineers, Inc. exceeds the required containment volume utilizing the above criteria.

Sincerely,

Brent K. Leslie, P.E.
Sitts & Hill Engineers, Inc.



SITTS & HILL ENGINEERS, INC.
TACOMA, WASHINGTON (253) 474-9449

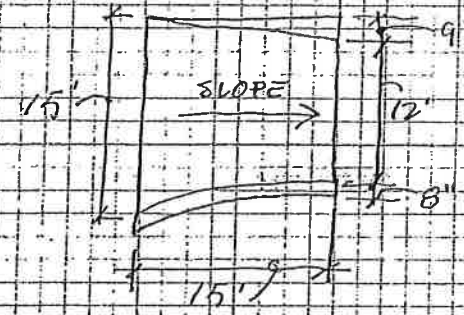
DESIGNED RT DATE 09-14-10 JOB 14,731
CHECKED _____ DATE _____ SHEET

PROJECT BURLINGTON ENVIRONMENTAL - NORTH CONTAINMENT PAD 1 OF 4

CONTAINMENT PAD VOLUME CALCULATIONS

(1) AREA SQUARE FOOTAGE TRIBUTARY TO CONTAINMENT.

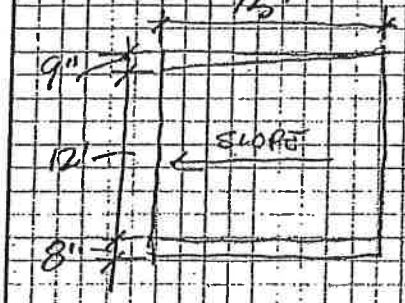
A. WEST RAMP AREA =



15' + 13'-5" = 28'-5"/2 = 14'-2.5",
SAY 14.21' AVE WIDTH

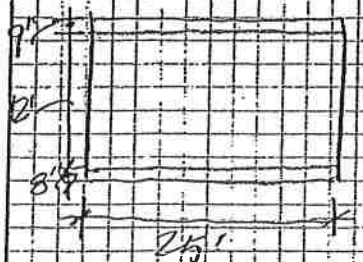
14.21' x 15' = 213.15 SQ. FT.

B. EAST RAMP AREA =



13.42' x 15' = 201.30 SQ FT

C. BOTTOM AREA



13.42' x 25 = 335.50 SQ FT

TOTAL TRIBUTARY SURFACE AREA =
213.15 + 201.30 + 335.50 = 749.95 SQ. FT.

(2) VOLUME (BY AREA) W/IN CONTAINMENT ZONE

A. WEST RAMP AREA

VERTICAL FALL ACROSS LENGTH OF RAMP = .50', THEREFORE AVERAGE DEPTH IS .25'.

AVAILABLE AREA FOR STORING VOLUME =

ABOVE RAMP SURFACE ONLY = 15' + 12' = 27'/2 = 13.50' AVERAGE WIDTH

13.50' X 15' = 202.50 SQ. FEET.

202.50 SQ. FT. X .25' = 50.63 C.F.T.

ABOVE ANGLED CURB AREA

9"/2 = 4.5" OR 0.375' AVE WIDTH

VERTICAL FALL ALONG LENGTH OF CURB = 50', THEREFORE AVERAGE HEIGHT IS .25'.

CONSERVATIVE -

0.375' WIDTH X 0.25' HEIGHT = 0.094 C.F.T./L.F. X 15 = LACF.

ABOVE FULL HEIGHT CURB AREA = 0 C.F.T.

50.63 + 1.41 + 0 = 52.04 C.F.T. AVAILABLE STORAGE VOLUME

B. EAST RAMP AREA

VERTICAL FALL ACROSS LENGTH OF RAMP = .50', THEREFORE AVERAGE DEPTH IS .25'.

AVAILABLE AREA FOR STORAGE VOLUME =

ABOVE RAMP SURFACE ONLY = 12'-9" OR 12.75' AVERAGE IS 12.375'

12.375' X 15' = 185.63 SQ.FT.

185.63 SQ.FT. X .25 = 46.41 C.F.T.

ABOVE ANGLED CURB AREA

9"/2 = 4.5" OR 0.375' AVE WIDTH

VERTICAL FALL ALONG LENGTH OF CURB IS .50', THEREFORE AVERAGE HEIGHT IS .25'.

0.375' WIDTH X 0.25 HEIGHT = 0.094 C.F.T.

ABOVE FULL HEIGHT CURB AREA = 0 C.F.T.

(2) VOLUME BY AREA (CONTINUED)

E. EAST POND AREA

46.41 C.F.T + 0.094 CFT + Ø CF = 46.50 CFT. AVAILABLE STORAGE VOL.

C. BOTTOM AREA

ABOVE BOTTOM

1/2 X 25 = 300 SF. CURB HEIGHT IS 50' TYP.

300 S.F. X .50' = 150 C.FT.

ABOVE ANGLED CURB

9" WIDE = .75' WIDE, HEIGHT IS .50'.

.75' X .50' = .375 C.FT. / WITH ANGLED CURB FACE

.375 X 50 = 18.75 C.FT. AVE PER 1 LF.

.1875 C.FT X 25 LF = 4.69 C.FT

ABOVE FULL HEIGHT CURB = Ø CF

150 C.FT + 4.69 C.FT + 0 C.FT = 154.69 AVAIL. STORAGE VOLUME

(3) AVAILABLE STORAGE VOLUME OF CONTAINMENT AREA AT SURFACE W/IN CONTAINMENT CURB.

A.) 58.04 C.FT + B.) 46.50 CFT + C.) 154.69 C.FT = 253.23 C.FT.

(4.) VOLUME REQUIRED TO BE STORED

A.) BY RAINFALL EVENT. KING CO. STORM MANUAL 25 YEAR / 24 HOUR EVENT = 3.54 INCHES OR .295'

.295' X TOTAL TRIBUTARY AREA 749.5 SQ. FT = 221.24 C.FT. (10% REQUIRED)

B.) BY PERCENTAGE OF DRUM VOLUME. 1 GAL = 0.1337 CF.

55 GAL. X 0.1337 CF = 7.35 CF

MAX. TOTAL DRUMS AT ONE TIME - STACK AT ONE HIGH = 20 DRUMS.

20 X 7.35 CF = 147 C.FT.

10% OF 147.00 CF = 14.70 CFT

(4.) VOLUME REQUIRED TO BE STORED (CONTINUED)

C. VOLUME DISPLACED BY DRUMS IF CONTAINMENT AREA IS FILLED TO TOP (0.50' DEPTH) FOR 20 TOTAL DRUMS.

AREA OF EACH DRUM (πr^2) $= 3.14(1)^2 = 3.14$

$3.14 \times 0.50'$ DEPTH $= 1.57$ CF EACH DRUM.

1.57 CF $\times$ 20 DRUMS $=$ **31.40 C.FT.**

TOTAL VOLUME REQUIRED TO BE STORED

A.) 22.124 CFT + B) 14.70 C.FT. + C) 31.40 C.FT. = **267.34 C.FT.**

(5.) IS CONTAINMENT CURB ABOVE PROPOSED SURFACES ADEQUATE TO HOLD REQUIRED STORAGE VOLUME?

AVAILABLE CONTAINMENT VOLUME + 253.23 C.FT.

REQUIRED STORAGE VOLUME - 267.34 C.FT.

NEED MORE STORAGE VOLUME → **- 14.11 C.FT.**

(6.) VOLUME PROVIDED IN SUMP AREA

$2.5' \times 2.5' \times 2.5' = 15.63$ C.FT.

(7.) IS CONTAINMENT CURB ABOVE PROPOSED SURFACES INCLUDING SUMP VOLUME ADEQUATE?

AVAILABLE CONTAINMENT VOLUME W/ SUMP. $253.23 + 14.63 = 268.86$

REQUIRED STORAGE VOLUME $= 267.34$

EXCESS STORAGE VOLUME AVAILABLE IS → **+1.52 C.FT.**

CONTAINMENT AREA AS DESIGNED IS O.K.

(CONSIDERING CONSERVATIVE CALC. OF VOLUME, ADDITIONAL CONTAINMENT VOLUME AT SLOPED FLOOR AT BOTTOM OF CONTAINMENT PAD WAS NOT INCLUDED.)

Secondary Containment Calculation

TSCA/DW Storage Area

For dimensions and stacking arrangements refer to Figure D1-2, TSCA/DW Area Stacking Patterns.

- Storage area is covered, neglect rainfall
- Container size is a standard 55 gallon drum
- Containment berm depth is 6 inches
- Containment calculations demonstrate the requirements of 40 CFR 761.65(b)(1) are met.
- Combined TSCA/DW liquids are placed in containment trays that meet requirements of WAC 173-303-630(7) or overpack containers. Specification for containment trays can be found in Appendix D-2.

Total Storage Surface Area = 42.25 ft x 24.50 ft = 1,035.13 ft^2

Volume taken up by 66 drums) on the deck surface (22 drums on deck per stack)

= 3.14 x $(1)^2$ x 66 = 207.3 ft^2

Effective Surface Area = 1,035.13 ft^2 - 207.3 ft^2 = 827.8 ft^2

Volume taken up by entrance ramp = 1/2 x 8 ft x 12 ft x 0.5 ft = 24 ft^3

Available containment volume = (827.8 ft^2 x 0.5 ft) - 24 ft^3 = 389.9 ft^3

Containment required for 3-60 drum stacks = 60 x 3 = 180-55 gallon drums

Total volume = (180 x 55) / 7.48 gal/ ft^3 = 1,323.5 ft^3

Required containment volume = 1,323.5 ft^3 x 25% = 330.1 ft^3

Since the **Available Containment** is greater than the **Required Containment,** there is adequate containment for 180-55 gallon containers in a triple stacked pattern.

Dangerous Wastewater Tank System
Secondary Containment Calculations

See attached map for the corresponding field elevations measurement locations and containment area dimensions. Elevations recorded using a "Builder's Level" from 0.00 reference elevation outside containment area.

Average Contaiment Basin Elevation h_1 (recorded at seven different locations)

1	-1.25	h_1=	-8.14	=	-1.16 ft
2	-1.28		7		
3	-1.30				
4	-0.99				
5	-1.66				
6	-0.67				
7	-0.99				
	-8.14				

Top of Wall Elevation (h_2) = +1.16 ft

Sump Volume (V_S)

V_S = 2 ft x 2 ft x 3 ft = 12 ft^3

Containment Basin Volume (V_B)

V_B = A_B (Basin Area) x (h_2 - h_1) (Average Wall Height) =

V_B = A_B x (h_2 - h_1) = $[(28 \times 36) + (32 \times 4) + \pi \cdot (32)^2/4] \times [1.16 - (-1.16)]$

V_B = = 4,501.4 ft^3

Total Containment Volume (V_{TOTAL})

V_{TOTAL} = $V_S + V_B$

V_{TOTAL} = 12.0 ft^3 + 4,501.4 ft^3 = 4,513.4 ft^3

Dangerous Wastewater Tank System
Secondary Containment Calculations

Tank and Slab Displacement Volume (V_{TANK})

Slab height for T-9B and T-9C is 1.5 ft

V_{T9A} =	$[\pi (12 / 2)^2] \times [1.16 - (-1.16)]$	=	262.4 ft^3
$V_{T9B\ slab}$=	12.5 ft x 12.5 ft x 1.5 ft	=	234.4 ft^3
V_{T9B} =	Cone bottom above top of wall	=	0.0 ft^3
V_{T9C} =	$[\pi (9 / 2)^2] \times [1.16 - (-1.16) - 1.5]$	=	52.2 ft^3
$V_{T9C\ slab}$=	12.5 ft x 12.5 ft x 1.5 ft	=	234.4 ft^3
$V_{carbon\ canisters}$ =	Carbon canister above top of wall	=	0.0 ft^3
V_{TANK} =	$V_{T9A} + V_{T9B\ slab} + V_{T9B} + V_{T9C\ slab} + V_{T9B} + V_{carbon\ canisters}$	=	783.4 ft^3

Rainfall Displacement Volume (V_{PRECIP})

V_{PRECIP} = $[(28 \times 36) + (32 \times 4) + \pi (32)^2/4] \times (3.54/12)$

= 572.4 ft^3

Total Available Volume (V_A)

V_A = $V_{TOTAL} - V_{TANK} - V_{PRECIP}$

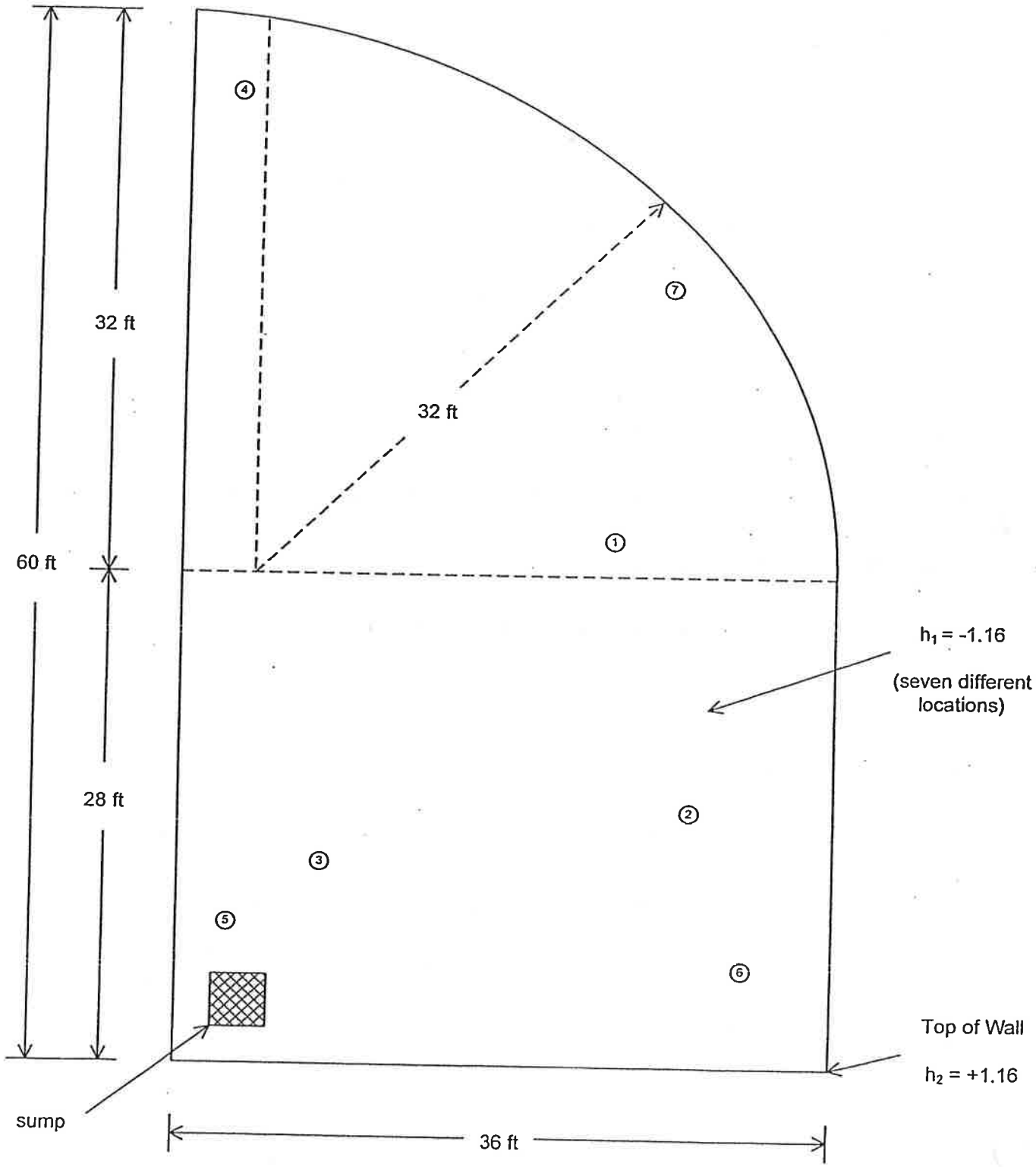
4,513.4 - 783.4 - 572.4 = 3,157.6 ft^3

3,157.6 ft^3 x 7.48 gal/ft^3 = **23,619 gal**

Since the largest tank in the area is 13,500 gallons the containment is adequate.

Dangerous Wastewater Secondary Containment Area

Field Measurements and Elevations



APPENDIX D-4

TANK CERTIFICATIONS

APPENDIX D-4

TANK CERTIFICATIONS

TANK

INTEGRITY ASSESSMENT

REPORT

for

Tank No. 9A
PSC
Kent, Washington

Report Number: 169597-1
Inspection Date: 8/21/08

TABLE OF CONTENTS

SECTION	PAGE
Equipment Data Sheet	3
Introduction and Tank History	4
Primary Tank, Secondary Containment	5
Tank Externals	5
Recommendations / Summary	7
Tank Certification	8
APPENDIX:	
References	
Client Provided Tank Data Sheet	
Drawings	
Photographs	
Calculations	

EQUIPMENT DATA SHEET

Tank No.	9A	**Building No.**	
Site	Tacoma	**Door**	
Location (Inside or Outside)	Outside	**Column**	

TANK CHARACTERISTICS

Contents	Waste Water	**NFPA Hazard Rating**	Yes, 2, 1, 0
Nominal capacity in gallons	13,500	**Primary Regulatory Class**	.WAC 173-303-640
Year Installed	2006	**Material of Construction**	Steel
Style	Single wall	**Orientation**	Vertical
Primary Wall Thickness	5/16"	**Minimum Allowable Thickness**	0.1
Internal Coating	No (has internal anodes instead)	**External Coating**	Yes
Shell Height	16'	**Length**	N/A
Internal Diameter	12'-0"	**Tank Shape**	Cylindrical shell, flat bottom

SECONDARY CONTAINMENT

Type	Diked area	**Leak Detection**	
Material	Concrete	**Thickness**	
Internal Coating	None currently	**External Coating**	
Internal Height		**Internal Length**	
Internal Width		**Capacity in gallons**	Greater than 110% of largest tank in diked area.

PIPING

Type	Single wall	**Above/Underground**	Above
Material	Steel	**Nominal Diameter(s)**	3"
Internal Coating	No	**External Coating**	Paint
Connections	Welded	**Fittings**	Tees, Ells

EQUIPMENT

Type of Level Gauge	Mechanical float and level board.	**Pressure/Vacuum Relief Valve**	No
Type of Overfill	None	**Spill Prevention**	Vault
High Level Alarm	No	**Set Point**	N/A
Feed Pump Cutoff	Unknown	**Set Point**	Unknown

Note: this equipment data sheet was compiled by Conam Inspection, see Appendix for client provided tank data sheet.

INTRODUCTION & HISTORY

Client: PSC **Type of Assessment:** WAC 173-303-640, existing tank

Date Inspected: 8/21/08 **Inspected by:** George Roni, PE & Byron Johnson - technician

Built by: Busby Marine & Tank

Other Name Plate Data: UL Tank for flammable liquids

Last Cleaned by: PSC

Date of Last Cleaning: August 2008

Last Painted by: Busby Tank **Date of Last Painting:** 2006

Number of Coats: Unknown **Color:** White

Foundation Type & Condition: Tank sits on and is anchored to a concrete pad, which appears in satisfactory condition. 9 anchors, ¾" diameter anchor bolts with chairs. Galvanized steel bolts bonded into the concrete pad.

Settlement Observed: None observed.

Major Repairs or Alterations: None observed or reported by the client representative.

Additional Remarks:

During the current assessment described in this report the exterior (and the interior) of the tank system was visually inspected for weld breaks, cracks, punctures, coating damage, and other inadequate construction or installation procedures. The tank was entered (after it was verified safe for entry) to assess the condition of the interior surfaces and parts. A half-mask respirator was worn by the inspector as required by PSC safe entry protocol.

PRIMARY TANK:

Condition of Tank Bottom: Floor and roof have no observable corrosion or pitting.

Condition of Tank Shell: Shell has only minor generalized corrosion. The steel surfaces appeared in satisfactory condition.

Condition of Internal Coating: None.

Condition of Welds: The tank bottom butt welds appear visually acceptable. The tank bottom has a turned up edge – like a pan – and the shell fits inside the turned up edge of the floor. It is not welded to the shell on the inside of the tank; it is welded on the exterior only.

The shell plates are butt welded. The vertical shell joints are butt welded. All welds appeared satisfactory. The roof butt welds also appear satisfactory.

Condition of Other Internals: New anodes appear in good condition.

Visible Distortions to Tank Shell or Heads? None observed, the shell, floor and roof plates all appeared satisfactory.

Additional Remarks: Liquid level float appears in good condition.

SECONDARY CONTAINMENT:

Description: Diked area for several tanks including 9A, 9B, and 9C – in the future.

Condition of Walls or Plates: Concrete walls and floor, not coated.

Condition of Joints or Welds: Not inspected. No water stops in concrete joints.

Visible Distortions to Walls or Plates: None observed.

Additional Remarks: None.

TANK EXTERNALS:

Condition of Paint and/or Insulation: The shell and roof paint is in satisfactory condition.

Condition of Valves and Nozzles: Appear satisfactory with acceptable ultrasonic thickness readings. No repads on nozzles.

Condition of Piping and Ancillary Equipment: Satisfactory.

Condition of Piping Supports/Hangers: Satisfactory.

Condition of Liquid Level Gauge: The liquid level board, liquid level float and guide wires appear satisfactory.

Condition of External Ladder/Stairs: The caged ladder appears straight and structurally sound.

Venting: The tank is equipped (on the roof) with one 3 inch open nozzle, which serves as a vent.

Additional Remarks: The anchor bolts and chairs appear satisfactory.

RECOMMENDATIONS / SUMMARY

SCOPE OF WORK:

Conduct an assessment per WAC 173-303-640 (2), which is a tank system integrity assessment of an existing tank in accordance with the Washington State Dangerous Waste Regulations. An internal and external inspection & of the tank was done in conjunction with a nondestructive test method (ultrasonic thickness testing of the tank walls). A confined space entry into the tank per PSC safety procedures was performed by Conam Inspection. It should be noted that others are to conduct the formal structural design review and the formal corrosion assessment which are covered in WAC 173-303-640 (3).

BACKGROUND INFORMATION: Tank was under the designation of "permit by rule" but is being switched to a WAC 173-303-640 Dangerous Waste designation. 8 new anodes were installed just prior to our inspection of the tank.

SUMMARY

No noteworthy items to report: the tank appeared in good condition with no corrosion or degradation apparent. All ultrasonic thickness measurements were found to be acceptable and close to nominal. Attached structural calculations indicate that wall thickness of the shell is acceptable. The vent appears sized appropriately for this tank and there are no signs of over or under pressurization. The tank proper is fit for service.

RECOMMENDATIONS

1) Mark the tank with its tank number and contents per WAC 173-303-640 (5) (d)
2) Install overfill protection equipment to tank per WAC 173-303-640 (5) (b). For example: a liquid level gauge and a high level alarm would satisfy this subsection. Tank currently has a liquid level gauge, but doesn't have a high level alarm.
3) Coat secondary containment area to comply with WAC 173-303-640.
4) Conduct next WAC 173-303-640 (2) integrity assessment within 5 years.

Evaluated by:



George Roni, P.E.
API 653 Cert. No. 2042, Exp. 4/30/11

TANK CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."[1]

George Roni, P.E.



10/22/08

EXPIRES 3/31/09

1) Per WAC 173-303-810 as required by WAC 173-303-640 (2)

Conam Inspection has evaluated the condition of this tank based on the observations and measurements made by the tank Inspector. While our evaluation accurately describes the condition of the tank at the time of inspection, the tank owner/operator must independently assess the inspection information/report provided by Conam Inspection and any conclusions reached by the tank owner/operator and any action taken or omitted to be taken are the sole responsibility of the owner/operator. With respect to inspection and testing, Conam Inspection warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Conam Inspection shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the exclusive remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE SHALL APPLY, nor shall Conam Inspection be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Conam Inspection be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Conam Inspection or any associated damage to facilities, down-time costs or claims of other damages.

APPENDIX

References:

1) Washington State Department of Ecology, Dangerous Waste Regulations, Chapter 173-303 WAC
2) Previous Integrity Reports on the tank provided by the client
3) Tank Data Sheet provided by the client
4) Conversations with the client engineer, Tom Nelson
5) API RP 652, Lining of Above Ground Petroleum Storage Tanks
6) API RP 651, Cathodic Protection of Above Ground Storage Tanks
7) API Guide for the Inspection of Refinery Equipment – Chapter 13, Atmospheric and Low Pressure Tanks
8) API Standard 650, Welded Steel Tanks for Oil Storage
9) API Standard 653, Tank Inspection, Repair, Alteration, and Reconstruction
10) API Standard 620, Design and Construction of Large, Welded, Low Pressure Storage Tanks

Tank Data Sheet

RCRA-Regulated? Yes
Tank Location: **Kent**
Tank Number: **T-9A**
Process Description: **Storage of Dangerous Wastewaters**
Vessel Fluid: **Wastewater Containing Oil and/or Organic Compounds**
Specific Gravity: **<1.2** Freeboard At Working Vol (ft^3): **1'0**
Normal Operating Pressure (psig): **Atmospheric** Temperature (°F): **Ambient**

	Material	Thickness	Type
Bottom	**Carbon Steel**	**5/16" nominal**	**Cone**
Shell	**Carbon Steel**	**5/16" nominal**	**Cylindrical**
Head (ends)	**Carbon Steel**	**5/16" nominal**	**Cone**

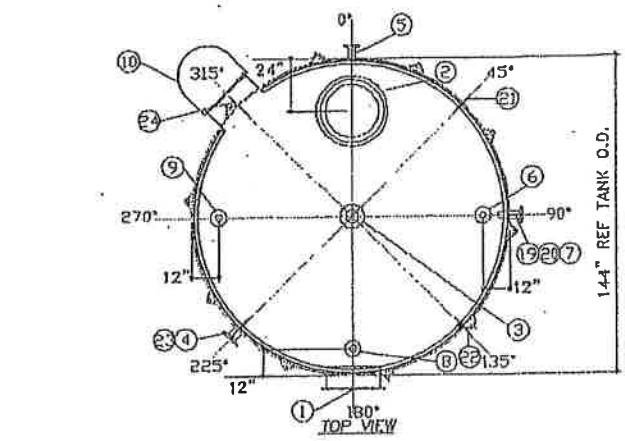
Working Volume (USG): **12,700**
Nominal Volume (USG): **13,500**
Tank I.D. (ft): **12' 0"**
Design Code Used: **Non-UL / IBC**
Anchorage: **Hold downs are seismic/wind rated**

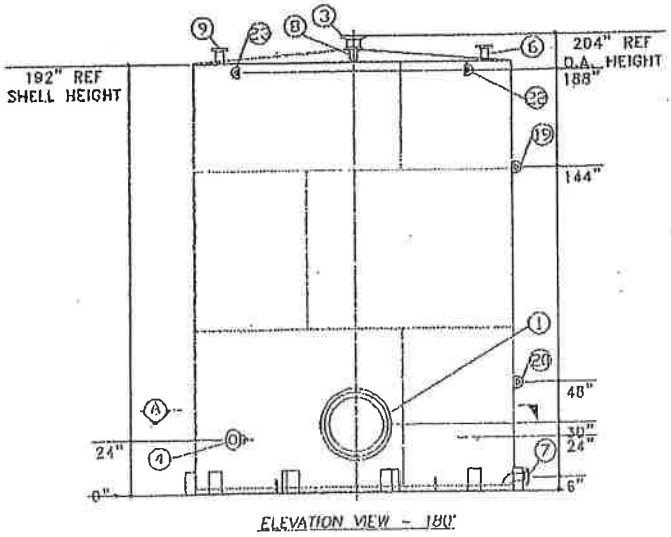
Insulation: **None**
Method of Construction: **Welded Steel**
Tank Height or Length (ft): **17' 0"**
Date in Service: **4/1/2006**

Connections

Item No.	Size (In.)	Description
1	**24"**	**Manway - side**
2	**24"**	**Manway - top**
3	~~6"~~ 10"	**Nozzle / 150#**
4	**4"**	**Nozzle / 150#**
5	**3"**	**Nozzle / 150#**
6	**3"**	**Nozzle / 150#**
7	**3"**	**Nozzle / 150#**
8	**3"**	**Nozzle / 150#**
9	**3"**	**Nozzle / 150#**
10		**Ladder**
11		
12		

Tank Sketch

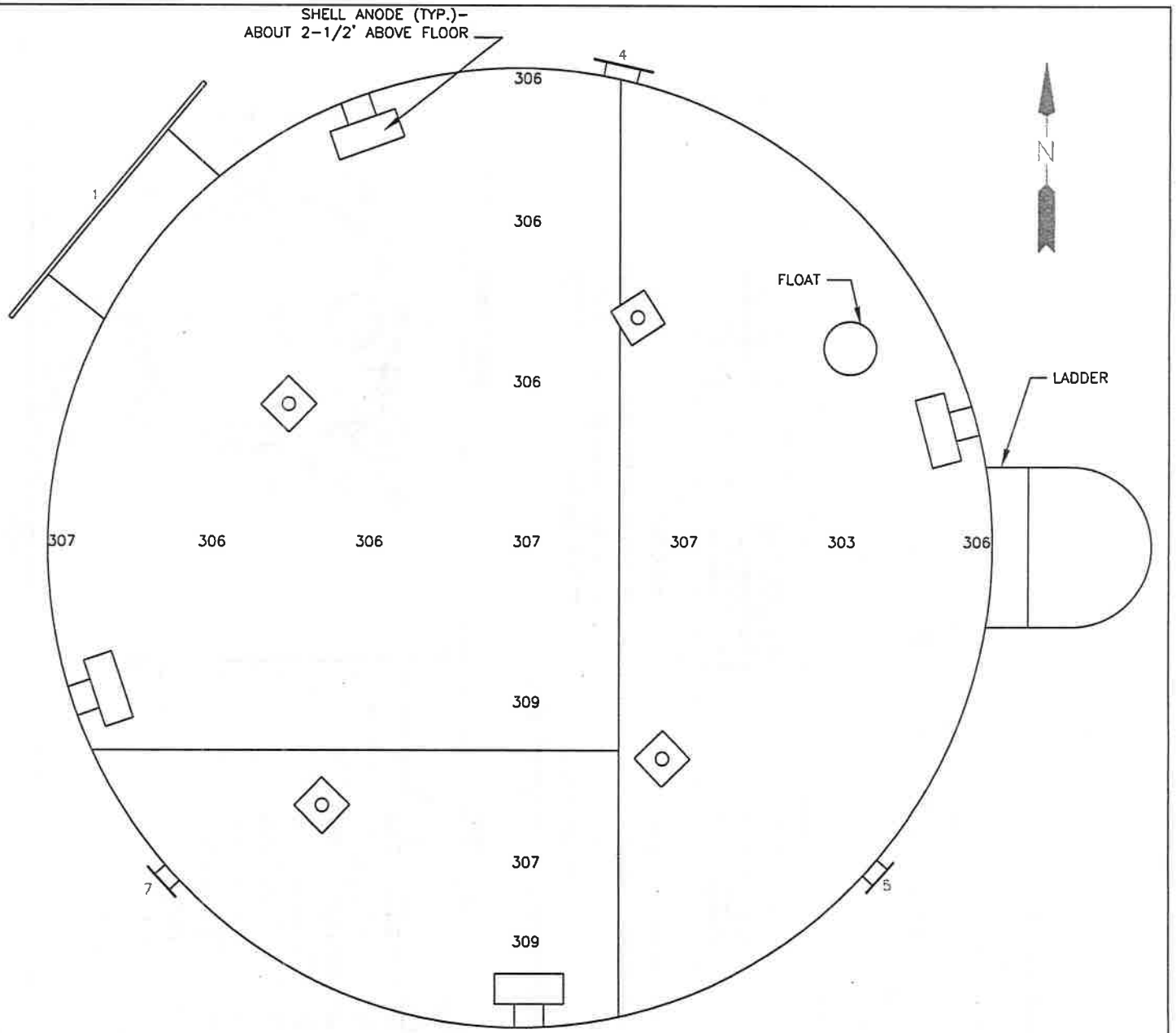




Interior Coating: **none**
Exterior Coating: **Tnemec 73 & 66 (Polyurethane over Enamel)**
Tank Manufacturer: **Busby Marine and Tank**
Year Manufactured: **2006**

Remarks:
Cathodic protection provided zinc or magnesium anodes as recommended by certifying engineer.

TANK BOTTOM PLAN

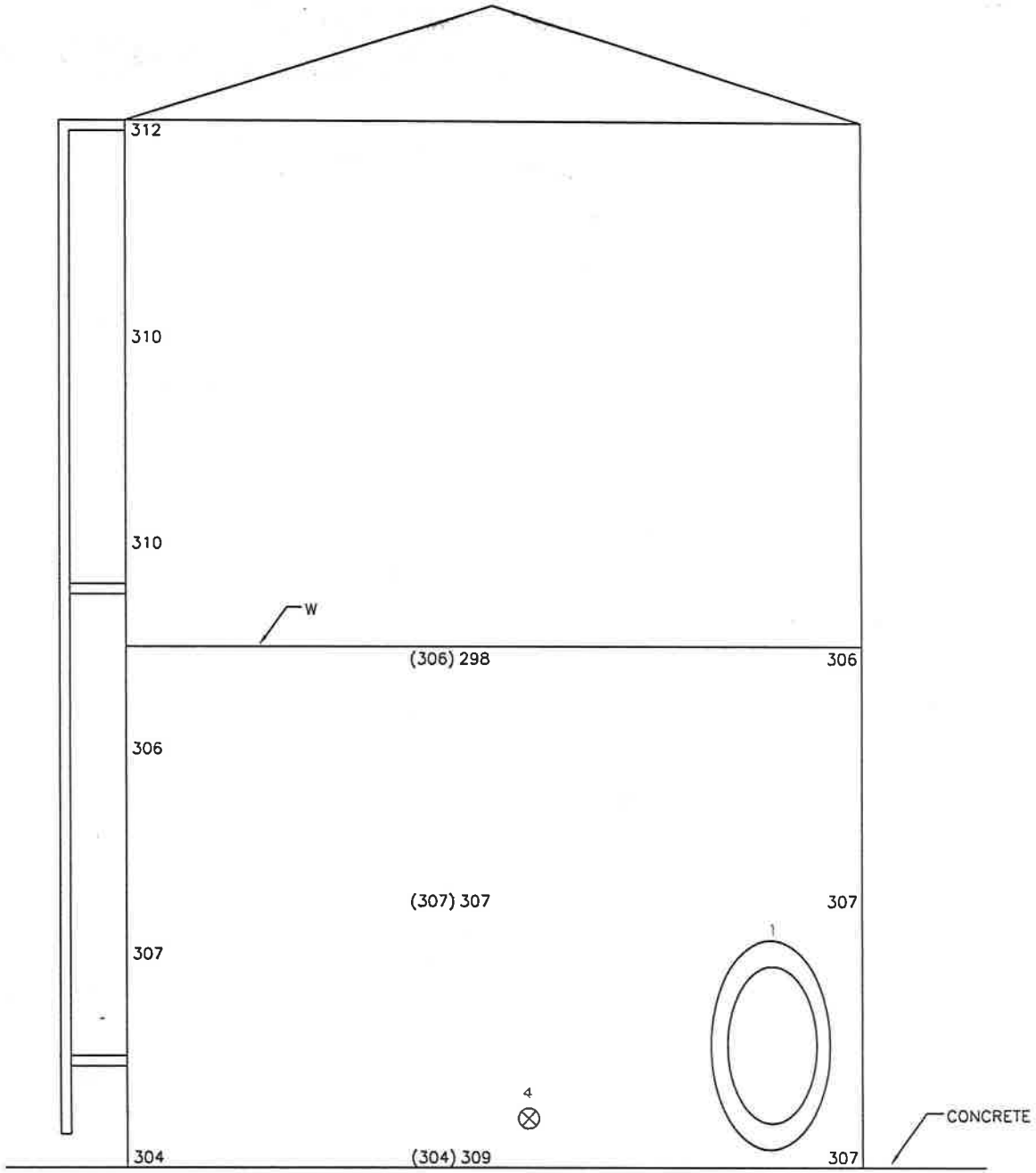


NOTES:

XXX AN ULTRASONIC THICKNESS MEASUREMENT IN THOUSANDTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

CUSTOMER: PSC	SHELL HEIGHT: 16'-0" DIAMETER: 12'-0"	INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9A-B	7820 S 210th Street, Building Suite 110
TANK NUMB 9A	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	KENT, WA 98032
PRODUCT: WASTE WATER	REPORT NUMBER: 169597-1		

TANK ELEVATION PLAN
NORTH SIDE



NOTES:

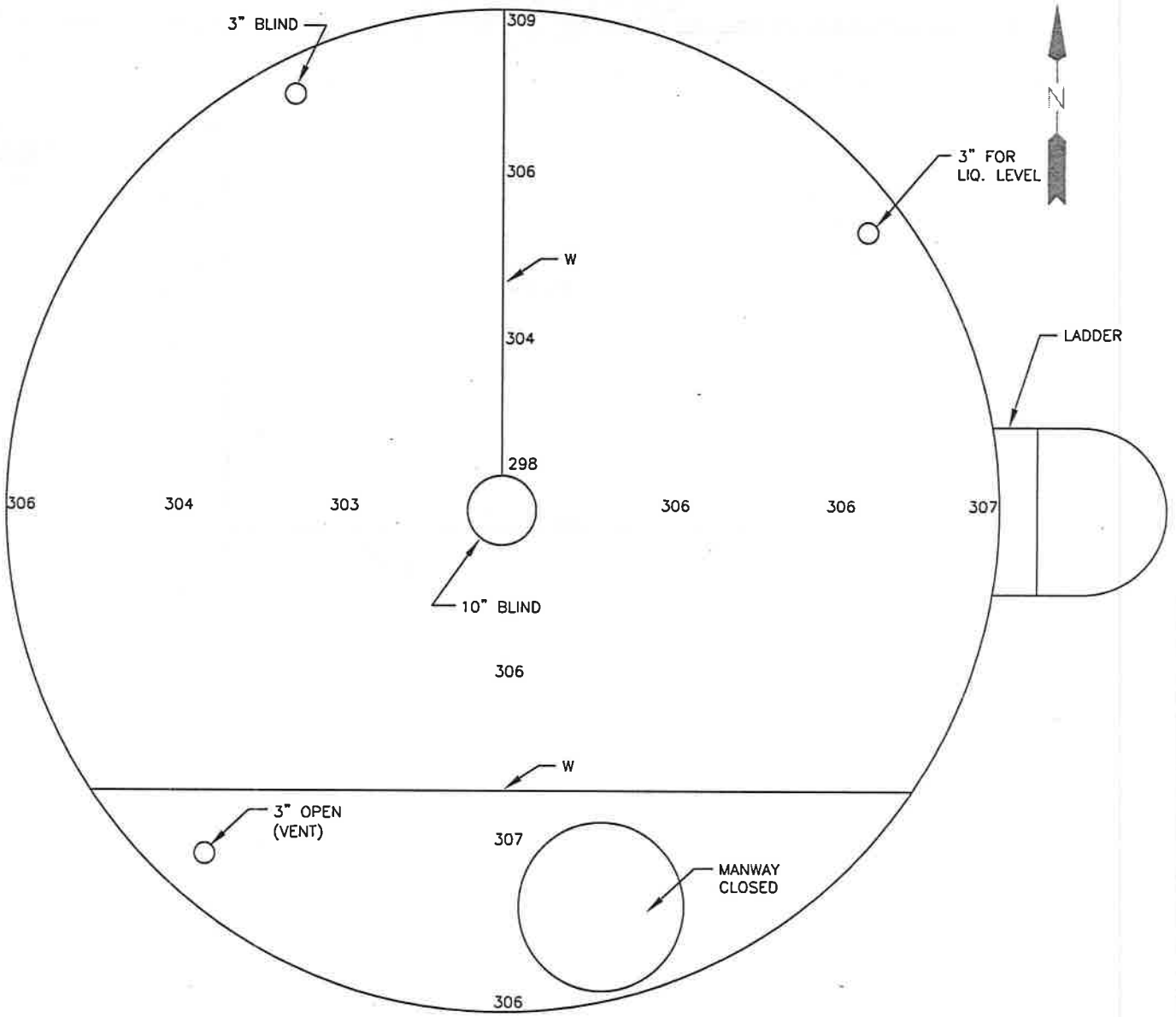
XXX AN ULTRA SONIC THICKNESS MEASUREMENT IN THOUSANTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

(XXX) HIDDEN OR SOUTH SIDE UT.

NO.	SIZE	TYPE	REPAD TYPE	UT			
				TOP	RIGHT	BOTTOM	LEFT
1	24"	MANWAY	NONE	241	243	241	246
4	4"	NOZ. & VLV.	NONE	334	337	325	323
5	3"	NOZ. & VLV.	NONE	281	300	281	309
7	3"	NOZ. & VLV.	NONE	301	314	282	304

CUSTOMER: PSC	SHELL HEIGHT: 16'-0" DIAMETER: 12'-0"	INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9A-E	
TANK NUMBER: 9A	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	7820 S 210th Street, Building C, Suite 110 KENT, WA 98032
PRODUCT: WASTE WATER	REPORT NUMBER: 169597-1		

TANK ROOF PLAN

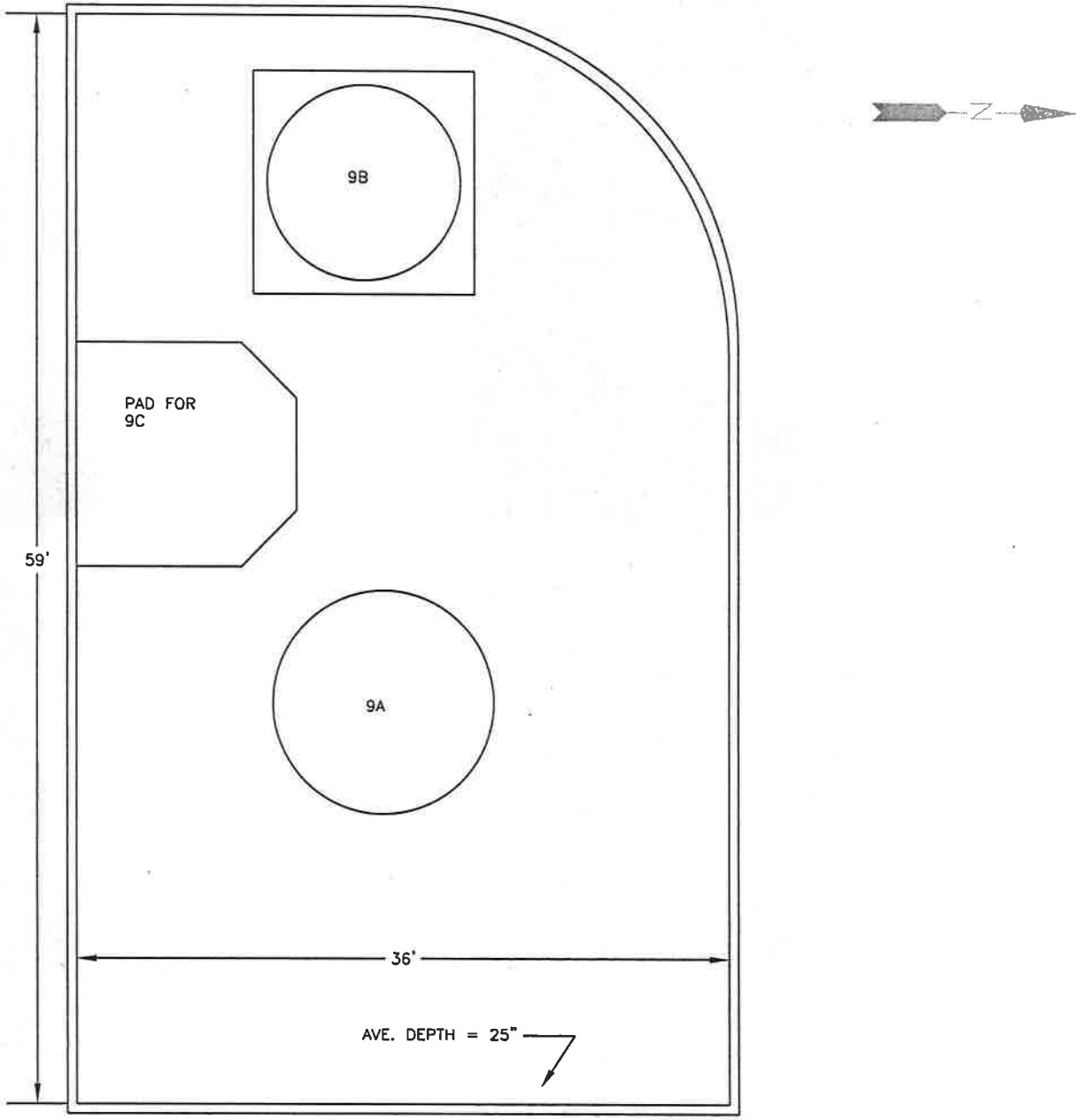


NOTES:

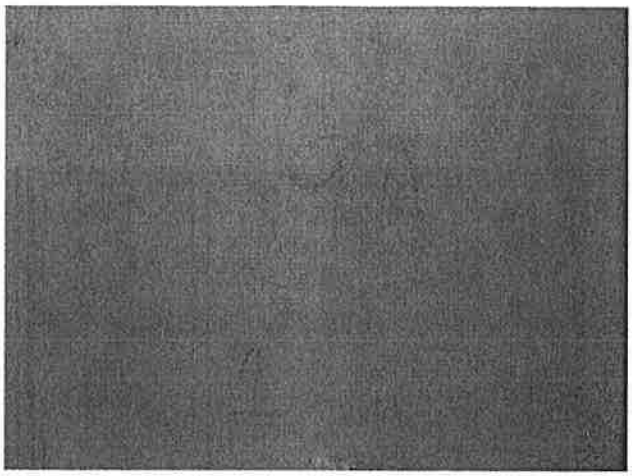
XXX AN ULTRASONIC THICKNESS MEASUREMENT IN THOUSANDTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

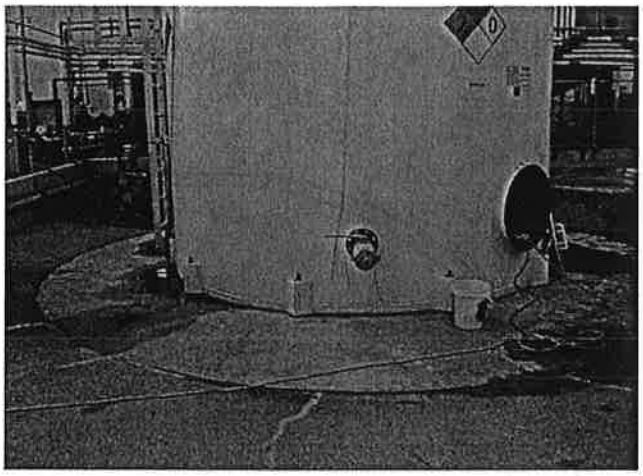
CUSTOMER: PSC	SHELL HEIGHT: 16'-0" DIAMETER: 12'-0"	INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9A-R	7820 S 210th Street, Building Suite 110
TANK NUMB 9A	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	KENT, WA 98032
PRODUCT: WASTE WATER	REPORT NUMBER: 169597-1		

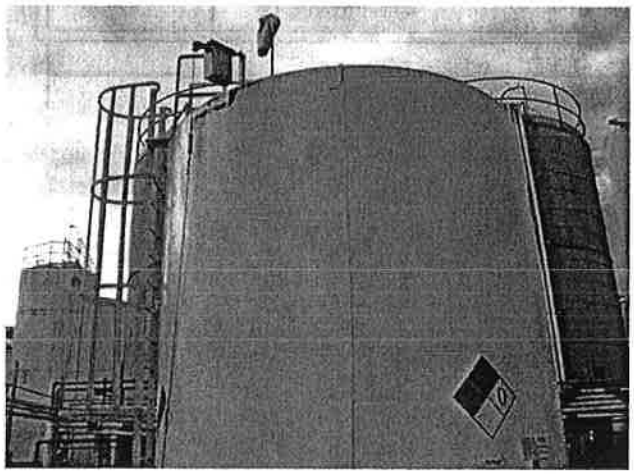
PLAN VIEW OF TANK 9A, 9B, 9C

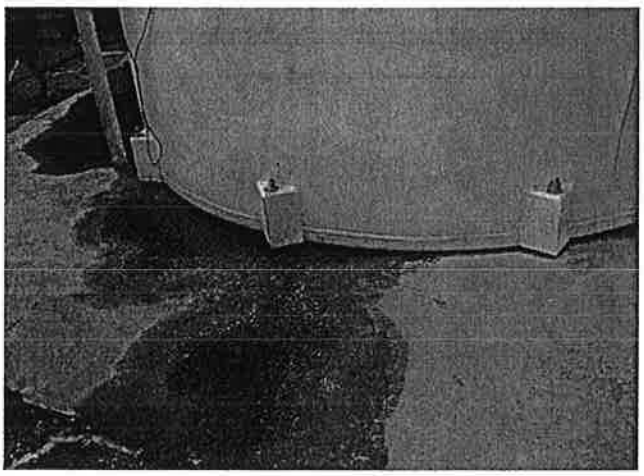


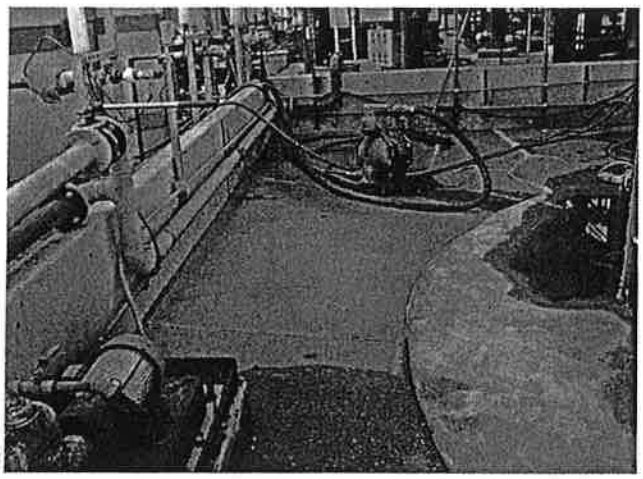
CUSTOMER: PSC		INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9A-9B-9C	7820 S 210th Street, Building C, Suite 110 Kent, WA 98032
TANK NUMBER: 9A, 9B, 9C	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	

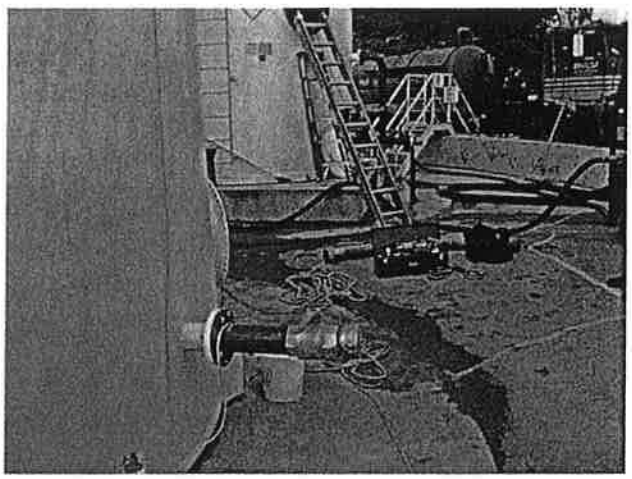


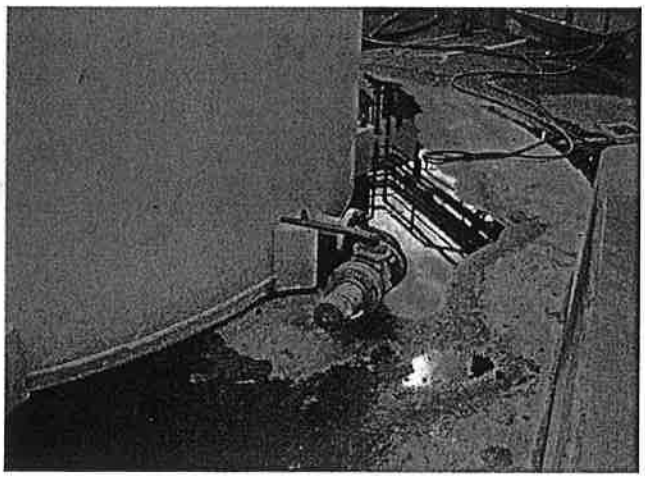


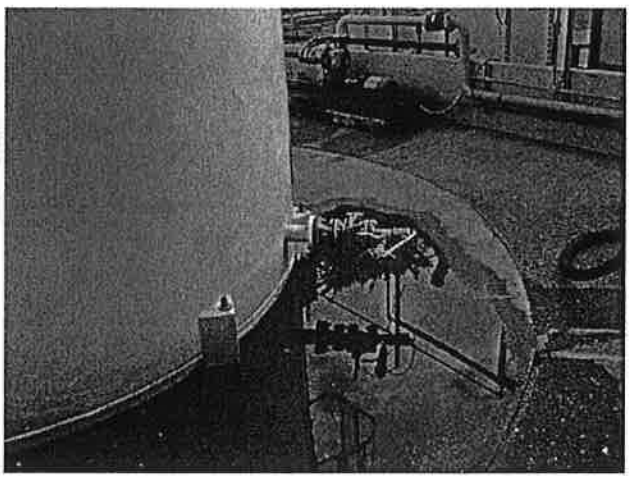


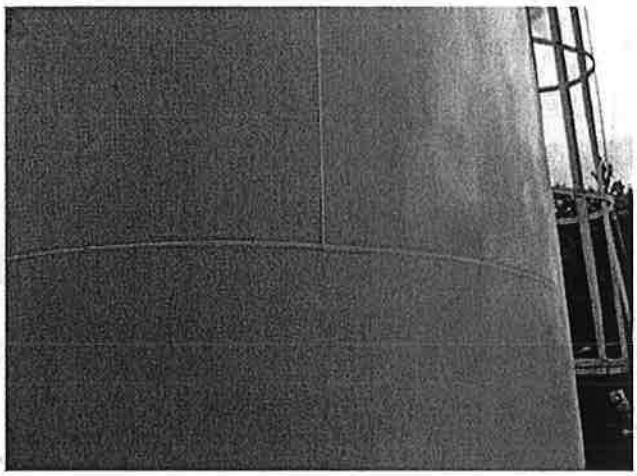






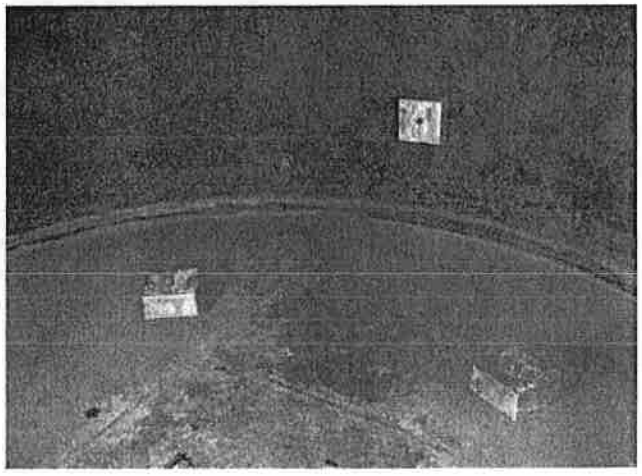


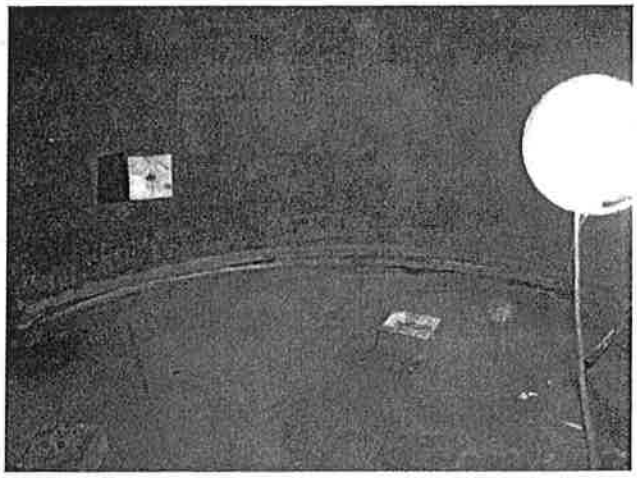


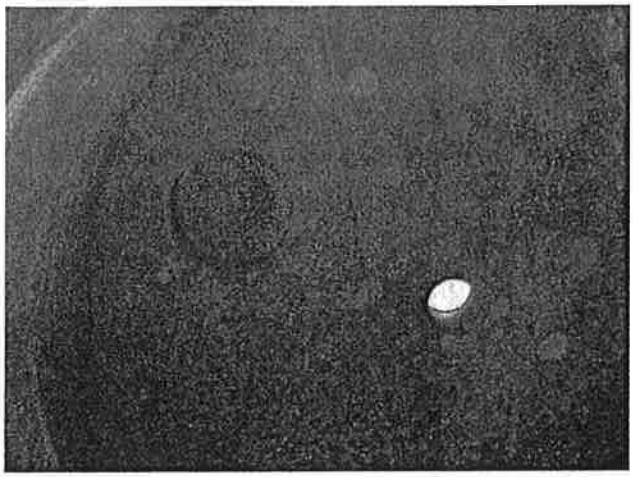


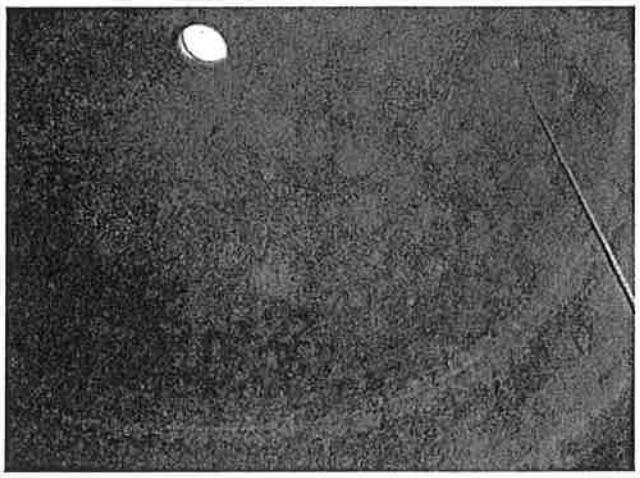


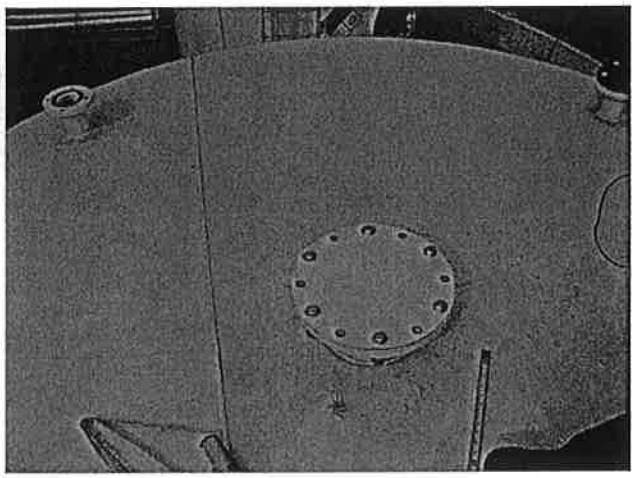


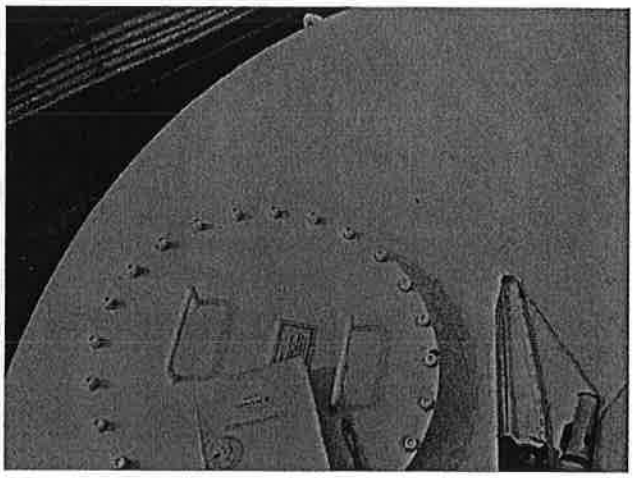


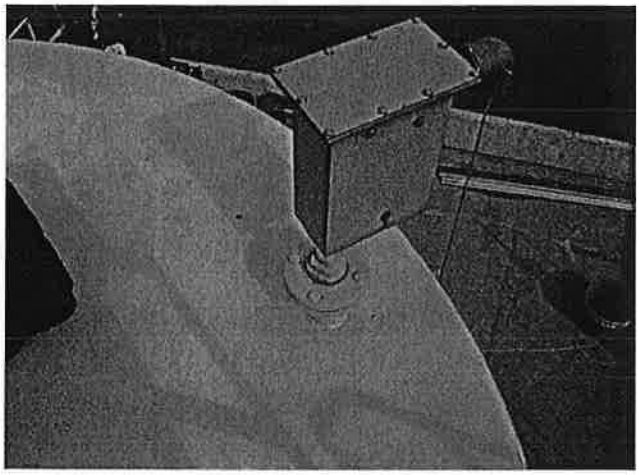


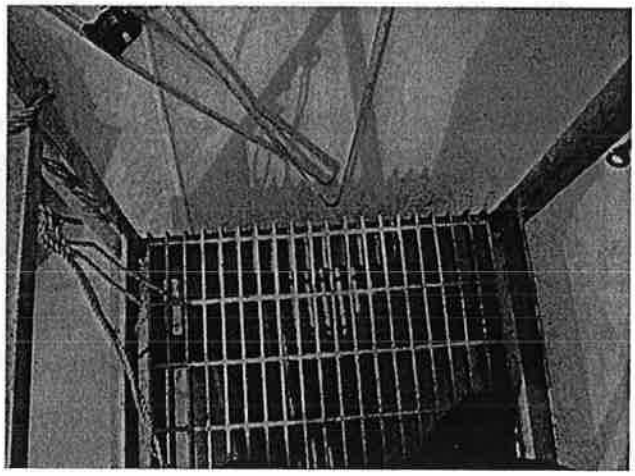












SHELL THICKNESS CALCULATIONS

PER API 653, THIRD EDITION, DECEMBER 2001, ADDENDUM 2, NOVEMBER 2005

tmin = 2.6*D*(H-1)*G / S*E

tmin — The minimum allowable shell thickness for each course, at least 0.1".

Max. Fill Height		16.000	ft	Capacity of tank (42 gal barrels) =	322	bbl based on max fill height
Total Height of Shell		16.000	ft	Capacity of tank (42 gal barrels) =	322	bbl based on shell height
Diameter	D	12.000	ft			
Gravity	G	1.2000	Highest specific gravity of the contents			
Yield Str.	Y	36,000	30,000 if unknown, or if known use the specified min. yield strength.			psi
Tensile	T	58,000	55,000 if unknown, or if known use the smaller of 80,000 and			psi
			the specified min. yield strength.			

Course No.	1 and 2	3 and above
S1 shall equal	28800	31680 psi
S2 shall equal	24882	27376 psi
S shall = the least of S1 & S2	24882	27376 psi

E = the joint efficiency. May use 1.0 when evaluating retirement thickness in corroded plate when away from weld by at least the greater or 1 inch or twice the plate thickness. See API 653 Table 4-2 or for riveted tanks Table 4-3.

If there are large corroded or locally thinned areas < tmin, the following procedure shall be used:

For each area under consideration, t2 shall be determined where t2 is the low thickness in the thinned area exclusive of widely scattered pitting. Then the vertical corrsion plane length, L, shall be computed where L = 3.7* SqRt(D*t2), but not > 40". At least 5 equally spaced readings are taken over length L are averaged. This average is defined as t1.

The acceptance criteria is that t1 shall be > or = tmin and t2 shall be > or equal to 60% of tmin

For a 1st cut analysis all readings per course are compared to each respective tmin. If all are > tmin, then the shell is acceptable and the 5 corrosion plane readings are not needed.

Shell Course No.	THE READINGS USED TO FIND t1 & t2						t1	t2	L	
1	0.298						0.298	0.298	7	
2	0.31						0.310	0.310	7	

Shell Course No.	Course Height (ft)	E	H (ft)	S	t min.	t1	t2	t1> tmin ?	t2>0.60* tmin?	Shell Course Acceptable? (Y/N)	Remaining CA
1	8.0000	0.70	16.0000	24,882	0.100	0.298	0.298	TRUE	TRUE	yes	0.198
2	8.0000	0.70	8.0000	24,882	0.100	0.310	0.310	TRUE	TRUE	yes	0.210

Note: Remaining corrosion allowance is based on t2. All shell thickness readings and t1, t2, tmin are in inches.

Shell Pitting Evaluation

Acceptance Criteria

1) No pit shall result in remaining shell thickness being < 1/2 of tmin exclusive of the corrosion allowance, and

2) The sum of their dimensions along any vertical line does not ecxeed 2 inches in any 8 inch length.

Shell Course No.	t min.	Measured or Estimated Pit Depths (in.) A	B	C	D	E	Local wall	Remaining wall =local - max pit	1/2*tmin	Acceptable?
1	0.100						0.298	0.298	0.050	yes
2	0.100						0.310	0.310	0.050	yes

Conclusions

Tank may be filled to full capacity with the current product or a lighter product based on the above calculations.

TANK

INTEGRITY ASSESSMENT

REPORT

for

Tank No. 9B
PSC
Kent, Washington

Report Number: 169597-2
Inspection Date: 8/21/08

TABLE OF CONTENTS

SECTION	PAGE
Equipment Data Sheet	3
Introduction and Tank History	4
Primary Tank, Secondary Containment	5
Tank Externals	5
Recommendations / Summary	7
Tank Certification	8
APPENDIX:	
References	
Client Provided Tank Data Sheet	
Drawings	
Photographs	
Calculations	
Nondestructive Test Report of Repairs	

EQUIPMENT DATA SHEET

Tank No.	9B	**Building No.**	
Site	Tacoma	**Door**	
Location (Inside or Outside)	Outside	**Column**	

TANK CHARACTERISTICS

Contents	Waste Water	**NFPA Hazard Rating**	Yes, 2, 1, 0
Nominal capacity in gallons	12,100	**Primary Regulatory Class**	WAC 173-303-640
Year Installed	2006	**Material of Construction**	Steel
Style	Single wall	**Orientation**	Vertical
Primary Wall Thickness	5/16"	**Minimum Allowable Thickness**	0.1
Internal Coating	No (has internal anodes instead)	**External Coating**	Yes
Shell Height	18', not including the cone bottom	**Length**	N/A
Internal Diameter	10'-6"	**Tank Shape**	Cylindrical shell, cone bottom supported above grade.

SECONDARY CONTAINMENT

Type	Diked area	**Leak Detection**	
Material	Concrete	**Thickness**	
Internal Coating	None currently	**External Coating**	
Internal Height		**Internal Length**	
Internal Width		**Capacity in gallons**	Greater than 110% of largest tank in diked area.

PIPING

Type	Single wall	**Above/Underground**	Above
Material	Steel	**Nominal Diameter(s)**	3", 4"
Internal Coating	No	**External Coating**	Paint
Connections	Welded	**Fittings**	Tees, Ells

EQUIPMENT

Type of Level Gauge	Mechanical float and level board.	**Pressure/Vacuum Relief Valve**	No
Type of Overfill	None	**Spill Prevention**	Vault
High Level Alarm	No	**Set Point**	N/A
Feed Pump Cutoff	Unknown	**Set Point**	Unknown

Note: this equipment data sheet was compiled by Conam Inspection, see Appendix for client provided tank data sheet.

INTRODUCTION & HISTORY

Client: PSC **Type of Assessment:** WAC 173-303-640, existing tank

Date Inspected: 8/21/08 **Inspected by:** George Roni, PE & Byron Johnson - technician

Built by: Busby Marine & Tank

Other Name Plate Data: UL Tank

Last Cleaned by: PSC

Date of Last Cleaning: August 2008

Last Painted by: Busby Tank **Date of Last Painting:** 2006

Number of Coats: Unknown **Color:** White

Foundation Type & Condition: Tank is supported above grade by a steel skirt and is anchored to a concrete pad, which appears in satisfactory condition. 8 anchors, 1" diameter anchor bolts double nutted with chairs. Galvanized steel bolts bonded into the concrete pad.

Settlement Observed: None observed.

Major Repairs or Alterations: None observed or reported by the client representative.

Additional Remarks:

During the current assessment described in this report the exterior (and the interior) of the tank system was visually inspected for weld breaks, cracks, punctures, coating damage, and other inadequate construction or installation procedures. The tank was entered (after it was verified safe for entry) to assess the condition of the interior surfaces and parts. A half-mask respirator was worn by the inspector as required by PSC safe entry protocol.

PRIMARY TANK:

Condition of Tank Bottom: Floor has no observable significant corrosion or pitting. A light surface coating of rust observed on the floor of this cone down bottom tank. The underside of the tank bottom was inspected and found to be in satisfactory condition and the paint was still in good condition.

Condition of Tank Shell: Shell has no significant corrosion or pitting. The steel surfaces appeared in satisfactory condition.

Condition of Internal Coating: None.

Condition of Welds: The tank bottom butt welds appear visually acceptable. The tank bottom-to-shell weld has two short lengths (each about 3" long) on the interior that were observed to have lack of fill. These areas were marked on a drawing and the tank for repair. This weld appeared in good condition except for these original welding flaws.

The vertical shell joints are butt welded. The shell horizontal joints are fitted and lapped and welded on the outside. All welds appeared satisfactory. The roof lap welds also appear satisfactory.

Condition of Other Internals: New anodes appear in good condition.

Visible Distortions to Tank Shell or Heads? We did some magnetic particle testing to bulged area of butt welds in the floor near the shell and no cracks were found.

Additional Remarks: Liquid level float appears in good condition.

SECONDARY CONTAINMENT:

Description: Diked area for several tanks including 9A, 9B, and 9C – in the future.

Condition of Walls or Plates: Concrete walls and floor, not coated.

Condition of Joints or Welds: Not inspected. No water stops in concrete joints.

Visible Distortions to Walls or Plates: None observed.

Additional Remarks: None.

TANK EXTERNALS:

Condition of Paint and/or Insulation: The floor, shell and roof paint is in satisfactory condition.

Condition of Valves and Nozzles: Appear satisfactory with acceptable ultrasonic thickness readings. No repads on nozzles.

Condition of Piping and Ancillary Equipment: Satisfactory.

Condition of Piping Supports/Hangers: Satisfactory.

Condition of Liquid Level Gauge: The liquid level board, liquid level float and guide wires appear satisfactory.

Condition of External Ladder/Stairs: The caged ladder appears straight and structurally sound.

Venting: The tank is equipped (on the roof) with one 3 inch open nozzle, which serves as a vent.

Additional Remarks: The anchor bolts and chairs appear satisfactory.

RECOMMENDATIONS / SUMMARY

SCOPE OF WORK:

Conduct an assessment per WAC 173-303-640 (2), which is a tank system integrity assessment of an existing tank in accordance with the Washington State Dangerous Waste Regulations. An internal and external inspection & of the tank was done in conjunction with a nondestructive test method (ultrasonic thickness testing of the tank walls). A confined space entry into the tank per PSC safety procedures was performed by Conam Inspection. It should be noted that others are to conduct the formal structural design review and the formal corrosion assessment which are covered in WAC 173-303-640 (3).

BACKGROUND INFORMATION: Tank was under the designation of "permit by rule" but is being switched to a WAC 173-303-640 Dangerous Waste designation. 8 new anodes were installed just prior to our inspection of the tank.

SUMMARY

Two short lengths (each about 3" long) of the shell-to-bottom weld on the interior were observed to have lack of fill. These areas were marked on a drawing and the tank for repair. The tank appeared in good condition except for these original welding flaws.

RECOMMENDATIONS

1) Deposit weld metal to the two weld flaws mentioned above.
2) Test the weld repairs with dry magnetic particle testing.
3) Mark the tank with its tank number and contents per WAC 173-303-640 (5) (d)
4) Install overfill protection equipment to tank per WAC 173-303-640 (5) (b). For example: a liquid level gauge and a high level alarm would satisfy this subsection. Tank currently has a liquid level gauge, but doesn't have a high level alarm.
5) Coat secondary containment area to comply with WAC 173-303-640.
6) Conduct next WAC 173-303-640 (2) integrity assessment within 5 years.

On 8/27/08 Conam Inspection returned to this tank and inspected the 2 repairs made to the shell-to-bottom weld interior (item 1 above) visually and with magnetic particle testing and found the repairs acceptable. A report of this work is in the Appendix. Prior to the repairs, we interviewed the welder about his procedure and credentials and found them to be acceptable to do the recommended work. Therefore the hot work repairs are acceptable.

Evaluated by:

George Roni

George Roni, P.E.
API 653 Cert. No. 2042, Exp. 4/30/11

TANK CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."[1]

George Roni

George Roni, P.E.



10/22/08

EXPIRES 3/31/09

1) Per WAC 173-303-810 as required by WAC 173-303-640 (2)

Conam Inspection has evaluated the condition of this tank based on the observations and measurements made by the tank Inspector. While our evaluation accurately describes the condition of the tank at the time of inspection, the tank owner/operator must independently assess the inspection information/report provided by Conam Inspection and any conclusions reached by the tank owner/operator and any action taken or omitted to be taken are the sole responsibility of the owner/operator. With respect to inspection and testing, Conam Inspection warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Conam Inspection shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the exclusive remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE SHALL APPLY, nor shall Conam Inspection be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Conam Inspection be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Conam Inspection or any associated damage to facilities, down-time costs or claims of other damages.

APPENDIX

References:

1) Washington State Department of Ecology, Dangerous Waste Regulations, Chapter 173-303 WAC
2) Previous Integrity Reports on the tank provided by the client
3) Tank Data Sheet provided by the client
4) Conversations with the client engineer, Tom Nelson
5) API RP 652, Lining of Above Ground Petroleum Storage Tanks
6) API RP 651, Cathodic Protection of Above Ground Storage Tanks
7) API Guide for the Inspection of Refinery Equipment – Chapter 13, Atmospheric and Low Pressure Tanks
8) API Standard 650, Welded Steel Tanks for Oil Storage
9) API Standard 653, Tank Inspection, Repair, Alteration, and Reconstruction
10) API Standard 620, Design and Construction of Large, Welded, Low Pressure Storage Tanks

Tank Data Sheet

RCRA-Regulated? **Yes**
Tank Location: **Kent**
Tank Number: **T-9B**
Process Description: **Treatment/Storage of Dangerous Wastewaters**
Vessel Fluid: **Wastewater Containing Oil and/or Organic Compounds**
Specific Gravity: **<1.2** Freeboard At Working Vol (ft^3): **1'0**
Normal Operating Pressure (psig): **Atmospheric** Temperature (°F): **Ambient**

	Material	Thickness	Type
Bottom	**Carbon Steel**	**5/16" nominal**	**Cone**
Shell	**Carbon Steel**	**5/16" nominal**	**Cylindrical**
Head (ends)	**Carbon Steel**	**5/16" nominal**	**Cone**

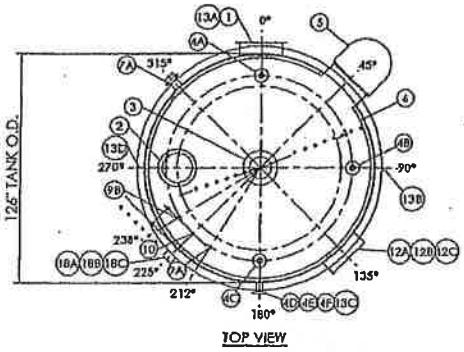
Working Volume (USG): **11,400**
Nominal Volume (USG): **12,100**
Tank I.D. (ft): **10' 6"**
Design Code Used: **Non-UL / IBC**
Anchorage: **Hold downs are seismic/wind rated**

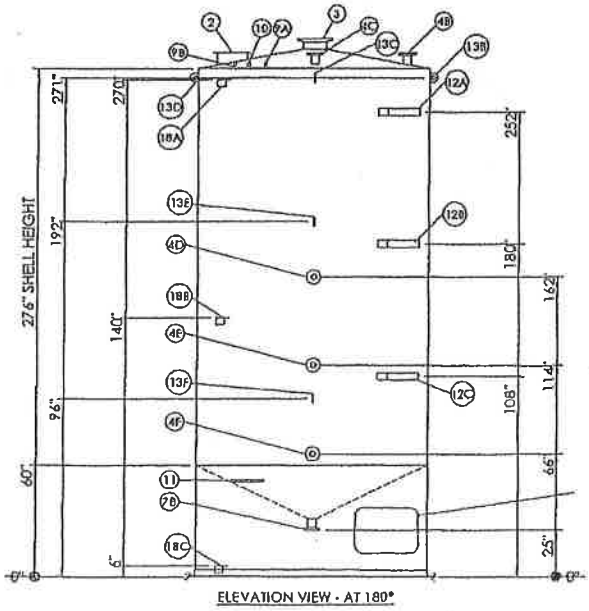
Insulation: **None**
Method of Construction: **Welded Steel**
Tank Height or Length (ft): **24' 0"**
Date In Service: **9/1/2006**

Connections

Item No.	Size (In.)	Description
1	**24"**	**Manway**
2	**16"**	**Manway**
3	**12"**	**Nozzle / 150#**
4	**3"**	**Nozzles / 150#**
5		**Ladder**
6		**Handrail**
7	**4"**	**Nozzles / 150#**
8		
9	**1 ¼"**	**Threaded Nipples**
10	**1"**	**Threaded Coupling**
11		**Gauge Anchor Bar**
12		**Pipe Brackets**

Tank Sketch

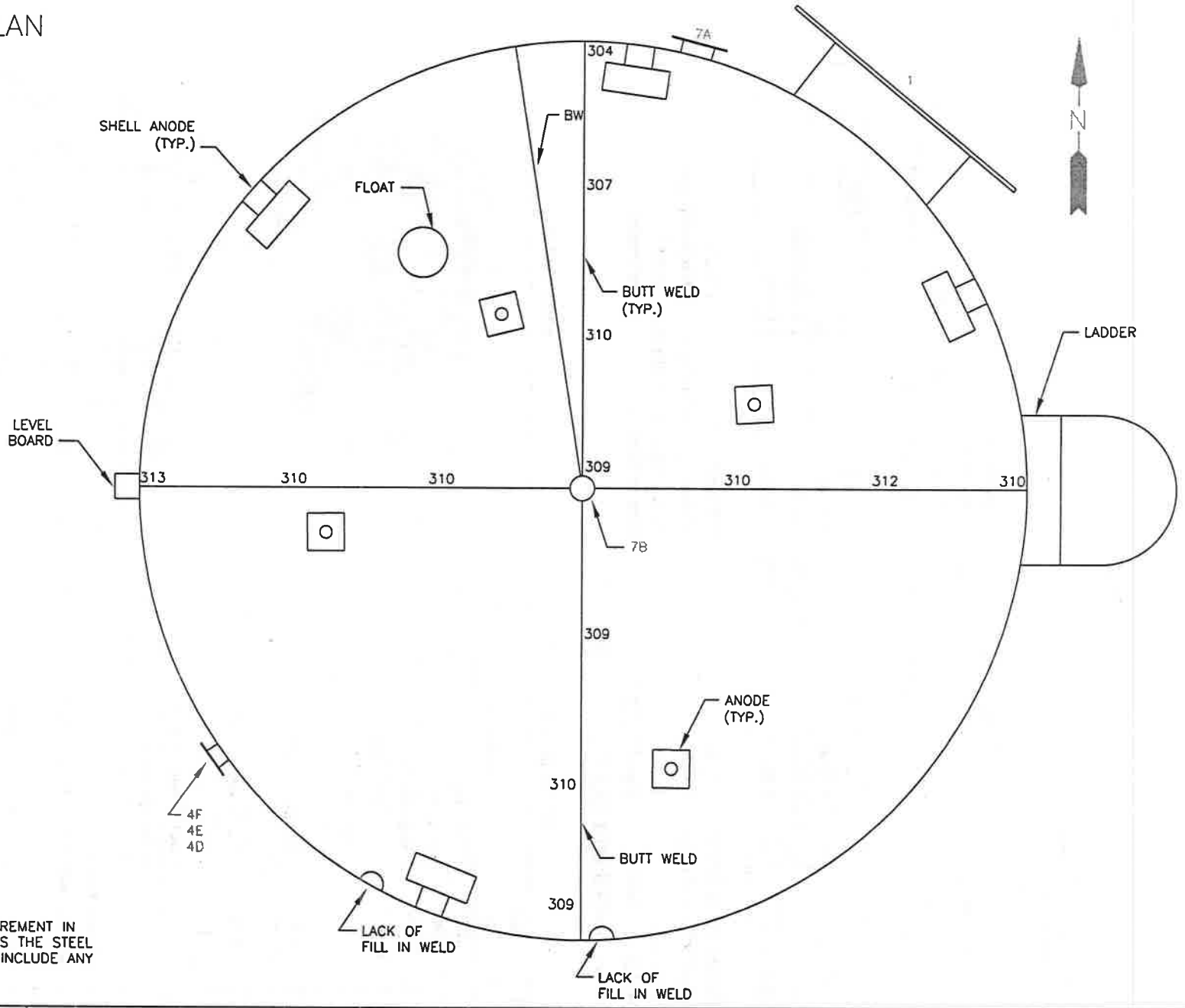




Interior Coating: **none**
Exterior Coating: **Tnemec 73 & 66 (Polyurethane over Enamel)**
Tank Manufacturer: **Busby Marine and Tank**
Year Manufactured: **2006**

Remarks:
Cathodic protection provided by zinc or magnesium anodes as recommended by certifying engineer.

TANK BOTTOM PLAN

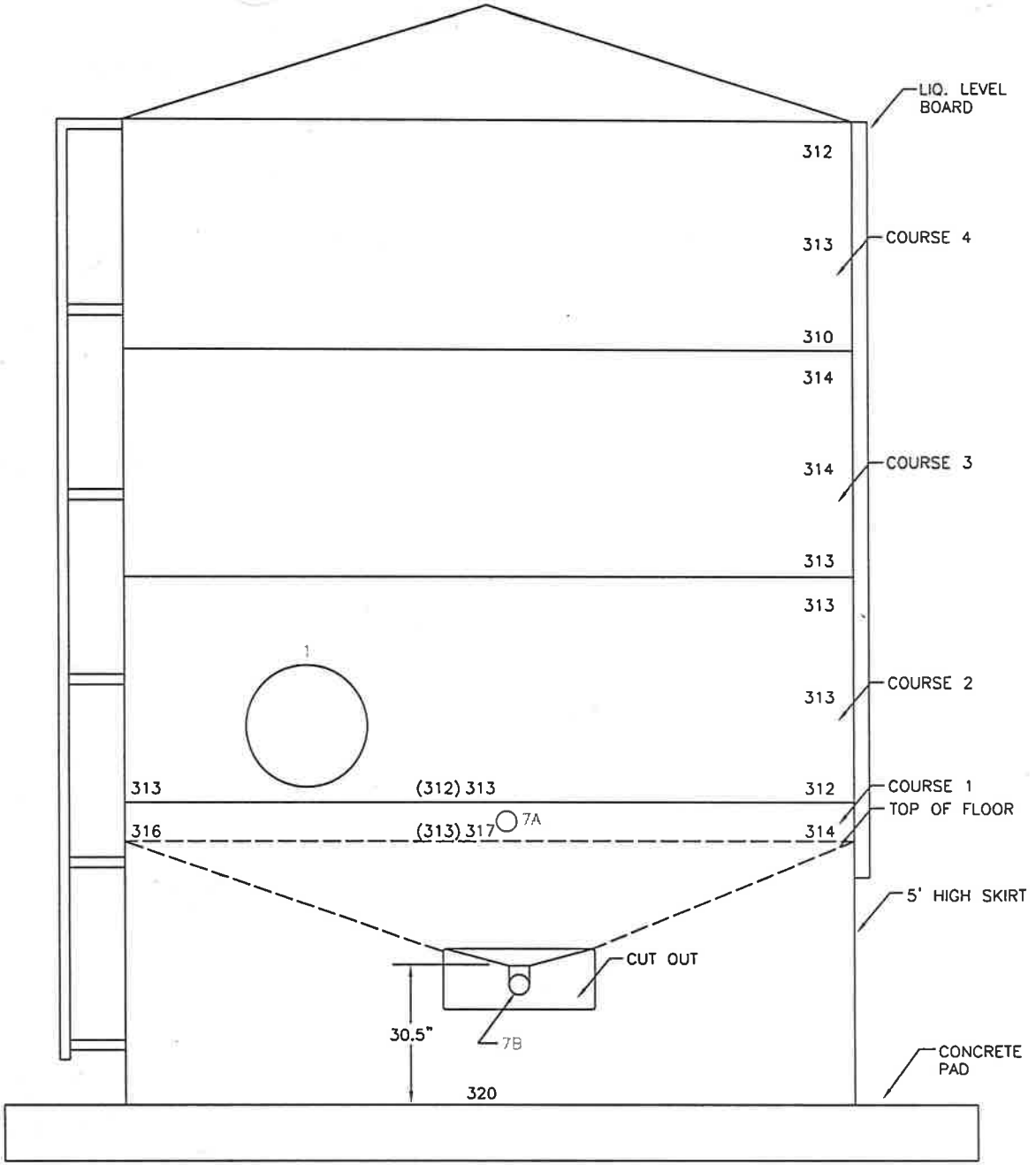


NOTES:

XXX AN ULTRASONIC THICKNESS MEASUREMENT IN THOUSANDTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

CUSTOMER: PSC	SHELL HEIGHT: 18'-0" DIAMETER: 10'-6"	INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9B-B	7820 S 210th Street, Building Suite 110
TANK NUME 9B	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	KENT, WA 98032
PRODUCT: WASTE WATER	REPORT NUMBER: 169597-2		

TANK ELEVATION PLAN
NORTH SIDE



NOTES:

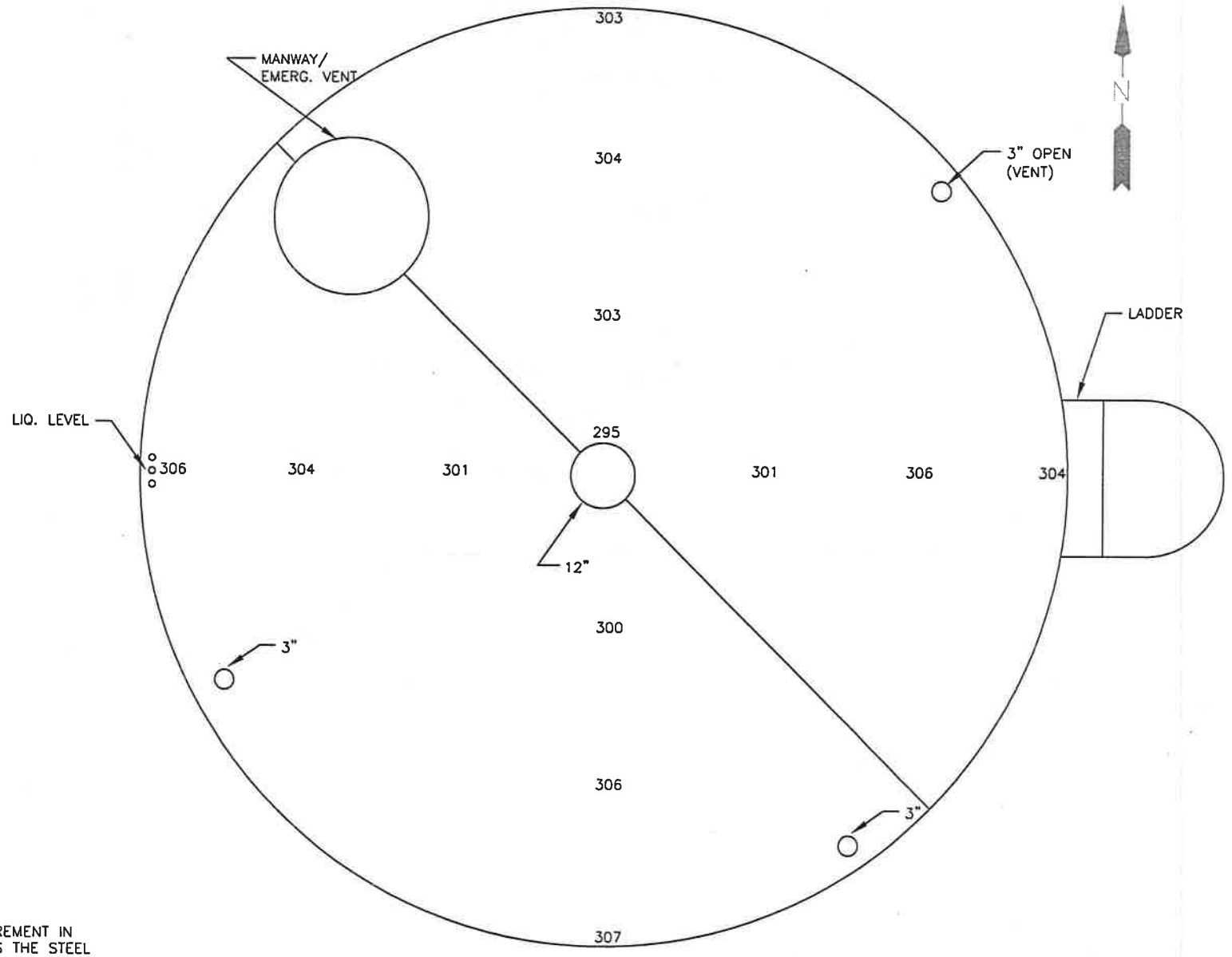
XXX AN ULTRA SONIC THICKNESS MEASUREMENT IN THOUSANTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

(XXX) HIDDEN OR SOUTH SIDE UT.

NO.	SIZE	TYPE	REPAD TYPE	UT			
				TOP	RIGHT	BOTTOM	LEFT
1	24"	MANWAY	NONE	246	243	246	244
7A	4"	NOZ.	NONE	339 N	341 S	322 E	335 W
7B	4"	NOZ.	NONE	354	388	357	325
4F	3"	NOZ.	NONE	197	196	196	183

CUSTOMER: PSC	SHELL HEIGHT: 18'-0" DIAMETER: 10'-6"	INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9B-E	7820 S 210th Street, Building C, Suite 110 KENT, WA 98032
TANK NUMBER: 9B	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	
PRODUCT: WASTE WATER	REPORT NUMBER: 169597-2		

TANK ROOF PLAN

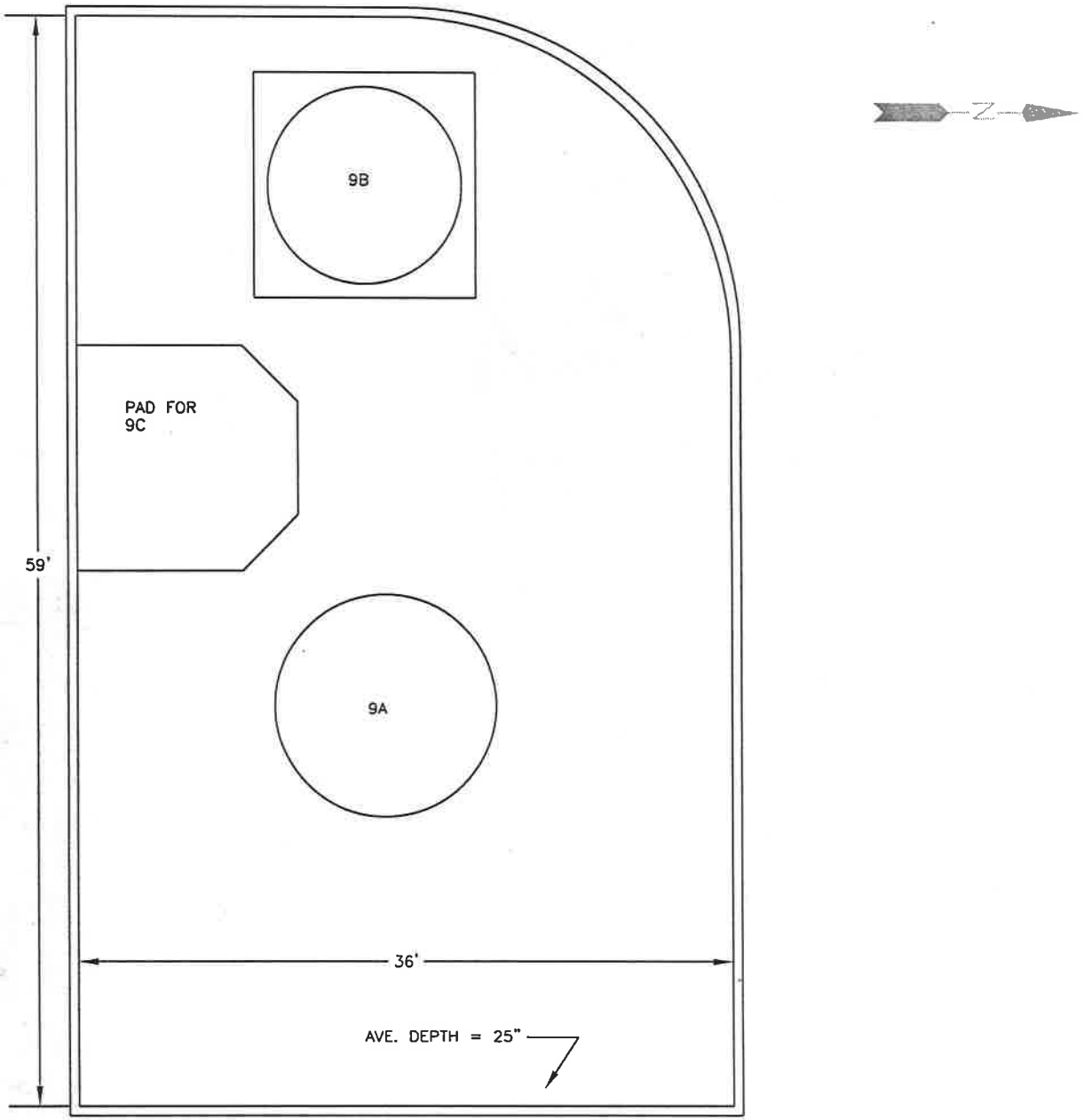


NOTES:

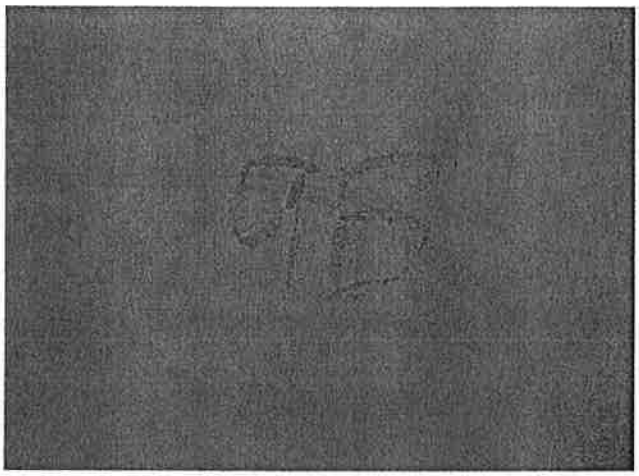
XXX AN ULTRASONIC THICKNESS MEASUREMENT IN THOUSANDTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

CUSTOMER: PSC	SHELL HEIGHT: 18'-0" DIAMETER: 10'-6"	INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9B-R	7820 S 210th Street, Building Suite 110
TANK NUMB 9B	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	KENT, WA 98032
PRODUCT: WASTE WATER	REPORT NUMBER: 169597-2		

PLAN VIEW OF TANK 9A, 9B, 9C

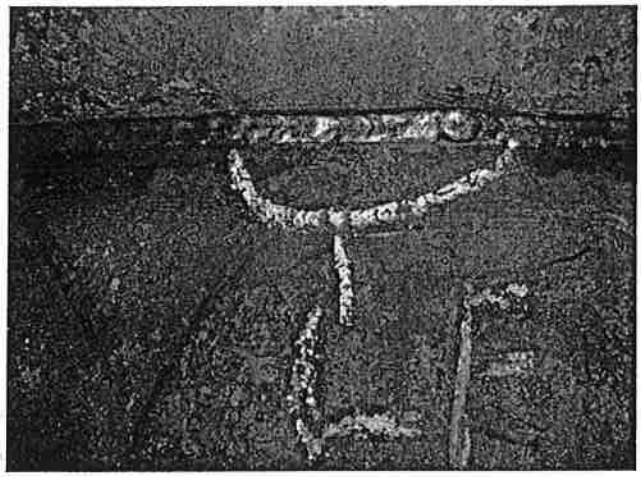


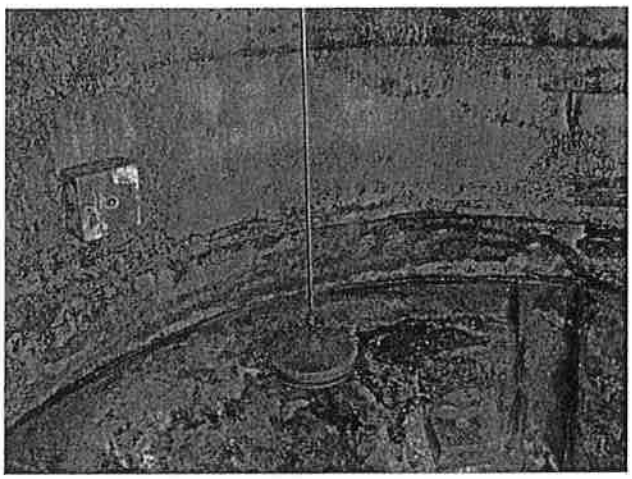
CUSTOMER: PSC		INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9A-9B-9C	7820 S 210th Street, Building C, Suite 110 Kent, WA 98032
TANK NUMBER: 9A, 9B, 9C	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	

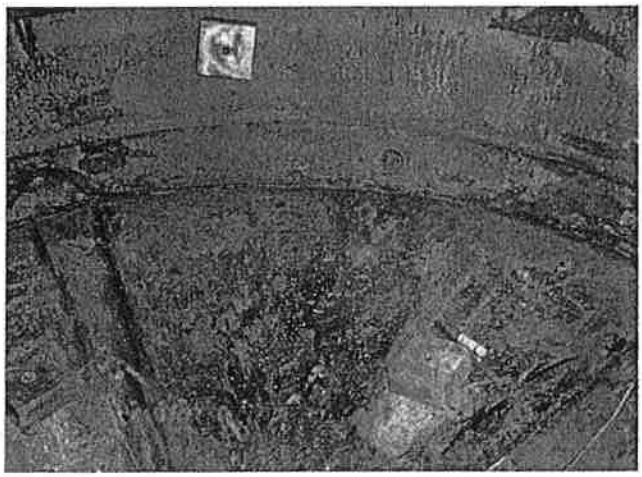




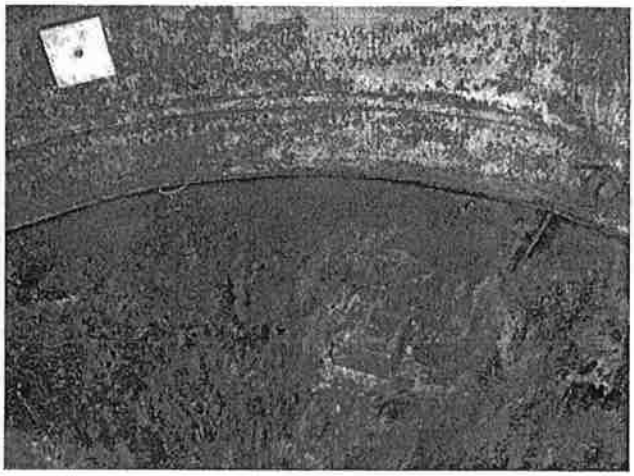




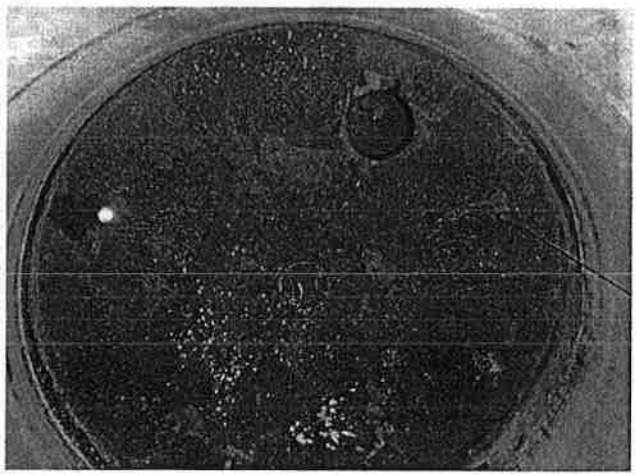


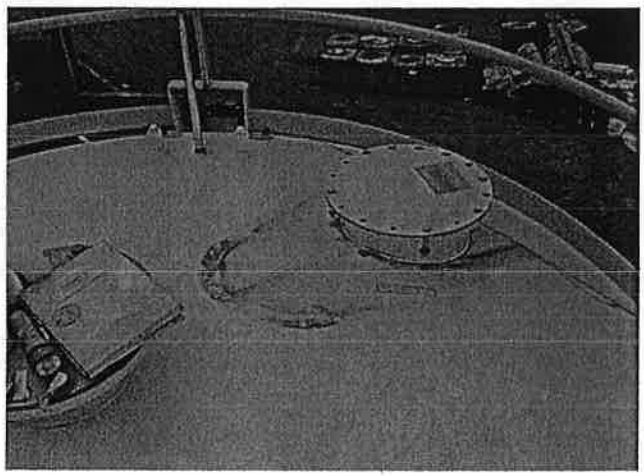


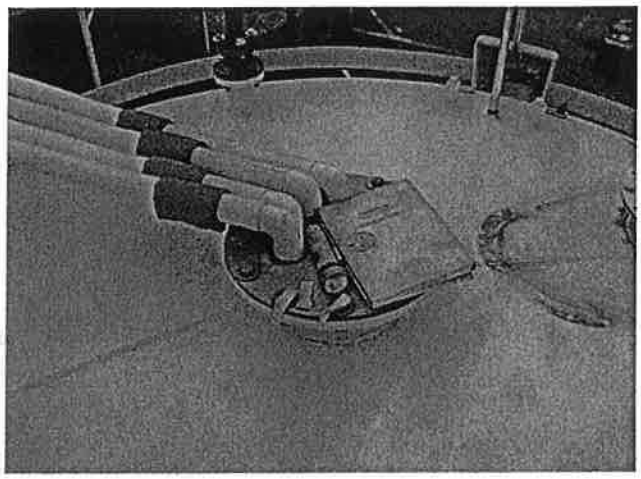


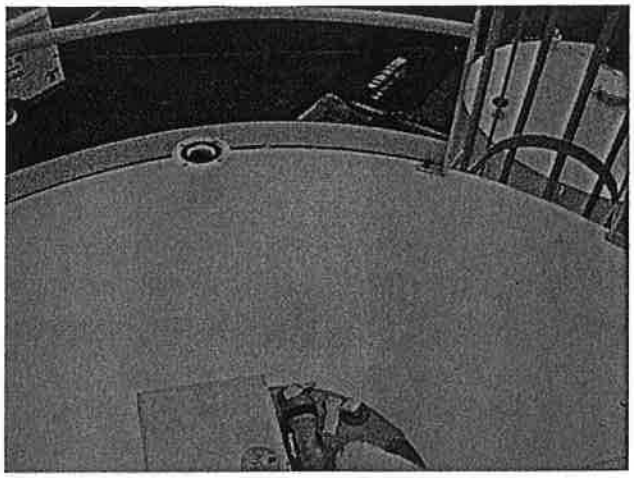


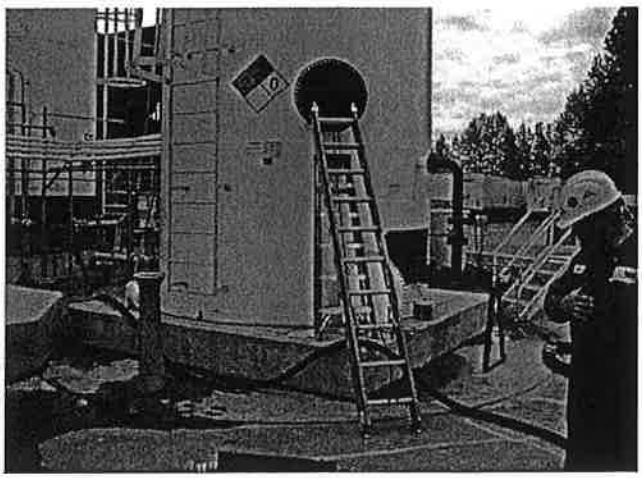


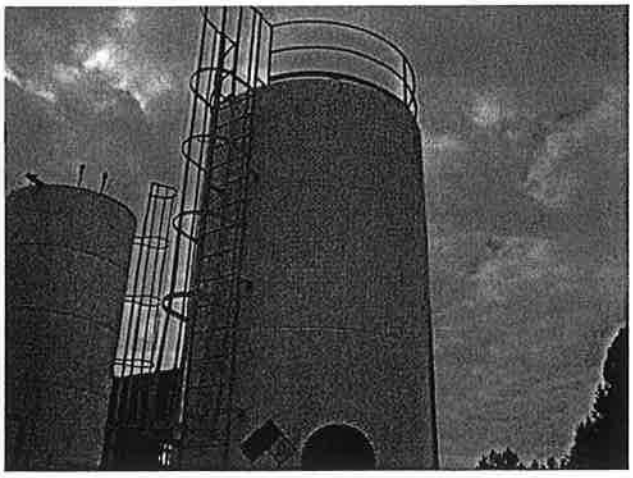


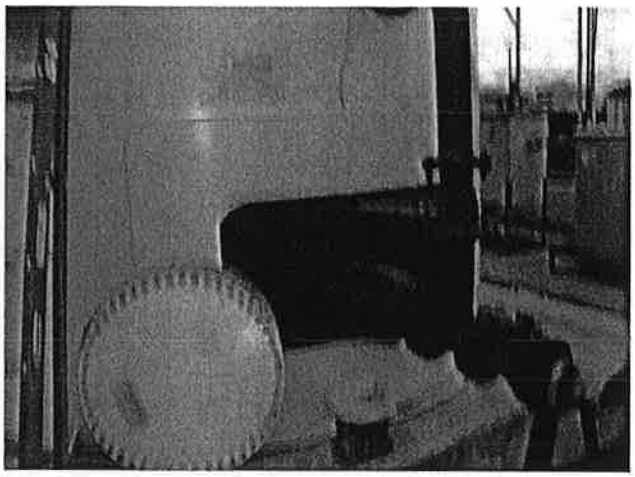


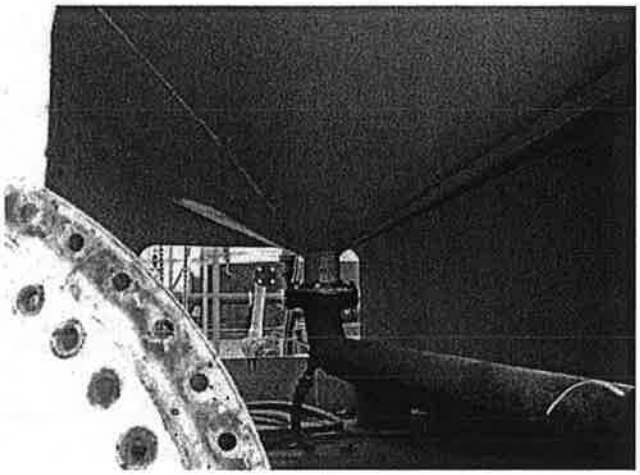


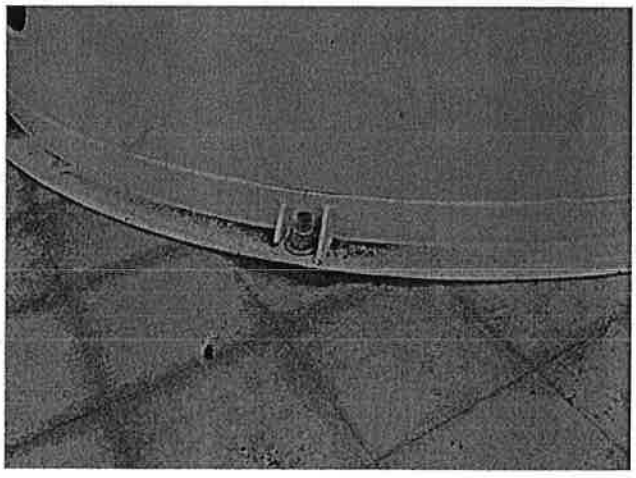


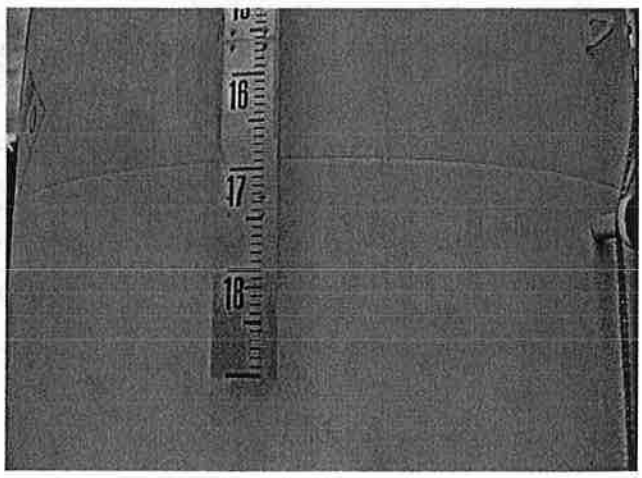


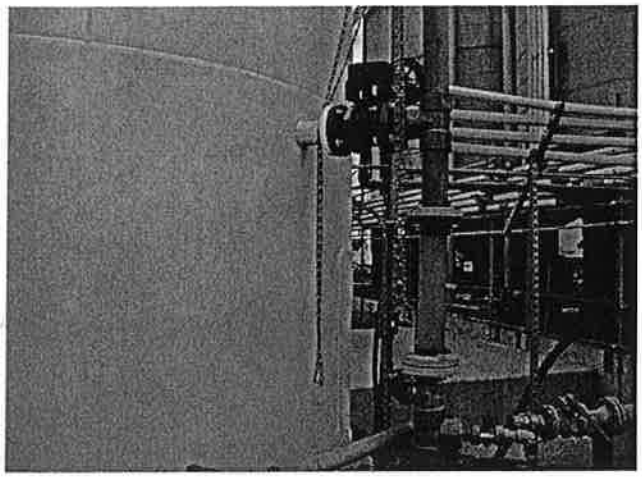


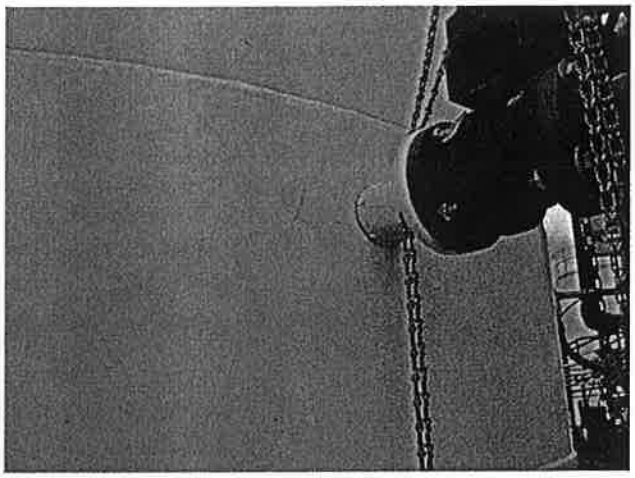


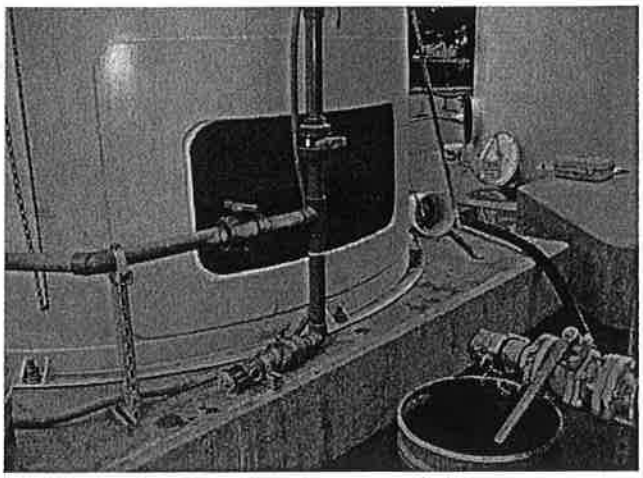


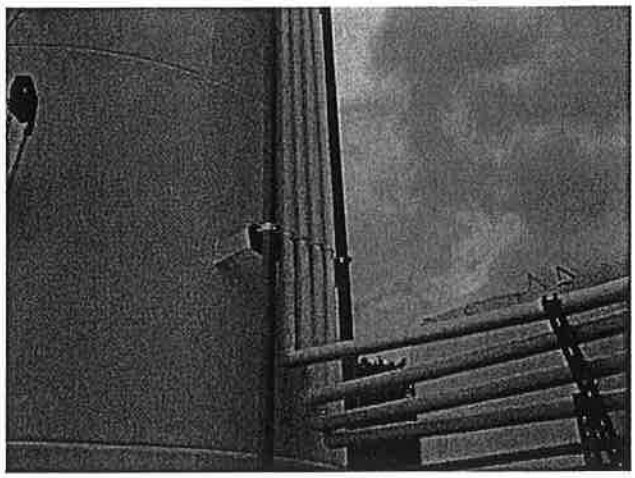



16
17
18

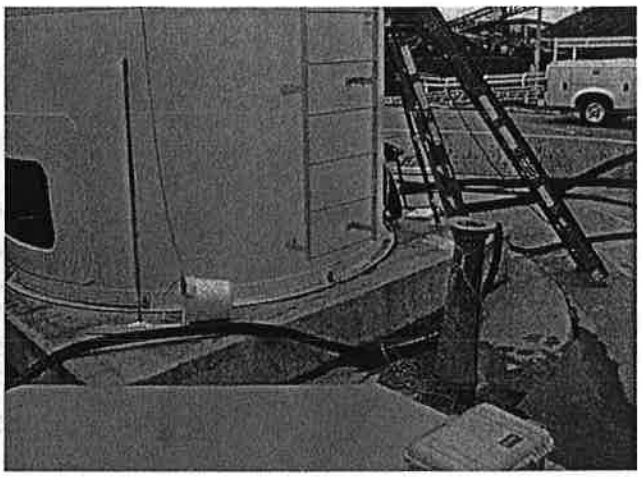















MARINE AND TANK, INC.
TANK HAS INTEGRAL STEEL FOUNDATION
AND IS FOR STATIONARY USE ONLY.
LIFT OR TRANSPORT ONLY WHEN EMPTY.
Plastic Plugs
Before
Installing Tank

Calculations for Shell & Cone-Shaped Tank Bottom - per API 620

Owner	PSC		
Tank No.	9B		
Diameter, D	10.500	ft	126.00 inches
Shell Height, H	18.000	ft	216.00 inches
Fill Height	18.000	ft	216.00 inches
Nominal Shell thickness	0.313	inches	
Measured Shell thickness, t_c	0.312	inches	
Nominal Cone thickness	0.313	inches	
Measured Cone thickness, t_h	0.313	inches	
Specific Gravity of contents of tank, SG	1.200		
Depth of Cone, d	29.50	inches	
S, allowable tensile stress of shell & cone	15,200	psi	
Joint Efficiency cone-to-shell, E_1	0.85		
Joint Efficiency shell vertical joints, E_2	0.85		
Operating Pressure at top of tank, P_o	0.00	psi	0 psf

Note that per API 620 the max. operating pressure at top of tank is 15 psig.

1/2 Apex angle, alpha = a 1.132867 radians 64.90847 degrees

Total Pressure, P at plane AA 1347.84 psf (includes hydrostatic head + P_o) 9.36 psi

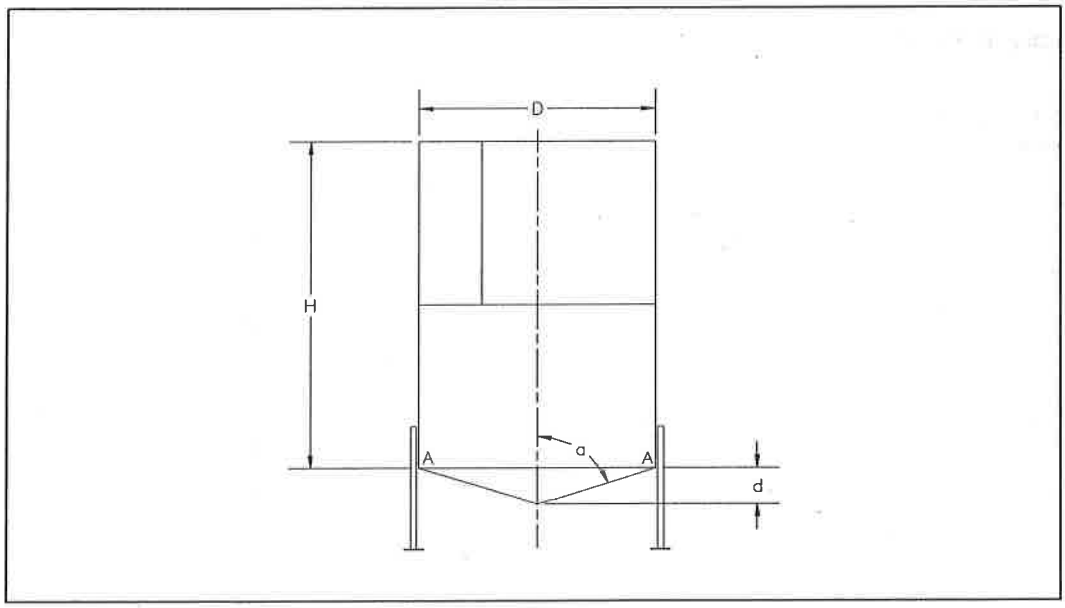


Figure No. A1

1) Shell Unit Forces @ Plane AA, See Figure No. A2

Sum $F_x = 0$

$2T_{2s} = PD$

$T_{2s} = PD/2$

T_{2s} = 590 lb/in

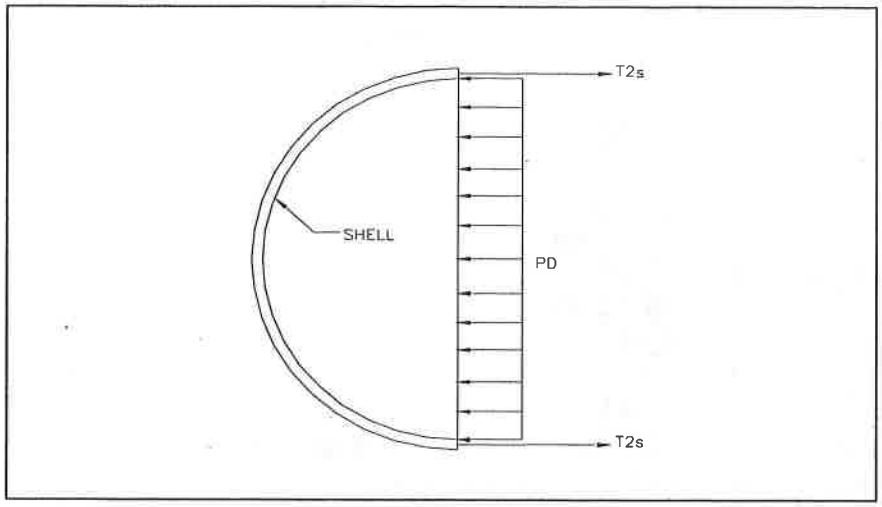


Figure No. A2

2) Cone unit force, T_2, the latitudinal unit force. Also known as the circumferential unit force.
See Figure No. A3
R_2, radius of curvature of cone at A
$R_2 = AB/\cos(a)$
R_2 = 148.5619 inches

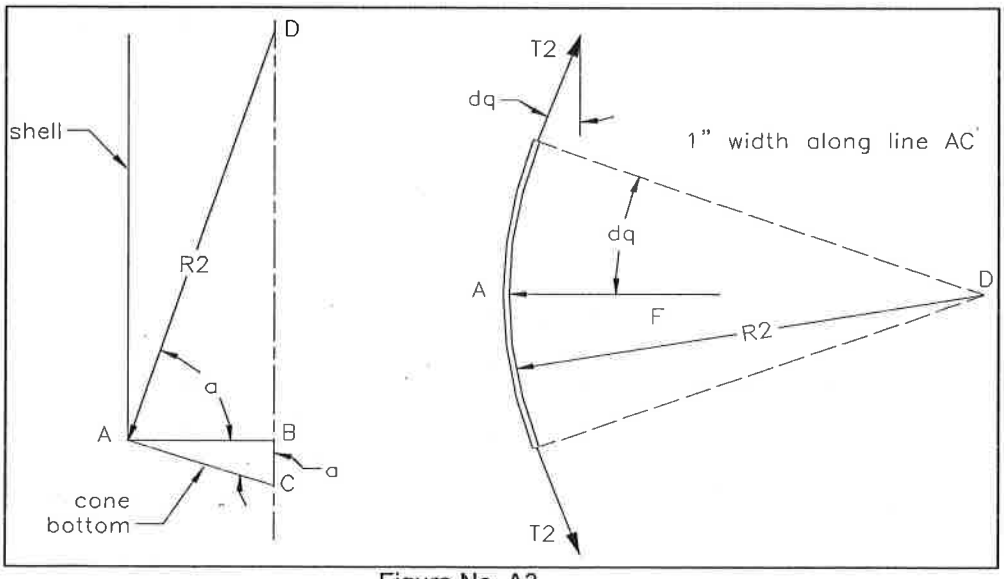


Figure No. A3

F = the force on 1 inch wide section of cone at point A with an infinitesimal arc length = 2 x dq

Sum of $F_x = 0$

$F - 2T_2 * \sin(dq) = 0$

$2PdqR_2 = 2T_2\sin(dq)$ and for small dq, $\sin(dq) = dq$

$PR_2 = T_2$

$F = P(1)(2)(dq)(R_2)$ $T_2 = PR_2$

$F = 2PdqR_2$ $T_2 =$ 1391 lb/in

3) Cone unit force, T_1, the Meridional unit force. See Figure No. A4

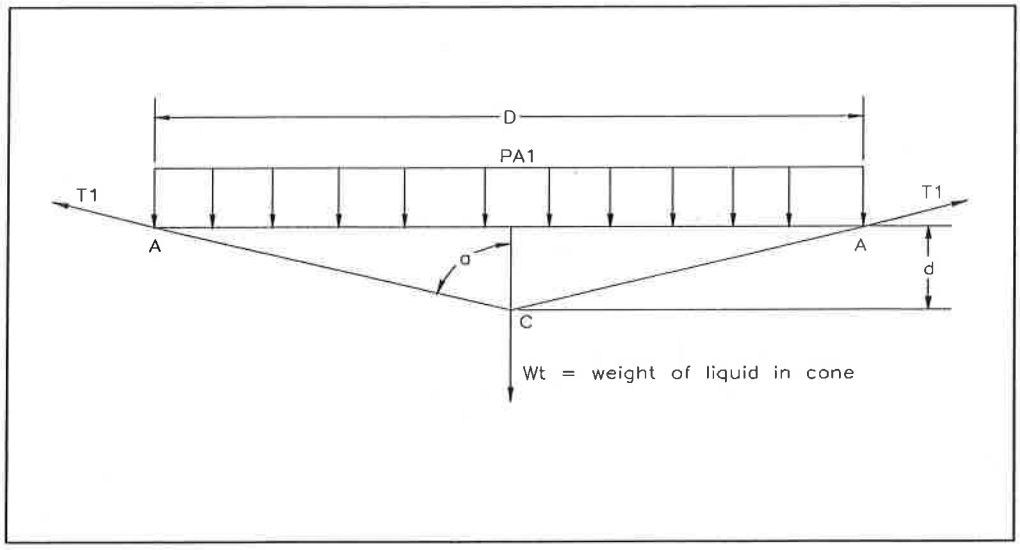


Figure No. A4

$A_1 = PI/4 * D^2$

$A_1 =$ 12468.98 square inches 86.59015 square feet

V, Volume of Cone = (PI*D/2*D/2*d)/3

V = 70.95582 ft^3

$W_t = SG* 62.4\ lb/ft^3 * V$

$W_t =$ 5,313 lb

Sum $F_y = 0$

$T_1Cos(a)PI*D - W_t - PA_1 = 0$

$T_1 = (W_t + PA_1)/Cos(a)PI*D$

$T_1 =$ 727 lb/in

4) Knuckle Region Reinforcement Check per API 620 3.12

The measured cone bottom thickness is defined as t_h here, $t_h =$ 0.313 inches

The measured shell thickness is defined as t_c here, $t_c =$ 0.312 inches

R_2, radius of curvature of cone at A = 148.5619 inches

R_c, radius of curvature shell = 63 inches

$w_h = 0.6* sqrt(R_2 *t_h)$ $w_c = 0.6* sqrt(R_c *t_c)$ w_{skirt} = width of skirt co

$w_h =$ 4.09145 inches $w_c =$ 2.660105 inches $w_{skirt} =$ 2.660105

t_{skirt} = 0.3125

Available reinforcing area, A_a = $w_h*t_h + w_c*t_c + wskit*tskirt$

A_a = 2.941859 sq inches

T_1 = 727 lb/in

T_{2s} = 590 lb/in

T_2 = 1391 lb/in

Per API 620, the magnitude of the total circumferential force acting on any vertical cross section through the compression ring region shall be computed as follows:

$Q = T_2w_h + T_{2s}w_c - T_1R_cSin(a)$ Note that if Q is negative, compression is indicated.

Q = 5,689 + 1,569 - 41,474

Q = -34,216

A_c, the required compression ring reinforcing area = Q/15,000

A_c = 2.281096 sq. inches

A_a	>	Ac	
2.941859	>	2.281096	TRUE

and since Q is negative the following condition must be true also.

$w_hSin(a)$	>	$0.015 * R_c$	
3.705346	>	0.945	TRUE

Since both conditions are true, knuckle region is adequately reinforced.

5) Check Measured Shell Thickness vs Required Shell Thickness

The required shell thickness is $t_{cr} = T_{2s}/SE_2$

0.045641 However, thickness must be at least 0.100" per API 653, so final required shell thickness is 0.100

t_c	>	t_{cr}	
0.312	>	0.100	TRUE

6) Check Measured Cone Bottom Thickness vs Required Cone Bottom Thickness

The required cone thickness, t_{hr}, is the greater of the following 2 formulas

$t_{hr} = T_1/SE_1$ or $t_{hr} = T_2/SE_1$

t_{hr} = 0.056263 t_{hr} = 0.107627

t_{hr} = 0.107627 However, thickness must be at least 0.100" per API 653, so final required cone bottom thickness is: t_{hr} = 0.108

t_h	>	t_{hr}	
0.313		0.108	TRUE

7) Tank Volume or Capacity Calculation

V_{total} = Volume of Cone + Volume of Shell

	70.95582 ft^3	+	(PI/4) *D^2*H
	70.95582	+	1558.623

V_{total} =	1630 ft^3	or	12,191 gallons

CONAM Inspection & Engineering Services, Inc.
7820 South 210th Street, Suite 110
Kent, WA 98032
Ph: (206) 764-8123 • Fax: (206) 764-8124

CALIBER INSPECTION

REPORT NUMBER 170127
DATE ISSUED 8-27-08
CUSTOMER P.O. 41326TN

MT INSPECTION REPORT

CUSTOMER

PSC
20245 77th Ave S.
Kent WA 98032

WORK SITE LOCATION

PSC
20245 77th Ave S.
Kent WA 98032 Tanks 9B and 9C

PROCEDURE: SIP4009 Rev B

SPECIFICATION: ~~ASME Sec V Article~~ API 653/650

CLASS: N/A

ACCEPTANCE: ASME Sec VIII

QUANTITY: 5

MATERIAL: C.S.

DESCRIPTION: Dry Magnetic partical inspection of 2 each fillet weld Repair in Tank 9B and 3 Puddle welds in Tank 9C

INSPECTION RESULTS: Inspected: 5
Accepted: 5
Rejected: 0

EQUIPMENT: Parker Probe MODEL: DA 400 S/N: 10805

CAL. DUE: 12-10-08 MAG. POWDER: 8A Red BATCH: 08E023

Byron D. Johnson	II	8-27-08
PREPARED BY	LEVEL	DATE
Byron D. Johnson	II	8-27-08
PREPARED BY	LEVEL	DATE

CERTIFICATE OF CONFORMANCE: We certify that the above material was inspected in accordance with the stated specifications.

NOTE: This report is unbiased. It is expressly understood that all descriptions, comments, and expressions of opinion reflect the opinion or observation of the engineer(s)/technician(s) and are not intended nor can they be construed as representation or warranty as to the actual circumstances. Conam/Caliber Inspection is not assuming any responsibility of the owner/operator and the owner/operator retains complete responsibility for the engineering, repair and use decisions as a result of the data or other information provided by Conam/Caliber Inspection. In no event shall Conam/Caliber Inspection liability in respect to the services referred to herein exceed the amount paid for such services. No other warranty, expressed or implied is made or intended by Conam/Caliber Inspection.

TANK

INTEGRITY ASSESSMENT

REPORT

for

Tank No. 9C
PSC
Kent, Washington

Report Number: 169597-3
Inspection Date: 8/21/08

TABLE OF CONTENTS

SECTION	PAGE
Equipment Data Sheet	3
Introduction and Tank History	4
Primary Tank, Secondary Containment	5
Tank Externals	5
Recommendations / Summary	7
Tank Certification	9
APPENDIX:	
References	
Client Provided Tank Data Sheet	
Drawings	
Photographs	
Calculations	
Nondestructive Test Report of Repairs	

EQUIPMENT DATA SHEET

Tank No.	9C, formerly was 201	**Building No.**	
Site	Tacoma	**Door**	
Location (Inside or Outside)	Outside	**Column**	

TANK CHARACTERISTICS

Contents	Processed Water	**NFPA Hazard Rating**	In poor shape and may not be applicable for next contents. Replace.
Nominal capacity in gallons	9,500	**Primary Regulatory Class**	WAC 173-303-640
Year Installed	Yet to be installed at time of this assessment.	**Material of Construction**	Steel
Style	Single wall	**Orientation**	Vertical
Primary Wall Thickness	¼"	**Minimum Allowable Thickness**	0.1
Internal Coating	Poor condition overall.	**External Coating**	Yes
Shell Height	20'	**Length**	N/A
Internal Diameter	9'-0"	**Tank Shape**	Cylindrical shell, flat bottom

SECONDARY CONTAINMENT

Type	Diked area	**Leak Detection**	
Material	Concrete	**Thickness**	
Internal Coating	None currently	**External Coating**	
Internal Height		**Internal Length**	
Internal Width		**Capacity in gallons**	Greater than 110% of largest tank in diked area.

PIPING

Type	None	**Above/Underground**	N/A
Material	N/A	**Nominal Diameter(s)**	N/A
Internal Coating	N/A	**External Coating**	N/A
Connections	N/A	**Fittings**	N/A

EQUIPMENT

Type of Level Gauge	None	**Pressure/Vacuum Relief Valve**	No
Type of Overfill	None	**Spill Prevention**	Vault
High Level Alarm	No	**Set Point**	N/A
Feed Pump Cutoff	Unknown	**Set Point**	Unknown

Note: this equipment data sheet was compiled by Conam Inspection, see Appendix for client provided tank data sheet.

INTRODUCTION & HISTORY

Client: PSC **Type of Assessment:** WAC 173-303-640, existing tank

Date Inspected: 8/21/08 **Inspected by:** George Roni, PE & Byron Johnson - technician

Built by: Burlington Environmental, Inc.

Other Name Plate Data: UL Tank. The name plate is mostly illegible and in poor condition.

Last Cleaned by: PSC

Date of Last Cleaning: Unknown

Last Painted by: Unknown **Date of Last Painting:** Unknown

Number of Coats: Unknown **Color:** White

Foundation Type & Condition: At time of inspection the tank sat in a grass field at the Kent PSC facility. It is to be moved and anchored to a concrete pad near tank #9A and 9B. The tank has anchor chairs.

Settlement Observed: N/A.

Major Repairs or Alterations: None observed or reported by the client representative.

Additional Remarks:

During the current assessment described in this report the exterior (and the interior) of the tank system was visually inspected for weld breaks, cracks, punctures, coating damage, and other inadequate construction or installation procedures. The tank was entered (after it was verified safe for entry) to assess the condition of the interior surfaces and parts. A half-mask respirator was worn by the inspector as required by PSC safe entry protocol.

PRIMARY TANK:

Condition of Tank Bottom: The floor appeared satisfactory with no observable pitting. The floor coating was mostly intact.

Condition of Tank Shell: The tank had a band of corrosion and pitting to the interior of the 1st course. The nominal shell thickness was ¼" for all 3 courses. The average depth of the pitting in this region is 0.100" with a range of depths from 0.080" to 0.125". One single isolated pit had a depth of 0.155". Two others had a depth of 0.135" and 0.130" which were also marked.

Condition of Internal Coating: The coating on the shell interior is in poor condition. It appears to be some sort of black material.

Condition of Welds: The tank bottom consists of 1 plate. The tank bottom has a turned up edge – like a pan – and the shell-to-bottom butt weld appears visually acceptable. The shell plates are butt welded. The vertical shell joints and the horizontal joints are butt welded. All welds appeared satisfactory.

Condition of Other Internals: Four new studs on the floor are present for anodes. At time of this inspection no anodes had yet been installed.

Visible Distortions to Tank Shell or Heads? None observed, the shell and floor plates all appeared satisfactory.

Additional Remarks: No liquid level float in the tank.

SECONDARY CONTAINMENT:

Description: Diked area for several tanks including 9A, 9B, and 9C – in the future.

Condition of Walls or Plates: Concrete walls and floor, not coated.

Condition of Joints or Welds: Not inspected. No water stops in concrete joints.

Visible Distortions to Walls or Plates: None observed.

Additional Remarks: None.

TANK EXTERNALS:

Condition of Paint and/or Insulation: The shell paint is in poor condition. The roof paint appeared in satisfactory condition.

Condition of Valves and Nozzles: Nozzles satisfactory with acceptable ultrasonic thickness readings. No repads on nozzles.

Condition of Piping and Ancillary Equipment: None.

Condition of Piping Supports/Hangers: None.

Condition of Liquid Level Gauge: None.

Condition of External Ladder/Stairs: Ladder had been removed prior to our inspection.

Venting: Roof vent (assuming one exits) not inspected due to lack of access.

Additional Remarks: Three random UT readings obtained at the edge of the roof in one area were 0.140", 0.112", and 0.141".

RECOMMENDATIONS / SUMMARY

SCOPE OF WORK:

Conduct an assessment per WAC 173-303-640 (2), which is a tank system integrity assessment of an existing tank in accordance with the Washington State Dangerous Waste Regulations. An internal and external inspection & of the tank was done in conjunction with a nondestructive test method (ultrasonic thickness testing of the tank walls). A confined space entry into the tank per PSC safety procedures was performed by Conam Inspection. It should be noted that others are to conduct the formal structural design review and the formal corrosion assessment which are covered in WAC 173-303-640 (3).

BACKGROUND INFORMATION: Tank built in 1989 by Reliable Steel. Tank was until recently in PSC bone yard in Tacoma for about 2 years. It is currently sitting in a staging area in at the PSC Kent facility, where it will be moved a short distance and installed and anchored to a concrete pad in the secondary containment dike next to tank # 9A and 9B. It will be used to store processed waste water before disposal. Client mentioned that they desire at least 4 years of service from this tank.

SUMMARY

The tank had a band of corrosion and pitting to the interior of the 1st course. The nominal shell thickness was ¼" for all 3 courses. The average depth of the pitting in this region is 0.100" with a range of depths from 0.080" to 0.125". One single isolated pit had a depth of 0.155". The tank should provide more than 4 years of acceptable service with the repair of this one pit, the installation of new anodes and no new internal coating applied. The application of an internal coating would be an optional action, which is not needed in our opinion.

The floor was in good condition with no pitting observed. The entire interior of the tank has a black colored coating, which is in a deteriorated condition, although, it appears it is still providing some corrosion protection to the floor.

Welds and nozzles appeared satisfactory. Roof plates and paint from a cursory inspection via an extension ladder were also satisfactory.

RECOMMENDATIONS

1) Puddle weld and grind flush to the shell the one pit with a depth of 0.155", which was marked on the interior of the tank and on a sketch.
2) Perform dry magnetic particle testing to the repaired pit.
3) Suitably prepare and paint the exterior shell.
4) Mark the tank with its tank number and contents per WAC 173-303-640 (5) (d).
5) Placard the tank with a NFPA warning triangle regarding the intended stored contents of the tank.
6) Install tank per WAC 173-303-640.
7) Install new anodes inside the tank to protect against internal corrosion.
8) Install overfill protection equipment to tank per WAC 173-303-640 (5) (b). For example: a liquid level gauge and a high level alarm would satisfy this subsection.
9) For compliance the code the tank should undergo a WAC 173-303-640 (3) assessment to ensure that it has been installed properly and without damage.
10) Coat secondary containment area to comply with WAC 173-303-640.

11) Conduct the next WAC 173-303-640 (2) integrity assessment within 5 years.

On 8/27/08 Conam Inspection returned to this tank and inspected the pit (item 1 above) visually and with magnetic particle testing and found the repairs acceptable. The two other pits in the shell (0.135" deep and 0.130" deep) had also been repaired and were therefore inspected and tested by Conam Inspection. A report of this work is in the Appendix. Prior to the repairs, we interviewed the welder about his procedure and credentials and found them to be acceptable to do the recommended work. Therefore the hot work repairs are acceptable.

Evaluated by:



George Roni, P.E.
API 653 Cert. No. 2042, Exp. 4/30/11

Attachments

Conam Inspection has evaluated the condition of this tank based on the observations and measurements made by the tank Inspector. While our evaluation accurately describes the condition of the tank at the time of inspection, the tank owner/operator must independently assess the inspection information/report provided by Conam Inspection and any conclusions reached by the tank owner/operator and any action taken or omitted to be taken are the sole responsibility of the owner/operator. With respect to inspection and testing, Conam Inspection warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Conam Inspection shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the exclusive remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE SHALL APPLY, nor shall Conam Inspection be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Conam Inspection be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Conam Inspection or any associated damage to facilities, down-time costs or claims of other damages.

TANK CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."[1]

George Roni, P.E



10/22/08

EXPIRES 3/31/09

1) Per WAC 173-303-810 as required by WAC 173-303-640 (2)

Conam Inspection has evaluated the condition of this tank based on the observations and measurements made by the tank Inspector. While our evaluation accurately describes the condition of the tank at the time of inspection, the tank owner/operator must independently assess the inspection information/report provided by Conam Inspection and any conclusions reached by the tank owner/operator and any action taken or omitted to be taken are the sole responsibility of the owner/operator. With respect to inspection and testing, Conam Inspection warrants only that the services have been performed in accordance with accepted industry practice. If any such services fail to meet the foregoing warranty, Conam Inspection shall re-perform the service to the same extent and on the same conditions as the original service.

The preceding paragraph sets forth the exclusive remedy for claims based on failure or of defect in materials or services, whether such claim is made in contract or tort (including negligence) and however instituted, and, upon expiration of the warranty period, all such liability shall terminate. The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE SHALL APPLY, nor shall Conam Inspection be liable for any loss or damage whatsoever by reason of its failure to discover, report, repair or modify latent defects or defects inherent in the design of any tank inspected. In no event, whether a result of breach of contract, warranty or tort (including negligence) shall Conam Inspection be liable for any consequential or incidental damages including, but not limited to, loss of profit or revenues, loss of use of equipment tested or services by Conam Inspection or any associated damage to facilities, down-time costs or claims of other damages.

APPENDIX

References:

1) Washington State Department of Ecology, Dangerous Waste Regulations, Chapter 173-303 WAC
2) Previous Integrity Reports on the tank provided by the client
3) Tank Data Sheet provided by the client
4) Conversations with the client engineer, Tom Nelson
5) API RP 652, Lining of Above Ground Petroleum Storage Tanks
6) API RP 651, Cathodic Protection of Above Ground Storage Tanks
7) API Guide for the Inspection of Refinery Equipment – Chapter 13, Atmospheric and Low Pressure Tanks
8) API Standard 650, Welded Steel Tanks for Oil Storage
9) API Standard 653, Tank Inspection, Repair, Alteration, and Reconstruction
10) API Standard 620, Design and Construction of Large, Welded, Low Pressure Storage Tanks

Tank Data Sheet

RCRA-Regulated? Yes
Tank Location: **Kent**
Tank Number: **T-9C**
Process Description: **Storage/Discharge of Dangerous Wastewaters**
Vessel Fluid: **Wastewater Containing Oil and/or Organic Compounds**

Specific Gravity:	<1.6	Freeboard At Working Vol (ft):	1'0
Normal Operating Pressure (psig):	Atmospheric	Temperature (°F):	Ambient

	Material	Thickness	Type
Bottom	**Carbon Steel**	**0.25" nominal**	**Flat Bottom**
Shell	**Carbon Steel**	**0.25" nominal**	**Cylindrical**
Head (ends)	**Carbon Steel**	**0.25" nominal**	**Conical**

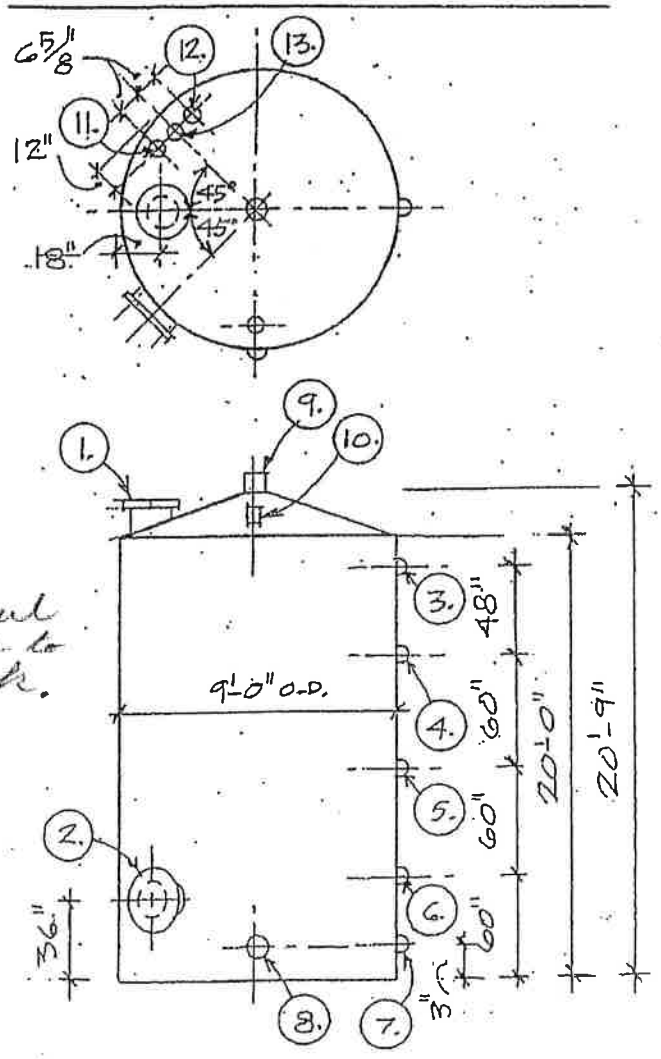
Working Volume (USG):	9,000	Insulation:	None
Nominal Volume (USG):	9,500	Method of Construction:	Welded Steel
Tank I.D. (ft):	9'0"	Tank Height or Length (ft):	20' 9"
Design Code Used:	UBC	Date in Service:	08/26/2008
Anchorage:	Anchors are seismic and wind rated		

Item No.	Size (In.)	Description
1	16	Manway
2	24	Manway
3	3	Inlet/Outlet CPLG, PLUG&D
4	3	Inlet/Outlet " "
5	~~2~~ 3	Inlet/Outlet " "
6	2	Inlet/Outlet
7	4	Coupling vent
8	3	Coupling ~~vent~~
9	1 ¼	Coupling
10	1 ¼	Coupling
11	1 ¼	Coupling
12	1	Coupling
13	1 ¼	Coupling

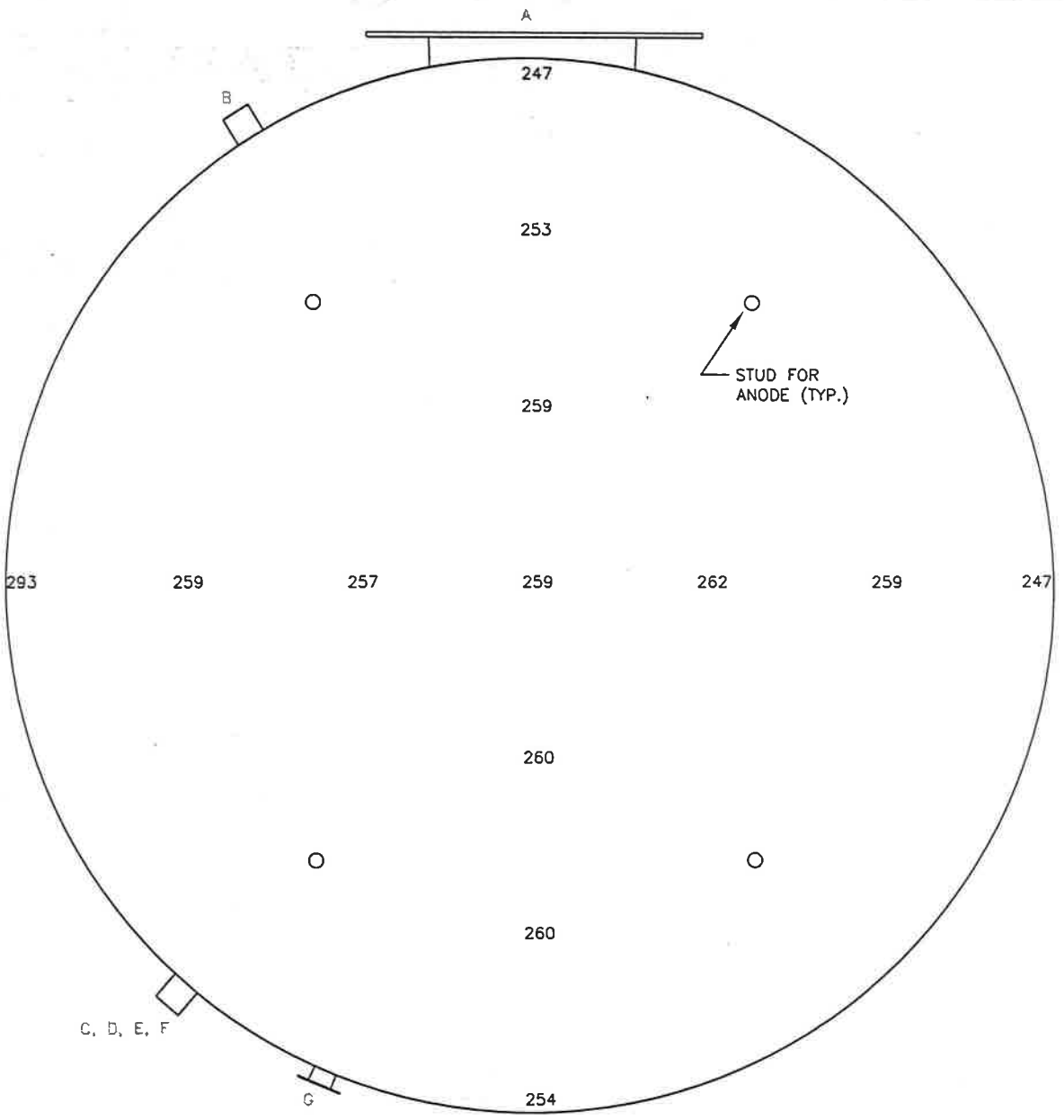
Interior Coating: ~~none~~ Hydra. coating, but deteriorated. Looks to be black.
Exterior Coating: **Polyurethane Enamel**
Tank Manufacturer: **Reliable Steel**
Year Manufactured: **1989**

Remarks:
Cathodic protection provided by zinc or magnesium anodes as recommended by certifying engineer.

Tank Sketch



TANK BOTTOM PLAN



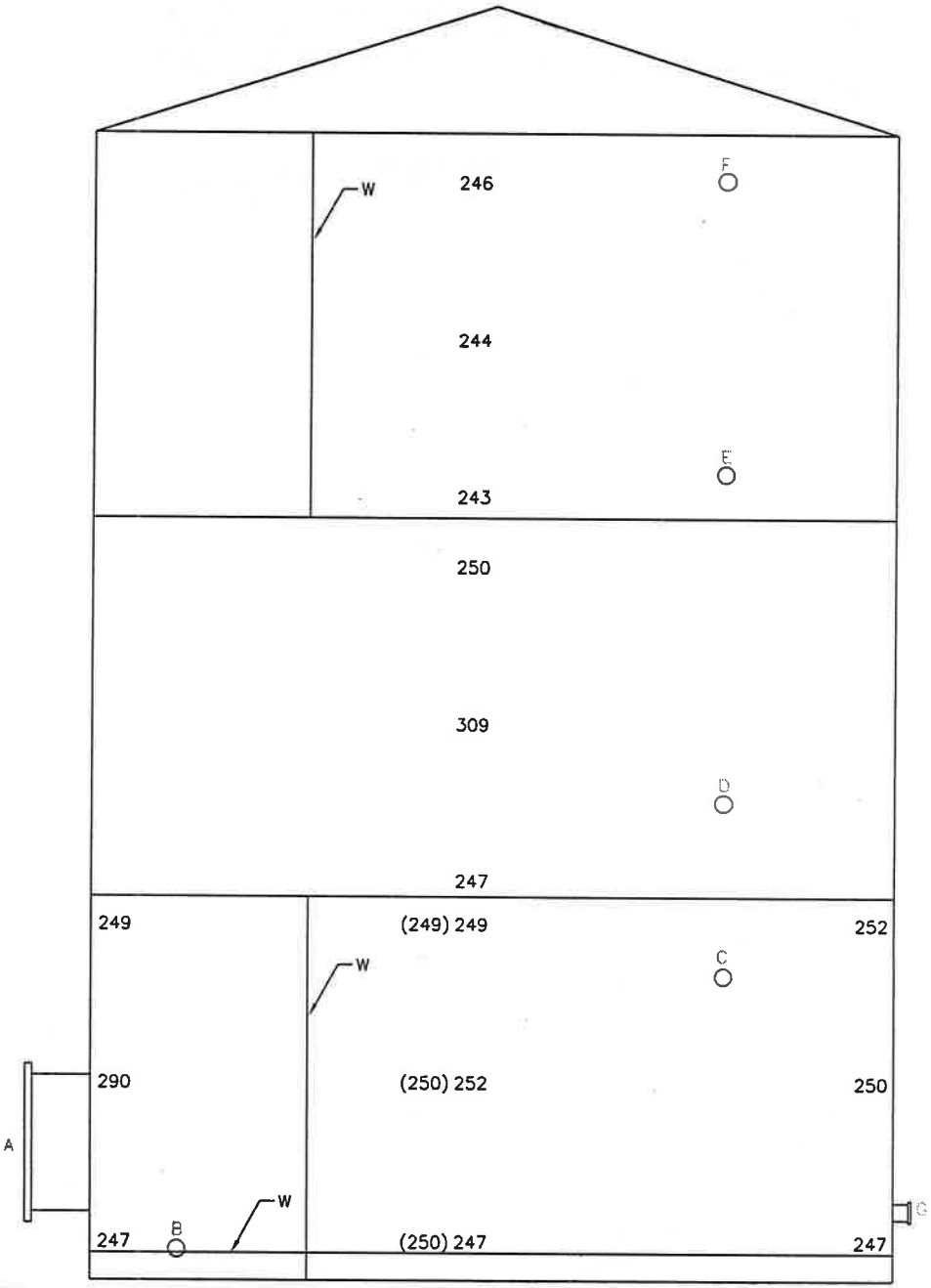
NOTES:

XXX AN ULTRASONIC THICKNESS MEASUREMENT IN THOUSANDTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

SHELL I.D. ALSO HAS 4 STUDS FOR ANODES ON 1ST COURSE.

CUSTOMER: PSC	SHELL HEIGHT: 20'-0" DIAMETER: 9'-0"	INSPECTION DATE: 8/21/08	CONAM INSPECTION
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9C-B	
TANK NUMBER: 9C	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	7820 S 210th Street, Building C, Suite 110 KENT, WA 98032
PRODUCT: PROCESSED WATER	REPORT NUMBER: 169597-3		

TANK ELEVATION PLAN
WEST SIDE



NOTES:

XXX AN ULTRA SONIC THICKNESS MEASUREMENT IN THOUSANTHS OF AN INCH. THIS IS THE STEEL PLATE THICKNESS AND DOES NOT INCLUDE ANY COATING OR PAINT.

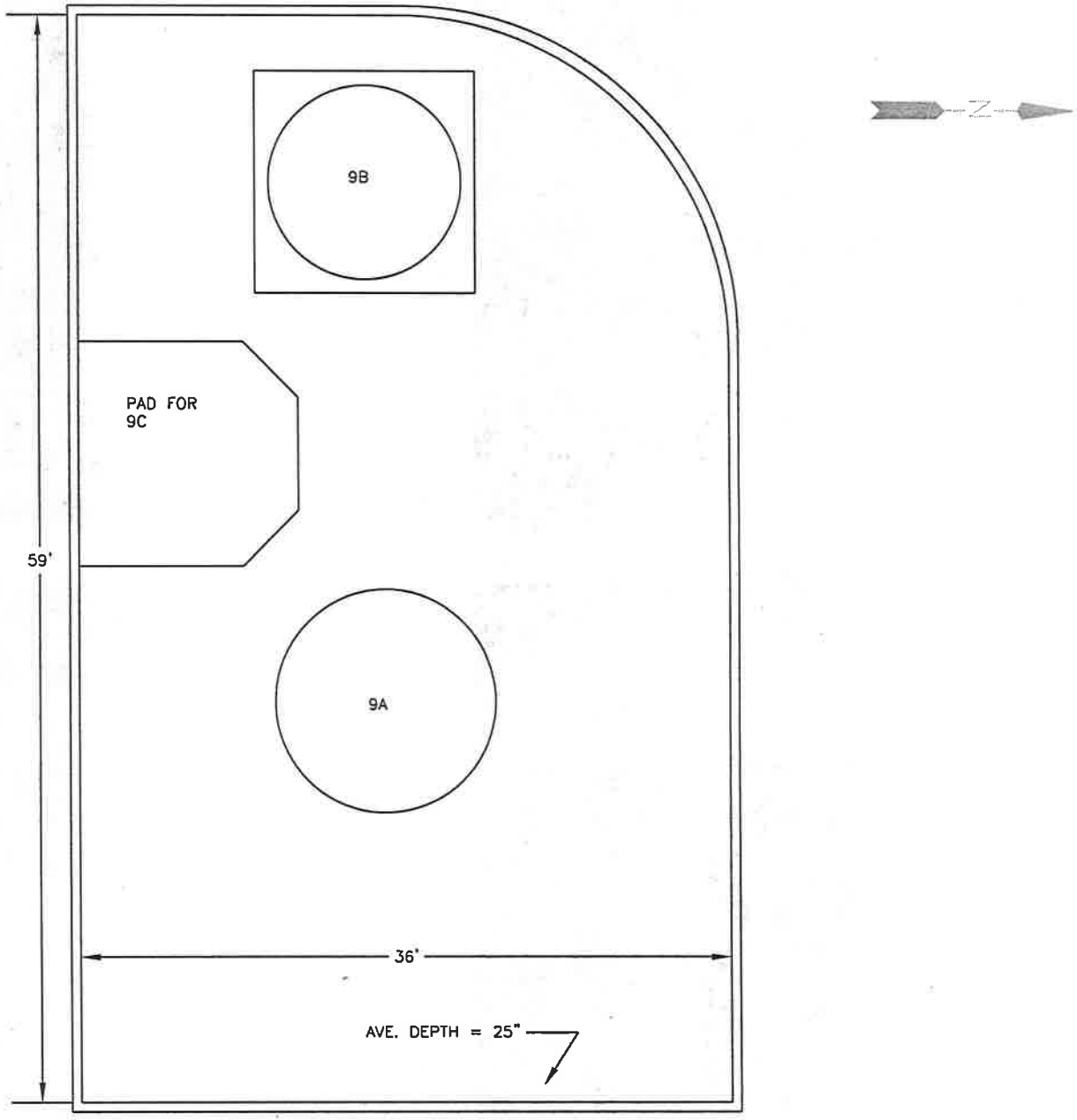
(XXX) HIDDEN OR EAST SIDE UT.

NO.	SIZE	TYPE	CL TO BOT (IN.)	REPAD TYPE	UT			
					TOP	RIGHT	BOTTOM	LEFT
A	24"	MANWAY	36"	NONE	269	243	241	248
B	3"	CPLG. W/ PLUG	6"	NONE	N/A			
C	3"	CPLG. W/ PLUG	60"	NONE	N/A			
D	3"	CPLG. W/ PLUG	2ND COURSE	NONE	N/A			
E	3"	CPLG. W/ PLUG	3RD COURSE	NONE	N/A			
F	3"	CPLG. W/ PLUG	3RD COURSE	NONE	N/A			
G	3"	CPLG. W/ PLUG	6"	NONE	N/A			

CUSTOMER: PSC	SHELL HEIGHT: 16'-0" DIAMETER: 9'-0"	INSPECTION DATE: 8/21/08
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9A-E
TANK NUMB[illegible] 9C	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA
PRODUCT: PROCESSED WATER	REPORT NUMBER: 169597-3	

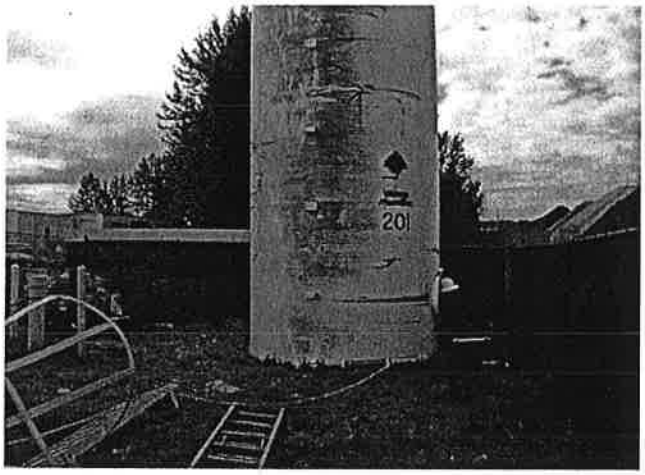
CONAM INSPECTION
7820 S 210th Street, Building [illegible] Suite 110
KENT, WA 98032

PLAN VIEW OF TANK 9A, 9B, 9C



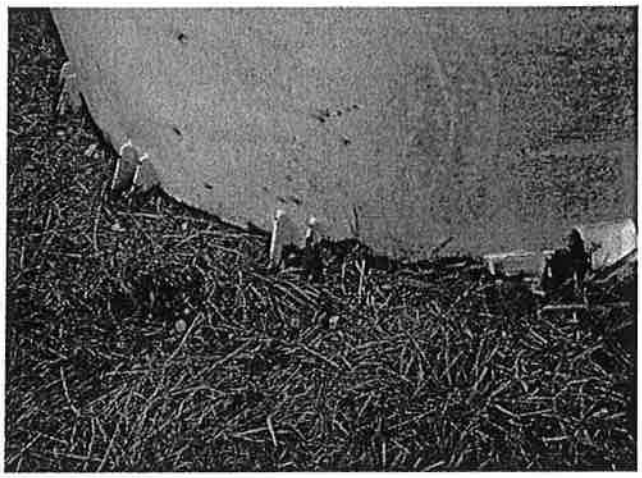
CUSTOMER: PSC		INSPECTION DATE: 8/21/08	CONAM INSPECTION 7820 S 210th Street, Building C, Suite 110 Kent, WA 98032
LOCATION: KENT, WA	ENGINEER: GEORGE RONI	DRAWING NUMBER: PSC-9A-9B-9C	
TANK NUMBER: 9A, 9B, 9C	TECHNICIAN: BYRON JOHNSON	CAD DRAFTSMAN: SRA	

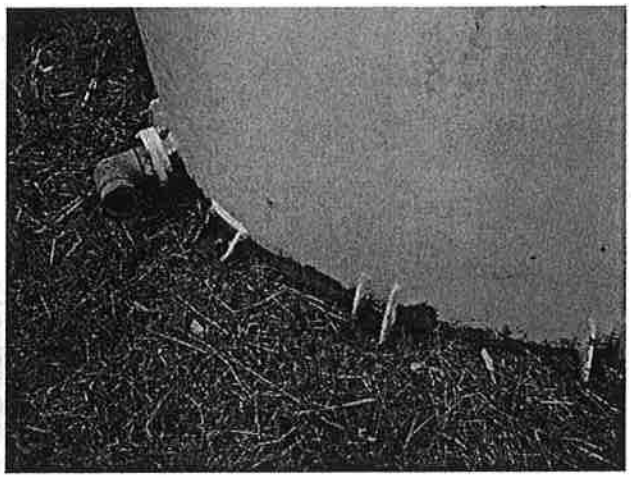

201


201

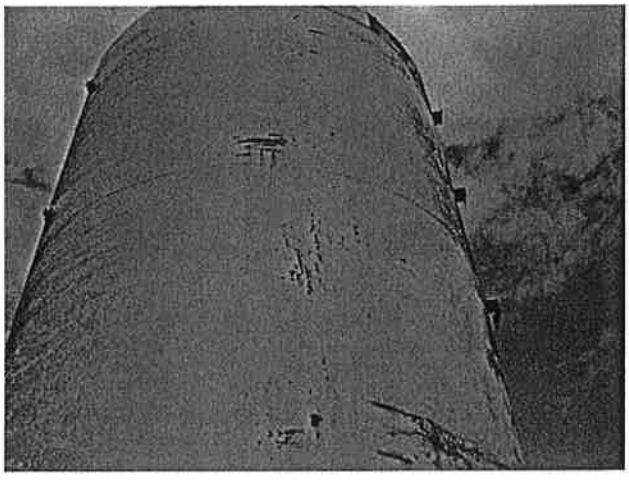

201



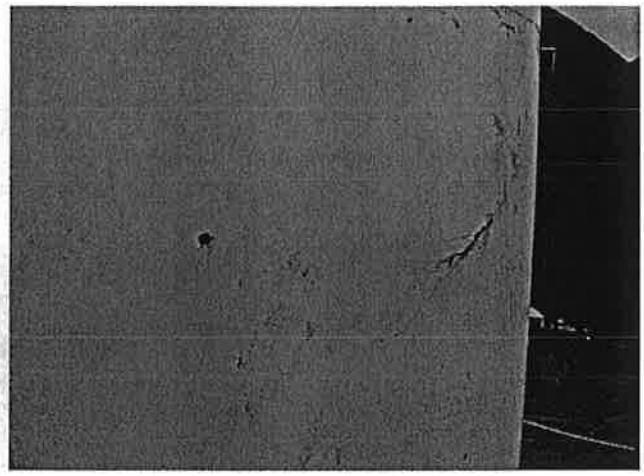


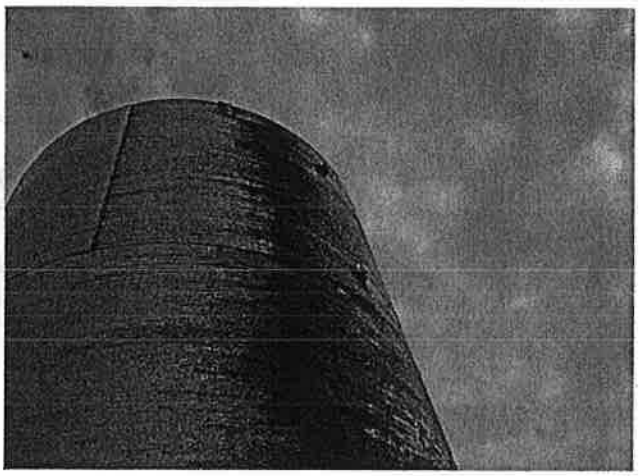


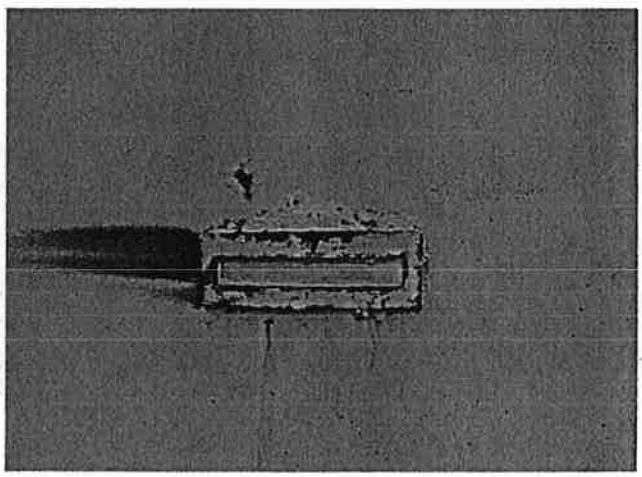


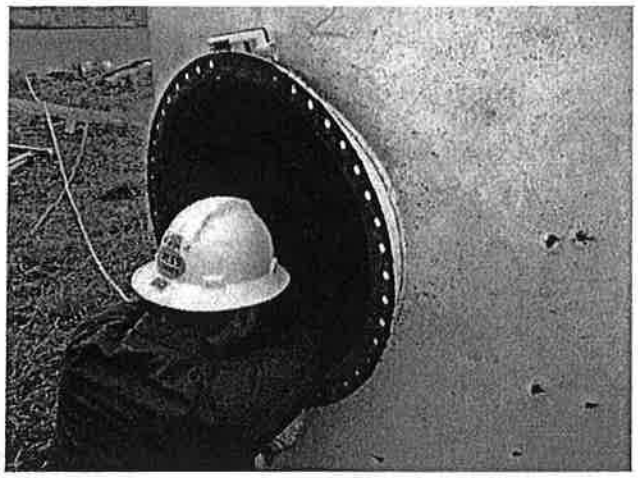


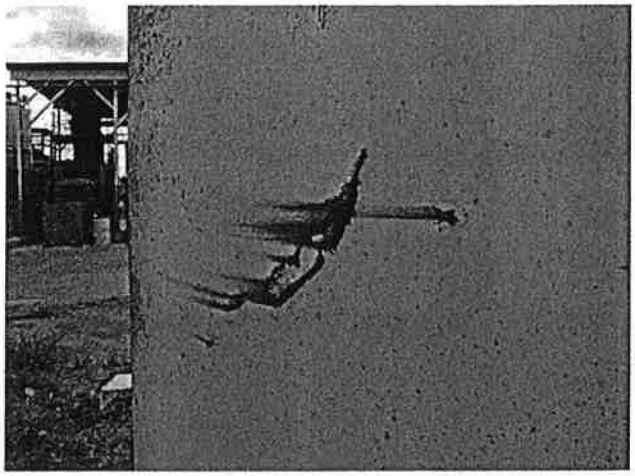


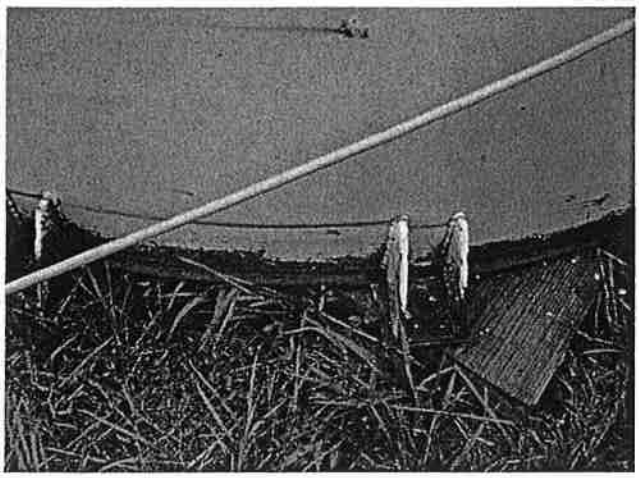




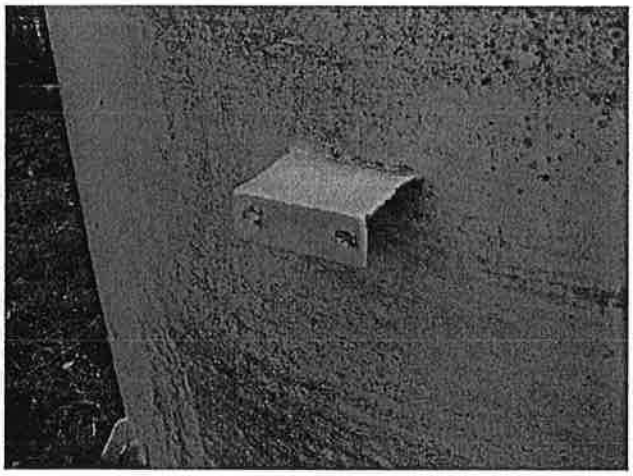




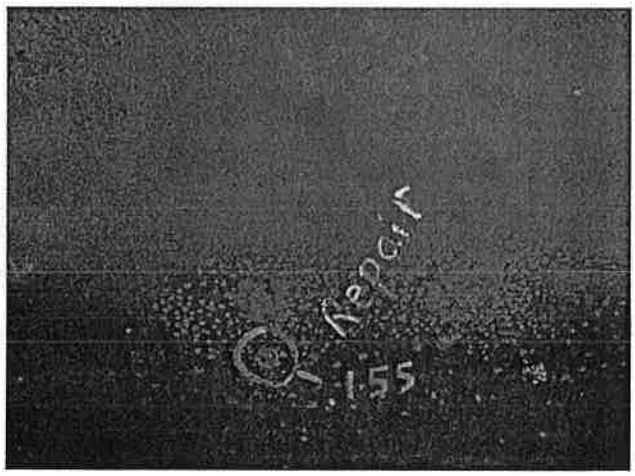


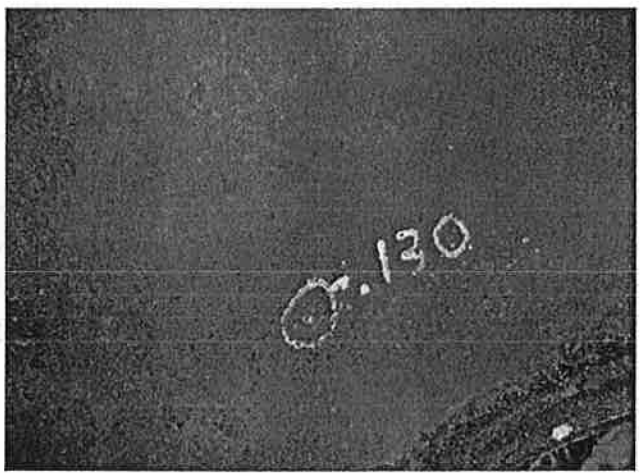




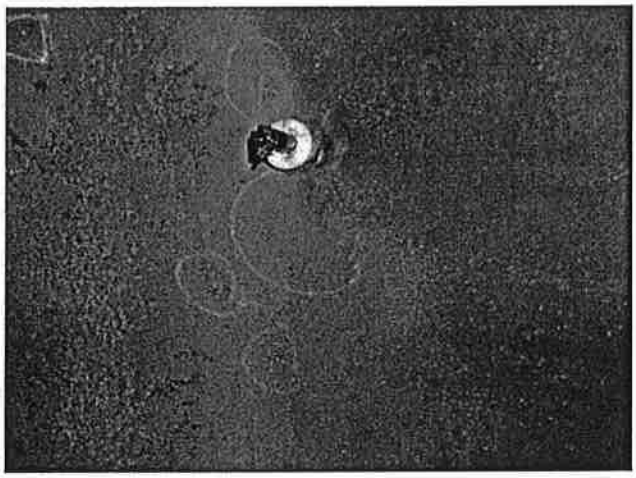


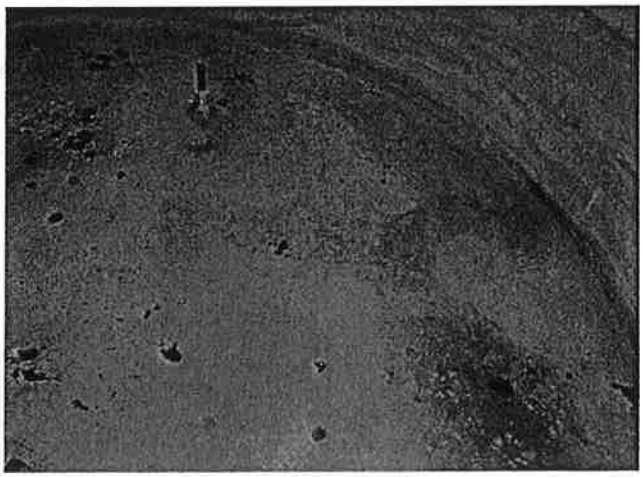


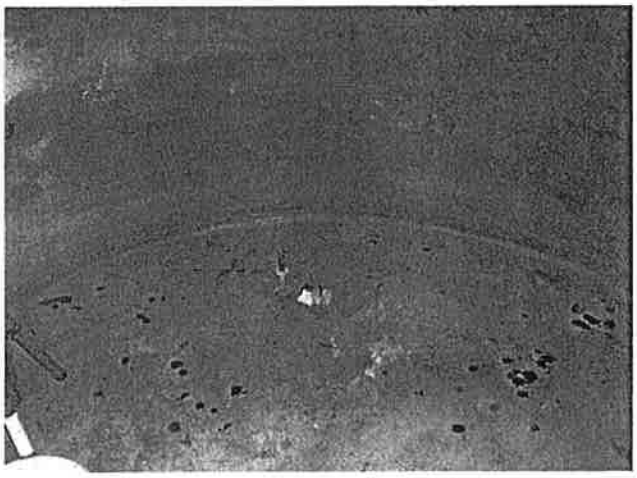

Repair
155

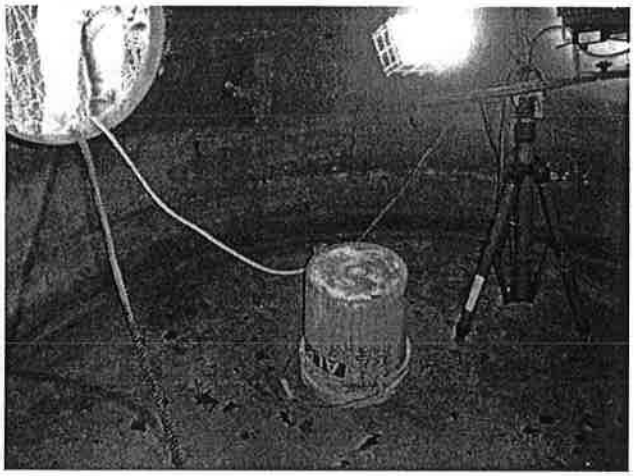

130

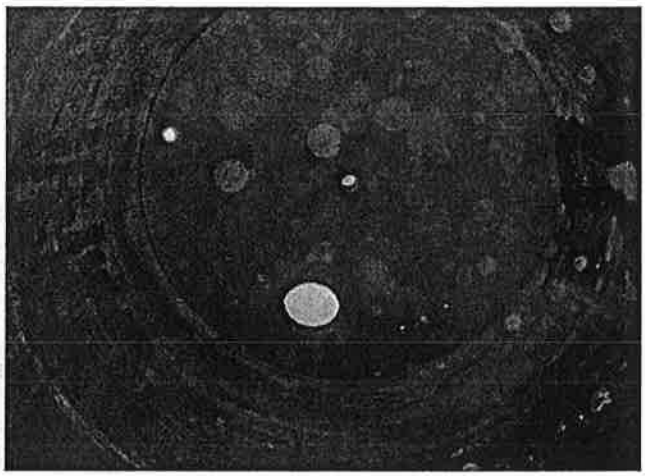

135

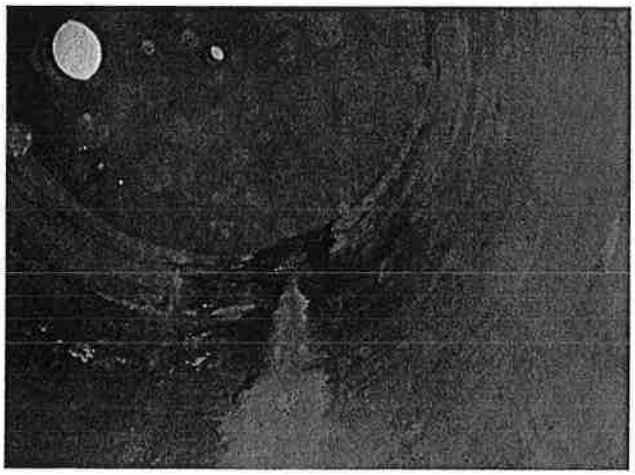














SHELL THICKNESS CALCULATIONS

PER API 653, THIRD EDITION, DECEMBER 2001, ADDENDUM 2, NOVEMBER 2005

tmin = 2.6*D*(H-1)*G / S*E

tmin — The minimum allowable shell thickness for each course, at least 0.1".

Max. Fill Height		20.000	ft	Capacity of tank (42 gal barrels) =	227	bbl based on max fill height	
Total Height of Shell		20.000	ft	Capacity of tank (42 gal barrels) =	227	bbl based on shell height	
Diameter	D	9.000	ft				
Gravity	G	1.2000	Highest specific gravity of the contents				
Yield Str.	Y	30,000	30,000 if unknown, or if known use the specified min. yield strength.			psi	
Tensile	T	55,000	55,000 if unknown, or if known use the smaller of 80,000 and			psi	
			the specified min. yield strength.				
Course No.		1 and 2	3 and above				
S1 shall equal		24000	26400	psi			
S2 shall equal		23595	25960	psi			
S shall = the least of S1 & S2		23595	25960	psi			

E = the joint efficiency. May use 1.0 when evaluating retirement thickness in corroded plate when away from weld by at least the greater or 1 inch or twice the plate thickness. See API 653 Table 4-2 or for riveted tanks Table 4-3.

If there are large corroded or locally thinned areas < tmin, the following procedure shall be used:

For each area under consideration, t2 shall be determined where t2 is the low thickness in the thinned area exclusive of widely scattered pitting. Then the vertical corrsion plane length, L, shall be computed where L = 3.7* SqRt(D*t2), but not > 40". At least 5 equally spaced readings are taken over length L are averaged. This average is defined as t1.

The acceptance criteria is that t1 shall be > or = tmin and t2 shall be > or equal to 60% of tmin

For a 1st cut analysis all readings per course are compared to each respective tmin. If all are > tmin, then the shell is acceptable and the 5 corrosion plane readings are not needed.

Shell	Course No.	THE READINGS USED TO FIND t1 & t2					t1	t2	L	
	*1	0.147					0.147	0.147	4	
	2	0.247					0.247	0.247	6	
	3	0.243					0.243	0.243	5	

* This reading includes pitting to 0.10" which was subttracted from wall thickness to be conservative.

Shell Course No.	Course Height (ft)	E	H (ft)	S	t min.	t1	t2	t1> tmin ?	t2>0.60* tmin?	Shell Course Acceptable? (Y/N)	Remaining CA
1	6.6667	0.70	20.0000	23,595	0.100	0.147	0.147	TRUE	TRUE	yes	0.047
2	6.6667	0.70	13.3333	23,595	0.100	0.247	0.247	TRUE	TRUE	yes	0.147
3	6.6667	0.70	6.6667	25,960	0.100	0.243	0.243	TRUE	TRUE	yes	0.143

Note: Remaining corrosion allowance is based on t2. All shell thickness readings and t1, t2, tmin are in inches.

Shell Pitting Evaluation

Acceptance Criteria

1) No pit shall result in remaining shell thickness being < 1/2 of tmin exclusive of the corrosion allowance, and

2) The sum of their dimensions along any vertical line does not ecxeed 2 inches in any 8 inch length.

Shell Course No.	t min.	Measured or Estimated Pit Depths (in.) A	B	C	D	E	Local wall	Remaining wall =local - max pit	1/2*tmin	Acceptable?
1	0.100	0.155					0.247	0.092	0.050	yes
2	0.100						0.247	0.247	0.050	yes
3	0.100						0.243	0.243	0.050	yes

Conclusions

Tank may be filled to full capacity with the current product or a lighter product based on the above calculations.

CONAM Inspection & Engineering Services, Inc.
7820 South 210th Street, Suite 110
Kent, WA 98032
Ph: (206) 764-8123 • Fax: (206) 764-8124

CALIBER INSPECTION

REPORT NUMBER 170127
DATE ISSUED 8-27-08
CUSTOMER P.O. 41326 TN

MT INSPECTION REPORT

CUSTOMER

PSC
20245 77th Ave S.
Kent WA 98032

WORK SITE LOCATION

PSC
20245 77th Ave S.
Kent WA 98032 Tanks 9B and 9C

PROCEDURE: SIP4009 Rev B

SPECIFICATION: ~~ASME Sec V ASME~~ DOT API 653/650

ACCEPTANCE: ASME Sec VIII

CLASS: N/A

QUANTITY: 5

MATERIAL: C.S.

DESCRIPTION: Dry Magnetic partical inspection of 2 each fillet weld Repair in Tank 9B and 3 Puddle welds in Tank 9C

INSPECTION RESULTS: Inspected: 5
Accepted: 5
Rejected: Ø

EQUIPMENT: Parker Probe MODEL: DA 400 S/N: 10805

CAL. DUE: 12-10-08 MAG. POWDER: 8A Red BATCH: 08E023

Byron D. Johnson	II		8-27-08
PREPARED BY	LEVEL		DATE
Byron D. Johnson	II	CI MT 3.1	8-27-08
PREPARED BY	LEVEL		DATE

CERTIFICATE OF CONFORMANCE: We certify that the above material was inspected in accordance with the stated specifications.

NOTE: This report is unbiased. It is expressly understood that all descriptions, comments, and expressions of opinion reflect the opinion or observation of the engineer(s)/technician(s) and are not intended nor can they be construed as representation or warranty as to the actual circumstances. Conam/Caliber Inspection is not assuming any responsibility of the owner/operator and the owner/operator retains complete responsibility for the engineering, repair and use decisions as a result of the data or other information provided by Conam/Caliber Inspection. In no event shall Conam/Caliber Inspection liability in respect to the services referred to herein exceed the amount paid for such services. No other warranty, expressed or implied is made or intended by Conam/Caliber Inspection.

STRUCTURAL INTEGRITY ASSESSMENT OF EXISTING TANK
per WAC 173-303-640 (2) (a)

FACILITY Kent, WA **TANK NO.** T9-A

TANK NAME T9-A

SYSTEM WASTEWATER TREATMENT CONTAINMENT

VESSEL FLUID WASTEWATER

This structural integrity assessment has determined that the above tank is adequately designed and has sufficient structural strength to ensure that it will not collapse, rupture or otherwise fail due to structural failure. This assessment has considered the following:

A. ENGINEERING DOCUMENTS AND DESIGN STANDARDS USED FOR EVALUATION

1. International Building Code, 2006 edition
2. Seismic Anchor based on Sitts & Hill Engineers calculations, dated May 2008
3. Busby Marine and Tank, Inc. Job ID No. 329201 Rev 1, dated 30 Jan 2006

B. DOCUMENTED AGE OF TANK. IF UNAVAILABLE, ESTIMATED AGE:

1. Tank was originally fabricated and installed in 2006.

C. RESULTS OF STRUCTURAL INTEGRITY ANALYSIS:

1. Copy of structural calculations provided to Philip Environmental

D. COMMENTS:

1. Corrosion protection measures and the compatibility of tank materials with the wastes stored or treated is to be established by others.

2. We have relied on the Owner to furnish information on anticipated applicable loading conditions.

3. We have relied on proposed tank dimensions and support as shown on Sitts & Hill Drawing No. 14001/S1.1.

PHILIP SERVICES CORP.
18000 – 72nd Avenue S, Suite 217
Kent, WA 98032-1035

STRUCTURAL INTEGRITY ASSESSMENT
CERTIFICATION OF TANK No. T9-A

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
WAC 173-303-810 (13) (a).

The undersigned is an independent, qualified, registered Professional Engineer.

NAME: Brent K. Leslie, P.E.

SIGNATURE: _____ **DATE:** 12 MAY 2008

COMPANY: Sitts and Hill Engineers Inc.

ADDRESS: 2901 So. 40th St
Tacoma WA 98409

TELEPHONE: (253) 474-9449

FAX: (253) 474-0153



EXPIRES 2/26/09

STRUCTURAL INTEGRITY ASSESSMENT OF EXISTING TANK
per WAC 173-303-640 (2) (a)

FACILITY Kent, WA **TANK NO.** T9-B

TANK NAME T9-B

SYSTEM WASTEWATER TREATMENT CONTAINMENT

VESSEL FLUID WASTEWATER

This structural integrity assessment has determined that the above tank is adequately designed and has sufficient structural strength to ensure that it will not collapse, rupture or otherwise fail due to structural failure. This assessment has considered the following:

A. ENGINEERING DOCUMENTS AND DESIGN STANDARDS USED FOR EVALUATION

1. International Building Code, 2006 edition
2. Seismic Anchor based on Sitts & Hill Engineers calculations, dated May 2008
3. Busby Marine and Tank, Inc. Job ID No. 335701, dated 30 Jan 2006

B. DOCUMENTED AGE OF TANK. IF UNAVAILABLE, ESTIMATED AGE:

1. Tank was originally fabricated and installed in 2008.

C. RESULTS OF STRUCTURAL INTEGRITY ANALYSIS:

1. Copy of structural calculations provided to Philip Environmental

D. COMMENTS:

1. Corrosion protection measures and the compatibility of tank materials with the wastes stored or treated is to be established by others.

2. We have relied on the Owner to furnish information on anticipated applicable loading conditions.

3. We have relied on proposed tank dimensions and support as shown on Sitts & Hill Drawing No. 14001/S1.1.

PHILIP SERVICES CORP.
18000 – 72nd Avenue S, Suite 217
Kent, WA 98032-1035

STRUCTURAL INTEGRITY ASSESSMENT
CERTIFICATION OF TANK No. T9-B

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
WAC 173-303-810 (13) (a).

The undersigned is an independent, qualified, registered Professional Engineer.

NAME: Brent K. Leslie, P.E.

SIGNATURE: [signature]

DATE: 12 MAY 2008

COMPANY: Sitts and Hill Engineers Inc.

ADDRESS: 2901 So. 40th St
Tacoma WA 98409

TELEPHONE: (253) 474-9449

FAX: (253) 474-0153



EXPIRES 2/26/09

STRUCTURAL INTEGRITY ASSESSMENT OF EXISTING TANK
per WAC 173-303-640 (2) (a)

FACILITY Kent, WA **TANK NO.** T9-C

TANK NAME T9-C

SYSTEM WASTEWATER TREATMENT CONTAINMENT

VESSEL FLUID WASTEWATER

This structural integrity assessment has determined that the above tank is adequately designed and has sufficient structural strength to ensure that it will not collapse, rupture or otherwise fail due to structural failure. This assessment has considered the following:

A. ENGINEERING DOCUMENTS AND DESIGN STANDARDS USED FOR EVALUATION

1. International Building Code, 2006 edition
2. Seismic Anchor based on Sitts & Hill Engineers calculations, dated May 2008
3. EISI Consulting Engineers. Job ID No. 20019, dated 1 March 1993

B. DOCUMENTED AGE OF TANK. IF UNAVAILABLE, ESTIMATED AGE:

1. Tank was originally fabricated and installed in 2006.

C. RESULTS OF STRUCTURAL INTEGRITY ANALYSIS:

1. Copy of structural calculations provided to Philip Environmental

D. COMMENTS:

1. Corrosion protection measures and the compatibility of tank materials with the wastes stored or treated is to be established by others.

2. We have relied on the Owner to furnish information on anticipated applicable loading conditions.

3. We have relied on proposed tank dimensions and support as shown on Sitts & Hill Drawing No. 14001/S1.1.

PHILIP SERVICES CORP.
18000 – 72nd Avenue S, Suite 217
Kent, WA 98032-1035

STRUCTURAL INTEGRITY ASSESSMENT
CERTIFICATION OF TANK No. T9-C

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
WAC 173-303-810 (13) (a).

The undersigned is an independent, qualified, registered Professional Engineer.

NAME: Brent K. Leslie, P.E.

SIGNATURE: _____ **DATE:** 12 MAY 2009

COMPANY: Sitts and Hill Engineers Inc.

ADDRESS: 2901 So. 40th St
Tacoma WA 98409

TELEPHONE: (253) 474-9449

FAX: (253) 474-0153



EXPIRES 2/26/09

APPENDIX D-5

TANK DATA SHEETS

APPENDIX D-5

TANK DATA SHEETS

Tank Data Sheet

RCRA-Regulated? **Yes**
Tank Location: **Kent**
Tank Number: **T-9A**
Process Description: **Storage of Dangerous Wastewaters**
Vessel Fluid: **Wastewater Containing Oil and/or Organic Compounds**
Specific Gravity: **<1.2** Freeboard At Working Vol (ft^3): **1'0**
Normal Operating Pressure (psig): **Atmospheric** Temperature (°F): **Ambient**

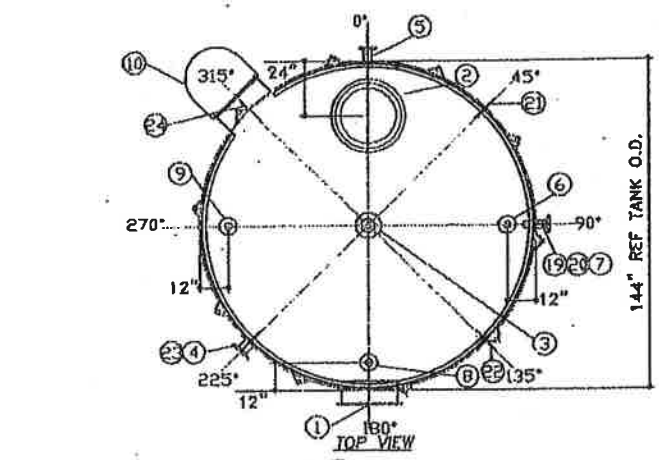
	Material	Thickness	Type
Bottom	**Carbon Steel**	**5/16" nominal**	**Cone**
Shell	**Carbon Steel**	**5/16" nominal**	**Cylindrical**
Head (ends)	**Carbon Steel**	**5/16" nominal**	**Cone**

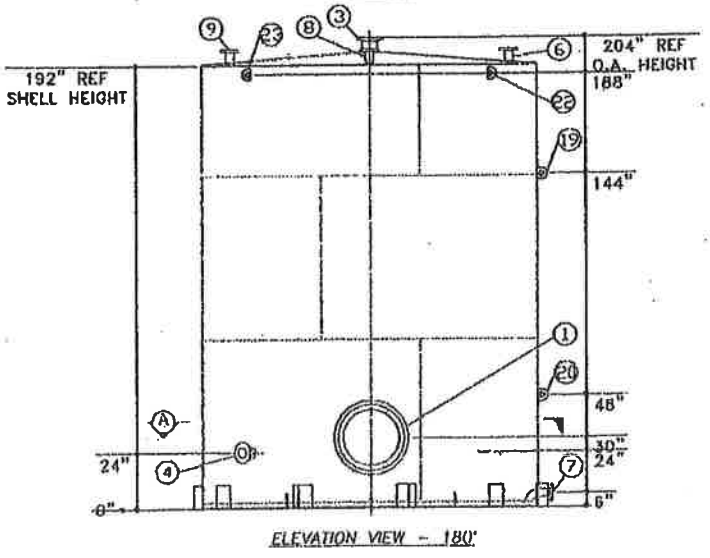
Working Volume (USG): **12,700** Insulation: **None**
Nominal Volume (USG): **13,500** Method of Construction: **Welded Steel**
Tank I.D. (ft): **12' 0"** Tank Height or Length (ft): **17' 0"**
Design Code Used: **Non-UL / IBC** Date in Service: **4/1/2006**
Anchorage: **Hold downs are seismic/wind rated**

Connections

Item No.	Size (In.)	Description
1	**24"**	**Manway - side**
2	**24"**	**Manway - top**
3	**6"**	**Nozzle / 150#**
4	**4"**	**Nozzle / 150#**
5	**3"**	**Nozzle / 150#**
6	**3"**	**Nozzle / 150#**
7	**3"**	**Nozzle / 150#**
8	**3"**	**Nozzle / 150#**
9	**3"**	**Nozzle / 150#**
10		**Ladder**
11		
12		

Tank Sketch





Interior Coating: **none**
Exterior Coating: **Tnemec 73 & 66 (Polyurethane over Enamel)**
Tank Manufacturer: **Busby Marine and Tank**
Year Manufactured: **2006**

Remarks:
Cathodic protection provided zinc or magnesium anodes as recommended by certifying engineer.

Tank Data Sheet

RCRA-Regulated? **Yes**
Tank Location: **Kent**
Tank Number: **T-9B**
Process Description: **Treatment/Storage of Dangerous Wastewaters**
Vessel Fluid: **Wastewater Containing Oil and/or Organic Compounds**
Specific Gravity: **<1.2** Freeboard At Working Vol (ft^3): **1'0**
Normal Operating Pressure (psig): **Atmospheric** Temperature (°F): **Ambient**

	Material	Thickness	Type
Bottom	**Carbon Steel**	**5/16" nominal**	**Cone**
Shell	**Carbon Steel**	**5/16" nominal**	**Cylindrical**
Head (ends)	**Carbon Steel**	**5/16" nominal**	**Cone**

Working Volume (USG): **11,400** Insulation: **None**
Nominal Volume (USG): **12,100** Method of Construction: **Welded Steel**
Tank I.D. (ft): **10' 6"** Tank Height or Length (ft): **24' 0"**
Design Code Used: **Non-UL / IBC** Date In Service: **9/1/2006**
Anchorage: **Hold downs are seismic/wind rated**

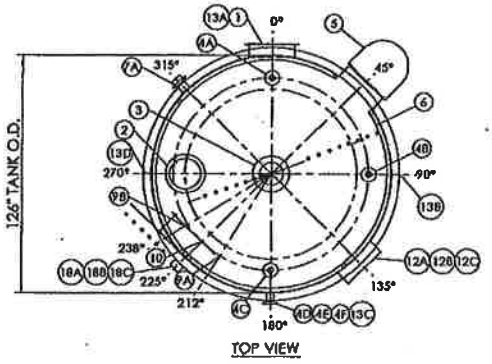
Connections

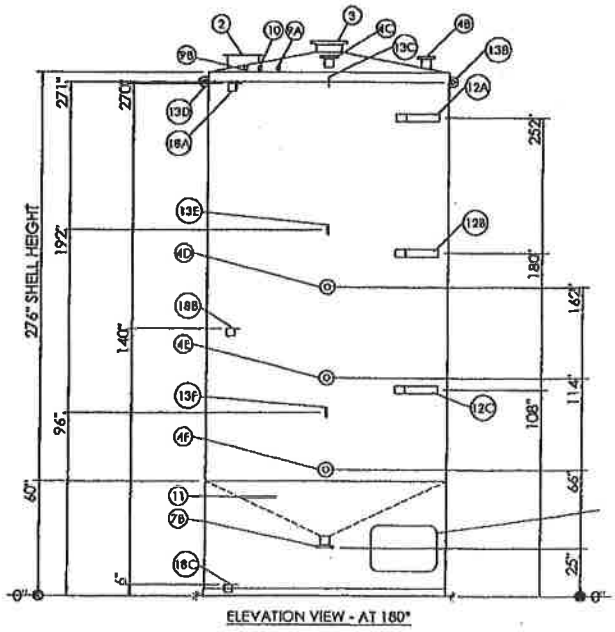
Item No.	Size (In.)	Description
1	**24"**	**Manway**
2	**16"**	**Manway**
3	**12"**	**Nozzle / 150#**
4	**3"**	**Nozzles / 150#**
5		**Ladder**
6		**Handrail**
7	**4"**	**Nozzles / 150#**
8		
9	**1 ¼"**	**Threaded Nipples**
10	**1"**	**Threaded Coupling**
11		**Gauge Anchor Bar**
12		**Pipe Brackets**

Interior Coating: **none**
Exterior Coating: **Tnemec 73 & 66 (Polyurethane over Enamel)**
Tank Manufacturer: **Busby Marine and Tank**
Year Manufactured: **2006**

Remarks:
Cathodic protection provided by zinc or magnesium anodes as recommended by certifying engineer.

Tank Sketch





Tank Data Sheet

RCRA-Regulated? **Yes**
Tank Location: **Kent**
Tank Number: **T-9C**
Process Description: **Storage/Discharge of Dangerous Wastewaters**
Vessel Fluid: **Wastewater Containing Oil and/or Organic Compounds**

Specific Gravity:	**<1.6**	Freeboard At Working Vol (ft):	**1'0**
Normal Operating Pressure (psig):	**Atmospheric**	Temperature (°F):	**Ambient**

	Material	Thickness	Type
Bottom	**Carbon Steel**	**0.25" nominal**	**Flat Bottom**
Shell	**Carbon Steel**	**0.25" nominal**	**Cylindrical**
Head (ends)	**Carbon Steel**	**0.25" nominal**	**Conical**

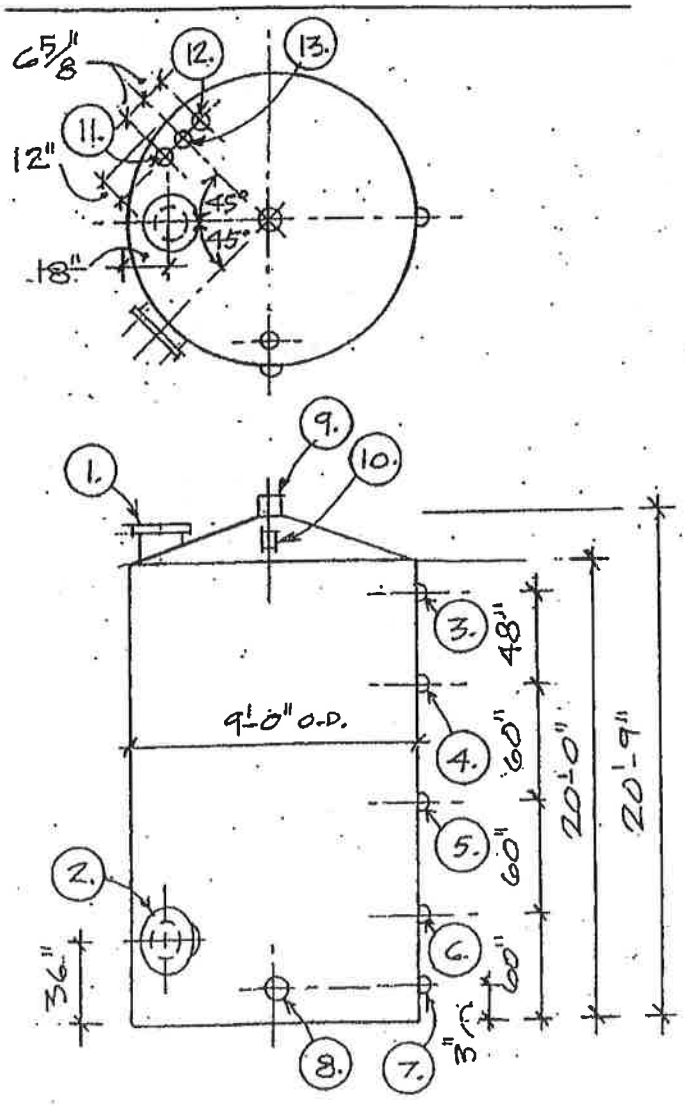
Working Volume (USG):	**9,000**	Insulation:	**None**
Nominal Volume (USG):	**9,500**	Method of Construction:	**Welded Steel**
Tank I.D. (ft):	**9'0"**	Tank Height or Length (ft):	**20' 9"**
Design Code Used:	**UBC**	Date in Service:	**08/26/2008**
Anchorage:	**Anchors are seismic and wind rated**		

Item No.	Size (In.)	Description
1	**16**	**Manway**
2	**24**	**Manway**
3	**3**	**Inlet/Outlet**
4	**3**	**Inlet/Outlet**
5	**2**	**Inlet/Outlet**
6	**2**	**Inlet/Outlet**
7	**4**	**Coupling vent**
8	**3**	**Coupling vent**
9	**1 ¼**	**Coupling**
10	**1 ¼**	**Coupling**
11	**1 ¼**	**Coupling**
12	**1**	**Coupling**
13	**1 ¼**	**Coupling**

Interior Coating: **none**
Exterior Coating: **Polyurethane Enamel**
Tank Manufacturer: **Reliable Steel**
Year Manufactured: **1989**

Remarks:
Cathodic protection provided by zinc or magnesium anodes as recommended by certifying engineer.

Tank Sketch



APPENDIX D-6

SOIL STUDY

APPENDIX D-6

SOIL STUDY

Earth Consultants Inc.
Geotechnical Engineers, Geologists & Environmental Scientists

October 11, 1990 E-998-3

Chempro
2203 Airport Way South, Suite 400
Seattle, Washington 98134

Attention: Mr. Dave Larimore

Subject: **Foundation Allowable Bearing Values**
South 206th Street and 76th Avenue South
Kent, Washington

Reference: Earth Consultant Inc.
Geotechnical Engineering Study
E-998; February 8, 1980

Gentlemen:

In accordance with the request of Douglas Condit of EISI, we have reviewed the referenced report in order to provide our opinion regarding an increase in the allowable bearing values for additional construction at the site. It is our understanding that the foundations for a new tank have been designed for dynamic conditions using an allowable bearing pressure of 3,500 pounds per square foot (psf) instead of the one-third increase above 2,000 psf as recommended in the above referenced report.

Based on the available data, and provided that the earthwork recommendations of our referenced report were followed, it is our opinion that foundations could be designed for dynamic conditions using an allowable bearing pressure of 3,500 psf. However, the use of this value will result in a reduction of the bearing capacity factor of safety from approximately 3.0 to approximately 1.7. Considering that dynamic loading is temporary in nature, this factor of safety would, in our opinion, be adequate for the proposed structure.

Should you have any questions or if we can be of further assistance, please call.

Very truly yours,

EARTH CONSULTANTS, INC.

Kyle R. Campbell, P.E.
Project Engineer

Theodore J. Schepper, P.E.
Project Manager

THEODORE J. SCHEPPER
STATE OF WASHINGTON
26742
REGISTERED
PROFESSIONAL ENGINEER

KRC/TJS/sar
[G998-3.L01]

1805 - 136th Place N.E., Suite 101, Bellevue, Washington 98005
222 E. 26th Street, Suite 101, Tacoma, Washington 98411-9998
Bellevue (206) 643-3780 Seattle (206) 464-1584 FAX (206) 746-0860 Tacoma (206) 272-6608

Earth Consultants Inc.

Geotechnical Engineering and Geology
1805 - 136th Place N.E., Suite 101, Bellevue, Washington 98005
Phone: (206) 643-3780 / Seattle (206) 464-1584

February 8, 1980 E-998

Crosby and Overton, Inc.
1620 West 16th Street
Long Beach, California 90813

Attention: Mr. Richard Potts

Subject: Geotechnical Engineering Study
Warehouse and Office Building
South 206th Street and 76th Avenue South
Kent, Washington

Gentlemen:

In accordance with your request and within the scope of our proposal dated July 12, 1979 this report presents the results of our Geotechnical Engineering Study for the subject project. The purpose of this study was to explore the subsurface soil conditions in order to provide recommendations for site preparation and foundation design. The scope of our study included seven borings, laboratory tests, geotechnical engineering analyses and the preparation of this report. Preliminary recommendations for geotechnical aspects of the project were submitted in our letter dated August 15, 1979. Since that time we have also monitored placement of structural and surcharge fills and provided consultation services to other project consultants.

Our study indicates that the site is underlain by generally loose and occasional medium dense silty soils and soft clayey silts to depths ranging from about 8 to 19 feet below the existing grades. The medium dense to dense granular soils underlying the loose and soft upper soils also contain occasional soft layers of clayey silts. The structures, therefore, should not be constructed directly bearing on these compressible soils which may cause large differential settlements to the structures.

Based on our study of this site and extensive experience on similar projects in the Green River Valley, we are of opinion that the proposed construction on this site is feasible using shallow foundations and slabs-on-grade supported on structural fill mats preloaded under surcharge loads.

Based on preliminary recommendations given in our letter dated August 15, 1979, earthwork construction was started on the site. Approximately 5 feet of fill has been placed in the building area in the southern part of the site. Structural and surcharge fills have also been placed in the northern part of the site where a Treatment Building and a number of fuel tanks will be constructed. The total thickness of these fills ranges from 7 to 18 feet in height. Settlements under the fill loads are being recorded. Through mid-January, 1980, the southern building area has undergone a settlement of about 1.5 to 2.5 inches and the northern tank and the Treatment Building area about 5 to 12 inches under the varying fill loads. Based on the available field data, it appears that settlements have essentially stabilized under the existing fill and surcharge loads.

We believe, that the above surcharge loads are, generally adequate in most building and tank areas. However, at the location of Tank T-3A and in the southeast corner of the Treatment Building, surcharge fill has not been placed to an adequate depth. We, therefore, recommend placement of additional surcharge fill at these two locations.

The following sections describe the study and explain our recommendations in greater detail.

PROJECT DESCRIPTION

At the time our study was performed, the site along with the extents of surcharge fill and their heights, and proposed building and tank locations were as shown schematically on the Boring Location Plan, Plate 1. This is based on building drawings provided by Crosby and Overton, Inc. (undated), and a topographical survey drawing (Job No. 147/68) by Leonard Schroeter, dated December 18, 1979.

It is planned to construct a two-story warehouse and office building approximately 4 feet higher than the original grade in the southern part of the project area. Placement of the structural fill (4 to 5 feet high) on this area was completed by the end of August, 1979. An additional 2 to 3 feet of fill was also placed on the central part of this area during that time. Based on survey readings obtained by Leonard Schroeter, Land Surveyor, a maximum ground settlement of about 2.5 inches has occurred under the weight of the fill through mid-January, 1980. The finish floor elevation of the building will be El. 27.5 feet. Maximum column loads will be on the order of 60 kips, and wall loads on the order of 2 to 3 kips per lineal foot, dead plus live loads. Floor loads are expected to be less than 200 psf. A few metal tanks for the storage of fuel will also be installed outside the western boundary of the building area.

We further understand that several cylindrical tanks for water and fuel storage purposes will be installed in the northern portion of the project area, as shown on the Boring Location Plan, Plate 1. Tank T-9 will be surrounded by a 4 foot high containment structure. A two-story Treatment Building will also be constructed south of the tanks as shown on Plate 1. The finish floor elevations of the tanks will be between Els. 25.5 and 26, and of the building about El. 28. This will necessitate placement of 4 to 6 feet of structural fill to attain design grades. The fill along the western boundary of the tank area will be sloped down, and the toe supported by a 2.5 foot high retaining wall. The column and the wall loads for the building will be almost similar to those of the warehouse and office building in the southern portion of the project site. The floor load will be around 350 psf. A 10 foot diameter tank will be installed inside the Treatment Building and will have a ground contact pressure of about 1,000 psf.

Based on information obtained from Crosby and Overton's Tank and Equipment Schedule (dated September 24, 1979), and subsequent revisions communicated to us, the approximate size and the loadings of the proposed water and fuel storage tanks are tabulated below:

Tank No.	Diameter (feet)	Height (feet)	Dry Weight (pounds)	Wet Weight (pounds)	Remarks
T-1	24	13.5	30,000	391,000	Flat Botto: with 3'x2' center sum;
T-2	12	12	6,000	84,000	Flat Bottor Open Top
T-3A and T-3B	32	30	39,000	1,499,000	Flat Botton Open Top
T-6A and T-6B	16	16	20,000	227,000	Flat Top and Bottom
T-8	10	12	7,000	43,000	Flat or Cone Roof
T-9	18	16	19,000	307,000	Cone Roof

The northern part of the project area has been preloaded with three different heights of surcharge fill, as shown on Plate 1. The tanks listed above are generally covered with about 12 to 14 feet of preload fill*, with the exception of Tank T-9 and Tank T-3A. In these areas, approximately 4 to 8 feet of preload fill has been

placed. The Treatment Building area is generally preloaded with about 2 to 3 feet of surcharge fill with the exception of a small portion of the southeast corner where the preload is virtually non-existent.
existent.

The above preload fills were placed between August and October 1979, and the ground settlements under the weight of the varying heights of the fill have ranged between 5 and 12 inches through mid-January, 1980. No significant settlements have occurred between December, 1979 and January, 1980.

If any of the above design criteria change, we should be consulted to review the recommendations contained in this report. In any case, it is recommended that Earth Consultants, Inc. be provided the opportunity for a general review of final design.

FIELD INVESTIGATION AND LABORATORY TESTING

Our field exploration was performed on August 8 through 10, 1979. Subsurface conditions at the site were explored by drilling seven borings to a maximum depth of 54 feet below the existing grade. The borings were drilled by Anderson Drilling Services using a truck-mounted drill rig. Continuous flight, hollow stem augers were used to advance and support the boreholes during sampling. The locations of the borings were approximately determined by tape measurements from staked property corners. Elevations of borings were approximately determined by interpolation between plan contours. The locations and elevations of the borings should be considered accurate only to the degree implied by the method used. These locations are shown on the Boring Location Plan, Plate 1.

The field exploration was continuously monitored by a engineering geologist from our firm who classified the soils encountered, maintained a log of each boring, obtained representative samples, measured groundwater levels, and observed pertinent site features. An observation well was installed in Boring B-6 so that groundwater levels could be monitored. In addition a pneumatic piezometer was installed in Boring B-3 to monitor pore pressures within the compressible layers. All samples were visually classified in accordance with the Unified Soil Classification System which is presented on Plate 2, Legend. Logs of the borings are presented on Plates 3 through 9. The final logs represent our interpretation of the field logs and the results of the laboratory examination and tests of field samples.

* Preload or surcharge fill is defined as the height of fill above the proposed finish floor elevation of a structure.

In each boring, Standard Penetration Tests (SPT) were performed at selected intervals in accordance with ASTM Test Designation D-1586. In addition, a 2.4 inch I. D. ring sampler was used to obtain relatively undisturbed soil samples at selected depths. Blow counts for this sampler have been adjusted to equivalent SPT values.

Shear strengths of undisturbed soils were measured where practical in the field with a penetrometer. These results are recorded on the boring logs at the appropriate sample depth.

Representative soil samples were placed in closed containers and returned to our laboratory for further examination and testing. Visual classifications were supplemented by index tests such as sieve analyses and Atterberg limits on representative samples. Field unit weight and moisture content determinations were performed on undisturbed ring samples, and moisture contents on all disturbed samples. Results of density and moisture content determinations, together with classifications, are shown on the boring logs included in this report. The results of sieve and hydrometer analyses are illustrated on Plates 10 through 12.

Consolidation tests were performed on three representative ring samples to evaluate the consolidation characteristics of the site soils. In addition, time readings were taken at each point of loading to evaluate the time rate of settlement. The results of these tests are shown on Plate 13.

SITE DESCRIPTION

Surface

The site is located at the northwest corner of the intersection of 76th Avenue South and South 206th Street in Kent, Washington. At the time of our field work, three wood-frame buildings and a concrete block greenhouse were located in the southern half of the parcel. Some of the area supported agricultural growth, with some trees in the southeast corner. The remainder of the site was covered with tall grass and brush. The north and east property lines were fenced with barbed wire. An 18 inch deep trench traversed the northern portion of the property terminating in a 20 foot diameter pond. The water level within the pond was at about El. 17.5. Before grading, the property was generally flat lying with about 5 feet of relief, the majority occuring at the north end. Some buried utilities existed near the greenhouse including power, water and an irrigation system. The site was being used for storage of farming equipment and supplies at the time of our field investigation.

Subsurface

The soil at the site is alluvium deposited by the White and Green rivers. The alluvium was deposited in a fluvial environment since the retreat of the Puget Sound ice lobe of the last glacial episode approximately 10,000 years ago. As indicated by the boring logs, the ground surface is underlain by generally loose with occasional medium dense granular soils consisting of sandy silt, silty sand and sand with some soft clay and organics extending to depths ranging from 6 to 19 feet.

The loose and soft soils are generally underlain by medium dense silty sand and sand with occasional thin layers of soft clayey to sandy silt which, generally, extend to the depths of our boring investigation. In Boring B-6, the upper granular materials are underlain by about 11 feet of medium stiff to very soft clayey silt. Underlying the clays, dense sand was encountered to the depth explored.

During our field work in August, groundwater was encountered in all the borings within a few feet of the ground surface. During winter, surface water could perch on the site because of the low permeability of the silty surficial soils.

DISCUSSION AND RECOMMENDATIONS

General

The loose and soft soils immediately below the original ground surface are not suitable for directly supporting the foundations. In our preliminary report, dated August, 1979, we, therefore, recommended that the tanks and the buildings be supported on structural fill mats preloaded with suitable surcharge loads.

Based on our field observations and available survey data, we understand that about 4 to 5 feet of structural fill has been placed on the southern building area. In addition, about 2 to 3 feet of additional fill has also been placed above the central part of this area. Similar magnitudes of structural fill have also been placed on the northerly tank and building areas with additional surcharge fills of between 2 and 14 feet, as shown on Plate 1.

The above surcharge fills appear to be adequate for most of the proposed structures. However, Tank T-3A has not been preloaded with a sufficient amount of surcharge fill. Also, a small portion of the southeastern corner of the Treatment Building area does not have a sufficient amount of preload fill. Hence, these areas should have additional preload fills placed on them. At the locations of Tank T-3A and the southeastern corner of the Treatment Building, we expect that additional fill heights of approximately 6 to 9 feet

(El. 39) and 3 feet (El. 33), respectively will be required.

The estimated settlements under the existing structural fill and the surcharge fill loads range from about 4 inches in the southern building area to about a maximum of 14 inches in the tank area. The corresponding actual settlements through mid-January, 1980 were about 2.5 and 12 inches, respectively. From the field settlement data, it appears that a majority of the settlements under the existing loads have already occurred. The construction of the buildings and the tank foundations, except Tank T-3A and the southeastern part of the Treatment Building for which additional preloading has been recommended, may, therefore, be started.

The following sections of this report present detailed recommendations for the various geotechnical engineering aspects of the project which should be incorporated into the project design and construction. This report has been prepared for the exclusive use of Crosby and Overton, Inc. and their representatives for specific application to this project in accordance with acceptable geotechnical practices. No other warranty, expressed or implied, is made.

Foundations

The existing preload fills may be removed from the tank and the Treatment Building areas in the northern portion of the site, and construction of the structures may be started. We, however, recommend additional preloading at the locations of Tank T-3A and the Treatment Building to Els. 39 and 33, respectively. The preload fills should extend laterally at least 5 feet beyond the tank and building perimeters. We expect that a majority of the settlement should occur within 30 to 45 days after completion of the fill placement.

In addition, we further recommend that the 2 to 3 feet of fill that currently exists above the structural fill in the central part of the southern building area, be evenly spread over the entire building area. Any fill remaining above the design finish grade may be removed prior to placement of footings and slabs.

Based on the design parameters outlined in the Project Description Section of this report it is our opinion that the proposed building and the tank structures may be supported on spread footings bearing directly on at least 2.5 feet of structural fill placed in accordance with the Site Preparation Section of this report. The structural fill should extend horizontally at least 2.5 feet beyond the footing perimeters. Tank sumps beneath foundation pads should also be supported on at least 2.5 feet of structural fill which should extend at least 2.5 feet laterally beyond the sump edge.

The building and the tank areas after above preloading, may be designed for an allowable bearing pressure of 2000 psf, dead plus normal live loads. A one-third increase in this value is permissible when short term lateral loads due to wind and earthquake are considered. We recommend a minimum footing width of 16 inches for the buildings.

We recommend that all footing bearing surfaces for the buildings and the tanks be examined by a representative of Earth Consultants, Inc. before pouring concrete.

All exterior footings for the building and the tank foundations should bear at least 18 inches below finish grade for frost considerations. Interior footings may bear at a minimum depth of 12 inches below the top of floor slabs.

We estimate that the building footings may undergo a maximum of about 1/2 inch settlement. The total and differential settlements below the tank bottoms may be a maximum of about 2 and 1 inches, resepctively.

Floor Slabs

Slabs-on-grade should be supported on a minimum of 12 inches of structural fill. Below tank bottoms, a minimum of 18 inches of structural fill should be placed. At least the top 4 inches below the subgrade should be free draining sand or gravel. Any structural fill required to attain design grade should be prepared in accordance with the Site Preparation section of this report. The building slabs may be isolated from foundations to reduce the detrimental effects of any differential settlements between the footings and the floor slabs.

Site Preparation

Structural fill and varying heights of surcharge fills have already been placed on the building and the storage tank areas. Any other areas requiring regrading and pavement areas should be cleared of all structures, utility lines, debris, vegetation, brush and other deleterious matter. In all areas that will receive pavements, the subgrade should be proofrolled under the observation of a representative of Earth Consultants, Inc. This procedure should indicate the presence of any exceptionally loose or unstable areas, which if present, should be overexcavated and replaced by structural fill or crushed rock. Generally, about 1 to 2 feet of fill may be required to "bridge" any soft yielding soils. A filter cloth placed directly on the excavated surface may also help to bridge unstable areas.

Structural Fill

All structural fill should be placed in 8 to 10-inch thick loose lifts and compacted to a minimum of 95 percent relative compaction as determined by ASTM D-1557-70 (Modified Proctor). The near surface site soils contain an excessive amount of fines which were wet at the time of our field exploration. This condition will make them difficult to compact in their present state. We do not recommend their use during wet weather. If fill placement is to be conducted during wet weather, we recommend that granular materials with a maximum size of 2 inches, containing less than 5 percent fines, be used for structural fill. During dry weather, other granular materials may be used provided they can be properly compacted. Imported fill samples should be submitted to Earth Consultants, Inc. prior to bringing on the site. The placement of structural fill should be monitored and tested by Earth Consultants, Inc.

Preload Fills

Most preload fills on the tank and building areas have already been placed. Additional surcharge fills on Tank T-3A and the Treatment Building areas should be immediately placed. These preloads need not be compacted, but the material should weigh at least 120 pcf. Existing preload materials northeast and northwest of the tank area may be used for preloading these areas. Any excess materials available, may be used for preloading the pavement areas until pavement construction starts.

Settlement Surveillance

To verify that structural fills and preloads are settling at the expected rates and magnitudes and to make supplemental recommendations if differences occur, settlements of both the tank and the building areas are being monitored continuously. Five settlement markers have been installed in the southern building area, and nine settlement markers in the northern tank and Treatment Building area. The existing settlement markers in the Tank T-3A and the Treatment Building areas may be used for monitoring further settlements under the recommended additional surcharge loads. Marker elevations should be resurveyed every three days while fill is being placed and settlement rates are high, and then less frequently, as requested by the Soil Engineer.

In addition, a piezometer has also been installed to monitor pore pressures within the compressible layers in Boring B-3 (Tank T-3B area). This instrument is used to monitor the rate of pore pressure buildup and dissipation during the placement of surcharge loads on the area and gives an indication of the rate at which the surcharge program is progressing.

Lateral Forces

Short term wind or seismic forces may be resisted by passive pressures, and/or friction between concrete and the supporting subgrade. The passive resistance may be considered as an equivalent fluid load of 300 pounds per cubic foot. This value assumes that all footing backfill will be compacted in accordance with the Site Preparation recommendations in this report. A coefficient of friction of 0.40 may be considered between concrete and soils.

Retaining Wall

We understand that a 2.5 foot high retaining wall will be constructed along the western boundary of the tank area to support a sloping earth fill (2 horizontal to 1 vertical) with a total height of about 7 feet. A maximum wheel load of about 32 kips may be applied on the edge of the fill at the top of the slope. The retaining wall should be designed for a load intensity of 90 psf at the top and 260 psf at the base of the retaining wall due to lateral earth pressure loads and surcharge loads due to the concentrated wheel load at the top of the slope. The walls must be provided with adequate subdrains and granular backfill to prevent development of hydrostatic pressures.

Pavements

On parking areas and lightly loaded roadways, we recommend at least 12 inches of structural fill beneath the pavement. A greater thickness may be necessary to stabilize soft unstable areas. The subgrade should be proofrolled, as recommended in the Site Preparation section above. Any excess preload materials, if placed on the pavement area, should be kept in-place until pavement construction starts. The pavement section for light traffic areas should consist of 2 inches asphalt and a 4 inch crushed stone base coarse. A 3 inch course of Asphalt Treated Base ATB also may be used in light traffic areas in lieu of the crushed stone base. For heavy traffic areas we suggest an 'R' value of 20 be used for pavement design.

Drainage

Surface finish grades should be planned to direct surface runoff away from foundations and toward suitable drainage facilities. Ponding of surface water should not be permitted adjacent to building or the tanks.

Additional Services

It is recommended that Earth Consultants, Inc. be provided the opportunity for a general review of the final design and

specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

The analyses and recommendations submitted in this report are based upon the data obtained from the borings. The nature and extent of variations between borings may not become evident until construction. If variations then appear evident, Earth Consultants, Inc. should be allowed to reevaluate the recommendations of this report prior to proceeding with the construction.

It is also recommended that Earth Consultants, Inc. be retained to provide geotechnical services during construction. This is to observe compliance with the design concepts, specifications or recommendations and to allow design changes in the event subsurface conditions differ from those anticipated prior to the start of construction.

The following plates are included and complete this report:

Plate 1	Boring Location Plan
Plate 2	Legend
Plates 3 through 9	Boring Logs
Plates 10 through 12	Seive and Hydrometer Analyses
Plate 13	Consolidation Data

We trust the information presented herein is adequate for your requirements. If you need additional information or clarification, please call.

Respectfully submitted,

EARTH CONSULTANTS, INC.

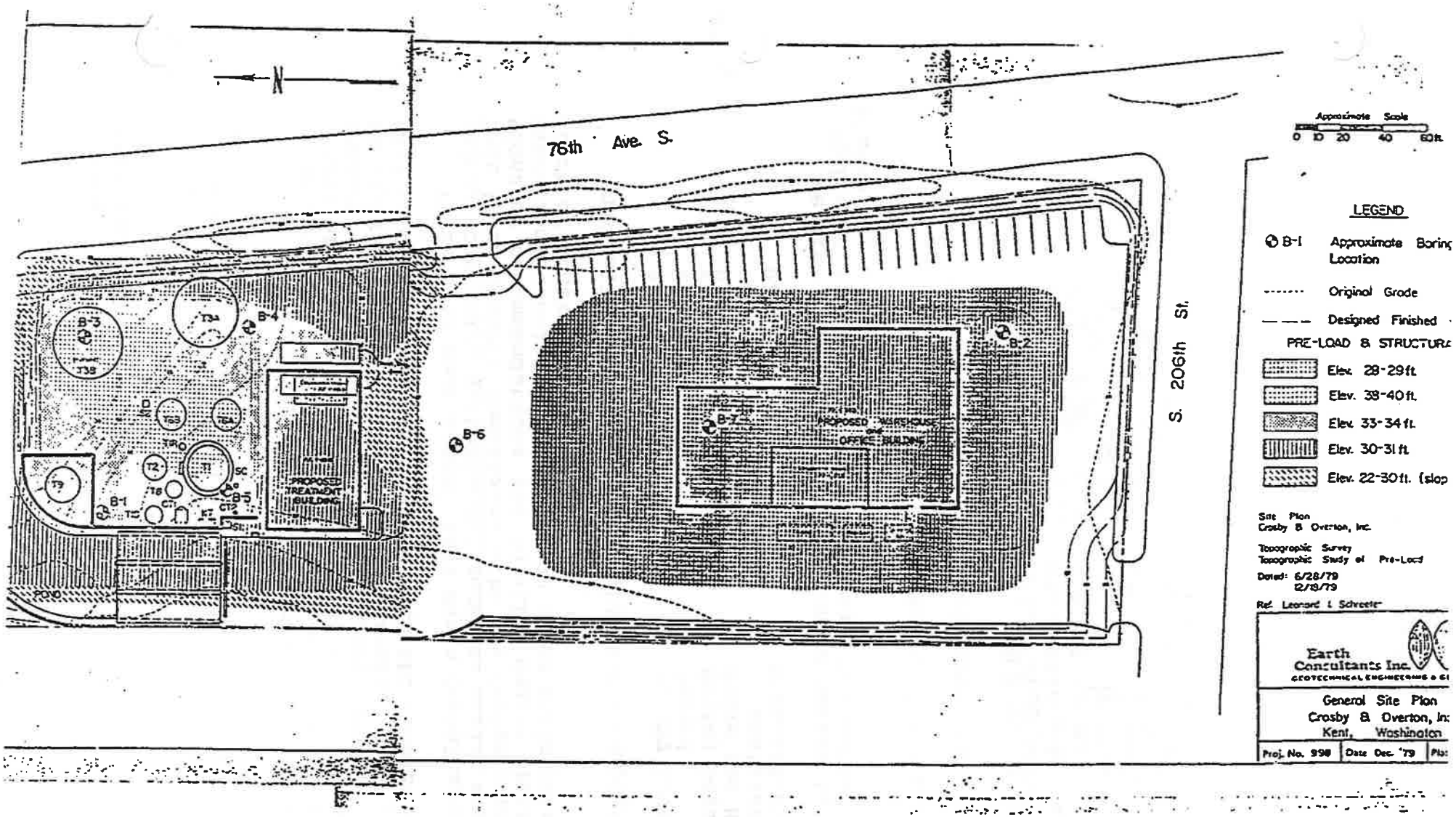


Utpal Bhattacharya

Utpal Bhattacharya, Ph.D., P. E.
Project Manager

Anil Butail, P. E.
Chief Engineer

UB/AB/mg


N
76th Ave. S.
S. 206th St.
B-1
B-2
B-3
B-4
B-5
B-6
B-7
PROPOSED TREATMENT BUILDING
PROPOSED WAREHOUSE and OFFICE BUILDING
POND
Approximate Scale
0 10 20 40 60ft.
LEGEND
B-1 Approximate Boring Location
Original Grade
Designed Finished
PRE-LOAD & STRUCTURA
Elev. 28-29ft.
Elev. 38-40ft.
Elev. 33-34ft.
Elev. 30-31ft.
Elev. 22-30ft. (slop
Site Plan
Crosby & Overton, Inc.
Topographic Survey
Topographic Study of Pre-Load
Dated: 6/28/79
12/19/79
Ref. Leonard I. Schreter
Earth Consultants Inc.
GEOTECHNICAL ENGINEERING & GI
General Site Plan
Crosby & Overton, In:
Kent, Washington
Proj. No. 998
Date Dec. '79

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (little or no fines)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (appreciable amount of fines)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING NO 4 SIEVE	CLEAN SAND (little or no fines)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (appreciable amount of fines)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

TOPSOIL		Humus and Duff Layer
FILL		Uncontrolled with Highly Variable Constituents

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SOIL CLASSIFICATION CHART

THE DISCUSSION IN THE TEXT OF THIS REPORT IS NECESSARY FOR A PROPER UNDERSTANDING OF THE NATURE OF THE MATERIAL PRESENTED IN THE ATTACHED LOGS

I	2"O.D. Split Spoon Sampler
II	Ring or Shelby Sample
P	Sampler Pushed
✱	Sample Not Recovered
▽	Water Level (date)
T_s	Torvane Reading
qu	Penetrometer Readings
	Water Observation Well

Earth Consultants Inc.

LEGEND

Proj.No. 998 | Date Aug. '79 | Plate 2

BORING NO. 1

ELEVATION 22±

Graph	USCS	Soil Description	Depth (ft.)	Sample	(N) Blows/Ft.	Wn (%)	
	ML	Brown, fine, sandy SILT to clayey silt, medium dense, moist.	5 ▽		17	7.4	
					13	42	
	SM	Gray, silty, fine to medium SAND, loose, wet.			4	37	
			10		9	30	
	ML	Gray, clayey SILT, soft, wet.			15	32	LL=36 PL=26
	SM	Gray, black, silty SAND with lenses of soft clayey silt, medium dense, wet.	15		16	32	
			20		16	59	
			25		9	27	
			30		24	25	
			35		15	45	
	SP	Black, clean SAND, medium dense, wet, with lenses of soft, clayey silt and silt with sand and clay.	40		25	26	
	SM	Gray, silty SAND, medium dense, wet.	45		11	27	
			50		18	33	

Boring terminated at 54 feet on 8/8/79.

Driving Energy: 140 lb. Weight Dropping 30 inches

W. O. No. 998

Earth Consultants

PLATE 3

BORING NO. 2

ELEVATION 23±

Graph	USCS	Soil Description	Depth (ft.)	Sample	(N) Blows/ Ft.	Wn (%)	Dry Density (pcf)
	ML	Brown, fine sandy SILT with clay, loose, wet.	▽		15	29	
					4	41	
			5		2	36	
					3	30	91 pcf
	SM	Black, silty fine to medium SAND, medium dense, wet with lens of clayey silt at 33 feet.	10			38	
					15	26	
			15				
					10	38	79 pcf
			20				
					7	29	
			25				
					41	23	
			30				
					15	46	
			35				
	SP	Black, clean, fine to medium SAND, medium dense, wet with lenses of silt.	40		11	28	
					5	39	
	ML	Gray, clayey SILT, soft, wet.	45				
	SP	Black, clean SAND, medium dense, wet.			15	36	
	SM	Gray, silty SAND, medium dense, wet.	50				
					13	29	

Boring terminated at 54 feet on 8/8/79.

Driving Energy: 140 lb. Weight Dropping 30 inches

W. O. No. 998

Earth Consu

PLATE

BORING NO. 3

ELEVATION 24.5±

Graph.	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows/ Ft.	Wn (%)	Dry Density (pcf)
	SM	Brown, silty SAND, medium dense, becomes loose, moist.	5		15	68	
					6	19	84.5
	ML	Brown, mottled SILT with clay and sand, soft, wet.			4	42	
					3	43	
					3	44	
	SM	Gray, silty SAND, loose, wet.	10		6		
					5	62	
	ML	Gray, fine SILT with clay and sand, loose, wet.	15		3	54	
					25	28	
	SM	Gray silty SAND, loose to medium dense, wet with silt lenses.	20				
					8	29	
	ML	Gray, clayey SILT with organics, soft, wet	25				
	SM SP	Black, slightly silty to silty SAND, medium dense, wet with clayey silt lens at 33 and 39 feet.	30		13	33	
					31	24	
			35				
					6	22	

Boring terminated at 39 feet on 8/9/79
Pore pressure transducer installed at 16 feet.

Driving Energy: 140 lb. Weight Dropping 30 inches

W. O. No. 998

Earth Consultant

PLATE

BORING NO. 4

ELEVATION 23±

Graph	USCS	Soil Description	Depth (ft.)	Sample	(N) Blows/Ft.	Wn (%)
	ML	Brown, mottled, fine, clayey SILT, medium dense, becomes loose, moist.	5 ▽		16	8.3
					7	34
					8	41
	SM SP	Gray, silty fine SAND to slightly silty SAND with lenses of clayey SILT at 12 and 28 feet, loose to medium dense grading to dense at about 33 feet.	10		12	31
			15		4	56
			20		20	32
			25		11	27
			30		11	47
					39	27

Boring terminated at 34 feet on 8/9/79.

Driving Energy: 140 lb. Weight Dropping 30 inches

W. O. No. 998

Earth Consultants

PLATE 6

BORING NO. 5

ELEVATION 22.5±

Graph	USCS	Soil Description	Depth (ft.)	Sample	(N) Blows/Ft.	Wn (%)	
	SM ML	Brown, silty SAND to sandy SILT.			13	9	
					6	43	
	ML	Mottled, fine, sandy SILT with clay, soft, wet.	5 ▽		4	42	
					13	28	
	SM	Black, silty fine to medium SAND, loose to medium dense, wet. Soft silt lens at 13 feet.	10				
			15		3	43	
			20		22	29	
	ML OL	Brown, clayey SILT with organics, stiff, moist.	25		4	103	qu-1.5tsf
	SM SP	Black, slightly silty to silty fine to medium SAND, loose becomes dense, wet.	30		8	36	
					34	24	

Boring terminated at 34 feet on 8/9/79.

Driving Energy: 140 lb. Weight Dropping 30 inches

W. O. No. 998

Earth Consultant

PLATE 7

BORING NO. 6

ELEVATION 23.5±

Graph	USCS	Soil Description	Depth (ft.)	Sample	(N) Blows/Ft.	Wn (%)
	ML	Mottled, sandy SILT, medium dense, moist.	5		11	94
					11	32
					4	41
	SM ML	Black, silty SAND, loose to medium dense, wet with lenses of clayey sandy SILT.	▽		7	32
			10		12	32
					3	28
			15			
					34	23
			20			
	ML	Gray, clayey SILT with some peat and organics, medium stiff, becomes very soft, wet.			5	45
			25			
					0	84
			30			
	SM	Black, silty SAND, dense, wet.			31	41

Boring terminated at 34 feet on 8/10/79.

Driving Energy: 140 lb. Weight Dropping 30 inches

W. O. No. 998

Earth Consultants

PLATE 8

BORING NO. 7

ELEVATION 23.5±

Graph	US CS	Soil Description	Depth (ft.)	Sample	(N) Blows/ Ft.	Wn (%)
	ML	Mottled SILT, medium dense, becomes loose, moist.	▽5		14	34
					5	39
	SM	Black, silty fine SAND, loose, wet.			6	36
			10		5	37
					4	44
	ML	Gray, clayey SILT, soft, wet.	15			
					35	
	SM SP ML	Black, slightly silty to silty sand with lenses of clayey SILT, loose to medium dense, wet.	20			
					5	59
			25			
					5	42
			30			
					28	30
			35			
					16	25

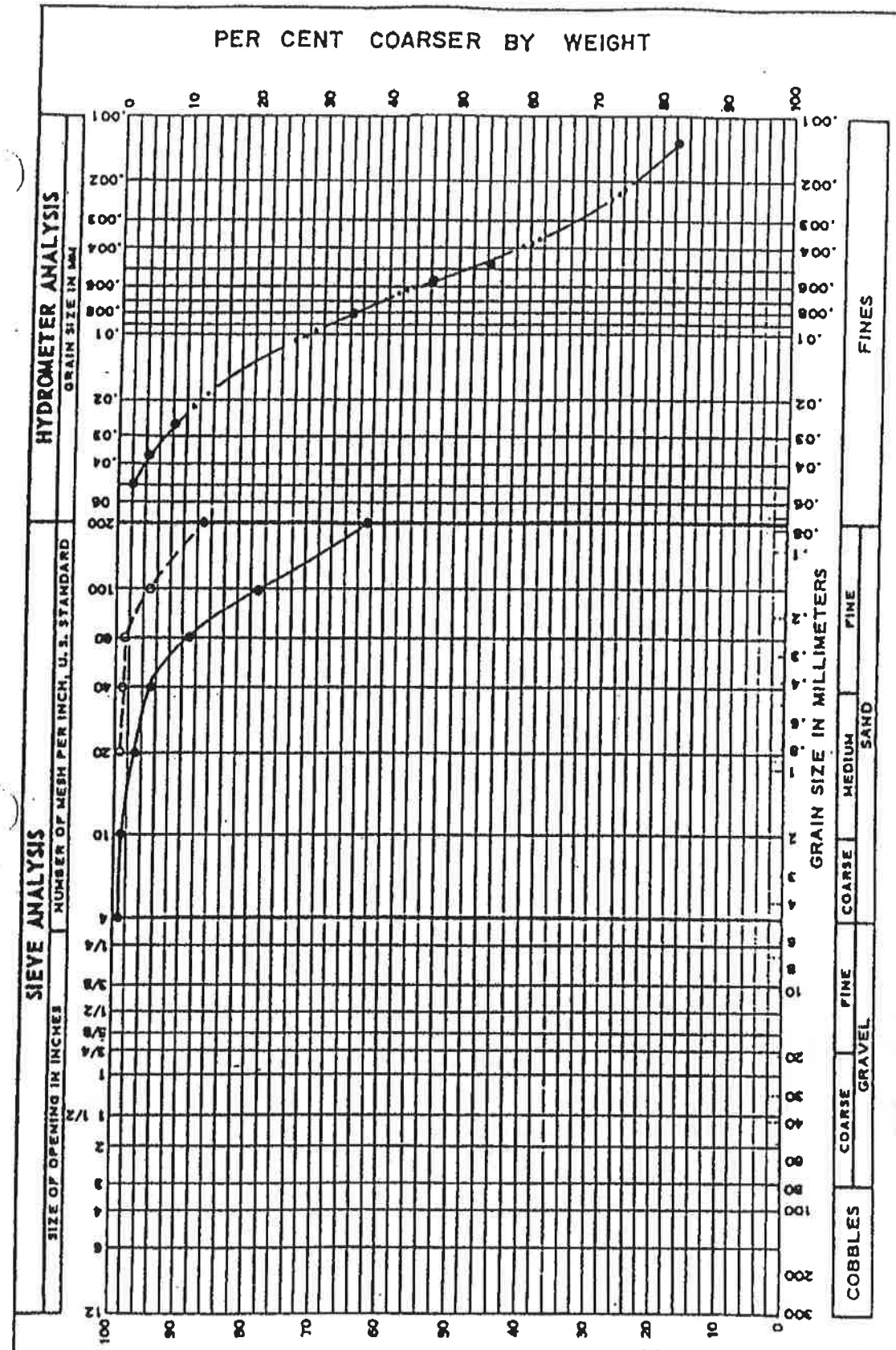
Boring terminated at 39 feet on 8/10/79.

Driving Energy: 140 lb. Weight Dropping 30 inches

W. O. No. 998

Earth Consultar

PLATE 9



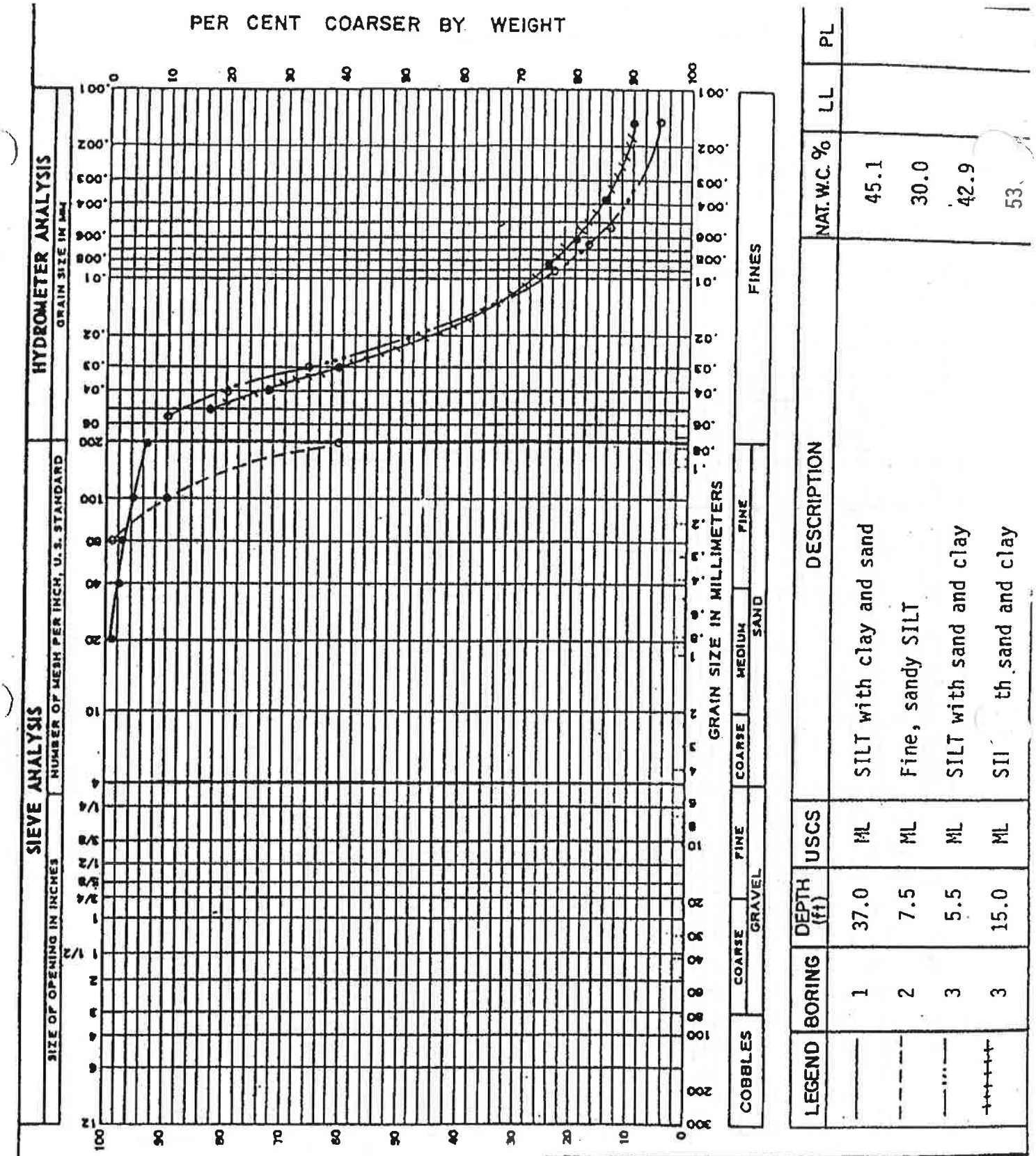
LEGEND	BORING	DEPTH (ft)	USCS	DESCRIPTION	NAT. W.C. %	LL	PL
———	1	0	ML	Sandy SILT	7.4		
– – – –	1	2.5	ML	Clayey SILT with sand	42.4		
—·—·—	1	12.5	ML	Clayey SILT	32.0		

GRAIN SIZE ANALYSES

Earth Consultants Inc.

CROSBY & OVERTON, INC.
PROPOSED BUILDINGS and TANKS

Proj.No.998	Date Aug. '79	Plate 10



GRAIN SIZE ANALYSES

LEGEND	BORING	DEPTH (ft)	USCS	DESCRIPTION	NAT. W.C. %	LL	PL
———	1	37.0	ML	SILT with clay and sand	45.1		
- - - - -	2	7.5	ML	Fine, sandy SILT	30.0		
—·—·—	3	5.5	ML	SILT with sand and clay	42.9		
+++++	3	15.0	ML	SIL th sand and clay	53		

Earth Consultants Inc.

CROSBY & OVERTON, INC.
PROPOSED BUILDINGS and TANKS

Proj.No. 998	Date Aug. '79	Plate 11

PER CENT COARSER BY WEIGHT

HYDROMETER ANALYSIS

SIEVE ANALYSIS

SIZE OF OPENING IN INCHES

NUMBER OF MESH PER INCH, U.S. STANDARD

GRAIN SIZE IN MILLIMETERS

COBBLES | GRAVEL (COARSE, FINE) | SAND (COARSE, MEDIUM, FINE) | FINES

LEGEND	BORING	DEPTH (ft)	USCS	DESCRIPTION	NAT.W.C. %	LL	P
———	4	2.5	ML	Clayey SILT	34.1		
— — —	4	12.5	ML/CL	Clayey SILT - silty CLAY	56.6		
—·—·—	5	0	ML	Sandy SILT	94.4		
—··—··—	6	17.5	SM	Silty fine SAND	23.6		
+++++	7	2.5	ML	SILT	33.6		

PERCENT FINER BY WEIGHT

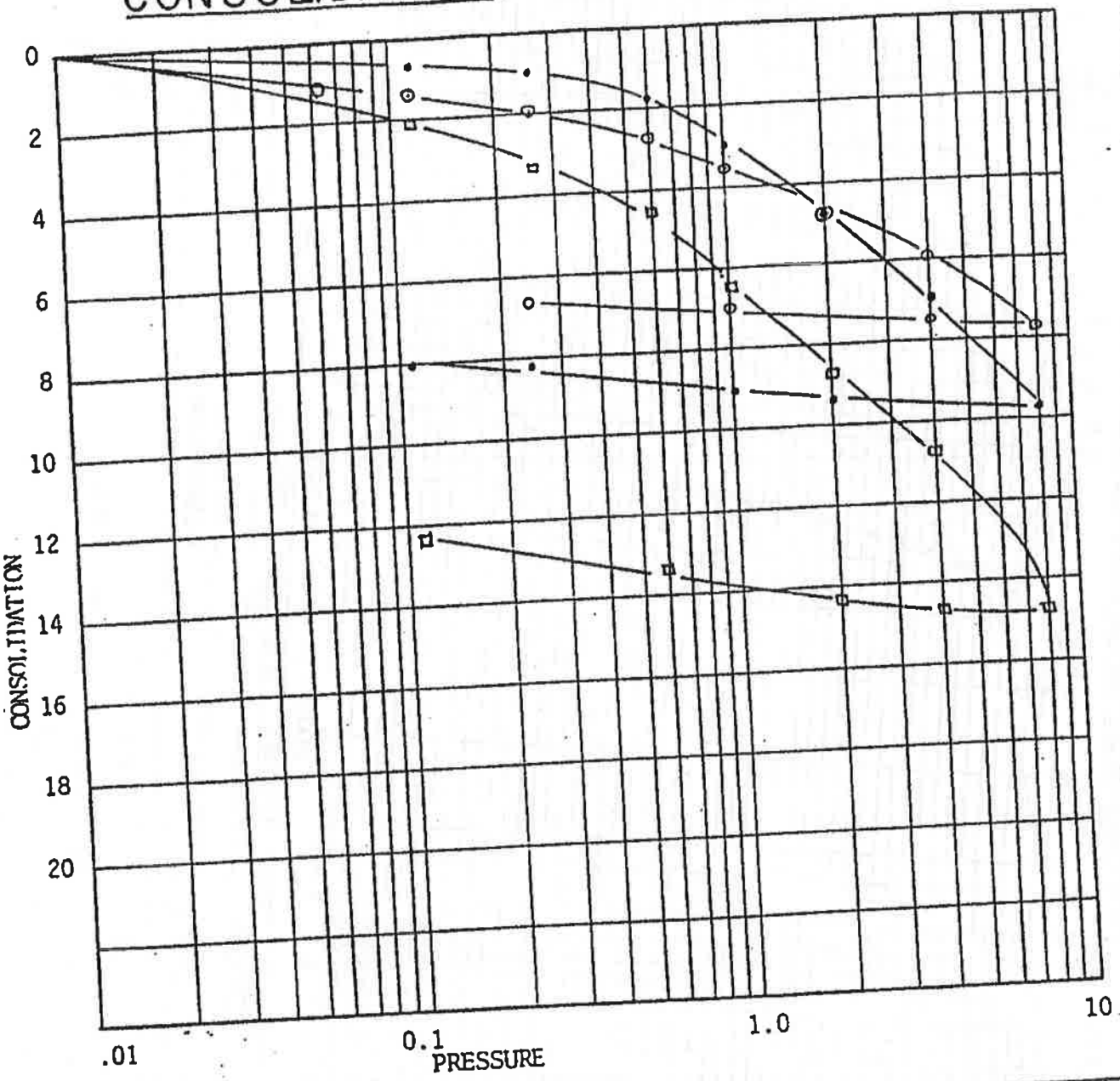
GRAIN SIZE ANALYSES

Earth Consultants Inc.

CROSBY & OVERTON, INC.
PROPOSED BUILDINGS and TANKS

Proj.No. 998	Date Aug. '80	Plate 12

CONSOLIDATION TEST DATA



KEY	BORING	DEPTH	USC	SOIL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE BEFORE	MOISTURE AFTER	DRY DENSITY
—•—	3	5.5	ML	Fine, sandy SILT with clay			43	34	77
—o—	2	5.5	SM	Silty SAND			35.4	32.3	82
—□—	3	15.0	ML	Fine sandy SILT wtih clay			40.2	29.8	72

W.O. 998

PLATE 13

APPENDIX D-7

STORM DRAINAGE STUDY

This study was prepared for a previous layout of the Kent Facility in 1992. Minor changes have been made to the facility layout; however, perimeter elevations, containment cells, and tank farm berms remain equivalent. Therefore, this report demonstrates that the facility design will prevent run-on from a 25 year/24 hour storm.

APPENDIX D-7

STORM DRAINAGE STUDY

This study was prepared for a previous layout of the Kent Facility in 1992. Minor changes have been made to the facility layout; however, perimeter elevations, containment cells, and tank farm berms remain equivalent. Therefore, this report demonstrates that the facility design will prevent run-on from a 25 year/24 hour storm.

STORM DRAINAGE STUDY
FOR
KENT FACILITY
BURLINGTON ENVIRONMENTAL, INC.

PREPARED BY
EISI
OCTOBER 15, 1990

REVISED
AUGUST 1992

STORM DRAINAGE STUDY

FOR

KENT FACILITY

BURLINGTON ENVIRONMENTAL INC.

I. INTRODUCTION:

The Storm Drainage Study was performed by EISI for the application of the Kent Facility Part B Permit for Burlington Environmental, Inc. Kent Facility. The 6.1 acre Facility is located in King County at 20245 77th Avenue So., Kent, Washington. Three acres of this site are currently used for dangerous waste management. The purpose of the study was to determine if there would be any storm water run-on onto the container storage areas and to modify the existing drainage system to prevent run-on if it was found that run-on would occur.

The Storm Drainage Study was based on the procedures outlined in the King County Surface Water Design Manual utilizing the Santa Barbara Urban Hydrograph Method. The study criteria used was a 25 year storm for a 24 hour duration.

II. EXISTING SITE

The area of the 6 acre property currently used for dangerous waste management is 2.9 acres in size and roughly rectangular

in shape. An undeveloped annex site is approximately 3.2 acres. The total property is approximately 6.1 acres. The dangerous waste management site is on fill approximately three feet higher than the abutting property. The site is flat at an approximate elevation of 27.0 feet, contoured with 0.75% slopes to the catch basins for general drainage control. There is a berm around the perimeter of dangerous waste management area at elevation 27.42 feet.

The existing buildings on the area of the site currently used for dangerous waste management are: the Process Containment Building, the Treatment/Stabilization Building and the Bulk Receiving Area. Other structures on the site consist of: Tank System, Process Staging Area, North Container Unloading Pad and North and South Container Storage Pads. Planned structures on this area of the site are the South Container Unloading Pad, a roof over the North and South Container Storage Pads, and the expansion of the Stabilization and Process Containment Buildings, and expansion of the Process Staging Area. A planned office building and parking area will be constructed on the currently undeveloped annex site.

III. STORM DRAINAGE ANALYSIS

The Kent Facility is made up of the dangerous waste management area and the annex site. The dangerous waste management area is divided into two categories of drainage areas: the

containment areas and the general property drainage areas. Of the dangerous waste management area the containment areas accounts for .54 acres which is self-contained and is not included in the Hydrograph analysis as it is self-contained. The remaining general drainage area within the dangerous waste management area accounts for 2.36 acres and is the area used in the Hydrograph analysis for the dangerous waste management site. The general drainage area is made up of the roofed areas, asphalt paved areas and the landscape areas. The run-off water for the general drainage area is to be diverted through the facility wastewater treatment system to the permitted Metro sewer discharge. The sewer line is located in 77th Avenue South through the Treatment Plant and run-off water for the annex site drains to the pond, and then follows natural local drainage patterns.

The containment areas subject to tributary precipitation include the Tank System at the north end of the site, Process Staging Area, North Container Unloading Pad, and Planned South Container Unloading Pad. The general drainage areas include the roofed areas, parking lot and drive areas, and the perimeter landscape strip.

The basis for the analysis was 3.4 inches of precipitation for a 24 hour duration as determined from King County Design Storm Hyetograph. The Facility was analyzed in two parts: the

dangerous waste management area and the annex site. For the dangerous waste management area, the Containment areas will store their respective tributary precipitation and thus are not included in the general drainage area. Each containment area was analyzed for ponding in the Containment calculations for its respective area. The general drainage area was analyzed for ponding based on a retention/detention pond using an off-site flow equivalent to the predevelopment flow rate or the maximum rate of treatment the facility could process assuming the Facility would process all the general area drainage. The hydrograph shows a peak flow of 1.52 cubic feet per second. A plot of the developed inflow hydrograph was used to graphically approximate the detention pond size required based on the treatment rate.

The peak predevelopment rate of discharge was determined to be .42 cubic feet per second and the process rate is .35 cubic feet per second. The process rate was used to determine the pond size in lieu of the predevelopment as this would give a larger pond. It was determined that at the treatment rate of discharge a retention pond the size of 6787 cubic feet would have to be developed. The detention pond is made up of a 4096 cubic foot pond in the parking area, and a 33,238 gallon tank in the tank system to store the remaining required retention of 2701 cubic feet or 20,203 gallons. The maximum pond water level of the surface ponding area between the Treatment and

Process buildings would be 27.25 feet in elevation. At this elevation, the North Container Storage Pad would have a run-on problem. Therefore curbs are proposed to be raised from a 26.92 elevation to an elevation of 27.30 at the north end of the Containment Pad to prevent run-on.

The Process Staging Area and the North and South Container Unload Pads have curb elevations of 27.42; .17 feet or two inches above the pond elevation at a 25 year occurrence storm. The Tank System has a containment wall at elevation 29.00, 1.75 feet or 21 inches above the pond elevation. The curb heights of these containment areas are all higher than the water level of the pond thus preventing run-on from the pond to the containment area. Each area has been checked for containment of the precipitation for the 25 year occurrence storm plus an assumed spill of 10% of the total container volume or the volume of the largest container.

The internal freeboards for each containment area is as follows:

Tank System*	Zone	T-I	-	2.40 inches
		T-II	-	1.92
		T-III	-	1.32
		T-IV	-	10.0
		T-V	-	3.30
		T-VI	-	3.30
		T-VII	-	3.30
		T-VIII	-	2.71
Container Storage Pads*		I	-	4.42

II	-	4.58
III	-	4.55
IV	-	4.62
V	-	4.10
VI	-	3.79
VII	-	3.71
VIII	-	3.50
IX	-	3.50
X	-	3.24
XI	-	3.14
XII	-	3.76
XIII	-	2.52

* Refer to containment calculations for secondary containment requirements.

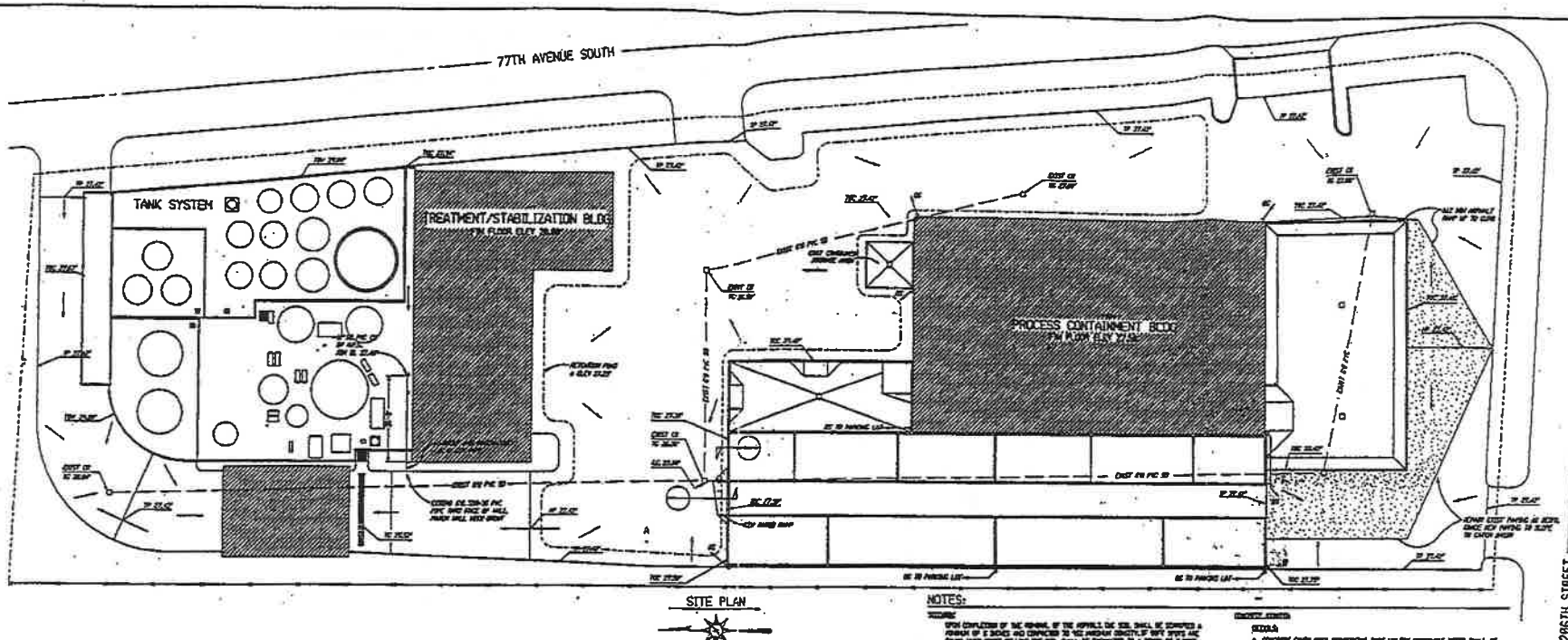
For the Annex Site the 1.28 acres of the site was analyzed as if it was paved for the future development. The hydrograph shows a peak flow of .7936 cubic feet per second. A plot of developed inflow hydrograph was used to graphically approximate the detention pond size required based on the predevelopment rate of .18 cubic feet per second. It was determined that a retention pond the size of 3,899 cubic feed is required.

IV. CONCLUSION:

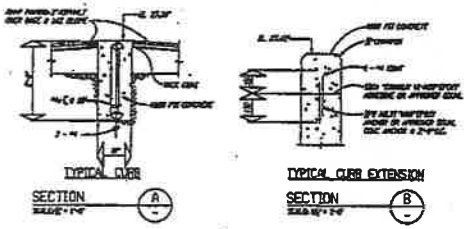
Based on the hydrograph developed for a 25 year event storm of 3.4 inches of precipitation for a 24 hour duration, the Containment pads and Tank System will not have run-on from the detention pond nor will these areas run-off onto the detention pond at elevation 27.25. This is based on the existing curbs being extended on the North Container Storage

Pad as shown on the proposed drainage plan. The proposed curb extensions would provide a minimum of one inch freeboard above the pond elevation.

The drainage system for the Annex site is totally independent from the Dangerous Waste Management Area. The run-off water from the Annex site is directed through a detention pond to the natural drainage patterns. There is no run-off water from the Dangerous Waste Management Area to the annex site nor is there any run-off water from the Annex site to the Dangerous Waste Management Area.



SITE PLAN



LEGEND:

NOTES:

BURLINGTON ENVIRONMENTAL INC.

STORMWATER DRAINAGE PLAN
PROCESS SITE
KENT FACILITY

51003

1 - 2

G:\users\sharib\engineer\kent\51100 Feb. 8, 1995 16:03:33

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4917.6 Sheet _____ Of _____
Project: _____
Subject: _____
Client: _____
By: _____ Date: _____

DRAINAGE CALCULATIONS

FOR

KENT FACILITY

PART B PERMIT

FOR

B.E.I.

AUG. 31, 1992

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet D1 Of 29
Project: KENT FACILITY
Subject: DRAINAGE
Client:
By: DLC Date: 8/31/92

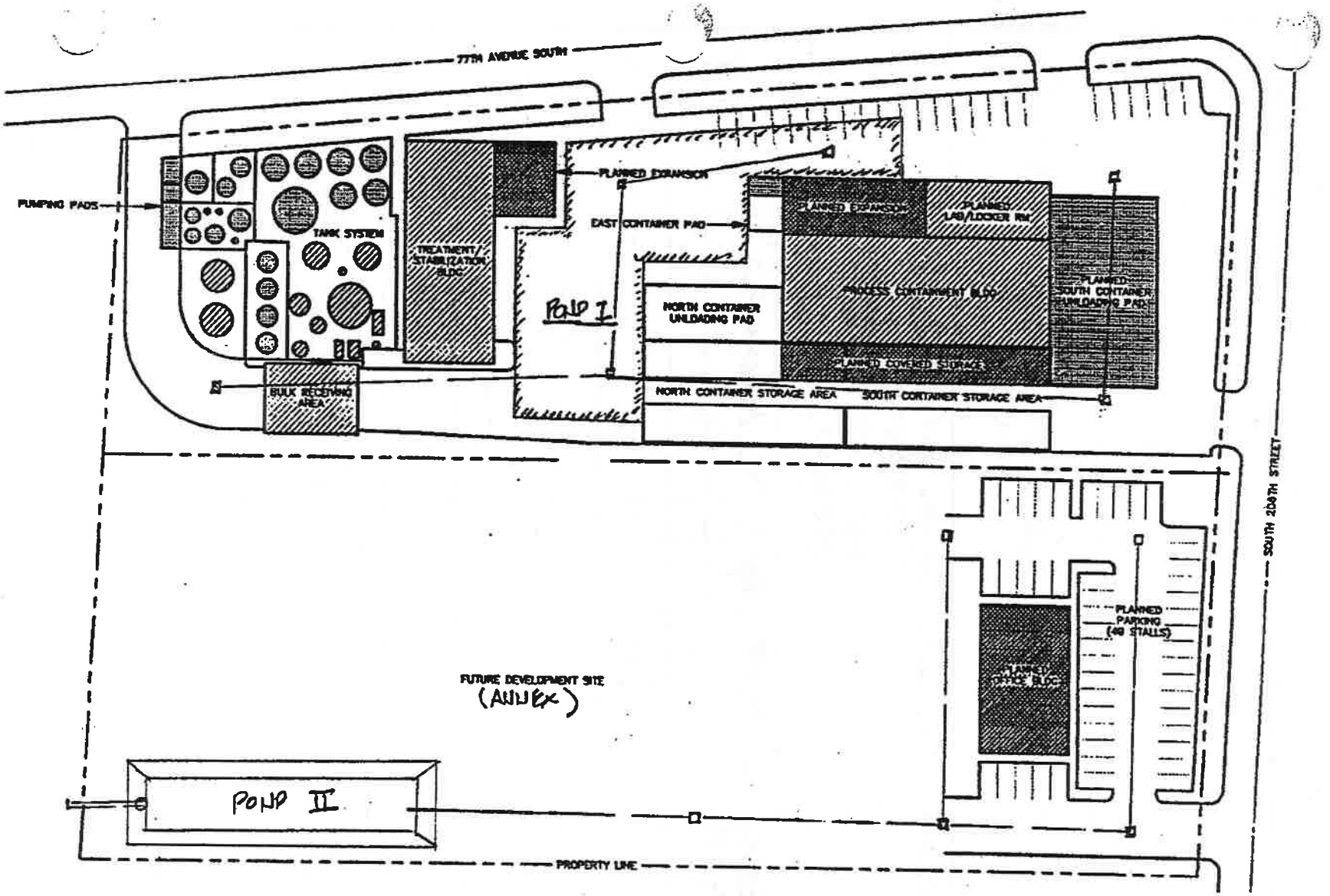
DRAINAGE STUDY

- ANALYSIS IS BASED ON 25 YEAR STORM FOR A 24 HOUR DURATION

- PROCEDURE USED: KING COUNTY SURFACE WATER DESIGN MANUAL.

- HYDROGRAPH METHOD: SANTA BARBARA URBAN HYDROGRAPH METHOD. W/ THE LEVEL POOL ROUTING METHOD

- PREDEVELOPMENT RATE USED AS ALLOWED RUN-OFF



LEGEND

- EXISTING
- PLANNED COVERED AREA
- PLANNED AREA

SITE PLAN

80 40 0 80

SCALE: 1" = 80'

N

BURLINGTON ENVIRONMENTAL INC.
KENT FACILITY

Site Plan

Section V

EISI
consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet 17 Of 29
Project: KENT FACILITY
Subject: DRAINAGE
Client:
By: DLC Date: 8/29/91

PEAK RUNOFF RATES

PREDEVELOPMENT (25 YR. STORM)

DETERMINE Tc:

L = 650'

S = .0060'/'

V (SHORT GRASS FIELD) = .6 fps

Tc = 650/60x.6'/SE + 10 = 28 MIN

DETERMINE Q:

A = 2.9 Ac.

$I_{R(25yr)} = 3.4$ ∴ $I_R = 3.4(28/2.4)^{-.625} = .73$ cfs/Ac

C = .20

$Q_{25yr} = .2 \times 2.9 \times .73 = .42$ cfs

Q @ PROCESSING RATE = .35 cfs

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4996 Sheet 1 of 2
Project: KENT FACILITY
Subject:
Client:
By: DLL Date: 3/2

DRAINAGE AREA TO BE USED IN STUDY

DANGEROUS WASTE MANAGEMENT SITE

TOTAL AREA = 2.9 AC

LESS CONTAINMENT AREAS:

SOUTH UNLOADING:	60X105	= 6300 SF
NORTH UNLOADING	30X78	= 2340
TANK SYSTEM	120X120	= 14400
PROCESS STAGING	20X30	= 600

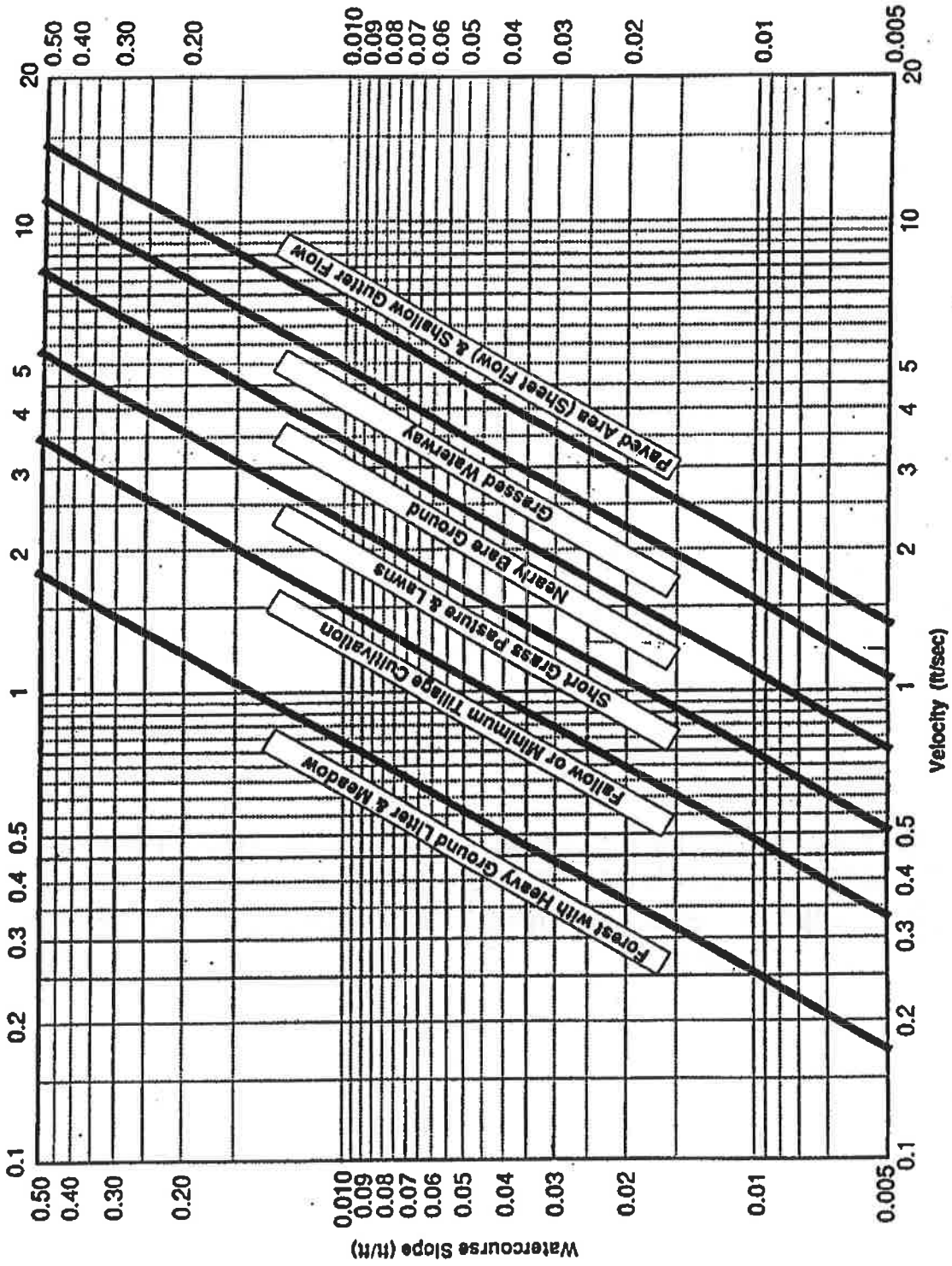
23640 SF (.54 AC)

AREA = 2.36 AC

LANDSCAPE AREA = .35 AC
IMPERVIOUS AREA = 2.01 AC

FIGURE 4.3.3A AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR OVERLAND FLOW*

*For use with the Modified Rational Method only; From Soil Conservation Service, Tech. Release No. 55, January 1975

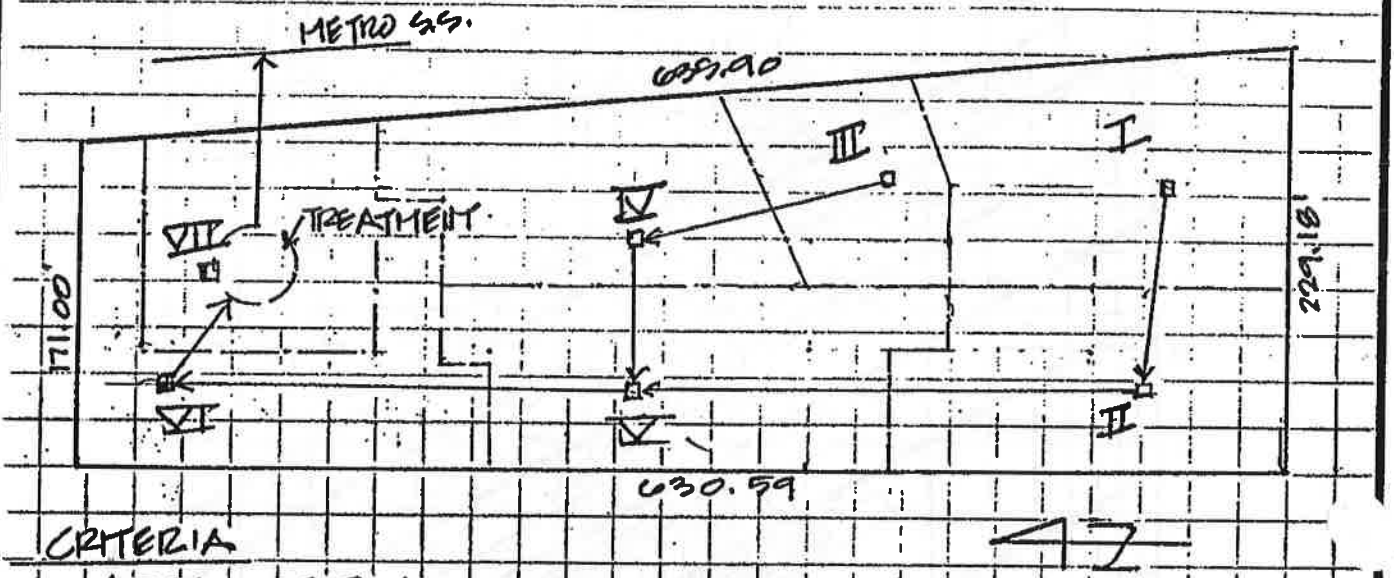


EISI
consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet V6 of 29
Project:
Subject:
Client:
By: DLC Date: 8/3

DRAINAGE ANALYSIS (25 YR STORM)

SITE PLAN W/ DRAINAGE BASINS



CRITERIA

AREA = 2.9 AC.
STORM 25 YR
PAVED SITE ($C = .90$)

ALL STORM WATER SHALL BE DIRECTED THRU THE ON SITE TREATMENT PLANT AND DISCHARGED INTO THE METRO S.S. SYSTEM. THE RATE OF PROCESSING IS .35 CFS.

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet 28 Of 29
Project:
Subject:
Client:
By: DLC Date: 7-16-9

DRAINAGE AREAS — CONT.

ZONE V

200 x 60	=	12000 SF
130 x 40	=	1200
80 x 20		1600
		14800 SF

.34 AC.

ZONE VI

130 x 35	4550 S.F.
180 x 40	7200
140 x 30	4200
150 x 10	1500
	17450 SF

.40 AC

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. [illegible] Sheet V1 of 27
Project:
Subject:
Client:
By: DLC Date: 7-1-92

DRAINAGE AREAS (43560 SF/AC)

ZONE I -

135 x 125 = 16875 SF.
− 60 x 55 = 3300 (UNLOAD PAD)

13575 SF .31 AC

ZONE II -

105 x 210 = 22050
− 60 x 50 = 3000 (UNLOAD PAD)

19050 SF .58 AC

ZONE III -

120 x 60 = 7200 SF
180 x 50 = 9000

16,200 SF .37 AC

ZONE IV -

60 x 55 = 3300 SF
120 x 130 = 15600
− 45 x 50/2 = −1125
− 45 x 45 = −2025

15750 SF .36 AC.

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4476 Sheet 129 Of 24
Project:
Subject:
Client:
By: DLC Date:

DRAINAGE BASINS

BASIN	AREA
I	.31 AC
II	.58
III	.37
IV	.36
V	.34
VI	.40
VII	— (CONTAINMENT AREA)
	2.36 AC

TC

I 10 MIN + 80'/(1.0 fps x 60) = 11.3 MIN.

II 11.3 + 110'/(3.0 fps/60) = 11.9 MIN

III 10 MIN + 80'/(1.0 fps x 60) = 11.3 MIN.

IV 11.3 + 140'/(3.0 fps x 60) = 12.1 MIN.

V 11.9 + 210/(3.0 fps x 60) = 13.4 MIN.

VI 13.4 + 250/(3.0 fps x 60) = 14.6 min.

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4776 Sheet 21 of 27
Project:
Subject:
Client:
By: DLC Date: 7-14

DRAINAGE BASINS – ANNEX

BASIN	AREA	
I	.32 Ac	OFFICE SITE = 1.28 Ac
II	.32 Ac	
III	.32 Ac	
IV	.32 Ac	
V	2.12 Ac	
	3.4 Ac	

Tc.

FROM ADJ. SITE

* ADD 100/(1.0 x 60) = 1.7

I 10 MIN + 100'/(1.0 fps x 60) = 11.7 MIN.

II 11.7 MIN + 160'/(3.0 fps x 60) = 12.16 MIN

III 10 MIN + 100/(1.0 fps + 60) = 11.7 MIN.

IV 12.16 MIN. + 130/(3.0 fps + 60) = 13.3 MIN.

V 10 MIN + 200/(1.0 fps + 60) + * = 15 MIN.

POND 15. MIN + 300/(3.0 fps x 60) = 16.7 MIN.

PROGRAM: HYDRO.XLS

SBUH RUNOFF HYDROGRAPH
B. E. I. - KENT FACILITY DANGEROUS WASTE MANAGEMENT SITE

STORM CRITERIA: 25 YR

A=	2.36
PT=	3.40
DT=	10.00
TC=	14.80
W=	0.25

IMPERVIOUS		PERVIOUS	
AI=	2.01	AP=	0.35
CNI=	98.00	CNP=	68.00
SI=	0.20	SP=	4.71
.2SI=	0.04	.2SP=	0.94

TIME INCR.	TIME MIN.	RAINFALL DIST. %	INCR. RAINFALL IN.	ACCUM. RAINFALL IN.	PERV. ACCUM. RUNOFF IN.	PERV. INCR. RUNOFF IN.	IMPERV. ACCUM. RUNOFF IN.	IMPERV. INCR. RUNOFF IN.	TOTAL RUNOFF IN.	INSTANT HYDRO. CFS	DESIGN HYDRO. CFS
1	10.00	0.40%	0.0136	0.0136	0.0000	0.0000	0.00	0.0000	0.0000	0.0000	0.0000
2	20.00	0.40%	0.0136	0.0272	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	30.00	0.40%	0.0136	0.0408	0.0000	0.0000	0.0000	0.0000	0.00	0.0000	0.0000
4	40.00	0.40%	0.0136	0.0544	0.0000	0.0000	0.0008	0.0008	0.0007	0.0103	0.0026
5	50.00	0.40%	0.0136	0.0680	0.0000	0.0000	0.0032	0.0023	0.0020	0.0285	0.0111
6	60.00	0.40%	0.0136	0.0816	0.0000	0.0000	0.0068	0.0036	0.0031	0.0437	0.0238
7	70.00	0.40%	0.0136	0.0952	0.0000	0.0000	0.0114	0.0047	0.0040	0.0565	0.0371
8	80.00	0.40%	0.0136	0.1088	0.0000	0.0000	0.0170	0.0055	0.0047	0.0674	0.0497
9	90.00	0.40%	0.0136	0.1224	0.0000	0.0000	0.0233	0.0063	0.0054	0.0768	0.0610
10	100.00	0.40%	0.0136	0.1360	0.0000	0.0000	0.0303	0.0070	0.0059	0.0848	0.0710
11	110.00	0.50%	0.0170	0.1530	0.0000	0.0000	0.0398	0.0095	0.0081	0.1158	0.0858
12	120.00	0.50%	0.0170	0.1700	0.0000	0.0000	0.0501	0.0103	0.0088	0.1250	0.1033
13	130.00	0.50%	0.0170	0.1870	0.0000	0.0000	0.0610	0.0109	0.0093	0.1330	0.1163
14	140.00	0.50%	0.0170	0.2040	0.0000	0.0000	0.0725	0.0115	0.0098	0.1398	0.1264
15	150.00	0.50%	0.0170	0.2210	0.0000	0.0000	0.0845	0.0120	0.0102	0.1457	0.1347
16	160.00	0.50%	0.0170	0.2380	0.0000	0.0000	0.0969	0.0124	0.0106	0.1509	0.1416
17	170.00	0.60%	0.0204	0.2584	0.0000	0.0000	0.1123	0.0154	0.0131	0.1870	0.1554

D10/24

18	180.00	0.60%	0.0204	0.2788	0.0000	0.0000	0.1281	0.0158	0.0135	0.1926	0.1728
19	190.00	0.60%	0.0204	0.2992	0.0000	0.0000	0.1444	0.0162	0.0138	0.1975	0.1840
20	200.00	0.60%	0.0204	0.3196	0.0000	0.0000	0.1610	0.0166	0.0141	0.2018	0.1919
21	210.00	0.60%	0.0204	0.3400	0.0000	0.0000	0.1779	0.0169	0.0144	0.2056	0.1979
22	220.00	0.60%	0.0204	0.3604	0.0000	0.0000	0.1950	0.0172	0.0146	0.2089	0.2026
23	230.00	0.70%	0.0238	0.3842	0.0000	0.0000	0.2154	0.0203	0.0173	0.2474	0.2155
24	240.00	0.70%	0.0238	0.4080	0.0000	0.0000	0.2360	0.0206	0.0176	0.2509	0.2325
25	250.00	0.70%	0.0238	0.4318	0.0000	0.0000	0.2569	0.0209	0.0178	0.2540	0.2425
26	260.00	0.70%	0.0238	0.4556	0.0000	0.0000	0.2780	0.0211	0.0180	0.2567	0.2490
27	270.00	0.70%	0.0238	0.4794	0.0000	0.0000	0.2993	0.0213	0.0181	0.2591	0.2535
28	280.00	0.70%	0.0238	0.5032	0.0000	0.0000	0.3208	0.0215	0.0183	0.2613	0.2569
29	290.00	0.82%	0.0279	0.5311	0.0000	0.0000	0.3462	0.0254	0.0216	0.3085	0.2710
30	300.00	0.82%	0.0279	0.5590	0.0000	0.0000	0.3717	0.0256	0.0218	0.3109	0.2906
31	310.00	0.82%	0.0279	0.5868	0.0000	0.0000	0.3975	0.0257	0.0219	0.3130	0.3013
32	320.00	0.82%	0.0279	0.6147	0.0000	0.0000	0.4234	0.0259	0.0221	0.3148	0.3077
33	330.00	0.82%	0.0279	0.6426	0.0000	0.0000	0.4494	0.0260	0.0222	0.3165	0.3117
34	340.00	0.82%	0.0279	0.6705	0.0000	0.0000	0.4755	0.0262	0.0223	0.3180	0.3145
35	350.00	0.95%	0.0323	0.7028	0.0000	0.0000	0.5060	0.0304	0.0259	0.3701	0.3294
36	360.00	0.95%	0.0323	0.7351	0.0000	0.0000	0.5365	0.0306	0.0260	0.3718	0.3504
37	370.00	0.95%	0.0323	0.7674	0.0000	0.0000	0.5672	0.0307	0.0261	0.3732	0.3616
38	380.00	0.95%	0.0323	0.7997	0.0000	0.0000	0.5980	0.0308	0.0262	0.3745	0.3678
39	390.00	0.95%	0.0323	0.8320	0.0000	0.0000	0.6289	0.0309	0.0263	0.3757	0.3715
40	400.00	0.95%	0.0323	0.8643	0.0000	0.0000	0.6599	0.0310	0.0264	0.3768	0.3739
41	410.00	1.33%	0.0452	0.9095	0.0000	0.0000	0.7034	0.0435	0.0371	0.5291	0.4138
42	420.00	1.33%	0.0452	0.9547	0.0000	0.0000	0.7471	0.0436	0.0372	0.5309	0.4725
43	430.00	1.33%	0.0452	0.9999	0.0007	0.0007	0.7908	0.0438	0.0374	0.5337	0.5027
44	440.00	1.80%	0.0612	1.0611	0.0030	0.0023	0.8503	0.0594	0.0509	0.7272	0.5672
45	450.00	1.80%	0.0612	1.1223	0.0067	0.0037	0.9098	0.0596	0.0513	0 7324	0.6494
46	460.00	3.40%	0.1156	1.2379	0.0176	0.0109	1.0228	0.1129	0.0978	1.3963	0.8590
47	470.00	5.40%	0.1836	1.4215	0.0445	0.0269	1.2029	0.1802	0.1574	2.2477	1.3454
48	480.00	2.70%	0.0918	1.5133	0.0620	0.0175	1.2933	0.0904	0.0796	1.1360	1.5203 ← PEA
49	490.00	1.80%	0.0612	1.5745	0.0751	0.0131	1.3536	0.0603	0.0533	0.7613	1.2316
50	500.00	1.34%	0.0456	1.6201	0.0856	0.0105	1.3986	0.0449	0.0398	0.5688	0.9455
51	510.00	1.34%	0.0456	1.6657	0.0967	0.0111	1.4435	0.0450	0.0399	0.5704	0.7556
52	520.00	1.34%	0.0456	1.7112	0.1083	0.0116	1.4885	0.0450	0.0401	0.5719	0.6625
53	530.00	0.88%	0.0299	1.7411	0.1162	0.0079	1.5181	0.0296	0.0264	0.3764	0.5674
54	540.00	0.88%	0.0299	1.7711	0.1244	0.0082	1.5477	0.0296	0.0264	0.3771	0.4711
55	550.00	0.88%	0.0299	1.8010	0.1328	0.0084	1.5773	0.0296	0.0265	0.3777	0.4237
56	560.00	0.88%	0.0299	1.8309	0.1415	0.0086	1.6069	0.0296	0.0265	0.3783	0.4006

4/11/29

57	570.00	0.88%	0.0299	1.8608	0.1503	0.0089	1.6365	0.0296	0.0265	0.3789	0.3895
58	580.00	0.88%	0.0299	1.8907	0.1594	0.0091	1.6661	0.0296	0.0266	0.3795	0.3843
59	590.00	0.88%	0.0299	1.9207	0.1687	0.0093	1.6957	0.0296	0.0266	0.3800	0.3820
60	600.00	0.88%	0.0299	1.9506	0.1783	0.0095	1.7254	0.0296	0.0267	0.3806	0.3811
61	610.00	0.88%	0.0299	1.9805	0.1880	0.0097	1.7550	0.0296	0.0267	0.3811	0.3810
62	620.00	0.88%	0.0299	2.0104	0.1980	0.0100	1.7847	0.0297	0.0267	0.3817	0.3812
63	630.00	0.88%	0.0299	2.0403	0.2081	0.0102	1.8143	0.0297	0.0268	0.3822	0.3816
64	640.00	0.88%	0.0299	2.0703	0.2185	0.0104	1.8440	0.0297	0.0268	0.3827	0.3820
65	650.00	0.72%	0.0245	2.0947	0.2271	0.0086	1.8683	0.0243	0.0220	0.3135	0.3649
66	660.00	0.72%	0.0245	2.1192	0.2359	0.0088	1.8926	0.0243	0.0220	0.3138	0.3390
67	670.00	0.72%	0.0245	2.1437	0.2447	0.0089	1.9169	0.0243	0.0220	0.3142	0.3264
68	680.00	0.72%	0.0245	2.1682	0.2538	0.0090	1.9411	0.0243	0.0220	0.3145	0.3203
69	690.00	0.72%	0.0245	2.1927	0.2629	0.0091	1.9654	0.0243	0.0220	0.3148	0.3174
70	700.00	0.72%	0.0245	2.2171	0.2722	0.0093	1.9897	0.0243	0.0221	0.3151	0.3162
71	710.00	0.72%	0.0245	2.2416	0.2816	0.0094	2.0140	0.0243	0.0221	0.3154	0.3157
72	720.00	0.72%	0.0245	2.2661	0.2911	0.0095	2.0383	0.0243	0.0221	0.3157	0.3156
73	730.00	0.72%	0.0245	2.2906	0.3007	0.0096	2.0627	0.0243	0.0221	0.3160	0.3157
74	740.00	0.72%	0.0245	2.3151	0.3105	0.0098	2.0870	0.0243	0.0222	0.3163	0.3160
75	750.00	0.72%	0.0245	2.3395	0.3203	0.0099	2.1113	0.0243	0.0222	0.3166	0.3162
76	760.00	0.72%	0.0245	2.3640	0.3303	0.0100	2.1356	0.0243	0.0222	0.3169	0.3165
77	770.00	0.57%	0.0194	2.3834	0.3383	0.0080	2.1549	0.0193	0.0176	0.2511	0.3001
78	780.00	0.57%	0.0194	2.4028	0.3464	0.0081	2.1741	0.0193	0.0176	0.2512	0.2754
79	790.00	0.57%	0.0194	2.4222	0.3545	0.0081	2.1934	0.0193	0.0176	0.2514	0.2632
80	800.00	0.57%	0.0194	2.4415	0.3627	0.0082	2.2126	0.0193	0.0176	0.2516	0.2573
81	810.00	0.57%	0.0194	2.4609	0.3710	0.0083	2.2319	0.0193	0.0176	0.2518	0.2545
82	820.00	0.57%	0.0194	2.4803	0.3793	0.0083	2.2512	0.0193	0.0176	0.2519	0.2531
83	830.00	0.57%	0.0194	2.4997	0.3877	0.0084	2.2704	0.0193	0.0177	0.2521	0.2526
84	840.00	0.57%	0.0194	2.5191	0.3962	0.0085	2.2897	0.0193	0.0177	0.2522	0.2524
85	850.00	0.57%	0.0194	2.5384	0.4048	0.0085	2.3090	0.0193	0.0177	0.2524	0.2523
86	860.00	0.57%	0.0194	2.5578	0.4134	0.0086	2.3282	0.0193	0.0177	0.2526	0.2524
87	870.00	0.57%	0.0194	2.5772	0.4220	0.0087	2.3475	0.0193	0.0177	0.2527	0.2525
88	880.00	0.57%	0.0194	2.5966	0.4308	0.0087	2.3668	0.0193	0.0177	0.2529	0.2527
89	890.00	0.50%	0.0170	2.6136	0.4385	0.0077	2.3837	0.0169	0.0155	0.2220	0.2450
90	900.00	0.50%	0.0170	2.6306	0.4463	0.0078	2.4006	0.0169	0.0156	0.2221	0.2334
91	910.00	0.50%	0.0170	2.6476	0.4541	0.0078	2.4175	0.0169	0.0156	0.2222	0.2277
92	920.00	0.50%	0.0170	2.6646	0.4620	0.0079	2.4344	0.0169	0.0156	0.2223	0.2249
93	930.00	0.50%	0.0170	2.6816	0.4699	0.0079	2.4513	0.0169	0.0156	0.2224	0.2236
94	940.00	0.50%	0.0170	2.6986	0.4778	0.0080	2.4682	0.0169	0.0156	0.2225	0.2231
95	950.00	0.50%	0.0170	2.7156	0.4859	0.0080	2.4851	0.0169	0.0156	0.2226	0.2228

D12/29

96	960.00	0.50%	0.0170	2.7326	0.4939	0.0081	2.5021	0.0169	0.0156	0.2228	0.2228
97	970.00	0.50%	0.0170	2.7496	0.5020	0.0081	2.5190	0.0169	0.0156	0.2229	0.2228
98	980.00	0.50%	0.0170	2.7666	0.5102	0.0082	2.5359	0.0169	0.0156	0.2230	0.2229
99	990.00	0.50%	0.0170	2.7836	0.5184	0.0082	2.5528	0.0169	0.0156	0.2231	0.2229
100	1000.00	0.50%	0.0170	2.8006	0.5266	0.0082	2.5697	0.0169	0.0156	0.2232	0.2230
101	1010.00	0.40%	0.0136	2.8142	0.5332	0.0066	2.5833	0.0135	0.0125	0.1786	0.2119
102	1020.00	0.40%	0.0136	2.8278	0.5399	0.0067	2.5968	0.0135	0.0125	0.1787	0.1951
103	1030.00	0.40%	0.0136	2.8414	0.5466	0.0067	2.6103	0.0135	0.0125	0.1788	0.1868
104	1040.00	0.40%	0.0136	2.8550	0.5533	0.0067	2.6239	0.0135	0.0125	0.1788	0.1828
105	1050.00	0.40%	0.0136	2.8686	0.5600	0.0067	2.6374	0.0135	0.0125	0.1789	0.1808
106	1060.00	0.40%	0.0136	2.8822	0.5668	0.0068	2.6510	0.0135	0.0125	0.1790	0.1799
107	1070.00	0.40%	0.0136	2.8958	0.5736	0.0068	2.6645	0.0135	0.0125	0.1790	0.1794
108	1080.00	0.40%	0.0136	2.9094	0.5804	0.0068	2.6780	0.0135	0.0125	0.1791	0.1792
109	1090.00	0.40%	0.0136	2.9230	0.5873	0.0069	2.6916	0.0135	0.0125	0.1792	0.1792
110	1100.00	0.40%	0.0136	2.9366	0.5942	0.0069	2.7051	0.0135	0.0126	0.1792	0.1792
111	1110.00	0.40%	0.0136	2.9502	0.6011	0.0069	2.7187	0.0135	0.0126	0.1793	0.1792
112	1120.00	0.40%	0.0136	2.9638	0.6080	0.0069	2.7322	0.0135	0.0126	0.1794	0.1793
113	1130.00	0.40%	0.0136	2.9774	0.6150	0.0070	2.7457	0.0135	0.0126	0.1794	0.1793
114	1140.00	0.40%	0.0136	2.9910	0.6219	0.0070	2.7593	0.0135	0.0126	0.1795	0.1794
115	1150.00	0.40%	0.0136	3.0046	0.6290	0.0070	2.7728	0.0135	0.0126	0.1795	0.1795
116	1160.00	0.40%	0.0136	3.0182	0.6360	0.0070	2.7864	0.0135	0.0126	0.1796	0.1795
117	1170.00	0.40%	0.0136	3.0318	0.6431	0.0071	2.7999	0.0135	0.0126	0.1797	0.1796
118	1180.00	0.40%	0.0136	3.0454	0.6502	0.0071	2.8135	0.0135	0.0126	0.1797	0.1796
119	1190.00	0.40%	0.0136	3.0590	0.6573	0.0071	2.8270	0.0135	0.0126	0.1798	0.1797
120	1200.00	0.40%	0.0136	3.0726	0.6644	0.0071	2.8406	0.0135	0.0126	0.1799	0.1798
121	1210.00	0.40%	0.0136	3.0862	0.6716	0.0072	2.8541	0.0135	0.0126	0.1799	0.1798
122	1220.00	0.40%	0.0136	3.0998	0.6788	0.0072	2.8676	0.0135	0.0126	0.1800	0.1799
123	1230.00	0.40%	0.0136	3.1134	0.6860	0.0072	2.8812	0.0135	0.0126	0.1800	0.1799
124	1240.00	0.40%	0.0136	3.1270	0.6933	0.0072	2.8947	0.0135	0.0126	0.1801	0.1800
125	1250.00	0.40%	0.0136	3.1406	0.7005	0.0073	2.9083	0.0135	0.0126	0.1801	0.1801
126	1260.00	0.40%	0.0136	3.1542	0.7078	0.0073	2.9218	0.0135	0.0126	0.1802	0.1801
127	1270.00	0.40%	0.0136	3.1678	0.7151	0.0073	2.9354	0.0135	0.0126	0.1803	0.1802
128	1280.00	0.40%	0.0136	3.1814	0.7225	0.0073	2.9489	0.0135	0.0126	0.1803	0.1802
129	1290.00	0.40%	0.0136	3.1950	0.7299	0.0074	2.9625	0.0135	0.0126	0.1804	0.1803
130	1300.00	0.40%	0.0136	3.2086	0.7373	0.0074	2.9760	0.0135	0.0126	0.1804	0.1803
131	1310.00	0.40%	0.0136	3.2222	0.7447	0.0074	2.9896	0.0136	0.0126	0.1805	0.1804
132	1320.00	0.40%	0.0136	3.2358	0.7521	0.0074	3.0031	0.0136	0.0126	0.1805	0.1805
133	1330.00	0.40%	0.0136	3.2494	0.7596	0.0075	3.0167	0.0136	0.0126	0.1806	0.1805
134	1340.00	0.40%	0.0136	3.2630	0.7671	0.0075	3.0302	0.0136	0.0127	0.1807	0.1806

D13/29

135	1350.00	0.40%	0.0136	3.2766	0.7746	0.0075	3.0438	0.0136	0.0127	0.1807	0.1806
136	1360.00	0.40%	0.0136	3.2902	0.7821	0.0075	3.0573	0.0136	0.0127	0.1808	0.1807
137	1370.00	0.40%	0.0136	3.3038	0.7897	0.0076	3.0709	0.0136	0.0127	0.1808	0.1807
138	1380.00	0.40%	0.0136	3.3174	0.7973	0.0076	3.0844	0.0136	0.0127	0.1809	0.1808
139	1390.00	0.40%	0.0136	3.3310	0.8049	0.0076	3.0980	0.0136	0.0127	0.1809	0.1808
140	1400.00	0.40%	0.0136	3.3446	0.8125	0.0076	3.1116	0.0136	0.0127	0.1810	0.1809
141	1410.00	0.40%	0.0136	3.3582	0.8202	0.0077	3.1251	0.0136	0.0127	0.1810	0.1810
142	1420.00	0.40%	0.0136	3.3718	0.8278	0.0077	3.1387	0.0136	0.0127	0.1811	0.1810
143	1430.00	0.40%	0.0136	3.3854	0.8355	0.0077	3.1522	0.0136	0.0127	0.1811	0.1811
144	1440.00	0.40%	0.0136	3.3990	0.8433	0.0077	3.1658	0.0136	0.0127	0.1812	0.1811

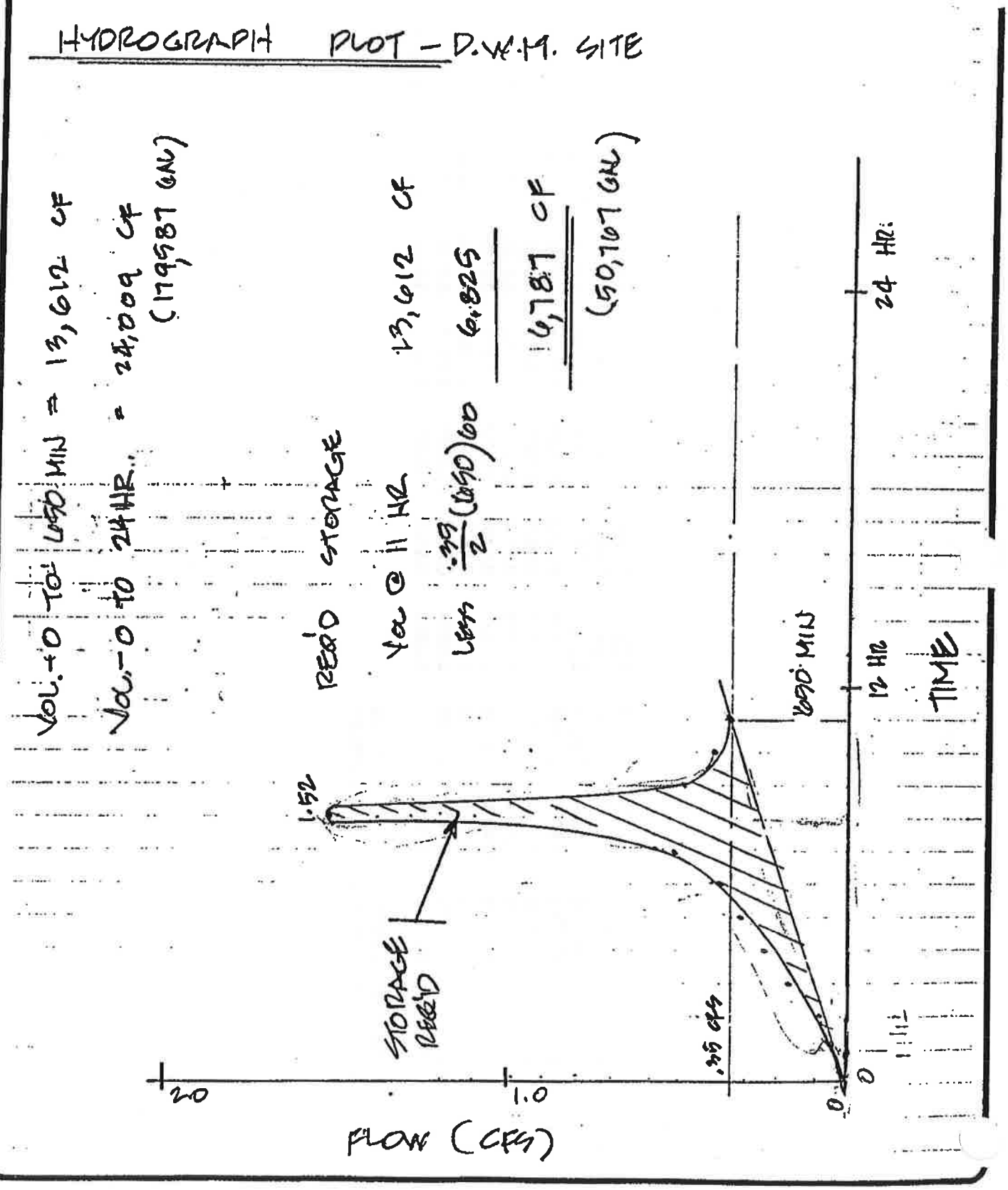
VOLUME @ 11 HOUR = 13611.52
VOLUME @ 24 HOUR = 24008.94

D14/29

EISI
consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet D15 Of 29
Project:
Subject:
Client:
By: DL Date: 8/31

HYDROGRAPH PLOT – D.W.M. SITE



consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet V10 Of 27
Project:
Subject:
Client:
By: DLC Date: 7/21/92

RETENTION POND

POND: I

FLOOD PLAIN EL. 27.25'

70' x 80' (27.25 - 26.36)/3	=	1661 CF.
120' x 30' (27.25 - 26.5)/3	=	800
100 x 45' (27.25 - 26.5)/3	=	1125
90 x 20' (27.25 - 27)/3	=	150
SUB-TOTAL.		3536 CF.
PIPE 402 LF x 1.39 CF/LF	=	560
TOTAL VOLUME	=	4096 CF.
VOL. REQ'D	=	6787 CF.
VOL. REQ'D TO BE STORED IN TANK	—	2701 CF (20,203 GAL)

YARD POND IS NOT LARGE ENOUGH FOR ALL THE REQUIRED RETENTION THEREFOR PART OF THE STORAGE WILL BE IN A DESIGNATED TANK IN THE TANK SYSTEM.

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet D17 of 29
Project: KENT FACILITY
Subject:
Client:
By: DLC Date:

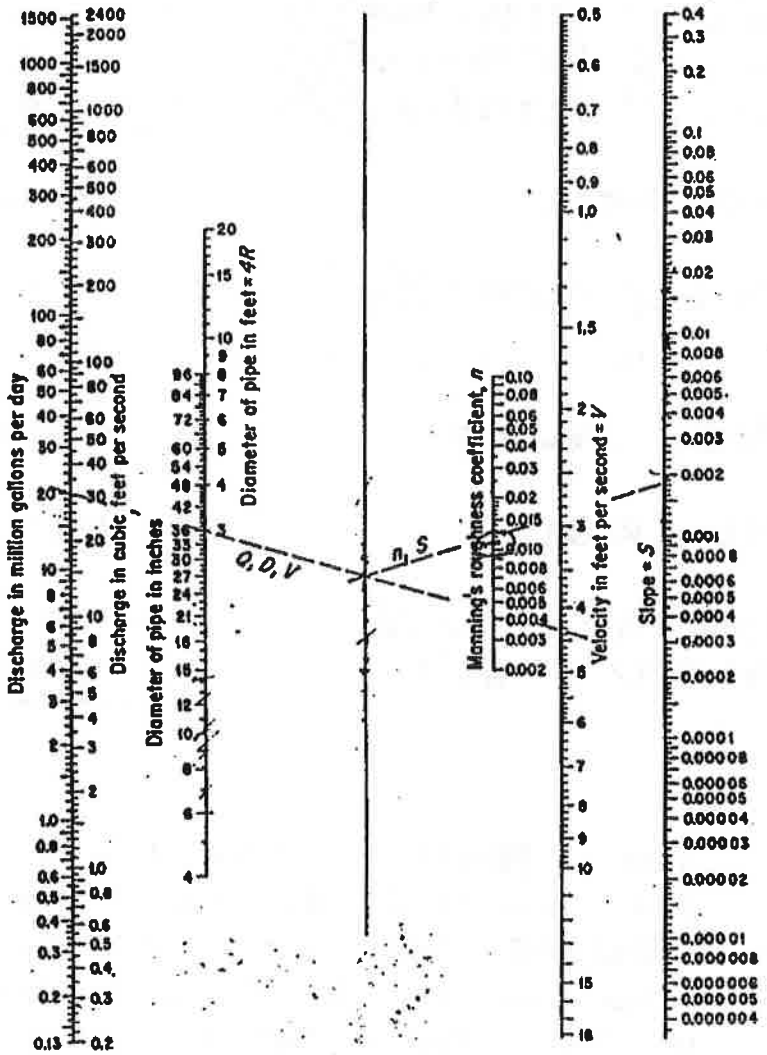


FIG. 13. Diagram for the solution of Manning's formula.

$I = 3.4(T_c/2.4) - .625$

.25 YR. / n = .011

LOCATION FROM	LOCATION TO	INCREMENTAL AREA A	RUN-OFF COEFFIC. C	AC	Σ AC	TIME OF CONCENTRATION TC	RAINFALL INTENSITY I	RUN-OFF Q (Σ AC I)	PIPE DIA.	SLOPE	VELOCITY AT DESIGN Q	LENGTH	FLOW TIME IN SYSTEM	UPPER ELEVATION		LOWER ELEVATION	
		ACRES				MINUTES	INCHES/HR.	C.F.S.	INCHES	%	F.P.S.	FEET	MIN.	GROUND	INVERT	GROUND	INVERT
I	II	.31	.9	.28	.28	11.3	1.29	.36	6	.0021		125					
II	VI	.58	1	.52	.80	11.9	1.25	1.00	10	.0012		200					
									← NEW								
III	IV	.37		.33	.33	11.3	1.29	.43	6	.0014		140					
IV	V	.36		.33	.66	12.1	1.24	.82	6	.0049		90					
									↑								
									← EXISTING								
V	VI	.34		.31	1.77	13.4	1.16	2.05	8	.0054		250					
VI	I	.40	↓	.36	2.13	14.8	1.09	2.32		PUMP							

55

USWB. CHART NO.:

STORM FREQUENCY:

PIPE COEFFICIENT:

KENT FACILITY

B.E.I.

NAME OF PROJECT

CALCULATIONS BY: DLC

REMARKS:

JOB NO. _____ DATE _____ SHEET 1 OF 1 SHEETS

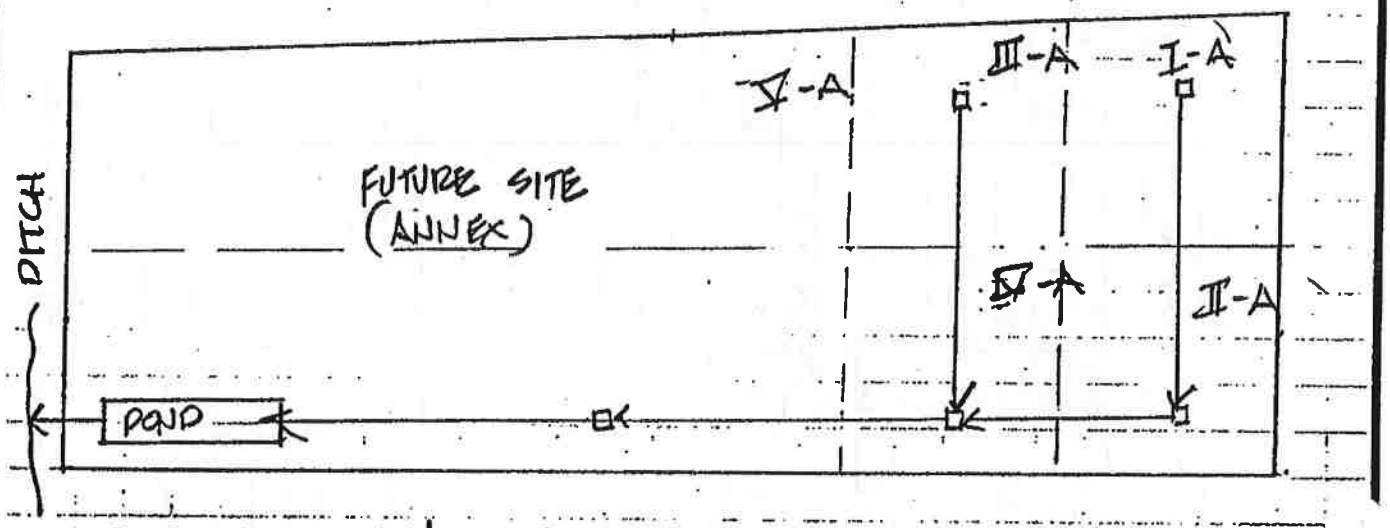
VIC/29

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet 19 Of 29
Project:
Subject:
Client:
By: DLC Date: 3/3

DRAINAGE ANALYSIS (25YR STORM) - ANNEX

SITE PLAN



- RATIONAL METHOD FOR PRELIMINARY DESIGN

AREA = 3.4 Ac
STORM = 25 YR.
PAVED SITE: C = .90

SIZE POND FOR OFFICE BUILDING ONLY. FUTURE SITE TO BE LEFT UNDEVELOPED.

OFFICE SITE 233' x 239' = 55687 SF. (1.28 Ac)

USED IN ANALYSIS

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4777Z Sheet 1.00 Of 29
Project:
Subject: ANNEX SITE - STORM
Client:
By: DLC Date: 8/31/92

PEAK RUNOFF RATES - ANNEX

PREDEVELOPMENT

DETERMINE TC:

L = 630'

S = 2'/630' = .003'

V (SHORT GRASS FIELD) = .5 fps

$T_C = \left[630'/.5 \text{ fps} \times 60 \right] + 10 = 31 \text{ MIN.}$

DETERMINE Q:

A = 3.4 Ac

$I_{100y} = 3.4 \therefore I_{25} = 3.4 \times \left(\frac{31}{2.4}\right)^{-.625} = .69 \text{ cfs/Ac}$

C = .20

$Q_{25y} = .2 \times 3.4 \times .69 = .47 \text{ cfs}$.

OFFICE SITE: $Q = .2 \times 1.28 \times .69 = .18 \text{ cfs}$

USED IN ANALYSIS

PROGRAM: HYDRO.XLS

SBUH RUNOFF HYDROGRAPH
B. E. I. - KENT FACILITY ANNEX

STORM CRITERIA: 25 YR

A=	1.28
PT=	3.40
DT=	10.00
TC=	16.70
W=	0.23

IMPERVIOUS		PERVIOUS	
AI=	1.08	AP=	0.20
CNI=	98.00	CNP=	68.00
SI=	0.20	SP=	4.71
.2SI=	0.04	.2SP=	0.94

TIME INCR.	TIME MIN.	RAINFALL DIST. %	INCR. RAINFALL IN.	ACCUM. RAINFALL IN.	PERV. ACCUM. RUNOFF IN.	PERV. INCR. RUNOFF IN.	IMPERV. ACCUM. RUNOFF IN.	IMPERV. INCR. RUNOFF IN.	TOTAL RUNOFF IN.	INSTANT HYDRO. CFS	DESIGN HYDRO. CFS
1	10.00	0.40%	0.0136	0.0136	0.0000	0.0000	0.00	0.0000	0.0000	0.0000	0.0000
2	20.00	0.40%	0.0136	0.0272	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	30.00	0.40%	0.0136	0.0408	0.0000	0.0000	0.0000	0.0000	0.00	0.0000	0.0000
4	40.00	0.40%	0.0136	0.0544	0.0000	0.0000	0.0008	0.0008	0.0007	0.0055	0.0013
5	50.00	0.40%	0.0136	0.0680	0.0000	0.0000	0.0032	0.0023	0.0020	0.0153	0.0055
6	60.00	0.40%	0.0136	0.0816	0.0000	0.0000	0.0068	0.0036	0.0030	0.0235	0.0119
7	70.00	0.40%	0.0136	0.0952	0.0000	0.0000	0.0114	0.0047	0.0039	0.0304	0.0188
8	80.00	0.40%	0.0136	0.1088	0.0000	0.0000	0.0170	0.0055	0.0047	0.0362	0.0255
9	90.00	0.40%	0.0136	0.1224	0.0000	0.0000	0.0233	0.0063	0.0053	0.0412	0.0316
10	100.00	0.40%	0.0136	0.1360	0.0000	0.0000	0.0303	0.0070	0.0059	0.0456	0.0370
11	110.00	0.50%	0.0170	0.1530	0.0000	0.0000	0.0398	0.0095	0.0080	0.0622	0.0448
12	120.00	0.50%	0.0170	0.1700	0.0000	0.0000	0.0501	0.0103	0.0087	0.0672	0.0540
13	130.00	0.50%	0.0170	0.1870	0.0000	0.0000	0.0610	0.0109	0.0092	0.0714	0.0610
14	140.00	0.50%	0.0170	0.2040	0.0000	0.0000	0.0725	0.0115	0.0097	0.0751	0.0667
15	150.00	0.50%	0.0170	0.2210	0.0000	0.0000	0.0845	0.0120	0.0101	0.0783	0.0713
16	160.00	0.50%	0.0170	0.2380	0.0000	0.0000	0.0969	0.0124	0.0105	0.0811	0.0752
17	170.00	0.60%	0.0204	0.2584	0.0000	0.0000	0.1123	0.0154	0.0130	0.1005	0.0824

5/15/29

18	180.00	0.60%	0.0204	0.2788	0.0000	0.0000	0.1281	0.0158	0.0134	0.1035	0.0914
19	190.00	0.60%	0.0204	0.2992	0.0000	0.0000	0.1444	0.0162	0.0137	0.1061	0.0976
20	200.00	0.60%	0.0204	0.3196	0.0000	0.0000	0.1610	0.0166	0.0140	0.1084	0.1021
21	210.00	0.60%	0.0204	0.3400	0.0000	0.0000	0.1779	0.0169	0.0143	0.1104	0.1055
22	220.00	0.60%	0.0204	0.3604	0.0000	0.0000	0.1950	0.0172	0.0145	0.1122	0.1082
23	230.00	0.70%	0.0238	0.3842	0.0000	0.0000	0.2154	0.0203	0.0172	0.1329	0.1148
24	240.00	0.70%	0.0238	0.4080	0.0000	0.0000	0.2360	0.0206	0.0174	0.1348	0.1236
25	250.00	0.70%	0.0238	0.4318	0.0000	0.0000	0.2569	0.0209	0.0176	0.1365	0.1291
26	260.00	0.70%	0.0238	0.4556	0.0000	0.0000	0.2780	0.0211	0.0178	0.1379	0.1328
27	270.00	0.70%	0.0238	0.4794	0.0000	0.0000	0.2993	0.0213	0.0180	0.1392	0.1355
28	280.00	0.70%	0.0238	0.5032	0.0000	0.0000	0.3208	0.0215	0.0181	0.1404	0.1375
29	290.00	0.82%	0.0279	0.5311	0.0000	0.0000	0.3462	0.0254	0.0214	0.1658	0.1447
30	300.00	0.82%	0.0279	0.5590	0.0000	0.0000	0.3717	0.0256	0.0216	0.1670	0.1547
31	310.00	0.82%	0.0279	0.5868	0.0000	0.0000	0.3975	0.0257	0.0217	0.1682	0.1606
32	320.00	0.82%	0.0279	0.6147	0.0000	0.0000	0.4234	0.0259	0.0218	0.1692	0.1643
33	330.00	0.82%	0.0279	0.6426	0.0000	0.0000	0.4494	0.0260	0.0220	0.1701	0.1668
34	340.00	0.82%	0.0279	0.6705	0.0000	0.0000	0.4755	0.0262	0.0221	0.1709	0.1685
35	350.00	0.95%	0.0323	0.7028	0.0000	0.0000	0.5060	0.0304	0.0257	0.1989	0.1760
36	360.00	0.95%	0.0323	0.7351	0.0000	0.0000	0.5365	0.0306	0.0258	0.1998	0.1868
37	370.00	0.95%	0.0323	0.7674	0.0000	0.0000	0.5672	0.0307	0.0259	0.2005	0.1929
38	380.00	0.95%	0.0323	0.7997	0.0000	0.0000	0.5980	0.0308	0.0260	0.2012	0.1966
39	390.00	0.95%	0.0323	0.8320	0.0000	0.0000	0.6289	0.0309	0.0261	0.2019	0.1989
40	400.00	0.95%	0.0323	0.8643	0.0000	0.0000	0.6599	0.0310	0.0261	0.2025	0.2004
41	410.00	1.33%	0.0452	0.9095	0.0000	0.0000	0.7034	0.0435	0.0367	0.2843	0.2202
42	420.00	1.33%	0.0452	0.9547	0.0000	0.0000	0.7471	0.0436	0.0368	0.2853	0.2500
43	430.00	1.33%	0.0452	0.9999	0.0007	0.0007	0.7908	0.0438	0.0370	0.2868	0.2666
44	440.00	1.80%	0.0612	1.0611	0.0030	0.0023	0.8503	0.0594	0.0505	0.3909	0.2999
45	450.00	1.80%	0.0612	1.1223	0.0067	0.0037	0.9098	0.0596	0.0509	0.3938	0.3425
46	460.00	3.40%	0.1156	1.2379	0.0176	0.0109	1.0228	0.1129	0.0970	0.7510	0.4485
47	470.00	5.40%	0.1836	1.4215	0.0445	0.0269	1.2029	0.1802	0.1562	1.2097	0.6936
48	480.00	2.70%	0.0918	1.5133	0.0620	0.0175	1.2933	0.0904	0.0790	0.6116	0.7936
49	490.00	1.80%	0.0612	1.5745	0.0751	0.0131	1.3536	0.0603	0.0529	0.4100	0.6633
50	500.00	1.34%	0.0456	1.6201	0.0856	0.0105	1.3986	0.0449	0.0396	0.3064	0.5227
51	510.00	1.34%	0.0456	1.6657	0.0967	0.0111	1.4435	0.0450	0.0397	0.3073	0.4232
52	520.00	1.34%	0.0456	1.7112	0.1083	0.0116	1.4885	0.0450	0.0398	0.3081	0.3700
53	530.00	0.88%	0.0299	1.7411	0.1162	0.0079	1.5181	0.0296	0.0262	0.2028	0.3172
54	540.00	0.88%	0.0299	1.7711	0.1244	0.0082	1.5477	0.0296	0.0262	0.2032	0.2646
55	550.00	0.88%	0.0299	1.8010	0.1328	0.0084	1.5773	0.0296	0.0263	0.2035	0.2364
56	560.00	0.88%	0.0299	1.8309	0.1415	0.0086	1.6069	0.0296	0.0263	0.2039	0.2213

PEAK

9/1/2020

57	570.00	0.88%	0.0299	1.8608	0.1503	0.0089	1.6365	0.0296	0.0264	0.2042	0.2134
58	580.00	0.88%	0.0299	1.8907	0.1594	0.0091	1.6661	0.0296	0.0264	0.2045	0.2092
59	590.00	0.88%	0.0299	1.9207	0.1687	0.0093	1.6957	0.0296	0.0265	0.2049	0.2071
60	600.00	0.88%	0.0299	1.9506	0.1783	0.0095	1.7254	0.0296	0.0265	0.2052	0.2062
61	610.00	0.88%	0.0299	1.9805	0.1880	0.0097	1.7550	0.0296	0.0265	0.2055	0.2058
62	620.00	0.88%	0.0299	2.0104	0.1980	0.0100	1.7847	0.0297	0.0266	0.2058	0.2057
63	630.00	0.88%	0.0299	2.0403	0.2081	0.0102	1.8143	0.0297	0.0266	0.2061	0.2058
64	640.00	0.88%	0.0299	2.0703	0.2185	0.0104	1.8440	0.0297	0.0266	0.2064	0.2060
65	650.00	0.72%	0.0245	2.0947	0.2271	0.0086	1.8683	0.0243	0.0218	0.1691	0.1976
66	660.00	0.72%	0.0245	2.1192	0.2359	0.0088	1.8926	0.0243	0.0219	0.1693	0.1845
67	670.00	0.72%	0.0245	2.1437	0.2447	0.0089	1.9169	0.0243	0.0219	0.1694	0.1775
68	680.00	0.72%	0.0245	2.1682	0.2538	0.0090	1.9411	0.0243	0.0219	0.1696	0.1738
69	690.00	0.72%	0.0245	2.1927	0.2629	0.0091	1.9654	0.0243	0.0219	0.1698	0.1719
70	700.00	0.72%	0.0245	2.2171	0.2722	0.0093	1.9897	0.0243	0.0219	0.1700	0.1710
71	710.00	0.72%	0.0245	2.2416	0.2816	0.0094	2.0140	0.0243	0.0220	0.1702	0.1706
72	720.00	0.72%	0.0245	2.2661	0.2911	0.0095	2.0383	0.0243	0.0220	0.1703	0.1704
73	730.00	0.72%	0.0245	2.2906	0.3007	0.0096	2.0627	0.0243	0.0220	0.1705	0.1704
74	740.00	0.72%	0.0245	2.3151	0.3105	0.0098	2.0870	0.0243	0.0220	0.1707	0.1705
75	750.00	0.72%	0.0245	2.3395	0.3203	0.0099	2.1113	0.0243	0.0221	0.1708	0.1706
76	760.00	0.72%	0.0245	2.3640	0.3303	0.0100	2.1356	0.0243	0.0221	0.1710	0.1707
77	770.00	0.57%	0.0194	2.3834	0.3383	0.0080	2.1549	0.0193	0.0175	0.1355	0.1627
78	780.00	0.57%	0.0194	2.4028	0.3464	0.0081	2.1741	0.0193	0.0175	0.1356	0.1502
79	790.00	0.57%	0.0194	2.4222	0.3545	0.0081	2.1934	0.0193	0.0175	0.1357	0.1435
80	800.00	0.57%	0.0194	2.4415	0.3627	0.0082	2.2126	0.0193	0.0175	0.1358	0.1399
81	810.00	0.57%	0.0194	2.4609	0.3710	0.0083	2.2319	0.0193	0.0175	0.1359	0.1380
82	820.00	0.57%	0.0194	2.4803	0.3793	0.0083	2.2512	0.0193	0.0176	0.1360	0.1370
83	830.00	0.57%	0.0194	2.4997	0.3877	0.0084	2.2704	0.0193	0.0176	0.1361	0.1366
84	840.00	0.57%	0.0194	2.5191	0.3962	0.0085	2.2897	0.0193	0.0176	0.1361	0.1364
85	850.00	0.57%	0.0194	2.5384	0.4048	0.0085	2.3090	0.0193	0.0176	0.1362	0.1363
86	860.00	0.57%	0.0194	2.5578	0.4134	0.0086	2.3282	0.0193	0.0176	0.1363	0.1363
87	870.00	0.57%	0.0194	2.5772	0.4220	0.0087	2.3475	0.0193	0.0176	0.1364	0.1363
88	880.00	0.57%	0.0194	2.5966	0.4308	0.0087	2.3668	0.0193	0.0176	0.1365	0.1364
89	890.00	0.50%	0.0170	2.6136	0.4385	0.0077	2.3837	0.0169	0.0155	0.1198	0.1326
90	900.00	0.50%	0.0170	2.6306	0.4463	0.0078	2.4006	0.0169	0.0155	0.1199	0.1267
91	910.00	0.50%	0.0170	2.6476	0.4541	0.0078	2.4175	0.0169	0.0155	0.1200	0.1236
92	920.00	0.50%	0.0170	2.6646	0.4620	0.0079	2.4344	0.0169	0.0155	0.1200	0.1219
93	930.00	0.50%	0.0170	2.6816	0.4699	0.0079	2.4513	0.0169	0.0155	0.1201	0.1211
94	940.00	0.50%	0.0170	2.6986	0.4778	0.0080	2.4682	0.0169	0.0155	0.1201	0.1206
95	950.00	0.50%	0.0170	2.7156	0.4859	0.0080	2.4851	0.0169	0.0155	0.1202	0.1204

U.W./29

96	960.00	0.50%	0.0170	2.7326	0.4939	0.0081	2.5021	0.0169	0.0155	0.1203	0.1203
97	970.00	0.50%	0.0170	2.7496	0.5020	0.0081	2.5190	0.0169	0.0155	0.1203	0.1203
98	980.00	0.50%	0.0170	2.7666	0.5102	0.0082	2.5359	0.0169	0.0155	0.1204	0.1203
99	990.00	0.50%	0.0170	2.7836	0.5184	0.0082	2.5528	0.0169	0.0156	0.1205	0.1204
100	1000.00	0.50%	0.0170	2.8006	0.5266	0.0082	2.5697	0.0169	0.0156	0.1205	0.1204
101	1010.00	0.40%	0.0136	2.8142	0.5332	0.0066	2.5833	0.0135	0.0125	0.0965	0.1149
102	1020.00	0.40%	0.0136	2.8278	0.5399	0.0067	2.5968	0.0135	0.0125	0.0965	0.1064
103	1030.00	0.40%	0.0136	2.8414	0.5466	0.0067	2.6103	0.0135	0.0125	0.0965	0.1019
104	1040.00	0.40%	0.0136	2.8550	0.5533	0.0067	2.6239	0.0135	0.0125	0.0966	0.0994
105	1050.00	0.40%	0.0136	2.8686	0.5600	0.0067	2.6374	0.0135	0.0125	0.0966	0.0981
106	1060.00	0.40%	0.0136	2.8822	0.5668	0.0068	2.6510	0.0135	0.0125	0.0967	0.0974
107	1070.00	0.40%	0.0136	2.8958	0.5736	0.0068	2.6645	0.0135	0.0125	0.0967	0.0971
108	1080.00	0.40%	0.0136	2.9094	0.5804	0.0068	2.6780	0.0135	0.0125	0.0967	0.0969
109	1090.00	0.40%	0.0136	2.9230	0.5873	0.0069	2.6916	0.0135	0.0125	0.0968	0.0968
110	1100.00	0.40%	0.0136	2.9366	0.5942	0.0069	2.7051	0.0135	0.0125	0.0968	0.0968
111	1110.00	0.40%	0.0136	2.9502	0.6011	0.0069	2.7187	0.0135	0.0125	0.0968	0.0968
112	1120.00	0.40%	0.0136	2.9638	0.6080	0.0069	2.7322	0.0135	0.0125	0.0969	0.0968
113	1130.00	0.40%	0.0136	2.9774	0.6150	0.0070	2.7457	0.0135	0.0125	0.0969	0.0969
114	1140.00	0.40%	0.0136	2.9910	0.6219	0.0070	2.7593	0.0135	0.0125	0.0969	0.0969
115	1150.00	0.40%	0.0136	3.0046	0.6290	0.0070	2.7728	0.0135	0.0125	0.0970	0.0969
116	1160.00	0.40%	0.0136	3.0182	0.6360	0.0070	2.7864	0.0135	0.0125	0.0970	0.0970
117	1170.00	0.40%	0.0136	3.0318	0.6431	0.0071	2.7999	0.0135	0.0125	0.0970	0.0970
118	1180.00	0.40%	0.0136	3.0454	0.6502	0.0071	2.8135	0.0135	0.0125	0.0971	0.0970
119	1190.00	0.40%	0.0136	3.0590	0.6573	0.0071	2.8270	0.0135	0.0125	0.0971	0.0971
120	1200.00	0.40%	0.0136	3.0726	0.6644	0.0071	2.8406	0.0135	0.0125	0.0972	0.0971
121	1210.00	0.40%	0.0136	3.0862	0.6716	0.0072	2.8541	0.0135	0.0125	0.0972	0.0971
122	1220.00	0.40%	0.0136	3.0998	0.6788	0.0072	2.8676	0.0135	0.0126	0.0972	0.0972
123	1230.00	0.40%	0.0136	3.1134	0.6860	0.0072	2.8812	0.0135	0.0126	0.0973	0.0972
124	1240.00	0.40%	0.0136	3.1270	0.6933	0.0072	2.8947	0.0135	0.0126	0.0973	0.0972
125	1250.00	0.40%	0.0136	3.1406	0.7005	0.0073	2.9083	0.0135	0.0126	0.0973	0.0973
126	1260.00	0.40%	0.0136	3.1542	0.7078	0.0073	2.9218	0.0135	0.0126	0.0974	0.0973
127	1270.00	0.40%	0.0136	3.1678	0.7151	0.0073	2.9354	0.0135	0.0126	0.0974	0.0973
128	1280.00	0.40%	0.0136	3.1814	0.7225	0.0073	2.9489	0.0135	0.0126	0.0974	0.0974
129	1290.00	0.40%	0.0136	3.1950	0.7299	0.0074	2.9625	0.0135	0.0126	0.0975	0.0974
130	1300.00	0.40%	0.0136	3.2086	0.7373	0.0074	2.9760	0.0135	0.0126	0.0975	0.0974
131	1310.00	0.40%	0.0136	3.2222	0.7447	0.0074	2.9896	0.0136	0.0126	0.0975	0.0975
132	1320.00	0.40%	0.0136	3.2358	0.7521	0.0074	3.0031	0.0136	0.0126	0.0975	0.0975
133	1330.00	0.40%	0.0136	3.2494	0.7596	0.0075	3.0167	0.0136	0.0126	0.0976	0.0975
134	1340.00	0.40%	0.0136	3.2630	0.7671	0.0075	3.0302	0.0136	0.0126	0.0976	0.0976

135	1350.00	0.40%	0.0136	3.2766	0.7746	0.0075	3.0438	0.0136	0.0126	0.0976	0.0976
136	1360.00	0.40%	0.0136	3.2902	0.7821	0.0075	3.0573	0.0136	0.0126	0.0977	0.0976
137	1370.00	0.40%	0.0136	3.3038	0.7897	0.0076	3.0709	0.0136	0.0126	0.0977	0.0976
138	1380.00	0.40%	0.0136	3.3174	0.7973	0.0076	3.0844	0.0136	0.0126	0.0977	0.0977
139	1390.00	0.40%	0.0136	3.3310	0.8049	0.0076	3.0980	0.0136	0.0126	0.0978	0.0977
140	1400.00	0.40%	0.0136	3.3446	0.8125	0.0076	3.1116	0.0136	0.0126	0.0978	0.0977
141	1410.00	0.40%	0.0136	3.3582	0.8202	0.0077	3.1251	0.0136	0.0126	0.0978	0.0978
142	1420.00	0.40%	0.0136	3.3718	0.8278	0.0077	3.1387	0.0136	0.0126	0.0979	0.0978
143	1430.00	0.40%	0.0136	3.3854	0.8355	0.0077	3.1522	0.0136	0.0126	0.0979	0.0978
144	1440.00	0.40%	0.0136	3.3990	0.8433	0.0077	3.1658	0.0136	0.0126	0.0979	0.0979

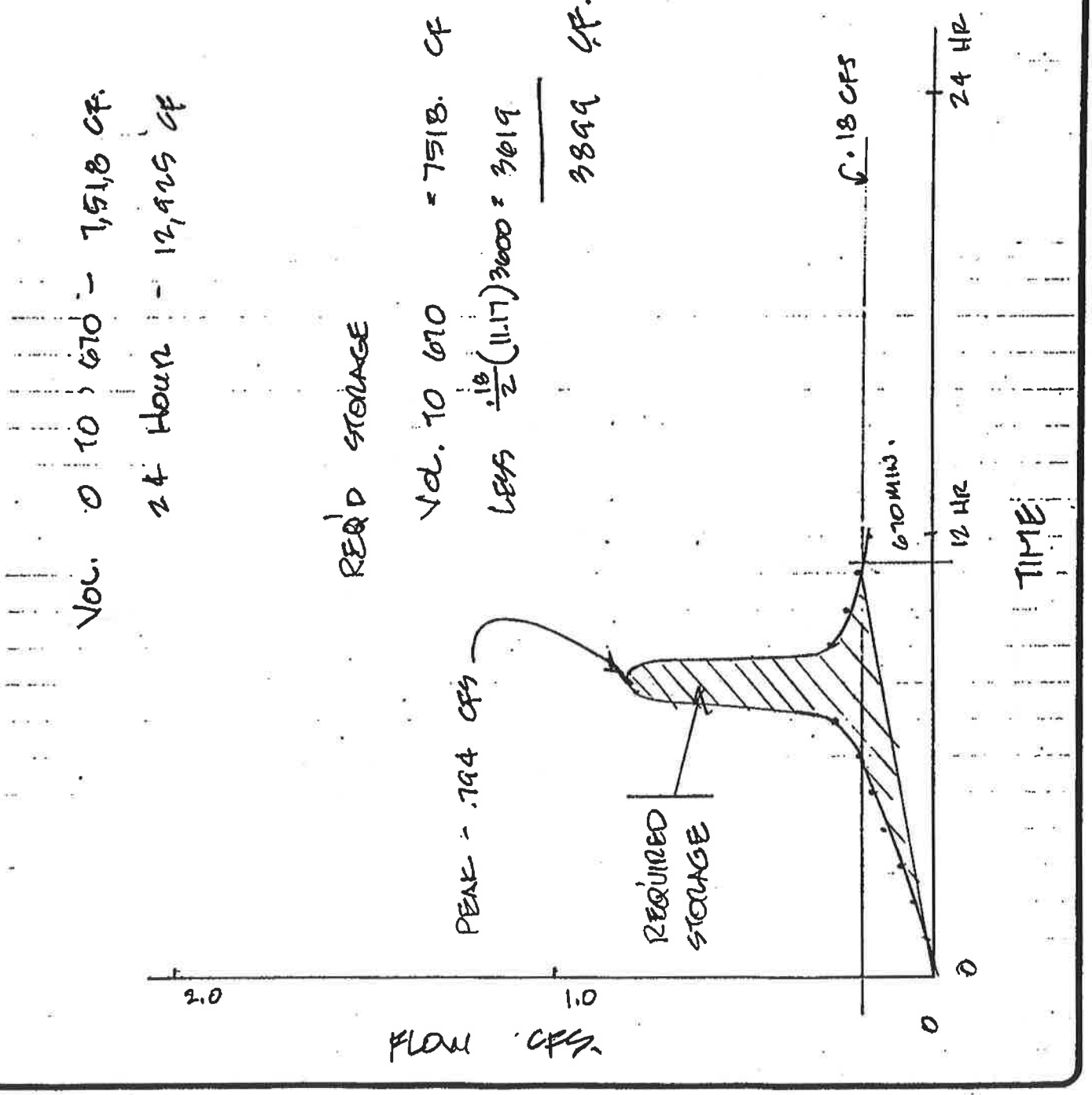
VOLUME @ 690 MIN = 7724.54 CF

D 24/29

consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. 4992 Sheet 127 Of 29
Project:
Subject:
Client:
By: DLL Date: 8-31-92

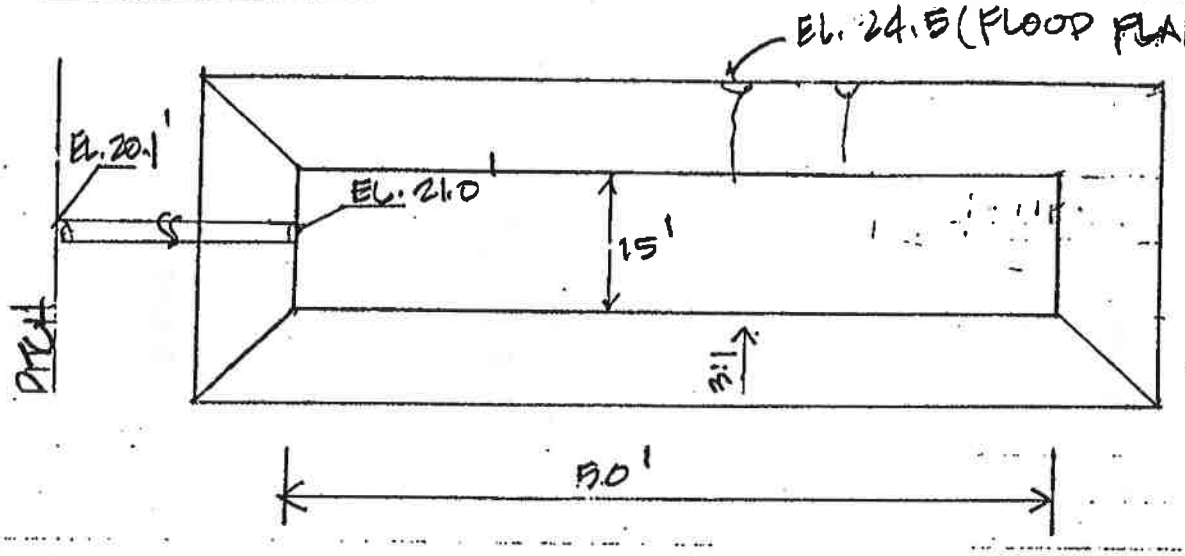
HYDROGRAPH PLOT - ANNEX (OFFICE)



consulting engineers
1800 West Emerson Place Suite 200
Seattle, Washington 98119
Phone (206) 284-1181 • FAX (206) 284-1236

Job No. [illegible] Sheet [illegible] Of [illegible]
Project:
Subject:
Client:
By: DLC Date: 7-?

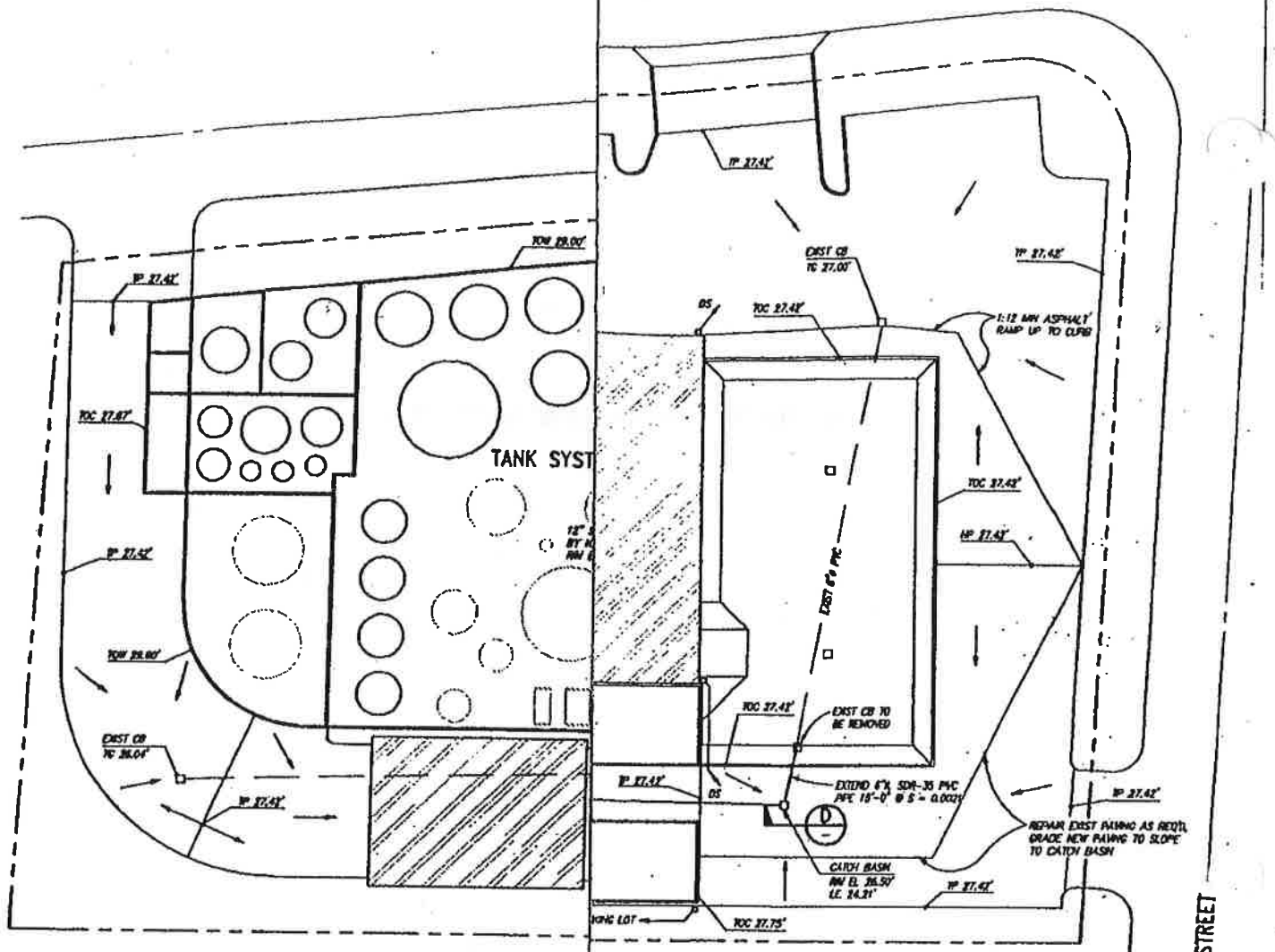
ANNEX - POND

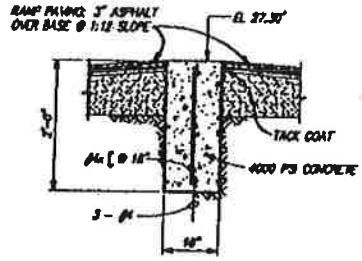


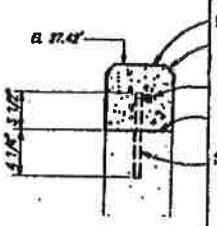
VOL. = 15' x 50' x 3.5' = 2625 CF
10.5' x 130 x 3.5/2 = 2389
5,014 CF > 3,899 C.F.

O.K.

ADDENDUM TO STORM DRAINAGE STUDY







CONCRETE (CONT'D):

DETAILS:

A. CONCRETE COVER OVER REINFORCING BARS, UNLESS OTHERWISE NOTED, SHALL BE 3 INCHES FOR CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH AND 2 INCHES FOR OTHER CONCRETE WITH ϕ5 AND SMALLER BARS.

B. ALL EXPOSED CONCRETE EDGES SHALL 3/4 INCH CHAMFERS.

C. SPLICES IN REINFORCING SHALL BE 21 INCHES FOR ϕ4 BARS.

STEEL:

STEEL SHALL CONFORM TO THE FOLLOWING:

A. ALL STEEL, UNLESS OTHERWISE NOTED, SHALL BE ASTM A36, Fy=36 KSI

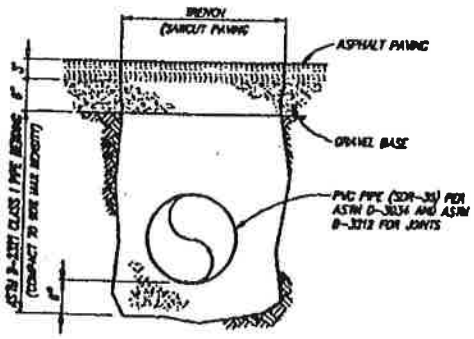
B. BOLTS SHALL CONFORM TO ASTM A307.

C. ALL WORK SHALL BE IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" AS REVISED THROUGH NOVEMBER 1978.

D. ALL WELDING SHALL BE DONE BY AWS CERTIFIED WELDERS AND IN ACCORDANCE WITH AWS "STRUCTURAL WELDING CODE", AND AWS D1.1. ALL WELDS SHALL BE MADE USING LOW HYDROGEN ELECTRODES E70XX, 3/16 INCH MINIMUM SIZE.

GALVANIZING:

ALL STEEL FABRICATIONS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A-123.



EISI
consulting engineers
1900 West Emerson Place
Suite 200
Seattle, Washington 98119

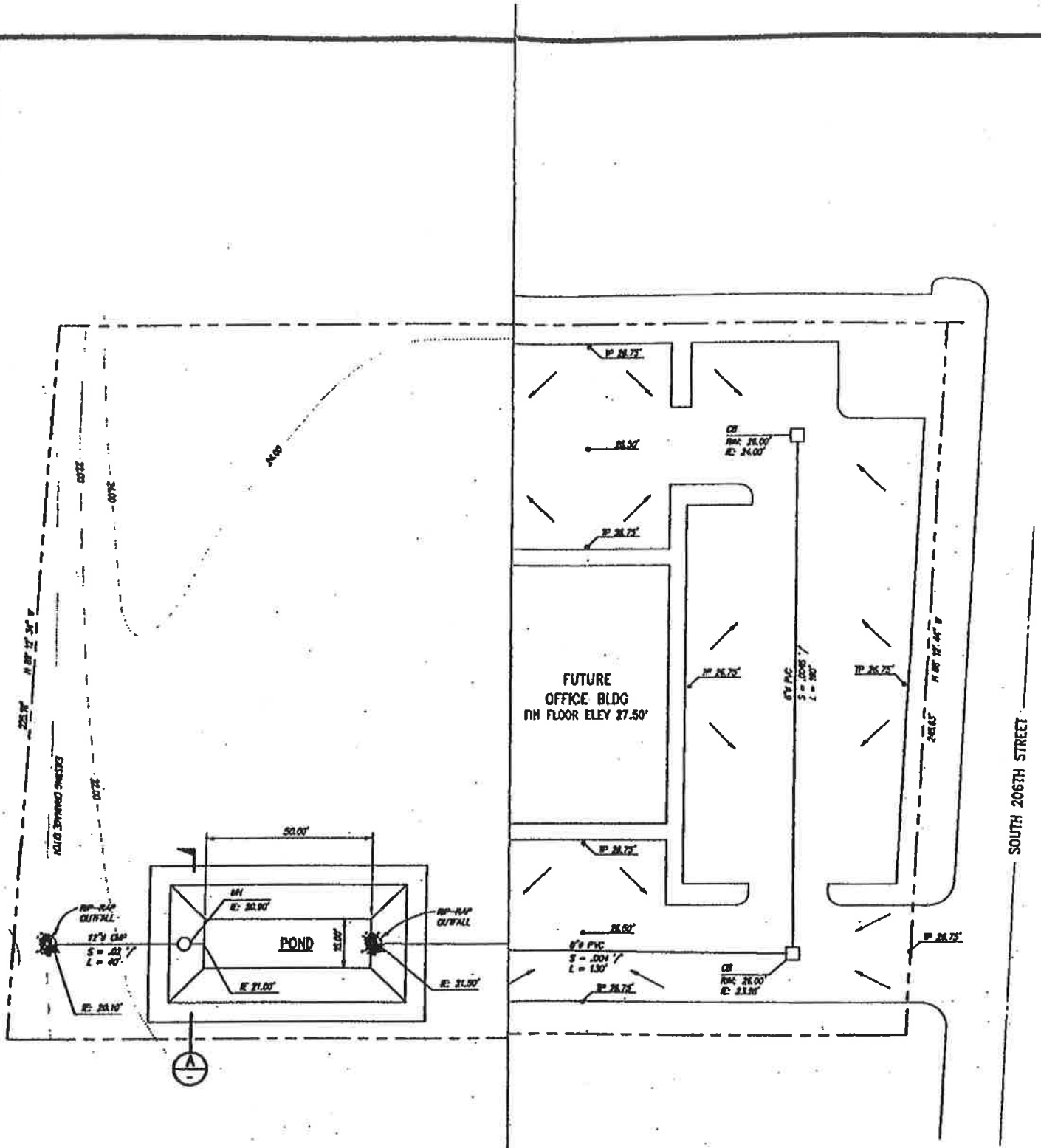
DOUGLAS L. CONDIE PRINCIPAL ENVIRONMENTAL ENGINEER

NO.	DATE	APPROVED BY	DESCRIPTION

BURLINGTON ENVIRONMENTAL INC.

TITLE: STORMWATER DRAINAGE PLAN
PROCESS SITE
KENT FACILITY

DESIGNED DLC/DJV	DRAWN MPW/DJV	CHECKED DLC	APPD.
SCALE 1" = 20'	DWG. NO. 51003		SHEET 1 of 2
DATE 8/11/82			





SECTION THRU POND (A)
NO SCALE

EISI
consulting engineers
900 West Emerson Place
Suite 200
Seattle, Washington 98119

DOUGLAS L. CONDIT
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

BURLINGTON ENVIRONMENTAL INC.

STORMWATER DRAINAGE PLAN
ANNEX SITE (PLANNED)
KENT FACILITY

DESIGNED	DRAWN	CHECKED	APPD
DS/DLC	DS/APW	DLC	
SCALE 1" = 30'			

51003

2 2

APPENDIX D-8

SEISMIC STUDY

APPENDIX D-8

SEISMIC STUDY

Consultants Inc.
Geotechnical Engineers, Geologists
& Environmental Scientists

July 19, 1988

E-3993

Crosby Overton
20245 - 76th Avenue South
Kent, Washington 98032

Attention: Mr. Ken Gaylord

Subject: Geotechnical Consultation
Existing Hazardous Waste Facility
20245 - 76th Avenue South
Kent, Washington

Reference: Earth Consultants, Inc. Proposal
PR-3071, dated June 17, 1988

Gentlemen:

As requested and in accordance with the scope of work outlined in the referenced proposal, we have performed an evaluation of the risk of surface faulting occurring in the vicinity of your facility during a major seismic event. We understand that this letter is required by the State of Washington for your permit to operate a hazardous waste facility per WAC 173:303-420.

After a review of our files pertaining to this subject and a review of materials published by others, we believe that, on the basis of currently available reviewed data, the risk posed by surface rupturing due to a major seismic event is low.

Seismic risk studies by the United States Geologic Survey and the Earthquake Data Tape, Publication 41-1, by the National Oceanic and Atmospheric Administration contain locations and depths of seismic events in the Puget Sound basin. The epicenters of these events are from thirty-two (32) to thirty-eight and one-half (38-1/2) miles in depth which would tend to indicate that they are related to the Benioff zone. These events occur as one tectonic plate is subducted under another. Because of the depth of these earthquakes, surface rupturing of the Holocent (recent) alluvial material in the Puget Sound and Kent Valley area is not known to have occurred. Geologic maps of the Puget Sound basin do not contain references to surface rupturing in the post-glacial Holocene Epoch and no active surficial fault featuers have been mapped to date.

We appreciate the opportunity to help you with this project. Should you have any questions or further concerns, please feel free to call.

Sincerely,

EARTH CONSULTANTS, INC.

Glen Mann, P. E.
Vice-President

JH/CRL/GM/kml



APPENDIX D-9

(RESERVED)

APPENDIX D-10

AIR QUALITY PROGRAM

Appendix D-10

AIR QUALITY PROGRAM
WAC 173-303-690-692
[40 CFR 264 Subparts AA, BB and CC]

Note: WAC 173-303-640(5)(e) specifies “all tanks holding dangerous wastes that are acutely or chronically toxic by inhalation must be designed to prevent escape of vapors, fumes, or other emissions into the air.” Stericycle believes that this air quality program satisfies the requirements of the state-only air regulation.

TABLE OF CONTENTS

Section Page

1.0 Subpart AA - Process Vents 1
2.0 Subpart BB - Equipment Leaks 1
2.1 Equipment Monitoring Plan 1
2.1.1 Pumps in Light Liquid Service 2
2.1.2 Compressors 3
2.1.3 Pressure Relief Devices in Gas/Vapor Service 3
2.1.4. Sampling Connection Systems 4
2.1.5 Open-ended Valves or Lines 4
2.1.6 Valves in Gas/Vapor Service or in Light Liquid Service 4
2.1.7 Pumps and Valves in Heavy Liquid Service, Pressure Relief Devices in Light or Heavy Liquid Service, and Flanges and other connectors 5
2.1.8 Closed-Vent Systems and Control Devices 5
2.2 Equipment Monitoring Procedures 5
2.2.1 "Leaks" Monitoring Procedure 6
2.2.2 "No Detectable Emissions" Monitoring Procedure 6
2.3 Recordkeeping 7
2.4 Reporting Requirements 8
3.0 Subpart CC – Tanks, Surface Impoundments, and Containers 8
3.1 Waste Determination 9
3.2 Tank Requirements 9
3.3 Container Requirements 9
3.4 Inspections 10
3.5 Recordkeeping Requirements 11
3.6 Repair Requirements 12
3.7 Reporting Requirements 12

Table 1 Monitoring Schedule

Table 2 Subpart CC Method of Compliance

Attachment A Recordkeeping Forms

Attachment B Subpart BB Compliance Documentation

1.0 Subpart AA - Process Vents

WAC 173-303-690 [40 CFR 264.1030-1036]

Process vents associated with distillation, fractionation, thin-film evaporators, solvent extraction, or air or steam stripping operation that manage hazardous waste with organic concentrations of at least 10 ppmw are subject to the requirement of WAC 173-303-690. The Kent Facility does not operate any hazardous waste process vents as described in WAC 173-303-690(1) and therefore is not subject to 40 CFR 264 Subpart AA requirements as incorporated by WAC 173-303-690(2).

2.0 Subpart BB - Equipment Leaks

WAC 173-303-691 [40 CFR 264.1050-1065]

Equipment that contains or comes in contact with hazardous waste with organic concentrations of at least 10 percent by weight is subject to the requirements of WAC 173-303-691. Equipment includes pumps, compressors, pressure relief devices, sampling connections, open ended valves or lines, flanges or connectors and close vent systems and control devices. The Kent Facility operates hazardous waste equipment as described in WAC 173-303-691(1) and therefore is subject to 40 CFR 264 Subpart BB requirements as incorporated by WAC 173-303-691(2).

2.1 Equipment Monitoring Plan

WAC 173-303-691(2) [40 CFR 264.1051, 1063]

Equipment (including pumps, compressors, pressure relief devices, sampling connections, open ended valves or lines, flanges or connectors and close vent systems and control devices) that contains or contacts hazardous waste streams with ≥10 percent organics are monitored periodically according to the equipment type and service. The equipment subject to the requirements of 40 CFR 264 Subpart BB will be clearly marked and readily distinguishable from other equipment. A log is maintained in the facility operating record that lists all equipment subject to the requirements of the rule (see “Monthly Valves, Fittings and Pumps Inspection/Monitoring Form” in Attachment B).

The organic concentration of a hazardous waste stream is determined by analytical methods or knowledge of the nature of the wastestream that is expected to contain the

highest total organic content. Refer to Section C2, Waste Analysis Plan, for further information on how incoming wastestreams are fully characterized and designated.

The monitoring requirements and frequencies for each type of equipment that contains or contacts hazardous wastes with ≥10 percent organics is presented in the subsections below and summarized in Table 1, Monitoring Schedule.

Some terms used to describe compliance with WAC 173-303-691 [40 CFR 264 Subpart BB] can be defined as follows:

- A "leak" is indicated by an instrument reading of ≥10,000 ppm organics.
- “No detectable emissions" is defined by an instrument reading of <500 ppm organics above background level. A “Designation of No Detectable Emissions” form is provided in Attachment A.
- “In light liquid service” means any piece of equipment that contains or contacts a waste stream where 20% or greater (by weight) of the waste stream is a combination of components that have a vapor pressure >2.25 mm Hg (0.3 kPa) at 20 C° (or 68° F).
- “Heavy liquid service” is any piece of equipment that is not in gas/vapor service or light liquid service.

2.1.1 Pumps in Light Liquid Service

WAC 173-303-691 [40 CFR 264.1052]

Each pump in light liquid service will be monitored monthly to detect “leaks”, except as described below, and visually inspected each week for indications of liquid dripping from the pump seal. Monthly monitoring is performed while the pumps are operating. Any drip discovered during a visual inspection is considered a “leak”.

Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the monthly monitoring requirements provided it meets the requirements outlined in 40 CFR 264.1052(d).

Any pump that is designated for no detectable emissions is exempt from monthly monitoring and weekly visual inspections provided it meets requirements in 40 CFR 264.1052(e) (e.g., has no externally actuated shaft penetrating the pump housing,

operates with no detectable emissions, and is monitored for no detectable emissions initially upon designation and annually).

Any pump that is equipped with a closed-vent system capable of capturing and transporting any leakage to a control device is exempt from all the requirements for pumps in light liquid service if it meets requirements in 40 CFR 264.1052(f).

2.1.2 Compressors

WAC 173-303-691 [40 CFR 264.1053]

Each compressor subject to this rule shall be equipped with a seal system that includes a barrier fluid system that prevents leakage of total organic emissions to the atmosphere. The seal system and barrier fluid system have specific requirements that include a sensor to detect failure of either system. The sensor must be checked daily or equipped with an audible alarm. If the sensor indicates a failure of the seal system or barrier fluid system, a leak is detected.

A compressor may be exempt from the requirements of a seal system and barrier system if equipped with a closed-vent system capable of capturing and transporting any leakage from the seal to a control device according to requirements in 40 CFR 264.1053(h). The compressor may be exempt from all of the above requirements, if designated for “no detectable emissions” if it meets requirements in 40 CFR 264.1053(i).

2.1.3 Pressure Relief Devices in Gas/Vapor Service

WAC 173-303-691 [40 CFR 264.1054]

Except during pressure releases, pressure relief devices are operated with no detectable emissions, and are returned to this condition after each pressure release event as confirmed by monitoring completed and soon as practicable but no later than five days after each pressure release. Any pressure relief device that is equipped with a closed-vent system capable of capturing and transporting leakage from the pressure relief device to a control device is exempt from the above requirements if it meets requirements in 40 CFR 264.1054(c).

2.1.4. Sampling Connection Systems

WAC 173-303-691 [40 CFR 264.1055]

Each sampling connection system must be equipped with a closed-purge system or closed-vent system and must be designed and operated with "no detectable emissions" or vented to a control device. These standards apply to the sampling of gaseous hazardous waste streams, not liquid hazardous waste streams. In situ sampling systems without purges are exempt from the above requirements.

2.1.5 Open-ended Valves or Lines

WAC 173-303-691 [40 CFR 264.1056]

Open-ended valves or lines are equipped with a cap, blind flange, plug, or a second valve that seals the open-ended valve or line except when flow through is required by operations. Open-ended valves or lines are not required to be monitored.

Each open-ended valve or line equipped with a second valve shall be operated such that the valve on the dangerous waste stream end is closed before the second valve is closed. When a double block and bleed system is used the bleed valve or line may remain open during operations, but shall be equipped with a cap, blind flange, plug, or second valve at all other times.

2.1.6 Valves in Gas/Vapor Service or in Light Liquid Service

WAC 173-303-691 [40 CFR 264.1057]

Valves must be monitored monthly to detect "leaks". If a leak is not detected in two consecutive months, the valve may be monitored the first month of each quarter, beginning with the next quarter, until a leak is detected. The Kent Facility may elect to use the alternative monitoring plan, after notifying Ecology, described in 40 CFR 264.1062.

Any valve that is designated for “no detectable emissions” is exempt from the monthly/quarterly monitoring provided the following: it has no external actuating mechanism in contact with the waste stream, operates with no detectable emissions, and is monitored for no detectable emissions initially upon designation, annually, and

when requested by Ecology. Exemptions are also made for valves that are "unsafe to monitor" (40 CFR 264.1057(g)) or "difficult to monitor" (40 CFR 264.1057(g)).

2.1.7 Pumps and Valves in Heavy Liquid Service, Pressure Relief Devices in Light or Heavy Liquid Service, and Flanges and other connectors

WAC 173-303-691 [40 CFR 264.1058]

Pumps and valves in heavy liquid service, pressure relief devices in light or heavy liquid service, and flanges and other connectors are required to be monitored for "leaks" within five days if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method.

Under normal operating practice, if sensory evidence of a potential leak is found, the existence of a "leak" is presumed and a first attempt of repair is made as soon as practicable but no later than five days. If the first attempt of repair is successful, the potential leak no longer exists precluding the requirement to monitor. If a "leak" is detected by monitoring, it will be repaired according to the repair schedule in subsection 3.6 and recorded on the “LEAK” REPAIR FORM in Attachment A.

2.1.8 Closed-Vent Systems and Control Devices

WAC 173-303-691 [40 CFR 264.1060]

Closed vent system and control devices used to comply with WAC 173-303-691 [40 CFR 264 Subpart BB] will comply with requirements in 40 CFR 264.1033 and 1064(e) and (f).

2.2 Equipment Monitoring Procedures

WAC 173-303-691 [40 CFR 264.1063]

Monitoring is performed to detect "leaks" ($\geq$10,000 ppm organics) and determine "no detectable emissions" (<500 ppm organics above background). Both monitoring programs are conducted using methods specified in 40 CFR Part 60 Appendix A, Method 21, "Determination of Volatile Organic Compounds Leaks". Monitoring frequency and type is summarized in Table 1, Monitoring Schedule, and will be

conducted using an Ecology-approved equivalent instrument consisting of an FID or PID.

2.2.1 "Leaks" Monitoring Procedure

WAC 173-303-691 [40 CFR 264.1063(b)]

Leak detection monitoring procedures comply with Method 21 in 40 CFR 60 (40 CFR 264.1063). The detection instrument meets the performance criteria of, and is calibrated before use, on each day of its use according to, Method 21. “Leak” repair requirements are described in Section 3.6. General procedures are listed below. Specific procedures for different equipment types are outlined in Attachment B.

1. Place the probe inlet at the surface of the component interface.
2. Move the probe along the entire interface periphery, as close to it as possible, while observing the instrument readout.
3. If an increased meter reading is indicated, sample that part of the interface until the maximum meter reading is obtained and leave the probe inlet in that position for approximately two times the response time.
4. If the maximum reading is $\geq$10,000 ppm, a "leak" in the component has been identified. A maximum reading of <10,000 ppm indicates a component does not "leak".

2.2.2 "No Detectable Emissions" Monitoring Procedure

WAC 173-303-691 [40 CFR 264.1063(c)]

“No detectable emissions” monitoring procedures comply with Method 21 in 40 CFR 60 (40 CFR 264.1063). The detection instrument meets the performance criteria of, and is calibrated before use, on each day of its use according to, Method 21.

1. Determine the background level around the component interface by moving the probe inlet randomly upwind or downwind at a distance of one to two meters. If an interference exists, such as a nearby vent, the background level may be determined no closer than 25 cm from the component interface.
2. Move the probe inlet around all potential leak interfaces, as close to the interfaces as possible, to determine the component interface reading.

3. Determine the arithmetic difference between the background level and the component interface reading.
4. If the arithmetic difference is <500 ppm, the equipment may be designated as having "no detectable emissions".

2.3 Recordkeeping

WAC 173-303-691 [40 CFR 264.1064]

The facility operating record shall contain a description of each regulated piece of equipment as identified on the “Monthly Valves, Fittings, and Pumps Inspection/Monitoring Form which will include: an identification number, the approximate location within the facility, the type of equipment (e.g., pump, valve), the percent-by-weight range of total organics in the wastestream at the equipment, the physical state of the wastestream (e.g., light or heavy liquid), and the method of determining compliance (e.g., monthly leak detection, no detectable emissions). Records will be kept in the facility operating record as required under WAC 173-303-380 (1)(c) and (f).

The procedures for identifying “leaks”, once they have been discovered, are described in Attachment A. When a leak is detected, the equipment will be identified and marked as required by 40 CFR 264.1064(c), and the information required by 40 CFR 264.1064(d) will be entered in the operating record.

The facility operating record shall also contain the following miscellaneous information:

- A list of equipment in vacuum service that are exempt from monitoring,
- A list of valves that are designated as “unsafe” or “difficult” to monitor (see Section 2.1.6) and, if the Kent Facility elects to use the alternative monitoring plan described in 40 CFR 264.1062, a monitoring schedule and the percentage of leaking valves,
- A statement listing the hazardous waste influent and effluent of each hazardous waste management unit and whether or not these wastes are heavy liquids, in order to determine which units are exempt from monitoring,
- Current analysis or knowledge, including supporting documentation, that indicates the nature (i.e., organic content) of the hazardous waste stream in order to determine whether or not a unit is exempt from monitoring,

- A description of any process changes that could result in an increased organic content of a wastestream in an exempt unit.
- Results from each required monitoring session.
- Records as required by 40 CFR 264.1064(b).

2.4 Reporting Requirements

WAC 173-303-691 [40 CFR 264.1065]

A semi-annual report to Ecology will only be required if "leaks" are not repaired within the time frame specified in 40 CFR 264.1065(a), or if a control device exceeds or operates outside of the design specifications for more than 24 hours. The semi-annual report will provide the following information.

- The facility EPA ID Number, name, and address;
- For each month during the semi-annual reporting period, the equipment identification number of each valve, pump, or compressor that was not repaired in the required time frame; and
- Dates of hazardous waste management unit shutdowns during the semi-annual period.
- Dates when the control device exceeded or operated outside of the design specifications, as indicated by control device monitoring, and was not corrected within 24 hours. The duration, cause, and corrective measures for each exceedance shall also be reported.

3.0 Subpart CC – Tanks, Surface Impoundments, and Containers

WAC 173-303-692 [40 CFR 264.1080-1090]

The requirements of WAC 173-303-692 apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers. The Kent Facility treats and stores hazardous waste in tanks and containers and is therefore subject to the requirements of 40 CFR 264 Subpart CC as incorporated by WAC 173-303-692(2).

Terminology used in this appendix to describe compliance with 40 CFR 264 Subpart CC can be found in 40 CFR 265.1081.

3.1 Waste Determination

WAC 173-303-692 [40 CFR 264.1083]

Procedures used to determine the average volatile organic compound (VOC) concentration of a hazardous waste at the point of generation will be conducted in accordance with the requirements of 40 CFR 264.1083(a) and 265.1084(c)(2) through (c)(4), as applicable. Procedures for determining the maximum organic vapor pressure of a hazardous waste in a tank will meet the requirements of 40 CFR 264.1083(c).

3.2 Tank Requirements

WAC 173-303-692 [40 CFR 264.1084(b), 1087(c)(i)]

Hazardous waste tanks containing organic materials at the facility meet the definition of a “fixed roof” tank and are less than 75 m^3 (20,000 gallons) in capacity. If tanks meet this definition and the waste in the tank is not heated, not used for stabilization, and the vapor pressure does not exceed 76.6 kPa (11.1 psi) the tank is not required to be vented to a control device. Per these conditions, Tanks T-9A, T-9B, and T-9C are required to have Level 1 controls. The control devices installed and operated on tanks to control air emissions at the facility perform to meet the requirements as specified in 40 CFR 264.1087(c)(1)(i).

The method of Subpart CC compliance for all tanks within the facility is listed in Table 2, Subpart CC Method of Compliance, based on the above factors. Figure D2-1, Waste Management in Wastewater Tanks in Section D illustrates the level of controls installed on each tank, if required. Solidification tanks (T-5305 and T-5306) are non-DW tanks and are therefore not subject to WAC 173-303-692 [40 CFR 264 Subpart CC].

3.3 Container Requirements

WAC 173-303-692 [40 CFR 264.1086(c)]

Most containers of waste received at the facility that are subject to Subpart CC requirements comply with DOT packaging requirement in 40 CFR 264.1086(f). Containers are inspected as described in Section 3.4.

At the Kent Facility, all VOC emissions from containers ≥ 26 gallon and ≤ 119 gallons in "light material service" are controlled with container Level 1 controls as required in 40 CFR 264.1086(c). Volatile organic compound emissions from containers ≥ 119 gallons in "light material service" are controlled with container Level 2 controls as required in 40 CFR 264.1086(d). Containers < 26 gallons are exempt from Subpart CC requirements.

Level 2 containers ≥ 119 gallons and containers ≥ 26 gallons and ≤ 119 gallons that do not meet the requirements of 40 CFR 264.1086(f) are monitored as required in 40 CFR 264.1086(d)(ii). This is performed upon receipt of the container using Method 21 in 40 CFR 60 Appendix A to ensure no detectable emissions leak from seams or lid and container interfaces. An example Designation of "No Detectable Emissions" Form can be located in Attachment A.

Containers being processed at the facility with Level 1 or Level 2 controls, in which waste is being added to or taken from, are closed, sealed, and secured as soon as the container is filled to its intended level, or if the container is not completely filled promptly after the transfer and not to exceed 15 minutes. This applies to containers that do not meet the conditions of an empty container as defined in WAC 173-303-160(2). All containers are closed sooner if waste technician(s) processing the waste leave the work vicinity before the 15 minute interval has elapsed.

Containers that are attached to or form a part of any truck, trailer or railcar are tested annually to be organic vapor tight per 40 CFR 264.1086(d)(iii) which includes the use of Method 27 in 40 CFR 60 Appendix A. An example Designation of "Organic Vapor Tight" Form can be located in Attachment A.

3.4 Inspections

WAC 173-303-692 [40 CFR 264.1084 through 1088]

A potential leak, found by visual, audible, olfactory, or any other detection method, may be noted during periodic (e.g. daily, weekly) inspections, as described in Section F2.2, General Inspection Requirements. A record of the discovery of these potential leaks and any remedial action is maintained in the inspection logs as described in Sections F2.2 and F2.3.

Tanks subject to Level 1 controls will be visually inspected at least annually in accordance with 40 CFR 264.1084(c)(4). Containers subject to Level 1 controls will be visually inspected within 24 hours after the container has been accepted by the facility in accordance with 40 CFR 264.1086(c)(4). Containers subject to Level 2 controls will be visually inspected within 24 hours after the container has been accepted by the facility in accordance with 40 CFR 264.1086(d)(4). Containers subject to Level 2 controls stored in the facility for a period of 1 year or more will be visually inspected to ensure the container and its cover have no visible cracks, holes, gaps, or other open spaces into the interior of the container and the covers are secured in the closed position.

3.5 Recordkeeping Requirements

WAC 173-303-692 [40 CFR 264.1089]

The Kent Facility will ensure that all relevant documentation requirements in 40 CFR 264.1089 are met and records are kept in the facility operating record for a minimum of 3 years. Records required by WAC 173-303-380(1)(c) and (f) will be kept until closure of the facility. Tank records will include the tank number and a record for each inspection that includes the following information:

- Date inspection was conducted.
- For each defect detected during the inspection: The location of the defect, a description of the defect, the date of detection, and corrective action taken to repair the defect.

Additionally, tanks at the facility using Level 1 controls will have documentation that demonstrates the maximum organic vapor pressure of the hazardous waste in each tank was established in accordance with §264.1084(c). The records will include the date and time the samples were collected, the analysis method used, and the analysis results or comparable modeling data that represents a worst case scenario of the tank contents.

3.6 Repair Requirements

WAC 173-303-692 [CFR 264.1084(k)(2)]

Repairs to tank defects, subject to Level 1 controls, are required to be performed no later than 5 calendar days after detection. If it is determined that a repair to the tank requires emptying or temporary removal from service of the tank and no alternative tank capacity is available the tank defect is repaired the next time the process or unit that is generating the hazardous waste managed in the tank stops operation. Repair of the defect will be completed before the process or unit resumes operation.

When a defect is detected on a container subject to Level 1 or 2 controls, it is repaired or overpacked in larger DOT within 24 hours after detection. If for some reason the repair to a container cannot be completed within 5 calendar days, then the hazardous waste will be removed from the container and the container will be appropriately disposed of or will not be used to manage hazardous waste until the defect is repaired as specified by 40 CFR 264.1086(c)(4)(iii) 40 CFR 264.1086(d)(4)(iii).

3.7 Reporting Requirements

WAC 173-303-692 [40 CFR 264.1090]

The facility shall report to Ecology each occurrence during the previous six months when a control device is operated continuously for 24 hours or longer in noncompliance with the applicable values. The facility shall report to Ecology within fifteen days of an occurrence in which tanks using controls as specified in 40 CFR 264.1084(c) receive a material with a vapor pressure above that allowed in 40 CFR 264.1084(c)(1) thru (c)(4). In accordance with 40 CFR 264.1090(a), Stericycle will also report each occurrence when hazardous waste is placed in a unit in noncompliance with the conditions specified in 40 CFR 264.1082(c)(1) or (c)(2), as applicable.

List of Tables

Table 1 Monitoring Schedule

Table 2 Subpart CC Method of Compliance

TABLE 1 MONITORING SCHEDULE

Equipment Type	Monitoring Frequency	Monitoring Category
Pumps in light liquid service (section 2.1.1); Not designated for “no detectable emissions”	Monthly monitoring, and Weekly visual	“Leak” Detection
Pumps in light liquid service (section 2.1.1); Designated for “no detectable emissions”	Annual monitoring	“No Detectable Emissions”
Pressure relief devices in gas/vapor service (section 2.1.3)	Monitored after each pressure release event	“No Detectable Emissions”
Valves in gas/vapor or light liquid service (section 2.1.6) Not designated for “no detectable emissions”	Monthly monitoring, or Quarterly monitoring (if no “leak” detected for 2 consecutive months)	“Leak” Detection
Valves in gas/vapor or light liquid service (section 2.1.6) Designated for “no detectable emissions”	Annual monitoring	“No Detectable Emissions”
Pumps and valves in heavy liquid service, Pressure relief devices in light liquid service, and Flanges and other connectors (section 2.1.7)	Monitored (within 5 days) after discovering a potential leak with sensory evidence	“Leak” Detection
Tank cover and cover openings	At Least Annually	“No Detectable Emissions”
Container Covers (Truck, trailer, Railcar)	Annually	Method 27
Closed Vent Systems	Annually	“No Detectable Emissions”
Container Covers	Semi-Annually/Annually	“No Detectable Emissions”

---insert Table 2

Attachment A

RECORDKEEPING FORMS

"LEAK" REPAIR FORM (WAC 173-303-691 [40 CFR 264.1064(d)])

Inspector's Name_____ Inspector's Signature_____

Monitoring Date_____

Date Noted in Daily RCRA Inspection Form_____

Component Location_____

Component Identification Number_____

Component Type_____

Date Potential "Leak" Found (if required)_____

Date "Leak" was Detected_____

Date of Each Repair Attempt	Method of Repair Attempt (include work order number)	Monitor Results after Repair Attempt (Pass or Fail)

Was the "Leak" Repaired in < 15 Days? Yes No

Successful Repair Date_____

Reason For Delay of Repair_____

Expected Date of Repair_____

Owner/Operator Signature_____

Designation of "No Detectable Emissions" Form

Date of Test_____

Component Location_____

Component Identification Number_____

Component Type_____

Background Level _____

Maximum Instrument Reading _____

Arithmetic Difference _____ Pass Fail

Date of Test_____

Component Location_____

Component Identification Number_____

Component Type_____

Background Level _____

Maximum Instrument Reading _____

Arithmetic Difference _____ Pass Fail

The above components, in meeting all applicable requirements and passing the compliance test, are designated as "no detectable emissions" per Method 21 in 40 CFR Part 60 Appendix A.

Owner/Operator Signature_____

Designation of "Organic Vapor Tight" Form

Date of Test_____

Component Location_____

Component Identification Number_____

Component Type_____

Initial Pressure/Time _____

Final Pressure/Time _____

Arithmetic Difference _____ Pass Fail

Date of Test_____

Component Location_____

Component Identification Number_____

Component Type_____

Initial Pressure/Time _____

Final Pressure/Time _____

Arithmetic Difference _____ Pass Fail

The above components, in meeting all applicable requirements and passing the compliance test, are designated as "organic vapor tight" per Method 27 in 40 CFR Part 60 Appendix A.

Owner/Operator Signature_____

Attachment B

SUBPART BB COMPLIANCE DOCUMENTATION

Stericycle Kent Facility

Subpart BB Compliance Documentation
Monthly Valves, Fittings and Pump Inspection/Monitoring Form

Per WAC 173-303-691 and 40 CFR Subpart BB, equipment (excluding tanks and containers) which contains or contacts hazardous waste streams with ≥10 percent organics must be monitored and/or inspected periodically according to equipment type and service. Equipment types covered under these regulations include pumps, valves, pipe fittings, flanges, and other pipe connectors. As applied to monitoring: A "leak" is indicated by an instrument reading of ≥10,000 ppm organics and "no detectable emissions" is defined by an instrument reading of <500 ppm organics above background level. Monitoring for "leaks and "no detectable emissions" is performed in accordance with EPA method 21.

Equipment subject to these regulations is clearly marked with bright orange or blue oversize washers. A blue washer indicates the item is difficult to monitor due to its location as specified in 40 CFR 264.257(h).

Monitoring Procedure:

This procedure is intended to meet the requirements in 40 CFR 264.1064 (b)(1). A map showing the locations of all valves, piping, and connectors subject to these regulations and updated information meeting all the requirements in WAC 173-303-691(2), [40 CFR 264.1064(b)(1)] is maintained in the operating record. Changes to update this information do not require a permit modification. All valves marked with an orange washer and the portable pumps will be monitored monthly for leaks using an FID/PID (or Ecology-approved equivalent instrument). All valves marked with a blue washer must be monitored at least annually. The specific location of any leak, defect, or defective equipment will be noted below and circled or marked on the map. Facility management will be notified immediately of any leaks or defects so that corrective actions can be implemented. A first attempt at repairing leaks must be made within five days of detection.

Inspect all organic waste piping systems, including flanges, fittings, threaded connections, and camlocks for evidence of potential leakage or other defects. All transfer hoses, open-ended lines, and camlock piping connections must be equipped with caps, plugs, or blind flanges. These caps, plugs, and blind flanges must be in place sealing the end of a hose or line at all times except when the component is in use. Hoses, flanges, pipe fittings, and camlock connections do not require periodic monitoring with the FID/PID (or Ecology-approved equivalent instrument) unless evidence of a potential leak is found by visual, audible, or olfactory methods. Any potential leaks must be monitored within five days of detection.

Date:_____ Time:_____

Comments:_____

_____

_____

Signature:_____

TABLE 2 SUBPART CC METHOD OF COMPLIANCE

Kent Facility
Relocation Modification (July 2015)

HWMU Designation	Tank Description	RCRA Service	Fixed Roof	Heated	Used for Stabilization	Exceeds Organic Vapor Pressure Limit	Method of Compliance
Tanks							
T1	Oil/Water Separator Receiving	no	yes	no	no	no	NA[1]
T2	Wastewater Storage	no	yes	no	no	no	NA[1]
T6A	Oil/Sludge Storage	no	yes	no	no	no	NA[1]
T6B	Oil/Sludge Storage	no	yes	no	no	no	NA[1]
T8	Oil Storage	no	no	no	no	no	NA[1]
T9A	Wastewater Storage	yes	yes	no	no	no	Level I[2]
T9B	Wastewater Treatment	yes	yes	no	no	no	Level I[2]
T9C	Wastewater Storage/Discharge	yes	yes	no	no	no	Level I[2]
4710	Stormwater Storage/Discharge	no	yes	no	no	no	NA[1]
BR1	Treatment Chemical Storage	no	yes	no	no	no	NA[1]
T11	Wastewater Storage	no	yes	no	no	no	NA[1]
T12	Oily Water Storage	no	yes	no	no	no	NA[1]
T13	Wastewater Storage	no	yes	no	no	no	NA[1]
T14	Wastewater Storage	no	yes	no	no	no	NA[1]
T15	Wastewater Storage/Discharge	no	yes	no	no	no	NA[1]
T16	Wastewater Storage/Discharge	no	yes	no	no	no	NA[1]
T17	Wastewater Treatment	no	yes	no	no	no	NA[1]
T18	Wastewater Treatment	no	yes	no	no	no	NA[1]
S1	Sludge Storage	no	yes	no	no	no	NA[1]
F1	MRW PRM Storage	no	yes	no	no	no	NA[1]
5305	Solidification	no	no	no	no	no	NA[1]
5306	Solidification	no	no	no	no	no	NA[1]
CT-1	Product Chemical Storage	no	yes	no	no	no	NA[1]
CT-2	Product Chemical Storage	no	yes	no	no	no	NA[1]
CT-3	Product Chemical Storage	no	yes	no	no	no	NA[1]
CT-3A	Product Chemical Storage	no	yes	no	no	no	NA[1]
CT-4	Product Chemical Storage	no	yes	no	no	no	NA[1]
CT-4A	Product Chemical Storage	no	yes	no	no	no	NA[1]

TABLE 2 SUBPART CC METHOD OF COMPLIANCE

Kent Facility
Relocation Modification (July 2015)

HWMU Designation	Container Description	RCRA Service	Light Material Service	Container Used for Stabilization	Method of Compliance
Containers					
TSCA/DW Area	< 26 gal	yes	NA	NA	NA[3]
	>26 gal and ≤ 121 gal, DOT	yes	yes	no	Level 1[4]
	> 121 gal or non DOT	yes	yes	no	Level 2[4],[5]

(1) Tank is not in RCRA service

(2) Tank Level I controls installed in accordance with 40 CFR 264.1084(c)

(3) Containers < 26 gallons are exempt from Subpart CC requirements

(4) Complies with container Level 1 standards in accordance with 40 CFR 264.1086(c).

(5) Complies with container Level 2 standards in accordance with 40 CFR 264.1086(d) for containers in "light material service".

APPENDIX D-11

SUPPLEMENTARY REGULATORY INFORMATION AND CORRESPONDENCE

Centralized Waste Treatment

Waste Receipt Classifications

Centralized Waste Treatment (CWT) Receipt Classification[1]

Oils Subcategory (Subcategory B):

- Used oils
- Oil-water emulsions or mixtures
- Lubricants
- Coolants
- Contaminated groundwater clean-up from petroleum sources
- Used petroleum products
- Oil spill clean-up
- Bilge water
- Rinse/wash waters from petroleum sources
- Interceptor wastes
- Off-specification fuels
- Underground storage remediation waste
- Tank clean-out from petroleum or oily sources
- Non-contact used glycols
- Aqueous and oil mixtures from parts cleaning operations
- Wastewater from oil bearing paint washes

Organics Subcategory (Subcategory C):

- Landfill leachate
- Contaminated groundwater clean-up from non-petroleum sources
- Solvent-bearing wastes
- Off-specification organic product
- Still bottoms
- Byproduct waste glycol
- Wastewater from paint washes
- Wastewater from adhesives and/or epoxies formulation
- Wastewater from organic chemical product operations
- Tank clean-out from organic, non-petroleum sources

[1]Table excerpted from [Federal Register: 40 CFR Parts 136 and 437, December 22, 2000 (Volume 65, Number 247)] Table XIII.A-1 Waste Receipt Classification

SECTION E

GROUNDWATER MONITORING

SECTION E GROUNDWATER MONITORING

WAC 173-303-645(1)(d), WAC 173-303-646, -61610, -64620, WAC 173-340-410

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as “Stericycle”.

The RCRA corrective action requirements of WAC 173-303-646 apply to the Stericycle-Kent facility which is required to have a permit to operate as a dangerous waste treatment and storage facility, WAC 173-303-64610(2).

Stericycle-Kent has indicated through field investigations that contamination is present in soils and groundwater under the tanks that managed dangerous waste. The nature and extent of this contamination is documented in the remedial investigation report, prepared by Geomatrix Consultants, Inc.(December, 2007) and subsequent data gaps reports and Feasibility Study Work Plan (2015).[1] A compendium of technical documents produced for corrective action at Stericycle-Kent is presented in Attachment A to this section.

Stericycle-Kent’s groundwater monitoring plan may be found in Appendix E-1, Final Groundwater Monitoring Plan (November 11, 105). The Final Groundwater Monitoring Plan provides the following items required by the regulations, WAC 173-303-64620.

1. A table with the current list of groundwater monitoring parameters
2. The current groundwater monitoring schedule for each well, identifying the sampling frequency and parameters being analyzed
3. A copy of the sampling and analysis plan for corrective action
4. A copy of the Quality Assurance Project Plan for corrective action

Corrective action is required regardless of the time at which waste was managed at the facility or placed in such units and regardless of whether such facilities or units were

[1] *Final Remedial Investigation Report, PSC Kent Facility, Kent, Washington*; Prepared for Philip Services Corporation by Geomatrix Consultants, Inc.; December 2007.

intended for the management of solid or dangerous waste. Financial assurance for corrective action will be provided pursuant to Section 2.6.4 of the Permit.

In the case of a facility seeking or required to have a permit under the provisions of chapter 173-303 WAC, corrective action must be specified in the permit. The permit will contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to issuance of the permit) and assurances of financial responsibility for completion of such corrective action, WAC 173-303-64620(3).

Attachment A

Corrective Action Technical Document Compendium

Revised Feasibility Study Work Plan, Stericycle Kent Facility, Kent, Washington; AMEC Foster Wheeler, Inc. for Burlington Environmental, LLC; July, 2015.

Semi-Annual Progress Report, Stericycle Facility, Kent Washington. July 14, 2015.

Draft Groundwater Monitoring Plan, PSC Kent Facility, Kent, Washington. *February 21, 2012.*

Feasibility Study Work Plan, PSC Kent Facility, Kent, Washington; AMEC Geomatrix, Inc. for Burlington Environmental, LLC; July 13, 2010.

Stabilization Tanks Area Results, PSC Kent Facility, Kent Washington; AMEC Geomatrix, Inc. for Burlington Environmental, LLC.; March 17, 2010;

Letter, Ecology Comment and Approval of the Amendment to the 2009 Data Gaps Work Plan, and the Revised 2009 Data Gaps Work Plan, PSC Kent facility, Burlington Environmental, LLC WAD991281767; Department of Ecology, December 17, 2009

2009 Data Gaps work Plan, PSC Kent Facility, Kent, Washington; AMEC Geomatrix, Inc.; July 2009.

Final Remedial Investigation Report, PSC Kent Facility; Geomatrix Consultants; December 2007.

Letter, Ecology Comments and Approval of the Additional Remedial Investigation Work Plan, PSC Kent Facility; and Ecology approval of the Permit Modification Changing the Date of Submittal for the Final Remedial investigation (RI) Report from March 2007 to December 2007, RCRA Permit No. WAD991281767; Department of Ecology, May 11, 2007.

Additional Remedial Investigation Work Plan, PSC Kent Facility; Geomatrix Consultants; April 13, 2007.

Letter, Review and Comment on the Draft Remedial Investigation Report, Volumes I and II, PSC Kent Facility; March 31, 2004 – WAD991281767; Department of Ecology, February 13, 2007.

Draft Remedial Investigation Report, Volumes I – III, PSC Kent Facility; Geomatrix Consultants; Exponent; March 31, 2004.

Addendum to the Groundwater Analysis Report, PSC Kent Facility; PSC Regulatory Affairs Dept., February 2, 2004.

Surface Water Analysis Report, PSC Kent Facility; PSC Regulatory Affairs Dept., August 23, 2002.

Letter, Review and approval of Addendum II to the Remedial Investigation Work Plan, PSC Kent Facility, Department of Ecology, August 15, 2002.

Addendum II to the Remedial Investigation Workplan, PSC Kent Facility; PSC Regulatory Affairs Dept., August 15, 2002.

Soil Analysis Report, PSC Kent Facility; PSC Regulatory Affairs Dept., August 15, 2002.

Kent Groundwater Analysis Report, PSC Kent Facility; PSC Regulatory Affairs Dept., February 28, 2002.

Permit for the Storage and Treatment of Dangerous Waste, Permit No. WAD991281767; Department of Ecology, U.S. Environmental Protection Agency, September 28, 1998.

SECTION F

PROCEDURES TO PREVENT HAZARDS

SECTION F PROCEDURES TO PREVENT HAZARDS

TABLE OF CONTENTS

SECTION			PAGE
F1.	**SECURITY PROCEDURES AND EQUIPMENT**		**1**
	F1.1.	Barrier and Means to Control Entry	1
	F1.2.	Warning Signs	2
F2.	**INSPECTION PLAN**		**2**
	F2.2.	General Inspection Requirements	3
	F2.3.	Periodic Inspections and Assessments	4
	F2.3.1.	Daily Inspections	4
	F2.3.2.	Weekly Inspections	6
	F2.3.3.	Monthly Inspections	7
	F2.3.4.	Quarterly Inspections	8
	F2.3.5.	Semi-Annual Inspections	8
	F2.3.6.	Annual Inspections	8
	F2.4.	Tank Condition Assessment	8
	F2.5.	Remedial Action and Reporting	10
	F2.6.	Air Emission Control and Monitoring	14
	F2.7.	Recordkeeping / Inspection Log	14
F3.	**PREPAREDNESS AND PREVENTION MEASURES**		**15**
	F3.1.	Equipment Requirements	15
	F3.1.1.	Internal and External Communications	15
	F3.1.2.	Emergency Equipment	16
	F3.1.3.	Water for Fire Control	17
	F3.2.	Aisle Space Requirements	17
F4.	**PREVENTION PROCEDURES, STRUCTURES AND EQUIPMENT**		**18**
	F4.1.	Unloading/Loading Operations	18
	F4.2.	Run-off Prevention	19
	F4.3.	Ground and Surface Water Protection	19
	F4.4.	Equipment and Power Failure	19
	F4.5.	Personal Protective Equipment	20
	F4.6.	Prevent Releases to the Atmosphere	21
F5.	**PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES**		**22**
	F5.1.	Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes	22
	F5.2.	General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste	23

Tables, Figures, and Appendices are presented
in separate sections following the main body of the text.

LIST OF TABLES

Table F2-1 Safety and Emergency Equipment: Inspection Schedule

Table F2-2 Security Equipment: Inspection Schedule

Table F2-3 Operational Equipment: Inspection Schedule

Table F2-4 Container Storage: Inspection Schedule

Table F2-5 Tank Systems: Inspection Schedule

LIST OF FIGURES

Figure F1-1 Facility Site Plan

LIST OF APPENDICES

Appendix F-1 Example Inspection Forms

Appendix F-2 Example Work Order Form

SECTION F. PROCEDURES TO PREVENT HAZARDS

WAC 173-303-310, 320, 340, 395(1), 630(3), (6), (8)(b), 640(2), (6), (7), 691, 692, 806(4)(a)(iv), (v), (vi), (viii), (ix)

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as “Stericycle”.

F1. SECURITY PROCEDURES AND EQUIPMENT

F1.1. Barrier and Means to Control Entry

WAC 173-303-310(2)(c), 806(4)(a)(iv)

F1.1.1. The entire property of the Kent Facility (including the ten-day transfer facility) is completely surrounded by a six-foot-high chain link fence. Exits and entrances are located to control traffic flow, limit access to the active area (i.e., waste and product handling area) of the facility, and provide emergency escape. Figure F1-1, Kent Facility Site Plan, shows the facility fences and gates. The main gates are electrically operated and require a passcode or a pre-programmed security device to enter the facility. All electrical gates automatically close after being opened.

F1.1.2. The plant is illuminated by automatic outdoor lighting. There are numerous surveillance cameras installed throughout the facility to monitor incoming and outgoing traffic activity. The cameras are monitored by office personnel during normal business hours.

F1.1.3. Access to the active area of the facility is restricted to waste transportation vehicles, authorized personnel, and authorized visitors. Gates to the active area are closed or attended by employees while open. Employees are instructed to monitor for unauthorized personnel during the course of their daily routine. During non-operational hours, all gates are closed and locked. The locks are heavy-duty units keyed alike. Only authorized personnel are issued keys, and each key is stamped "DO NOT DUPLICATE".

F1.1.4. Master keys, which can access all locks on the premises, are assigned to the Plant Manager, Supervisors, and Emergency Coordinators. Keys with

limited access are assigned on an as-needed basis. The distribution of keys is documented in the facility operating record.

F1.1.5. A private security guard may patrol the facility perimeter during non-operational hours. The guard patrols the perimeter of the facility, checking for vandalism, unauthorized entry, and evidence of leaks or spills. Guards are instructed to deny unauthorized personnel access into any portion of the facility during non-operational hours without first contacting the Plant Manager or an on-call Stericycle employee for verbal permission. Required daily inspections are always conducted by Stericycle employees, even during off-hours.

F1.1.6. All visitors and non-Stericycle employees are required to sign in at the office before entering the facility (including the ten-day transfer facility), and must be escorted or under observation by Kent Facility personnel while in these areas.

F1.2. Warning Signs

WAC 173-303-310(2)(a)

Signs printed with the legend, "Danger - Unauthorized Personnel Keep Out" are posted on the gates and approximately every 50 feet along the perimeter fence. The demographics of the City of Kent do not indicate a need for warning signs in languages other than English. The signs are visible from any approach to the facility and legible from a distance of 25 feet. They are attached to the fence and gates at a height of approximately five feet.

F2.INSPECTION PLAN

WAC 173-303-320(1), (2),(3), 340, 395(1)(d), 630(3),(6), 640(6),(7), 691-692, 806(4)(a)(v)

F2.1. The inspection plan is intended to protect human health and the environment by detecting, preventing, and responding to malfunctions, deterioration, operator errors, and unplanned discharges. The inspection plan, which is kept in the facility operating record, is based on the above regulatory requirements, operating experience and engineering knowledge.

F2.2. General Inspection Requirements

WAC 173-303-320(2)(b),(c), 630(3),(6), 640(6)

F2.2.1. Facility inspections are conducted to prevent, or detect and respond to, malfunctions and deterioration, operator error, and discharges before they result in environmental or human health hazards. Inspections address the following items: safety and emergency equipment, security equipment, operational equipment, container staging and storage areas, load/unload areas, and tank systems.

F2.2.2. The Plant Manager is responsible for the implementation of the inspection program. The Plant Manager has the training and authority to implement the required inspections, perform necessary evaluations and hazard assessments, and require appropriate corrective or remedial actions. Specific duties may be delegated by the Plant Manager to employees under his supervision who are trained to perform such duties.

F2.2.3. The inspection schedules in Tables F2-1 to F2-5 and the associated inspection forms in Appendix F-1 specify the items inspected, the types of problems looked for during inspections, and the frequency of inspection. Information provided through subsection F2.3 generally describes the inspection schedule.

F2.2.4. The frequency of inspection is based on the rate of possible deterioration of equipment and structures, and the probability of an environmental or human health incident if an unsatisfactory condition (i.e. deterioration, malfunction, or operator error) goes undetected between inspections. At a minimum, inspection frequency meets the regulatory requirements in Chapter 173-303 WAC.

F2.2.5. Operational equipment is inspected before use to ensure safe operation, and regularly scheduled servicing is completed to maintain the equipment in good operational condition.

F2.2.6. In cases where specialized outside contractors are needed to perform specific inspections (e.g., sprinkler systems), the results will be reported on the contractor's inspection forms, checked off on the facility’s inspection form and made part

of the formal inspection records. The Kent Facility reserves the right to change contractors, which provide equivalent services, without notice.

F2.2.7. Per requirements of WAC 173-303-395(1)(d), the storage areas for ignitable or reactive wastes are inspected at least annually by the Kent Facility, in the presence of a representative of the Kent Fire Department or a professional inspector familiar with the International Fire Code. The following information from the annual inspection is then recorded in the facility's operating record: date and time of inspection, name of inspector (i.e., professional inspector or fire marshal), observations, and remedial actions taken as a result of the inspection.

F2.3. Periodic Inspections and Assessments

The following subsections summarize inspections and assessments required on a specific schedule. Tables F2-1 through F2-5 and inspection forms in Appendix F-1 provide additional detail on “inspection observations” required for these inspections.

F2.3.1. Daily Inspections

F2.3.1.1. Safety and emergency equipment is checked daily for access and operability in the event of an emergency.

F2.3.1.2. Security equipment is inspected daily to prevent unauthorized access to the facility, ensure warning signs remain posted, and ensure the facility is properly lighted.

F2.3.1.3. Sumps and secondary containment structures provided for tank systems, container staging and storage areas, load/unload areas, and treatment systems are visually inspected daily during operational hours, and at a minimum every 24 hours during non-operational hours, for leaks, spills, or accumulated rain water. In this way accumulated liquids can be detected within 24 hours.

F2.3.1.3.1. During operational hours, any rain water will be removed by the end of the eight hour shift in which it was detected.

F2.3.1.3.2. During operational hours, spills or releases will be removed as soon as they are detected. Immediate removal shall be considered to occur when clean-up actions begin upon the discovery of the spill or leak and proceeds continuously until completion.

F2.3.1.3.3. In case of spill release during non-operational hours, the private security guard (if present) will contact the emergency coordinator (EC), for an immediate response.

F2.3.1.3.4. Also during non-operational hours, any accumulated precipitation will be noted on the inspection form and be removed within 24 hours or sooner if pumping sooner than 24 hours is necessary to prevent overflow from the secondary containment system. The inspection logs will note the time accumulated liquids were discovered and removed.

F2.3.1.4. Tank systems, which include the bulk receiving areas, secondary containment structures, and tank system piping and controls (ancillary equipment), are inspected daily for:

- Signs of corrosion, weld breaks, punctures, spills, secondary containment erosion, or deterioration.
- Good working order of over-filling control equipment.
- Evidence that DW tank secondary containment construction joints are in good condition (e.g., no cracks, gaps, signs of deterioration).

F2.3.1.4.1. The assessment of tanks to detect corrosion and cracks, determine vessel integrity, and discover wall thinning is addressed in Section F2.3, Tank Condition Assessment.

F2.3.1.4.2. All dangerous waste tanks are closed-roof and are not subject to overtopping by wave or wind action, or precipitation. Therefore WAC 173-303-640(5)(b)(iii) does not apply.

F2.3.1.4.3. To ensure tanks are operated according to design specifications, waste streams undergo the procedures of the Waste Analysis Plan (see Section C) prior to unloading into the tanks and during tank treatment.

F2.3.1.5. Containers are inspected daily for leaks, spills, appropriate and visible labels, proper stacking arrangements, aisle spacing, the segregation of incompatible materials, and appropriate holding times for staging and storage. Also, containers are inspected for any signs of physical deterioration or corrosion.

F2.3.1.5.1. Containers storing dangerous wastes are labeled in accordance with Department of Transportation (DOT), Environmental Protection Agency (EPA) and Washington Department of Ecology (Ecology) regulations. Labels are checked to ensure they are visible, legible, and contain the required information as applicable (e.g., major risk associated with the contents, container tracking number, accumulation start date, lab pack inventory, etc.).

F2.3.1.5.2. Dangerous waste containers are oriented in storage and staging areas to allow inspection of required information on the labels.

F2.3.1.5.3. Dangerous waste labels will be removed or destroyed as soon as a container has been emptied and residues removed. For the purpose of this condition, “empty” container is defined at WAC 173-303-160(2).

F2.3.2. Weekly Inspections

F2.3.2.1. All secondary containment systems and load/unload areas are inspected at least weekly for deterioration or cracking of concrete and chemically resistant coating, where applied, and the accumulation of dirt or other materials that may prevent the inspection of coatings or concrete. Inspections are conducted to determine the integrity of the containment area by inspection of gaps, cracks, deterioration, corrosion and erosion. These terms are defined as follows:

F2.3.2.1.1. **Integrity** is the ability of the secondary containment system to prevent a release of dangerous waste to the environment. A deficiency that represents a potential loss of integrity, such as exposed rebar, a structural crack in concrete containment, or a gap where there is no underlying water stop will be assigned the most urgent Response Level (Priority 1).

F2.3.2.1.2. **Gaps** are unexpected separations in concrete structures, such as those that could occur at joints. Gaps will be covered to prevent deterioration and to prevent the migration of dangerous waste to the water-stopped areas or other interior portions of the concrete or soil.

F2.3.2.1.3. **Cracks** are defined as any failure in a concrete surface creating an opening greater than 0.01 inches in width. Cracks in concrete containment systems, other than drying shrinkage cracks in recently placed concrete, indicate a potential loss of integrity (note that housekeeping or leveling pads within containment are not considered a secondary containment surface).

F2.3.2.1.4. **Deterioration** is any defect in the secondary containment area, and may be caused by corrosion, erosion, or other wear on concrete surfaces or coatings. Deterioration of secondary containment areas will be addressed so as to prevent a potential loss of integrity. Coatings, for example, will deteriorate over time. Signs of coating deterioration include chips, cracks, swelling, blistering, and crinkling.

F2.3.2.1.5. **Corrosion** is any defect in the secondary containment caused by chemical action on the secondary containment area that leads to deterioration.

F2.3.2.1.6. **Erosion** is any defect in a secondary containment system caused by chemical or physical action on the secondary containment surfaces that leads to deterioration.

F2.3.3. Monthly Inspections

Monthly inspections of alarm horns, fire extinguishers, emergency lighting, air compressors, and facility pumps are conducted and documented. Documentation for inspections fire extinguishers is also provided by ensuring current servicing tags or inspection cards are attached to the equipment.

F2.3.4. Quarterly Inspections

Emergency response equipment (as identified in Table G5-1) will be checked quarterly to confirm materials are present in minimum stock quantities, and that items are in satisfactory condition.

F2.3.5. Semi-Annual Inspections

A qualified engineer will inspect all secondary containment every six months. This inspection will use maps of any existing deterioration, including cracks greater than 0.010 inches wide and gaps to determine if additional deterioration has occurred. All containment deficiencies will be addressed as outlined in Section F2.5, Remedial Action. Documentation of this inspection will be by signed narrative memoranda incorporated into the operating record. Maps of all potential containment defects will be attached to these memoranda.

F2.3.6. Annual Inspections

Annual inspections consist of fire hydrant pressure checks, fire suppression system checks and annual fire inspection certification. These inspections are conducted by outside sources and the results will be incorporated into the operating record.

F2.4. Tank Condition Assessment

WAC 173-303-640(2)(e), 640(7)

F2.4.1. The integrity of tanks used to store or treat dangerous waste is periodically assessed over the life of the tank to ensure that the tank retains its structural integrity and will not collapse, rupture or fail (see Section D3.1.6, Tank Integrity Assessments). The assessment is conducted by an independent, qualified registered professional engineer. The inspection frequency is based on the age of the tank system, materials of construction, type of corrosion or erosion protection used (where applicable), historical and/or estimated data on corrosion rates, the nature of the material stored/treated and the threat to public health posed by a release of the contents due to failure. The assessment schedule and procedures are adequate to

detect cracks, leaks, corrosion or erosion. The schedule and assessment procedures and methods are discussed in this section.

F2.4.2. Dangerous waste tanks at the Kent Facility are inspected on a five (5) year tank integrity inspection schedule, except for those tanks which any of the following circumstances apply:

F2.4.2.1. The tank had a major repair and was recertified for dangerous waste service.

F2.4.2.2. For an unlined tank, the corrosion rate exceeded 1% of the thickness of the tank wall per year.

F2.4.2.3. If the measured corrosion rate continues, the tank wall thickness will be below the tank design standard before the next scheduled tank integrity inspection.

F2.4.2.4. The integrity inspection detected other problems that may cause the tank to fail before the next scheduled integrity inspection.

F2.4.3. Tanks that pertain to the circumstances described above will be inspected two (2) years from their last inspection. If subsequent inspections indicate tank repairs and/or operation changes have corrected the circumstances described above, tanks will be returned to five (5) year inspection frequency, unless Ecology or the independent, qualified, registered professional engineer require a more frequent schedule.

F2.4.4. Scheduled tank integrity assessments include exterior and interior visual inspections. Tank wall thickness measurements are also performed on unlined tanks. Tank integrity assessments will be conducted by an independent, qualified, registered professional engineer to ensure tanks retain their structural integrity. All tank inspections will be maintained in the tank log books as part of the facility operating record.

F2.4.5. Tank inspection methods are based on American Petroleum Institute, Guide for Inspection of Refinery Equipment, 821 series, or American Society of Testing Materials (ASTM) standards, or other standards as determined to be applicable by the certifying engineer (e.g., modified API 653).

F2.4.6. Tanks are operated, maintained and repaired as specified in the assessment by the independent, qualified registered professional engineer. Repairs will be completed on the schedule required or recommended in the assessment.

F2.4.7. If scheduled inspections indicate the need for major repairs (e.g., repair of a ruptured primary containment or secondary containment vessel) the tank system will be certified, prior to returning to service, by an independent, qualified, registered, professional engineer in accordance with WAC 173-303-810(13)(a). This ensures that the repaired system is capable of handling dangerous wastes without release for the intended life of the system. The certification will be forwarded to the department within 7 days of the unit's return to dangerous waste service.

F2.4.8. Procedures in WAC 173-303-640(7) will be followed for a tank system or secondary containment system from which there has been a leak or spill, or which is unfit for use.

F2.5. Remedial Action and Reporting

WAC 173-303-320(3)

F2.5.1. If during a periodic inspection or assessments the inspector notices that a point of observation is in unsatisfactory condition, the procedures for repair or remediation, described in the paragraphs below, are followed.

F2.5.2. When a direct response by an inspector, discovering an unsatisfactory condition, is required (e.g., leaking container), the situation will first be brought under control. After responding to the discovery, the situation and the corrective action will be noted on the inspection form. A Work Order form will be completed if necessary.

F2.5.3. When there is no requirement for a direct response by the inspector, the inspector notes and describes any unsatisfactory conditions in the comments column of the inspection form. Inspections that reveal deficiencies that require maintenance support will be immediately reported to supervisory personnel (Plant Manager or Supervisor). Supervisory personnel will complete a Work Order form for the maintenance item.

F2.5.4. Inspection forms (including daily, weekly, monthly, and quarterly) that indicate deficiencies requiring engineering consultation, (e.g. cracks in the secondary containment, pin holes in the tank outer surface) shall be submitted to supervisory personnel. Supervisory personnel will review all inspection forms identifying such deficiencies and will determine the priority and nature of any remedial actions to be taken. Supervisory personnel at the Kent Facility will issue Work Orders, assign personnel, and will document completion of the work. Remedial actions may require outside engineering consultation and/or contractors services. The decision to use outside services will be determined by supervisory personnel and/or Stericycle engineers. Inspection forms that do not require maintenance support are reviewed daily by supervisory personnel.

F2.5.5. Unsatisfactory conditions which do not require repair or maintenance of equipment (e.g., torn but still legible labels, fire extinguisher out of place) will be corrected by the end of the shift in which they were detected. The corrective action will be noted on the inspection form by the inspector or supervisory personnel.

F2.5.6. For unsatisfactory conditions regarding secondary containment systems and load/ unload areas, deficiencies will be categorized on the inspection form and Work Order form by supervisory personnel into one of the following groups:

F2.5.6.1. Level One Deficiencies are the most serious, and pose an immediate threat to human health or the environment. Any potential loss of integrity, such as a structural crack greater than 0.01 inches wide (i.e., cracks other than drying shrinkage cracks in recently placed concrete), or breach of containment due to seismic activity is considered a Level 1 Deficiency.

F2.5.6.2. Level Two Deficiencies do not pose an immediate threat to human health or the environment, but are considered to be significant deficiencies. Examples of Level 2 Deficiencies include coating defects (e.g., chips, blisters) in containment sumps and trenches, or defects (e.g., delaminations, cracks) in joint sealants where there is a water stop beneath the joint, and shrinkage drying cracks larger than 0.01 inches wide.

F2.5.6.3. Level Three Deficiencies are minor defects in the containment system, such as localized chips or blisters in the surface coating of the containment pads, shrinkage drying cracks less than 0.01 inches wide, early signs of concrete erosion, or isolated cracks in containment housekeeping or leveling pads. Note that cracks in housekeeping or leveling pads that appear to be aligned with structural cracks in containment slabs are considered Level 1 Deficiencies.

F2.5.7. For all unsatisfactory conditions which require response, repair or maintenance to equipment (e.g., a spill, containment pad crack, or a hole in security fencing), a priority level is determined by supervisory personnel and a Work Order form is issued which outlines the appropriate repair/remedial action. The response priority level and Work Order number are noted on the inspection form. Maintenance items are assigned a priority of response based on the following guidelines:

F2.5.7.1. Priority 1 - An urgent response level that requires the repair/remedial action to be initiated immediately and closely monitored until completion. A Priority 1 response indicates that there is an immediate threat to human health or the environment. Operations in the affected area will cease upon discovery of the Level 1 deficiency. Examples of repairs/remedial actions requiring a Priority 1 response include any Level 1 Deficiency in a secondary containment system, a pin hole in a tank, an inoperable air emission control system, a hole in security fencing allowing unauthorized access, a leaking tank, incompatible wastes in a common containment area, leaking or open containers, a faulty (e.g., inaccurate or nonfunctional) tank level indicator, inoperable eyewash or emergency shower, a lack of required emergency response equipment, and similar situations where there is a threat to human health or the environment. Immediate action may include performing temporary repairs, performing permanent repairs, or contacting outside contractors for repair services. If repairs cannot be implemented immediately due to weather, material or contractor availability, or other circumstances beyond the control of Kent Facility, a narrative memorandum including schedules or a timeframe for completion will be attached to the Work Order form. Normal operations in the affected area will resume only after the repair/remedial action is complete.

F2.5.7.2. Priority 2 - A routine response level that indicates that although the deficiency does not pose an immediate threat to human health or the environment, the repair/remedial action needs to be scheduled within a week and implemented as soon

as practicable. Examples of repairs/remedial actions requiring a Priority 2 response include any Level 2 Deficiency in a secondary containment system, a broken pump, an inoperable monitoring well, a small hole in the security fencing (e.g., less than one foot in diameter that does not allow unauthorized access), a damaged or faded warning identification sign, or supplies of emergency equipment approaching the minimum required. Lead times for parts or materials, or the scheduling of an outside contractor may dictate when repairs/remedial actions can be completed. A schedule for completion of a Priority 2 repair/remedial action will be developed and maintained with the Work Order form in the operating record.

F2.5.7.3. Priority 3 - A long-term response level that is for defects and conditions which do not present an immediate threat to human health or the environment and which do not require short-term scheduling or action. Examples of repairs/remedial actions requiring a Priority 3 response include any Level 3 Deficiency in a secondary containment system, worn (but still intact) waste transfer hoses, or localized deterioration in the security fence. Some Priority 3 conditions or defects may be scheduled for repair during good weather or equipment shutdowns, and some may be designated for observation to monitor whether the condition or defect deteriorates further. At that time, the response level may be upgraded to Priority 2 and repairs scheduled for completion. If a schedule for repair of a Priority 3 response is developed, a copy of the schedule will be kept with the Work Order form in the operating record.

F2.5.8. The Work Order forms specify repairs/remedial actions and note any supplies or equipment used to ensure replacements are ordered. A log is kept of the issued Work Order forms and is reviewed by supervisory personnel (Plant Manager or Supervisor) to ensure that required repairs/remedial actions are taken. An example of a Work Order form used at the Kent Facility is provided in Appendix F-2. Maintenance personnel are responsible for maintaining the Work Order log and will report to supervisory personnel when repairs are complete. This will be done by completing the Work Order and forwarding it to the supervisor.

F2.5.9. Copies of the inspection forms, Work Order forms and log are kept in the facility operating record for a minimum of five years.

F2.5.10. If Stericycle does not complete remedial action for an unsatisfactory condition as outlined in this section, they will report that as an incidence of noncompliance with their dangerous waste permit.

F2.5.10.1. Such reporting will be according to requirements in WAC 173-303-810(14)(f) or (g), depending on the threat of the deficiency.

F2.5.10.2. This reporting requirement is in addition to other notification and reporting requirements in the permit.

F2.6. Air Emission Control and Monitoring

WAC 173-303-691, 692 [40 CFR 264.1030-1091]

Air emission controls and monitoring procedures are described in Appendix D-10, Air Quality Program.

F2.7. Recordkeeping / Inspection Log

WAC 173-303-320(2)(d)

F2.7.1. The inspection log consists of all of the periodic (e.g. daily, weekly) inspection forms. The forms are designed to ensure the inspection, within the designated frequencies, of all items addressed in the inspection schedules of Table F2-1 to F2-5. Each form has been developed to assess a certain area of the facility. The forms note the date and time of inspection and the printed name and signature of the inspector. The forms also contain a detailed list of specific equipment and areas to inspect (e.g., fire extinguisher type / location, container stack number), the points of observation for each piece of equipment and area, and a space for the inspector to note whether or not the observation points are in satisfactory condition. There are also spaces for the inspector to note any comments, a priority level, a Work Order number, and a work completion date about any unsatisfactory condition. Example inspection forms used at the Kent Facility are provided in Appendix F-1.

F2.7.2. The inspection forms are periodically updated and modified to accommodate the changing needs of the facility. Although the forms may change in

appearance, the information contained on the forms will remain the same on any version of the forms used for the same purpose.

F2.7.3. Each required inspection will result in the following information being completed on the inspection forms:

- Date/time of inspection.
- An “S” (satisfactory) or “U” (unsatisfactory) for each “inspection observation.”
- In the event an unsatisfactory condition is observed, a description of the unsatisfactory condition will be written on the form.
- Corrective action priority level and, if required, a Work Order number.
- When corrections are complete the date the deficiency is corrected.
- Describe the correction made on the original inspection form.
- Printed name and handwritten signature of the inspector.
- Inspector’s supervisor’s signature.

F2.7.4. Records of periodic inspections must be kept in the facility record for a minimum of five years. Requirements for maintaining records relating to air emission monitoring (as described in Section F2.6) are outlined in Appendix D-10. Records related to tank integrity assessments (as described in Section F2.4) must be kept until final facility closure.

F3. PREPAREDNESS AND PREVENTION MEASURES

F3.1. Equipment Requirements

F3.1.1. Internal and External Communications

WAC 173-303-340(1)(a),(b), (2)(a)

F3.1.1.1. The plant is equipped with a facility-wide telephone system with intercom paging both phone-to-phone and via public address (PA) loudspeakers mounted inside buildings and outside near waste management areas. The telephone/intercom units are hard-wired to the PA speakers. The system is capable of providing immediate instruction to personnel. Each telephone is capable of direct dialing to emergency response groups such as police, fire and ambulance. Intercom/paging

(PA) numbers, emergency response phone numbers for police, fire and ambulance and the Kent Facility phone numbers are posted at telephones.

F3.1.1.2. An additional alarm system has been established by using hand-held, manually activated, compressed gas air horns. Horns of this type are audible up to a distance of one mile. Horns are located at or near telephones and in additional key locations throughout the plant.

F3.1.1.3. Figure G4-1 indicates the locations of telephone/intercoms and alarm horns throughout the plant.

F3.1.1.4. At all times, facility personnel are in visual or voice contact with another employee, as outlined in Table G4-1, Alarm Signals. Because at least two persons must always be present during operating hours, WAC 173-303-340(2)(b) does not apply.

F3.1.2. Emergency Equipment

WAC 173-303-340(1)(c)

F3.1.2.1. Equipment used for spill and emergency response is readily available and inspected regularly for access and operability in the event of an emergency situation. Refer to Table G5-1 and Figures G4-4 and G4-5 in Section G, the Contingency Plan, for a description and location of spill and emergency response equipment.

F3.1.2.2. Spill response equipment including absorbent materials, over pack drums, respirators, protective clothing and numerous hand tools are stored in various locations around the facility. Mobile equipment such as portable pumps and forklifts are available for use as well.

F3.1.2.3. Portable multi-use fire extinguishers are placed throughout the facility, in accordance with the International Fire Code (IFC). Two fire hydrants of adequate volume and pressure are located adjacent to facility grounds. One is located on 77th Avenue South on the east boundary and one is on South 206th Street on the south boundary, as shown on Figure G4-4 of Section G, the Contingency Plan.

F3.1.2.4. Fire suppression equipment, in accordance with minimum requirements set by the Kent Fire Department and the IFC, is present indoors in the Lab Pack Area. First aid kits are readily available. Emergency showers and eye wash stations are installed throughout the facility.

F3.1.3. Water for Fire Control

WAC 173-303-340(1)(d)

There are two fire hydrants to service the facility: one on 77th Avenue South on the east boundary and one on South 206th Street on the south boundary. The hydrants are maintained annually by the City of Kent. The City fire water system produces an adequate volume and pressure of water to be able to address an emergency in the facility.

F3.2. Aisle Space Requirements

WAC 173-303-340(3)

The facility is inspected for adequate aisle space, allowing unobstructed movement of emergency vehicles, personnel, and fire control/spill response equipment, and access to facility exits and entrances. To help assure unobstructed access and movement in an emergency, only waste transportation vehicles, intra-facility equipment (fork lifts) and service vehicles are allowed in the active area of the facility. Access lanes and areas are clearly marked throughout the facility. Containers are stacked such that the main aisles will be at least 5 feet wide, side aisles at least 30 inches wide between stacks of non-flammables and distances per the IFC between stacks of flammables, and aisles for access to any doors, windows and fire control equipment at least 3 feet wide.

F4. PREVENTION PROCEDURES, STRUCTURES AND EQUIPMENT

F4.1. Unloading/Loading Operations

WAC 173-303-806(4)(a)(viii)(A)

F4.1.1. Bulk waste materials are transported to and from the facility in tank trucks and end-dumps, while containerized wastes are transported on flat beds and in vans. Unloading and loading operations are conducted within specified areas. Facility personnel involved in the unloading/loading of waste are instructed in the proper operational procedures and use of equipment necessary to prevent hazards (see Section H, Personnel Training).

F4.1.2. The unloading/loading procedures used to prevent hazards and contain spills of bulk materials, such as liquids in tank trucks and solids in trucks (e.g., roll-off boxes, intermodals), are outlined in Section D3.3.1, Tank System Transfer Operations. Container unloading/loading procedures are outlined in Section D2.2, Container Management Practices.

F4.1.3. During each daily tank inspection and each time before waste is added to a tank, Stericycle will inspect the tank level indicator of each tank to ensure its proper operation and record the level of dangerous waste in each tank. Records of tank level measurements will be maintained in the operating record for a minimum of five (5) years.

F4.1.3.1. No tank shall be filled with dangerous wastes in excess of the tank's working volume specified in the tank data sheets in Appendix D-5 or the amount specified in the tank certification, whichever is less.

F4.1.3.2. If a tank level indicator is not functioning properly, Stericycle will discontinue use of the tank, or will ensure the tank will not be overfilled by using a manual gauging procedure to document waste levels for each daily tank inspection and each time before waste is added to the tank.

F4.1.3.3. Any faulty tank level indicator will be marked as inoperable with a readily visible tag, sign, or other marking.

F4.1.3.4. If a faulty tank level indicator is not repaired within one week of discovery, additional waste will not be placed in the tank until the repair is completed.

F4.1.3.5. If a tank level indicator is not properly functioning, that information shall be noted on the daily inspection forms. The date the repair of the tank level indicator is successfully completed shall also be noted in the daily inspection form.

F4.2. Run-off Prevention

WAC 173-303-806(4)(a)(viii)(B)

Run-off prevention procedures and stormwater handling processes are described in Sections D2.3.2, Containment System Capacity and Drainage Control.

F4.3. Ground and Surface Water Protection

WAC 173-303-806(4)(a)(viii)(C)

F4.3.1. Degradation of ground and surface water quality at the facility is prevented through operation of dangerous waste management units, including secondary containment systems, to prevent releases to the environment or endangerment of public health. A description of ground and surface waters can be found in Section J2.4, State Environmental Policy Act. Storm water and process water is handled according to the procedures described in Section J2.2, State Water Pollution Control Standards and Section D2.3.2, Containment System Capacity and Drainage Control. Design specifications for secondary containment systems can be found in Section D, Process Information.

F4.3.2. The Kent Facility has procedures in place to mitigate, control, and clean-up releases to the environment and to prevent contamination of water supplies (see Section G, Contingency Plan).

F4.4. Equipment and Power Failure

WAC 173-303-806(4)(a)(viii)(D)

F4.4.1. In the event of a power failure, plant personnel are instructed to shut down all operations, including truck unloading/loading, tank and container transfer

operations and treatment processes, until normal power is restored. Valves are closed and transfer pumps shut down to eliminate possible spills. Should a power failure occur during non-operational hours, the private security company monitoring the facility, if present, will contact on-call facility personnel. A power failure during non-operational hours would not impact the facility as all operations will have been shut down and secured.

F4.4.2. Emergency lighting is provided by battery powered flashlights placed throughout the facility. Backup power is not needed for the following safety devices because they do not have any electrical components: alarm horns, showers and eyewash stations, fire extinguishers, and fire suppression systems. Plant management are equipped with company cell phones that can be used the event of a power outage or emergency.

F4.4.3. In the event of a power failure, liquids can be removed from containment areas and sumps utilizing a vacuum truck. Power to portable equipment such as hand tools can be provided by a portable fuel-powered generator. The generator can provide power to temporary emergency lighting if needed. Additional equipment is available from rental companies in Kent, other company divisions, and local emergency response agencies.

F4.5. Personal Protective Equipment

WAC 173-303-806(4)(a)(viii)(E)

F4.5.1. Personal Protective Equipment (PPE) is provided to prevent undue exposure of facility personnel to dangerous waste. This is accomplished through plant layout and design, waste management equipment and practice, employee training, and use of proper protective clothing and equipment. A medical surveillance program is utilized to monitor the employee protection. The waste management systems are designed to minimize exposure of personnel in handling wastes.

F4.5.2. Liquid waste is stored or treated in closed-roof tanks. Waste is transferred, within tank systems, using fixed-in-place piping systems or hoses which are inspected before use. Container lids are kept closed except when adding to, removing from, or sampling the waste.

F4.5.3. All personnel are required to complete training in the proper management and safe handling of dangerous waste and in the use, selection, and proper fit of PPE. A complete listing of training programs is described in Section H, Personnel Training.

F4.5.4. Each employee is provided with safety equipment for their personal use. This equipment, which is kept at the facility, includes: hard hats with face shields, safety glasses/goggles, acid/organic cartridge respirators, ear protection (foam plugs), cotton and Tyvek coveralls or equivalent, full PVC rain suits, gloves (Neoprene, PVC), and steel-toed rubber boots. Emergency equipment available at the facility includes: first aid kits, eye wash and shower stations, and spill response kits (see Table G5-1, Emergency Equipment List).

F4.5.5. While engaged in loading, unloading, transfer, or cleaning operations, personnel are directed to wear steel-toed rubber boots, chemical-resistant gloves, eye/face protection, respirators as necessary, and PVC rainsuits where a splash hazard exists. All personnel within the active portion of the facility are required to wear hard hats and eye protection.

F4.5.6. Security measures (see Section F1.) prohibit entry into the site by unauthorized personnel. Administrative activity areas not directly involved with the transfer, storage or treatment of dangerous waste are not located within dangerous waste management areas. Authorized visitors must sign in and be escorted, or under observation, by plant personnel while in the facility's dangerous waste management areas.

F4.6. Prevent Releases to the Atmosphere

WAC 173-303-806(4)(a)(viii)(F)

Measures to prevent releases to the atmosphere are presented in Appendix D-10, Air Quality Program.

F5. PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES

Precautions to prevent the ignition or reaction of ignitable, reactive and incompatible wastes through proper handling, mixing, and treatment procedures, and the use of compatible equipment and systems, are described in the following sections.

F5.1. Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes

WAC 173-303-395(1)(a), 630(8)(b)806(4)(a)(ix)

F5.1.1. Open flame and smoking restrictions, acceptable container management practices, process information, and a description of how IFC buffer zone requirements are satisfied for this material are described in Section D2.4, Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Containers. Loading and unloading procedures for ignitable materials are described in Section D3.3.1, Tank System Transfer Operations.

F5.1.2. Storage and treatment tank management practices and process information are described in Section D3.3.4, Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes in Tanks. Should cutting or welding be needed, the tanks will be emptied, cleaned as required, and properly vented prior to beginning work (see Section F2.3, Tank Condition Assessment). A coated grounding cable is attached to tanks holding ignitable liquids to ensure that there is a metal to metal contact. Cables are connected to grounding rods to dissipate any static charge generated during the transfer process. Grounding straps are clamped to bare metal on tanker trucks to transfer static charges to grounding rods.

F5.1.3. Reactive wastes defined by WAC 173-303-090(7)(a)(vi)-(viii) are not accepted at the Kent Facility. Reactive wastes defined by WAC 173-303-090(7)(a)(i)-(v) managed in tanks are controlled by segregation, by isolation, and by operational controls, meeting the requirements of WAC 173-303-640(9)(a)(ii), as outlined in Section D3.3.4.5.

F5.2. General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste

WAC 173-303-395(1)(b), 806(4)(a)(ix)

F5.2.1. Prior to acceptance for storage or treatment, wastes are subject to chemical and/or physical analysis to determine, based on operational constraints and permit limitations, if the waste can be safely handled at the facility. The procedures for pre-acceptance and waste profiling are described in Section C5, Waste Profile Pre-Acceptance Procedures. Analytical methods are described in Section C8, Sampling and Analysis Methodologies and Table C2-1 Analytical Parameters, Methods and Rationale.

F5.2.2. Before accepting and unloading a waste shipment at the facility, representative samples of the waste are analyzed to verify that the load matches its pre-approved profile. The compatibility of materials is determined, prior to consolidation or blending, by mixing representative samples of the waste streams as described in Table C2-1. Noted reactions include changes in temperature, pH and color, gas evolution and precipitation.

F5.2.3. In conjunction with treatment activities, waste streams are sampled and analyzed to verify safe treatment procedures, process tolerance limits, and to ensure the equipment is operated within design specifications. Sampling, analysis, treatment processes, and tolerance limits are described in Section C8.

F5.2.4. Wastes are segregated, based on compatibility defined in Table D1-2, by secondary containment systems and appropriate distances according to IFC spacing and DOT requirements. The NFPA placard system and the HMIS system are utilized at the facility according to Section D3.3.5, Labeling of Tanks.

F5.2.5. All employees are trained in the proper handling, operational methods, and emergency procedures of management of ignitable, reactive and incompatible wastes (see Section H, Personnel Training). In the event of an incident involving reactive materials, facility personnel will respond by staying clear of the incident until the nature of the hazard has been evaluated and the determination has been made that the area is safe to enter for response activities. For example, in the event of a spill of water reactive material into a containment pad holding precipitation or

during a storm event, personnel will wait for the reaction to dissipate prior to commencing response activities. The procedures of the Contingency Plan (Section G) will be followed.

LIST OF TABLES

Table F2-1 Safety and Emergency Equipment: Inspection Schedule

Table F2-2 Security Equipment: Inspection Schedule

Table F2-3 Operational Equipment: Inspection Schedule

Table F2-4 Container Storage: Inspection Schedule

Table F2-5 Tank Systems: Inspection Schedule

TABLE F2-1. SAFETY AND EMERGENCY EQUIPMENT: INSPECTION SCHEDULE

EQUIPMENT/AREA	INSPECTION OBSERVATION	FREQUENCY
Absorbent Materials	Check for minimum stock quantities at storage location	Weekly
Overpack Drums	Check for minimum stock quantities at storage location	Weekly
Spill Response Kits	Check that units are in place and complete	Daily
Equipment Storage	Check for minimum stock quantities of hand tools, protective clothing, (items, sizes), other	Quarterly
First Aid Kits	Check accessibility Check for adequate stock, restock as needed	Daily Weekly
Emergency Showers and Eye Wash Stations	Check for pressure and flow, even flow/stream on eye wash, units turn on/off easily, adequate supply of eye wash fluid (where applicable), identification sign attached and legible	Daily
Fire Extinguishers	Check that units are in place, accessible and charged, servicing tags are attached and up to date	Daily
	Verify that any replacement / repair work called out during daily fire extinguisher checks has been completed	Monthly
Fire Suppression Systems	Check system pressure gauges Verify annual contractor services have been completed.	Daily Annually
Fire Hydrants	Verify city owned hydrants have had annual flow check	Annually
Emergency Lighting/Lanterns	Test AC/battery units and lanterns for operability, light at full intensity	Monthly
Alarm Horns	Verify that units are operational and audible. Replace as necessary.	Monthly
Telephone/Intercom (PA)	Verify that phone units are capable of acquiring an outside line and activating the PA system Verify that PA speakers are audible and working	Weekly Weekly

TABLE F2-2. SECURITY EQUIPMENT: INSPECTION SCHEDULE

EQUIPMENT/AREA	INSPECTION OBSERVATION	FREQUENCY
Fences	Check for holes, breaches, integrity	Daily
Gates	Check for operability, holes, breaches, integrity, unobstructed access	Daily
Locks (gates)	Verify locks are in place, operable and not tampered with	Daily
Outdoor Lighting	Verify lights turn on/off at dark and daylight, full brightness	Daily
Facility Access	Check general access throughout facility for unobstructed movement of emergency vehicles, personnel and equipment	Daily
Warning/Regulatory Signs	Verify signs are in place and legible throughout facility and on perimeter fence	Daily

TABLE F2-3. OPERATIONAL EQUIPMENT: INSPECTION SCHEDULE

EQUIPMENT/AREA	INSPECTION OBSERVATION	FREQUENCY
Portable Transfer Pumps	Check for leaks, proper operation, check oil level	Before/during use
	Account for all units, are all units in working order	Weekly
Portable Transfer Hoses	Check for wear, leaks in hose or at fittings	Before/during use
	Check for adequate supply	Daily
Drip Buckets	Check for adequate supply and check condition	Weekly
Fork Lifts	Check oil, hydraulic fluid, water, tire pressure, lights, horn, back up alarm, general operability	Before use
	Check service file for next scheduled maintenance	Monthly
Facility Air Compressor	Check oil and for oil leaks, temperature, pressure, drain condensate	Daily
	Check for oil leaks, test safety valves, clean air filter, cylinder fins and unit	Monthly
Facility Pumps (mounted)	Check for leaks, noises, proper operation, empty strainers (where applicable), note any evidence of corrosion	Before/during use
	Grease units, check packing change as needed	Weekly
Electrical Control Panels	Check access to breaker panel and general condition of unit/area	Daily
Vacuum Truck	Check for proper operation	Before/after use

TABLE F2-4. CONTAINER STORAGE: INSPECTION SCHEDULE

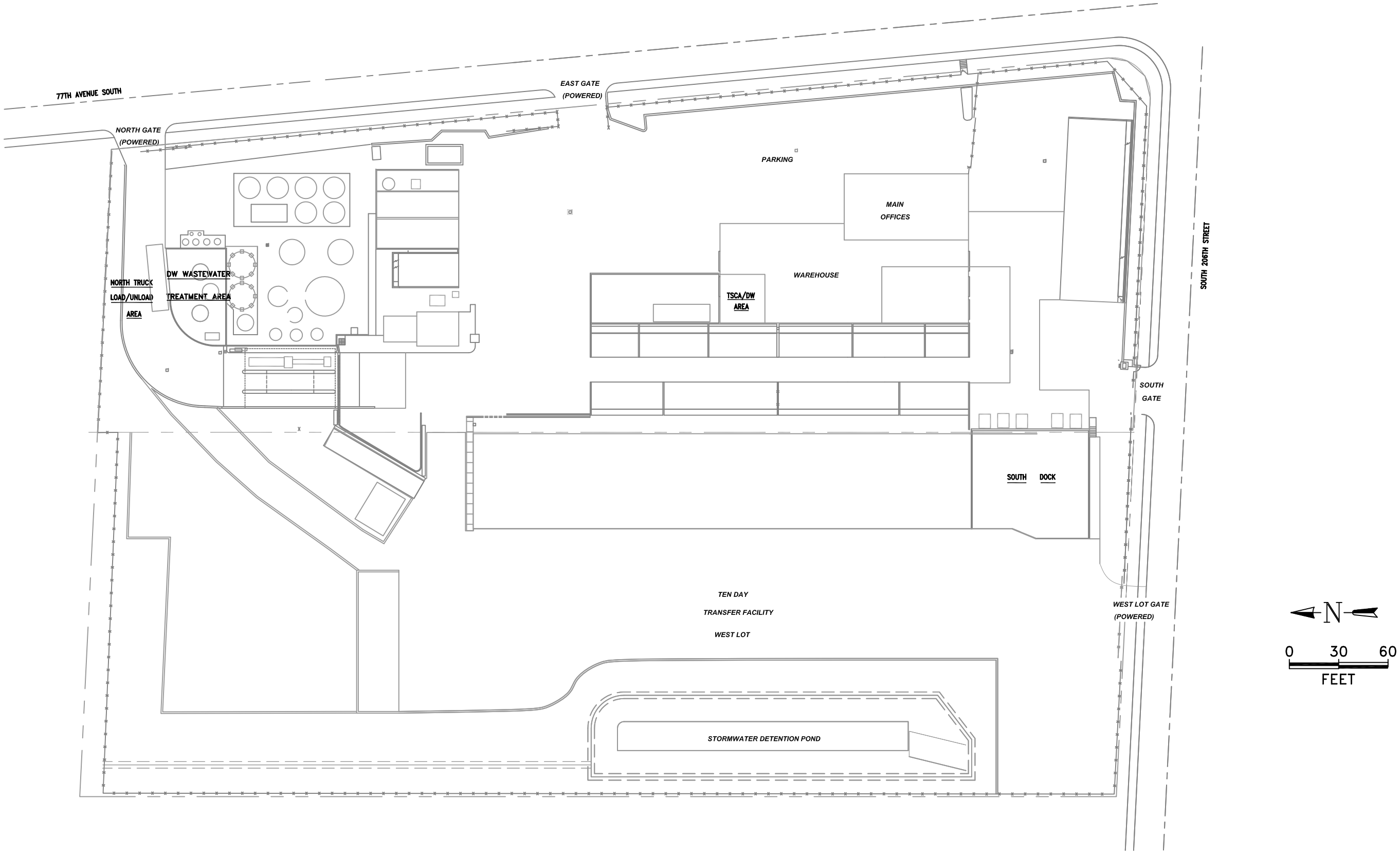
EQUIPMENT/AREA	INSPECTION OBSERVATION	FREQUENCY
Containers	Check for leaks, swelling deterioration, corrosion, and open lids	Daily
	Check that labels are visible, legible and in place	Daily
	Check for proper stacking and compatible storage	Daily
Container Storage Areas	Check sumps and containment structures for evidence of leakage, spills or accumulated liquids	Daily
	Verify aisle space, access to emergency equipment and to entrances/exits	Daily
	Check pad, berms, and curbs, for evidence of cracks, gaps, integrity, deterioration and corrosion or erosion	Weekly
	Check pads and sumps for evidence of spills or accumulated liquids	Daily, when in use
Loading/Unloading and Staging Areas	Check pads, berms, curbs, sumps and beneath dock levelers for cracks, gaps and integrity	Weekly
Secondary Containment	A qualified engineer will inspect all secondary containment structures every six months to determine if deterioration has occurred.	Semi-Annual

TABLE F2-5. TANK SYSTEMS: INSPECTION SCHEDULE

EQUIPMENT/AREA	INSPECTION OBSERVATION	FREQUENCY
DW Tank Overfilling Control Equipment	Move level indicator on gauge boards up and down by hand to ensure internal float raises and lowers easily	Daily
DW Tank Monitoring Data	Test incoming waste loads in accordance with WAP (e.g., pH, specific gravity, temperature) to determine proper storage/treatment tank and process	In accordance with the WAP
	Inspect tank change logs and treatment/analysis records noting pH, specific gravity, pressure and temperature to ensure proper safe operation and treatment application of tanks, piping and ancillary equipment	Daily, during treatment
DW Tank Construction Materials	Check tank base, walls and seams for rust and corrosion or erosion, leaks and evidence of overflow	Daily
	Check tank valves, fittings and fixtures for rust and corrosion or erosion and leaks	Daily
North Truck Load/Unload Area	Check pad, berms, curbs, and sumps for evidence of leakage, spills or accumulated liquids, cracks, gaps, integrity, deterioration and corrosion or erosion	Daily, when in use
DW Tank System: Secondary Containment Systems	Check pad, berms, curbs, sumps and coatings for evidence of leakage, spills or accumulated liquids, cracks, gaps, integrity, deterioration and corrosion or erosion	Daily
	Check construction joints for evidence of cracks, gaps, integrity, deterioration	Daily
	A qualified engineer will inspect all secondary containment structures every six months to determine if deterioration has occurred.	Semi-Annual
DW Tank System: Piping and Controls (ancillary equipment)	Check piping, valves, fittings, fixtures and pipe supports for evidence of leakage, spills or accumulated liquids, integrity, deterioration and corrosion or erosion	Daily
General Area	Walk perimeter of tank system secondary containment area and loading/unloading area noting evidence of leakage and spills and debris or vegetation accumulation	Daily

LIST OF FIGURES

Figure F1-1 Facility Site Plan



Stericycle®

TITLE:
Facility Site Plan

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: F1–1	
DATE: 8/6/15	REV.:		

APPENDIX F-1

EXAMPLE INSPECTION FORMS

The forms included in this appendix are for example only. The forms themselves may change in appearance. The information contained on the forms will remain the same on any version used for the same purposes.

10 – Day Transfer Facility **Daily Inspection Form** **Stericycle Kent**

Inspector's Name _____ Date _____ Time _____ AM/PM

Note: Comment if unsatisfactory and describe unit/area involved

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Containment & Load Inspection						
Transportation Containers	Verify trailers have not been opened, trailer seals broken or locks cut.					
	Verify transportation containers have not been compromised and are not leaking					
	Verify all loaded transportation containers are parked on concrete surfaces					
Fencing / Security	Verify fencing has not been compromised and is complete					
	Ensure gate is operational by opening and closing					
	Ensure access gate and driveways are not obstructed.					
Sumps	Verify all sumps located within the asphalt system are properly draining. Verify sumps have no evidence of contamination.					
	Inspect ponds for evidence of contamination. (Oil Sheen, Off Color, Odor)					
	Check sumps and containment structures for evidence of leakage, spills or accumulated liquids. Empty sumps by end of shift if liquid has accumulated, except spills will be removed immediately upon detection. -Roll Off staging -Trailer staging					
House Keeping	Verify the yard is free of dirt, paper and debris					

Inspector's Signature _____ Supervisor's Signature _____ Date _____

DW Tanks (T9A, T9B, T9C) **Daily Inspection Form** **Stericycle Kent**
(DW Tank Farm & North Load / Unload Pad)

Inspector's Name _____ Date _____ Time _____ AM/PM

Note: Comment if unsatisfactory and describe unit/area involved

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Emergency/Safety Equipment						
Spill Response Kits	**Check that unit is in place and complete**					
	Inside Non-Reg berm					
Emergency Lighting	**Verify lights are functioning properly**					
	Light box electrical room					
Safety Shower and Eye Wash Station	**Check pressure and flow by turning on/off, identification sign attached and legible**					
	North of DW tank system					
	East side of electrical room					
Fire Extinguishers Type / Location	**Check that units are in place, accessible and charged, servicing tags are attached and up to date**					
	10 lb. ABC, West side of electrical building					
	10 lb. ABC, So. Side of electrical building					
	10 lb. ABC, 20 lb. CO_2, 20 lb. ABC Electrical room					
	10 lb. ABC, Compressor room					
	20 lb. PKP, No. Compressor room					
	10 lb. ABC, North Bay					
	10 lb. ABC, T-18					
	10 lb. ABC, West of Discharge Tank					
	20 lb. ABC, Chemical Conex					
	10 lb. ABC WWT Plant Gate					

Inspector's Signature _____ Supervisor's Signature _____ Date _____

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Containment inspections						
Secondary containment, including sumps	**Check sumps and containment structures for evidence of leakage, spills or accumulated liquids. Empty by end of the shift if liquid has accumulated. Clean up spills immediately upon detection.**					
	DW Tank Farm					
	Check DW tank system containment pad, berms, and sumps for evidence of cracks, gaps, integrity deterioration, and corrosion or erosion[1]					
	DW Tank Farm					
	Check sumps and containment structures for evidence of leakage, spills or accumulated liquids. Empty sump by end of shift if liquid has accumulated, except spills will be removed immediately upon detection. * During non-operational hours, accumulated precipitation must be removed within 24 hours or sooner if is necessary to prevent overflow from the secondary containment system. Note the time accumulated liquids were discovered and removed.					
	North Truck Load / Unload Area					
	Check containment for gaps, cracks, deterioration, corrosion, erosion or loss of integrity[1]					
	North Truck Load / Unload Area					
Tank Inspections						
Tanks	Check tank base, walls, and seams for rust, corrosion or leaks.[1]					
Tank Ancillary Equipment	Check piping valves, fittings, fixtures, and piping supports for evidence of leakage, spills or accumulated liquids, integrity, and corrosion					
Tank Monitoring Data	Inspect tank change logs and analysis to ensure proper safe operation and treatment application of tanks, piping and ancillary equipment					
Level Indicators	Move level indicator or gauge boards up and down by hand to ensure internal float raises and lowers easily					
Operational Equipment						
Transfer Hoses	Check for fraying, leaks, bulges, and adequate supply					
Air Compressor	Verify shift maintenance is completed. Check oil, temperature, pressure, drain condensate, alarm (lights), ensure hour meter is operational					
Electrical Room	Verify access to breaker panel and general condition of unit/area					
Pumps (mounted)	Check for signs of leaks, noises, proper operation, and empty strainers (where applicable)					

1 A crack is defined as greater than 0.010 inches in width.

General Facility **Monthly, Quarterly, Semi-Annual & Annual Inspection Form** **Stericycle Kent**

Inspector's Name _____ Date _____ Time _____ AM/PM

Note: Comment if unsatisfactory and describe unit/area involved

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Monthly						
Alarm Horns	Verify that units are operational and audible					
Fire Extinguishers	Verify that any replacement / repair work called out during daily fire extinguisher checks has been completed.					
Emergency Lighting/Lanterns	Check lanterns for operability, light at full intensity. -Electrical room - South Warehouse Door - North Warehouse Door					
Fork Lifts	Check service file for next scheduled maintenance					
Air Compressors	Check for oil leaks, test safety valves, clean air filter, cylinder fins and unit. Check service file for next scheduled maintenance. Note engine hour reading and hour reading when next service is due.					
Facility Pumps	Check service file for next scheduled maintenance. Note when service is due in the comments column.					
Portable Welder/Generator	Check engine oil, cables and stingers for wear, presence and condition of helmet and gloves and stock of welding rod. Note check in service file.					

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Portable Cutting Torch	Check gas supply, regulator, hoses and cutting tip. Check connections for tightness; presence and condition of gloves and goggles. Note check in service file.					
Quarterly						
Breeze Way/Bays	Inventory equipment; check condition and operability of absorbent materials, overpack drums, hand tools, protective clothing, other. Reseal door upon completion. Check that the minimum quantities of each item are available.					
Semi-Annually						
Secondary Containment Structures	Verify that the qualified engineer's inspection report, maps, and all documentation of findings are present in the facility operating record.					
Annually						
Fire Suppression Systems	Verify annual contractor services have been completed. - Warehouse - Portable Extinguishers					
Storage Areas for Reactive or Ignitable Wastes	Annual inspection per requirements of WAC 173-303-395(1)(d) in the presence of a representative of the Kent Fire Department or a professional inspector familiar with the International Fire Code.					

Inspector's Signature _____ Supervisor's Signature _____ Date _____

Security **Daily Inspection Form** **Stericycle Kent**

Inspector's Name _____ Date _____ Time _____ AM/PM

Note: Comment if unsatisfactory and describe unit/area involved

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Facility Access & Security						
Fences/Gates/Locks	**Check for holes, breaches and integrity, and unobstructed access to gates. Check to see if locks in place, operable and not tampered with.**					
	10-Day Transfer Facility entrance/exit gate					
	WWTP man gate (north perimeter)					
	Emergency man gate (south perimeter)					
	Emergency truck entrance/exit gate (south perimeter)					
	Main truck exit/entrance gate (east perimeter)					
	Man gates employee parking (east perimeter)					
Outdoor Lighting	**Verify lights turn on/off at dark and daylight, full brightness**					
	Perimeter Light					
	Intra-Facility Lights					
Facility Access	Check general access throughout the facility for unobstructed movement of emergency vehicles, personnel and equipment.					
Warning Signs	**Verify signs are in place and legible from a least 25 feet away throughout facility and on perimeter fence**					
	Danger - Unauthorized Personnel Keep Out					
	Traffic Control					

Inspector's Signature _____ Supervisor's Signature _____ Date _____

South Dock - Load / Unload Area **Daily Inspection Form** **Stericycle Kent**

Inspector's Name _____ Date _____ Time _____ AM/PM

Note: Comment if unsatisfactory and describe unit/area involved

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Emergency/Safety Equipment						
Spill Response Kits	**Check that unit is in place and complete**					
	South Dock					
	Scale					
Safety Shower and Eye Wash Station	**Check pressure and flow by turning on/off, identification sign attached and legible**					
	South Check-In Area					
Fire Extinguishers	**Check that units are in place, accessible and charged, servicing tags are attached and up to date**					
Type / Location	10 lb. ABC, South Dock area					
	10 lb. ABC, South Check-In Area CK7					
	10 lb. ABC, South Check-In area CK14					
Operational Equipment						
Load Dock Levelers	**Check for proper operations. Inspect under levelers for cracks, gaps or deterioration**					
	South Dock					
Driving Surface Area						
South Lot	**Inspect waste traffic areas for evidence of cracks, gaps, leakage or spills**					

Inspector's Signature _____ Supervisor's Signature _____ Date _____

TSCA Storage / Processing Areas **Daily Inspection Form** **Stericycle Kent**

(Lab Pack Area, TSCA / DW Area)

Inspector's Name _____ Date _____ Time _____ AM/PM

Note: Comment if unsatisfactory and describe unit/area involved

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Emergency/Safety Equipment						
Spill Response Kits	**Check that unit is in place and complete**					
	TSCA / DW Area					
Emergency Lighting	**Verify lights are functioning properly**					
	Box South Warehouse Door					
	Box North Warehouse Door					
Safety Shower and Eye Wash Station	**Check pressure and flow by turning on/off, identification sign attached and legible**					
	TSCA / DW Area					
Fire Extinguishers Type / Location	**Check that units are in place, accessible and charged, servicing tags are attached and up to date**					
	10 lb. ABC, North Hallway					
	10 lb. ABC, South Hallway					
	10 lb. ABC, Common area					
	10 lb. ABC, South Breeze Way Door					
	10 lb. ABC, North Breeze Way Shop Door					
	10 lb. ABC, No. Lab					
	10 lb. ABC, No. Decon Area					

Inspector's Signature _____ Supervisor's Signature _____ Date _____

(Lab Pack Area, TSCA / DW Area)

Equipment/Area	Inspection Observation	Condition S/U	Comments	Priority Level (1,2,3)	Work Order #	Completion Date
Fire Extinguishers Type / Location	**Check that units are in place, accessible and charged, servicing tags are attached and up to date**					
	10 lb. ABC, Locker room					
	20 lb. D, 20lb. ABC, 10 ABC TSCA / DW Area					
	10 lb. ABC, Lab Pack Area Door					
	20 lb. D, East Wall Lab Pack Area					
	Misc. Spares in Cart Central Breeze Way					
First Aid Kit	Check accessibility – Center Breeze Way					
Containment inspections						
Containment	**Check containment structures for evidence of leakage, spills or accumulated liquids. Remove by end of shift if liquid has accumulated, except spills will be removed immediately upon detection**					
	TSCA / DW Area					
	Check containment for gaps, cracks, deterioration, corrosion, erosion or loss of integrity					
	TSCA / DW Area					
Container Storage	**Check for proper stacking and incompatible materials**					
	TSCA / DW Area					
	Verify aisle space, access for emergency equipment, and to exits/entrances					
	TSCA / DW Area					
	Verify that labels are correct, legible and in good condition					
	TSCA / DW Area					
	Check containers/drums for leaks, swelling, integrity, and closed lids					
	TSCA / DW Area					

APPENDIX F-2

EXAMPLE MAINTENANCE REQUEST FORM

MAINTENANCE WORK ORDER

REQUESTED BY:	PRIORITY LEVEL	KT-0815
TODAY'S DATE:	DATE STARTED:	DATE COMPLETED:
EQUIPMENT NAME:	EQUIPMENT I.D.:	LOCATION:
LEVEL OF DEFICIENCY	COST:	MAN HOURS:	HOURS MILEAGE:

DEFICIENCY / WORK DESCRIPTION

WORK PERFORMED

PART NAME	PART #	VENDOR
1.		
2.		
3.		
4.		
5.		
6.		
7.		

APPROVED BY:	COMPLETED BY:	E

SECTION G

CONTINGENCY PLAN

SECTION G CONTINGENCY PLAN

TABLE OF CONTENTS

SECTION PAGE

PREFACE 1
G1. GENERAL FACILITY DESCRIPTION 1
G1.1. Facility Identification, Location and Site Plan 1
G1.2. Facility Operations 2
G1.3. Dangerous Wastes Handled at the Facility 5
G2. EMERGENCY COORDINATOR RESPONSIBILITIES 5
G3. IMPLEMENTATION OF THE CONTINGENCY PLAN 6
G3.1.1. Fire/Explosion 6
G3.1.2. Release of Dangerous Waste or Hazardous Substance 6
G3.1.3. Incidents Due to Natural Disasters 7
G3.1.4. Damaged/Unacceptable Waste Shipment 8
G4. EMERGENCY RESPONSE PROCEDURES 8
G4.1. Incident Response, Assessment and Identification 8
G4.1.1. Employee Response 8
G4.1.2. Emergency Coordinator Response 9
G4.1.3. Security Personnel Response 11
G4.2. Notification 11
G4.3. Containment and Control of Emergencies 12
G4.3.4. Injured or Endangered Employees 13
G4.3.5. Fires and Explosions 13
G4.3.6. Spills and Releases 14
G4.3.7. Seismic Event 16
G4.3.8. Non-Permitted Discharge to Sewer 17
G4.3.9. Flooding Conditions 17
G4.3.10. Freezing Conditions 18
G4.3.11. Damaged Shipments 18
G4.3.12. Power Outage 19
G4.4. Prevention of Recurrence 19
G5. EMERGENCY EQUIPMENT 20
G6. POST-EMERGENCY PROCEDURES 20
G6.1. Storage and Treatment of Released Materials 20
G6.2. Equipment Decontamination and Maintenance 21
G6.3. Reactivation of Activities in the Affected Area 22
G6.4. Personnel Debriefing 22
G7. COORDINATION AGREEMENTS 22
G8. EVACUATION PLAN 25
G9. INCIDENT REPORTS 26
G10. AMENDMENTS TO CONTINGENCY PLAN 29
G11. RECORD KEEPING 29

Tables, Figures, and Appendices are presented
in separate sections following the main body of the text.

LIST OF TABLES

Table G2-1	Emergency Coordinator List
Table G3-1	Agency Notification Matrix
Table G4-1	Alarm Signals
Table G5-1	Emergency Equipment List

LIST OF FIGURES

Figure G1-1	Facility Access Routes
Figure G1-2	Facility Site Plan
Figure G1-3	DW Management Areas
Figure G4-1	Location of Telephones, Intercoms and Alarm Horns
Figure G4-4	Location of Emergency Equipment
Figure G4-5	Fire Control Equipment
Figure G8-1	Facility Exits and Assembly Areas

LIST OF APPENDICES

Appendix G-1	Letter of Authorization - Emergency Coordinators
Appendix G-2	Generic Clean Up Plan for Release to Soil
Appendix G-3	Letter of Arrangement, Coordination Agreements

SECTION G. CONTINGENCY PLAN

PREFACE

WAC 173-303-145, 340, 350, 360, 630(2), 640(7), 806(4)(a)(vii)

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as "Stericycle". The objectives of the Kent Facility Contingency Plan are to minimize and prevent hazards to public health or the environment from fires, explosions, or any unplanned, sudden or non-sudden, release of dangerous wastes or dangerous waste constituents to air, soil, or surface water. This plan also applies to the management of hazardous materials in which a release may require preventative and responsive actions on the part of the Kent Facility. A current copy of this plan is kept at the facility at all times and is provided to the appropriate public agencies and providers of emergency services.

G1. GENERAL FACILITY DESCRIPTION

G1.1. Facility Identification, Location and Site Plan

Facility Location

Stericycle – Kent Facility
20245 77th Avenue South
Kent, Washington 98032
Phone (253) 872-8030
EPA ID No. WAD 991 281 767

Corporate Office

Stericycle Environmental Solutions
18000 72nd Avenue South, Suite 201
Kent, Washington 98032
Phone (425) 227-0311

G1.1.1. The Kent Facility is located at 20245 77th Avenue South, Kent, in King County, Washington, at Section 1, Township 22 N., Range 4 E. (North Latitude 47°24'45" and West Longitude 122°14'8").

G1.1.2. The plant is approximately two miles north of downtown Kent, four miles south of the City of Renton, and about 1.3 miles east of the Green River. The major access routes to the facility are from Interstates 5 or 405 traveling north or southbound. From I-5, facility traffic would likely take exit 152 east to Orillia Road, which becomes

becomes South 212th Street approximately two miles to the south. Traffic would continue east on South 212th Street to a left turn (north) onto 77th Avenue South, to the facility entrance on the left. From I-405, traffic would exit onto S.R. 167 (Valley Freeway) heading south, to the exit onto South 212th Street heading west. Traffic would then continue on South 212th Street to a right turn (north) onto 77th Avenue South, to the facility entrance on the left.

G1.1.3. Figure G1-1 shows the access routes to the Kent Facility, and Figure G1-2 shows the facility site plan and operational areas.

G1.2. Facility Operations

G1.2.1. Dangerous waste management activities at the facility currently occur on approximately 3 acres of the 6 1/4 acre parcel. The facility consists of a truck dock, container check-in area, container storage, staging, and processing areas, a lab pack area, various processing equipment (MRW shredder and PRM Unit), and two wastewater treatment systems (DW and non-DW). Inbound and outbound vehicles are staged in a 10-day transfer facility located in the West Lot.

G1.2.2. Dangerous waste operations at the facility include chemical and physical treatments.

G1.2.3. Also stored and managed at the facility are other materials which by virtue of their origin may not be classified as Dangerous Waste but present hazards to human health and the environment nonetheless if mismanaged. These include but are not limited to the following:

G1.2.3.1. Moderate Risk Waste (MRW); which consists of household hazardous waste and small quantity generator wastes. MRW may be processed in the MRW shredder and solidified in Tanks 5305 and 5306.

G1.2.3.2. Paint Related Materials: This category consists of flammable or combustible materials such as oil-based paints, kerosene, solvents, paint thinners, contaminated motor oil, caulking, waxes, sealants, and other similar materials. These materials are processed in the PRM Unit, and liquids are collected to be sent off-site for energy recovery.

G1.2.3.3. Non-DW wastewater for treatment and discharge.

G1.2.3.4. Non-DW Labpacks: Small containers of HHW or MRW materials that are packed together according to their DOT hazard class. Materials may include pesticides, poisons, disinfectants, herbicides, acids, bases, or reactive materials. Materials may be incinerated, reused, or landfilled, depending on material.

G1.2.3.5. Landfill Ready Materials: This category consists of MRW materials which are able to go direct to landfill. Examples of such materials include debris, used PPE, floor dry, or oil filters.

G1.2.3.6. Propane Cylinders: This category consists of small and large barbeque cylinders that are sent off-site for recycling.

G1.2.3.7. Miscellaneous Batteries: Examples of HHW batteries received include automotive batteries, alkaline, alkaline/zinc, lithium/sulfur dioxide, magnesium, mercury, nickel cadmium, nickel hydrogen, zinc carbonaire, etc. Batteries are sorted by type and sent to off-site facilities for recycling, incineration, or landfill, depending on contractual agreements.

G1.2.3.8. Oil Filters: This category includes any oil filters that meet the recycling requirements for oil filters.

G1.2.3.9. E-waste: Electronic equipment such as monitors, computer peripherals, and other small electronics (no major appliances). E-waste is sorted by type and sent to off-site facilities for recycling.

G1.2.3.10. Aerosol Cans: All aerosol paints, cleaners, solvents, starting fluids and similar materials are in this category. Aerosol cans are sorted by DOT compatibility requirements and sent off-site for incineration.

G1.2.3.11. Latex Paint: Any latex paint product can be placed in this category. Depending on recycling specifications or contractual agreements, latex paint is sent off-site for recycling or landfill.

G1.2.3.12. Light Tubes: All types of light tubes can be placed in this category. Depending on generator requirements or contractual agreements, light tubes are sent off-site for recycling or Subtitle C landfill.

G1.2.3.13. PCB Light Ballasts: This category includes PCB-containing light ballasts from HHW sources. Depending on generator requirements or contractual agreements, PCB light ballasts are sent off-site for recycling, landfill, or incineration.

G1.2.4. The facility currently operates one shift, Monday through Friday, from 7:00 a.m. – 7:00 p.m., led by a Supervisor knowledgeable in emergency response and notification procedures. Employees receive training, and instruction in facility operations, emergency procedures, and contents of the Contingency Plan. See Section H, Training Plan, for further discussion of personnel qualifications and training procedures for all personnel who work and support the dangerous waste operations at the facility.

G1.2.5. During non-operational hours (holidays, Saturday and Sunday nights) a private security guard may patrol the entire facility checking for vandalism, unauthorized entry, and evidence of leaks or spills. The entire facility is surrounded by a chain link fence. All gates are kept closed at all times and locked during non-operational hours. The plant is illuminated by facility-wide outdoor lighting.

G1.2.6. All operational, security, safety, emergency, container storage area, and tank system equipment is inspected on a regular schedule based on regulatory requirements, operational experience and engineering knowledge of the equipment and systems, including the rate of possible deterioration. Scheduled inspections are completed using pre-printed forms which list the item/feature checks for the equipment or system to ensure proper safe operation and readiness. The contents of the inspections are itemized in Tables F2-1 through F2-5 in Section F2, Inspection Plan. During non-operational hours inspections are conducted by Kent Facility personnel.

G1.2.7. The facility is designed, constructed, maintained and operated to minimize the possibility of fire, explosion, or any unplanned sudden or non-sudden release of dangerous waste or dangerous waste constituents to air, soil, or surface or

ground water which could threaten public health or the environment. This plan describes preparations and preventive measures which help avoid or mitigate such situations.

G1.3. Dangerous Wastes Handled at the Facility

Wastes managed at the Kent Facility include dangerous waste fuels, oily wastes, corrosives, oxidizers, sludges, aqueous and non-aqueous metal-bearing wastes, batteries, lamps, labpack chemicals, and compressed gasses. Polychlorinated biphenyl (PCB)-contaminated wastes are also managed at the facility. Storage and treatment of dangerous wastes occurs in tanks and containers. Section G1.2.3 describes the range of materials that may be received at the facility. Figure G1-3 shows areas used for DW and MRW management, maximum quantities, and general waste types allowed in each area.

G2. EMERGENCY COORDINATOR RESPONSIBILITIES

WAC 173-303-350(3)(d), 360(1)

G2.1. At all times, Stericycle-Kent has qualified persons designated as the emergency coordinator and alternate emergency coordinators. These are identified in Table G2-1 by name, position at the facility, phone numbers, and office address. The first person on the list is the primary emergency coordinator. Other emergency coordinators are listed in the order in which they will assume responsibility as alternatives. Changes to the emergency coordinators will be made by a class 1 permit modification (WAC 173-303-830 Appendix I (B)(6)(d)).

G2.2. The Emergency Coordinator (EC) is responsible for coordinating emergency response procedures in the event of any fires, explosions, unplanned releases, spills, or other emergency situations occurring at the facility. The EC's duties include the following:

- Assure personnel safety.
- Assess the nature, severity, and material (s) involved in the situation.
- Initiation of the Contingency Plan if appropriate and evacuation of the facility if necessary.
- Direct containment and control operations.

- Contact emergency agencies and authorities.
- Initiate clean-up and emergency equipment replenishment (cleaning and restocking equipment).

G2.3. The EC is thoroughly familiar with all aspects of the Contingency Plan and all operations, activities, the locations and properties of wastes managed, the location of all records within the facility, and the facility layout. The EC or his/her designee has the complete authority to commit needed resources of the company in the event of an emergency (Refer to Appendix G-1, Letter of Authorization-Emergency Coordinators). The EC receives training as described in Section H, Personnel Training.

G2.4. The Primary or an Alternate Emergency Coordinator will be at the facility or on call at all times during both operational and non-operational hours. The Primary Emergency Coordinator is typically at the facility from 7:00 a.m. to 5:00 p.m. weekdays. Table G2-1 lists the names, position, office address, and office, home, and cellular telephone numbers, of the Primary Emergency Coordinator and Alternates in the order in which they assume Emergency Coordinator responsibilities.

G3. IMPLEMENTATION OF THE CONTINGENCY PLAN

WAC 173-303-350(1)

G3.1. The following situations and emergencies would call for the implementation of the Contingency Plan:

G3.1.1. Fire/Explosion

G3.1.1.1. Any fire or explosion at the facility.

G3.1.1.2. Any fire or explosion that could spread to or otherwise affect operations at the facility.

G3.1.2. Release of Dangerous Waste or Hazardous Substance

G3.1.2.1. A sudden or non-sudden spill, release, or other discharge of a dangerous waste or hazardous substance which poses a threat to human health or the environment, regardless of quantity.

G3.1.2.2. A spill, release, or other discharge which has the potential for contamination of soil, surface water, or groundwater, regardless of size. Examples are spills or releases to soil and releases of organic solvents to asphalt.

G3.1.2.3. An uncontrolled spill, release, or other discharge originating from a damaged shipment which has arrived at the facility in such a condition.

G3.1.2.4. A spill, release, or other discharge of a dangerous waste or hazardous substance greater than 100 pounds (12 gallons) or the “reportable quantity” established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) when any portion of the release extends beyond secondary containment.

G3.1.2.5. A release of gas to the air originating from an unplanned reaction of materials.

G3.1.2.5.1. Emissions to the air from a spill, release, or other discharge (including to secondary containment) of a dangerous waste or hazardous substance when:

G3.1.2.5.2. The spill or release is greater than 100 pounds (12 gallons) or a reportable quality in the most recent version of 40 CFR 302 Table 302.4 (whichever is less), and

G3.1.2.5.3. Any constituents in the dangerous waste or hazardous substance has a Henry’s Law constant of at least 0.1 mole-fraction-in-the-gas-phase/mole-fraction-in-the-liquid-phase at 25 degrees Celsius or is a volatile organic compound detected by SW 846 Method 8260B. Note that Appendix VI in 40 CFR 265 has a list of compounds known to have a Henry's law constant value less than the cutoff level.

G3.1.3. Incidents Due to Natural Disasters

A spill, release, or other discharge or potential for release of dangerous waste or hazardous substance caused by a natural disaster including but not limited to:

G3.1.3.1. Earthquake or severe flooding conditions which damage equipment, foundations, structures, or tanks.

G3.1.3.2. Severe storm involving high winds or lightning which damage or overturn tanks, containers or other equipment.

G3.1.4. Damaged/Unacceptable Waste Shipment

G3.1.4.1. A shipment container(s) of dangerous waste arriving at the facility is damaged so as to present a hazard to public health and the environment.

G3.1.4.2. The shipment cannot be transported because the containers are damaged to such an extent, or the waste is in such a condition, as to present a hazard to public human health or the environment in the process of further transportation.

G3.1.4.3. A prohibited waste, as defined in Section C5.5 (e.g., explosive, radioactive, or infectious material) received at the facility that presents a hazard to public health or the environment. If the material can be safely moved, it will be kept in drum jail until transport to an appropriate off-site facility can be arranged. If the material cannot be safely moved, the area will be cordoned off until appropriate response personnel can prepare the material for shipment off-site.

G3.2. Table G3-1 outlines the appropriate agencies to be notified in the event of incidents that result in the implementation of the Contingency Plan.

G4. EMERGENCY RESPONSE PROCEDURES

G4.1. Incident Response, Assessment and Identification

WAC 173-303-360(2)(a),(b),(c),(d)

G4.1.1. Employee Response

G4.1.1.1. Any employee, when faced with an actual or imminent emergency, will first attend to their own safety. Then, if it is safe to do so, he/she will attend to other employees requiring immediate assistance. The employee also will notify all facility personnel by means of alarm signals listed in Table G4-1. Locations of telephones/intercoms are shown in Figure G4-1.

G4.1.1.1.1. Practice emergency drills, during which employees use the various alarms and alarm signals, are held twice annually.

G4.1.1.1.2. At least once a year, Stericycle will invite the Kent Fire Department to participate in a practice emergency drill at the facility.

G4.1.1.2. In all emergency situations (regardless of size or extent) the employee, involved in or discovering the situation, will contact the Emergency Coordinator (EC) and provide information as to the location, nature, and extent of the incident. The names, addresses, and telephone numbers of the Primary and Alternate Emergency Coordinators are found in Table G2-1. If the employee is unable to reach a Kent Facility EC, then they are instructed to call the EH&S Department cell phone numbers. EH&S will then attempt to contact the Emergency Coordinators at other company regional support facilities, corporate personnel, and, if necessary, will contact appropriate emergency response agencies. Agency notification requirements are outlined in Table G3-1, Agency Notification Matrix.

G4.1.1.3. Section G4.3 lists the Kent Facility's emergency response procedures for the containment and control of emergency situations including injured or endangered employees, fires and explosions, spills and releases, and damaged shipments.

G4.1.2. Emergency Coordinator Response

G4.1.2.1. The EC will assess the situation immediately after an incident occurs (or immediately on arrival at the site if not on site at the time of the incident) to determine the appropriate emergency response actions, including implementation of the Contingency Plan where human health or the environment are threatened.

G4.1.2.1.1. Until an EC arrives onsite, Contingency Plan Implementation Authorization is given to the EC's designee. This person has the authorization and responsibility to implement the facility's Contingency Plan in the event of an incident which would require immediate emergency response.

G4.1.2.1.2. The EC will assure that the facility procedures for containment and control of emergency situations are initiated (see Section G4.3, Containment and Control of Emergencies) and, if necessary, the EC will contact outside emergency service providers.

G4.1.2.1.3. In the event of any emergency (regardless of size or extent) the EC will contact the EH&S Department and, as required, appropriate local, state, and federal agencies will be notified by the EC or the EH&S Department. The EC will evaluate the severity and nature of the incident and the character, source, quantity, and

extent of the released materials will be identified. Table G3-1 outlines agency notification requirements for each incident.

G4.1.2.2. The selection of appropriate response actions will depend on the consideration and assessment of the following factors:

G4.1.2.2.1. The severity and nature of the incident: fire, explosion or material release.

G4.1.2.2.2. The potential of severe consequences: what is the location of the incident and to what extent might other areas become involved; are persons off site in danger; will surrounding property be damaged or contaminated; is there a threat to surface and groundwater?

G4.1.2.2.3. The current weather conditions: temperature, wind direction and velocity and how response activities might be affected.

G4.1.2.3. Identification of the character, source, quantity, and extent of the released materials can be made through the following methods and sources of information:

G4.1.2.3.1. Eyewitness accounts: employee discovering emergency.

G4.1.2.3.2. Visual inspection: aerial extent, noted fumes, odors, and reactions.

G4.1.2.3.3. Source: origin of leak.

G4.1.2.3.4. Tank involved: type of waste stored or treated.

G4.1.2.3.5. Containers involved: labels or placards.

G4.1.2.3.6. Location of incident: operational or segregated storage area.

G4.1.2.3.7. In-plant records: waste tracking forms, tank volume logs, manifests, and generator’s waste profiles.

G4.1.2.4. If the proper identification of the material cannot be made by using available information, a sampling and analysis plan may be initiated to quantify the

extent of contamination and associated extent of clean up (see Appendix G-2, Generic Clean Up Plan for Release to Soil).

G4.1.3. Security Personnel Response

G4.1.3.1. Private security personnel may be present at the facility during non-operational hours. The security personnel are instructed to attempt first to contact the Primary Emergency Coordinator then the Alternates in the order they are listed on Table G2-1. If security is unable to reach a Kent Facility EC, then they are instructed to call the EH&S Department cell phone numbers. EH&S will then attempt to contact the Emergency Coordinators at other company regional support facilities, corporate personnel, and, if necessary, will contact appropriate emergency response agencies.

G4.1.3.2. Security personnel are instructed to immediately contact the EC in event of unauthorized entry, power outage, severe weather events, evidence of leaks or spills, alarms, or other unusual situations, both on site or on neighboring property, which could potentially impact the Kent Facility.

G4.2. Notification

WAC 173-303-145(2),360(2)(d),(e)

G4.2.1. The EC will contact the EH&S Department in the event of any emergency regardless of size or extent. The EC will supply specific information as to the type, quantity, and location of released material. EH&S together with the EC will evaluate this information to determine notification requirements.

G4.2.2. Table G3-1 outlines the appropriate agencies to be notified in the event of an incident. The EC will provide information in the hazard assessment report as required in WAC 173-303-360(2)(e).

G4.2.3. Stericycle-Kent will immediately notify Ecology HWTR when any one of the following occurs (some of these thresholds are below those for full implementation of the contingency plan):

G4.2.3.1. A fire or explosion at the facility, or any fire or explosion that could spread to or otherwise affect operations at the facility.

G4.2.3.2. An incidence of noncompliance with this Permit that could threaten human health or the environment. Any natural disaster at the facility that could threaten human health or the environment.

G4.2.3.3. In accordance with WAC 173-303-145(1) through (2) and WAC 173-303-360(2)(a), a sudden or non-sudden release of a dangerous waste or hazardous substance which poses a threat to human health or the environment, regardless of quantity.

G4.2.3.4. A spill, release, or other discharge of dangerous waste or hazardous substance greater than 10 pounds (1.2 gallons) or the “reportable quantity” established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) outside of secondary containment.

G4.2.3.5. A spill, release, or other discharge of dangerous waste or hazardous substance greater than 100 pounds (12 gallons) or the “reportable quantity” established in the most recent version of 40 CFR Part 302 Table 302.4 (whichever is less) inside secondary containment.

G4.2.3.6. Any incident that causes implementation of the Contingency Plan (Section G3.1).

G4.3. Containment and Control of Emergencies

WAC 173-303-145,350(3)(a),(b), 360(2)(f),(g),(i),(i), 630(2), 640(4)(c)

G4.3.1. The sections which follow discuss the Kent Facility’s emergency response procedures to minimize possible impact of emergency incidents on public health or the environment. All personnel receive training in the containment and control procedures described in this section (see section H, Personnel Training). A generic sampling and analysis plan to quantify the extent of contamination is presented in Appendix G-2.

G4.3.2. It is the EC's responsibility to commit all necessary resources of the company, including an outside contract clean-up service (when applicable), to assist in the control, containment, and clean up of a release. The EC will coordinate the activities of the emergency response agencies.

G4.3.3. Table G5-1 lists the type, location, and description of the emergency equipment maintained at the facility. Figure G4-2 shows the locations of the emergency equipment, and Figure G4-3 shows the locations of the fire control equipment.

G4.3.4. Injured or Endangered Employees

- Alert others who may be endangered, call for backup, and/or use alarm signals (Table G4-1).
- Use appropriate protective clothing and equipment.
- Apply first aid; first aid kits are located at various locations throughout facility (see Figure G4-2).
- Phone 911 if ambulance is needed.
- Immediately notify EC (Table G2-1).
- Determine notification requirements per Table G3-1.

G4.3.5. Fires and Explosions

- Shout "FIRE" warning.
- Alert others who may be endangered, call for back up, use alarm signals (Table G4-1).
- Cut off source, close valves, and/or shut down pumps/equipment.
- Use appropriate protective clothing and equipment.
- Control small fires with extinguishers located throughout the facility (Figure G4-3).
- Call 911.
- The Kent Fire Department must be notified of all fires, regardless of size.
- Immediately notify Emergency Coordinator EC (Table G2-1).
- Attempt to contain spills or runoff by use of absorbent material and diking.
- Remove or isolate incompatible wastes, containers, and other materials away from fire when possible.
- Determine notification requirements per Table G3-1.

G4.3.6. Spills and Releases

G4.3.6.1. Load/Unload Areas

- Alert others who may be endangered, call for back up, and/or use alarm signals (Table G4-1).
- Cut off source, close valves, shut down pumps/equipment, and/or eliminate ignition sources.
- Immediately notify EC (Table G2-1).
- Use appropriate protective clothing and equipment.
- Attempt to contain spills or runoff by use of absorbent material or by diking with soil/sand.
- Contain and prevent further migration of any visible release to the environment outside of containment, provide for removal and proper disposal of visibly contaminated soil or surface water.
- Pump sumps containing spilled material to appropriate storage/treatment tank. If material is unknown, then sample from sumps and analyze for compatibility and any constituents/parameters needed to assign an appropriate treatment method prior to pumping tanks.
- Determine notification requirements per Table G3-1.

G4.3.6.2. Containers (drums, bulk containers)

- Alert others who may be endangered, call for back up, and/or use alarm signals (Table G4-1).
- Use appropriate protective clothing and equipment.
- Eliminate ignition sources.
- Locate source and attempt to control leak so container can be moved and isolated.
- Immediately notify EC (Table G2-1).
- Place container in overpack drum, if necessary.
- Use absorbent materials to contain spill and prevent exposure to incompatible materials.
- After containment is assured, transfer leaky container contents to another specification drum. Spill residues and clean up materials are to be drummed as well.
- Contain and prevent further migration of any visible release to the environment outside of containment; provide for removal and proper disposal of visibly contaminated soil or surface water.

- Determine notification requirements per Table G3-1.

G4.3.6.3. Tanks

- Alert others who may be endangered, call for back up, and/or use alarm signals (Table G4-1).
- Cut off source to tank, close valves, shut down pumps, and/or eliminate ignition sources.
- Immediately notify EC (Table G2-1).
- Use appropriate protective clothing and equipment.
- Provide for containment of spill if secondary containment berms have been damaged.
- Contain and prevent further migration of any visible release to the environment outside of containment and provide for removal and proper disposal of visibly contaminated soil or surface water.
- After quantity and character of spill has been determined, transfer remaining contents of leaking tank and spilled material in sumps or bermed area to an appropriate storage/treatment tank.
- Immediately remove tank involved in spill or release from service if tank is leaking or unfit for use and follow procedures in WAC 173-303-640(7).
- Assess reason for leak or rupture.
- Determine notification requirements per Table G3-1.
- Procedures for tank repair:
  a. Transfer remaining material from tank to another compatible tank.
  b. Air ventilate for 24 hours.
  c. Use volatile organic vapor detector to verify no volatile vapors are present. Use confined space entry procedures for internal repairs, conducted by permit only for internal repairs.
  d. For internal repairs, clean tank with wire brush, pressure washer, or steam cleaner (for organics). Capture rinsate water for treatment.
  e. Specific repairs to a tank system must be certified by an independent, qualified, registered, professional engineer for compliance with 40 CFR 264.196(f) and WAC 173-303-640(7)(f). This certification must be submitted to Ecology within 7 days after returning the tank system to use (see Secton F2.4, Tank Condition Assessment).

G4.3.6.4. Transfer Lines and Piping

- Alert others who may be endangered, call for back up, and/or use alarm signals (Table G4-1).
- Cut off flow, close valves, and/or shut down pumps.
- Use appropriate protective clothing and equipment.
- Immediately notify EC (Table G2-1).
- After quantity and character of spill has been determined, transfer spilled material in sumps or bermed area to an appropriate storage/treatment tank.
- Determine notification requirements per Table G3-1.
- Specific repairs to transfer lines and piping must be approved by the Engineering Department and EH&S Department for compliance with 40 CFR 264.196(f) and WAC 173-303-640(7)(f).

G4.3.6.5. Releases to Air

- Alert others who may be endangered, call for back up, and/or use alarm signals (Table G4-1).
- Move people from downwind.
- Immediately notify EC (Table G2-1).
- Use appropriate protective clothing and equipment.
- Eliminate ignition sources.
- Control emissions by cutting off source.
- Determine notification requirements per Table G3-1.

NOTE: The systems designed to control emissions from tanks and containers are described in Section D, Process Information, and in Appendix D-10, Air Quality Program.

G4.3.7. Seismic Event

- Alert others who may be endangered, call for back up, and notify EC and/or corporate personnel.
- Use appropriate protective clothing and equipment.
- If a release has occurred; cut off source, contain and control.
- Assess damage to equipment and containment structures.
- If necessary, transfer wastes to an authorized off-site facility.
- Determine notification requirements per Table G3-1.

NOTE: The seismic design work for the tanks and tank and container containment structures is described in Section D, Process Information.

G4.3.8. Non-Permitted Discharge to Sewer

- Cut off flow, close valves, and/or shut down pumps.
- Immediately notify EC (Table G2-1).
- Record event, noting quantity, source, and duration of release.
- Determine notification requirements per Table G3-1.

G4.3.9. Flooding Conditions

- Alert others who may be endangered, call for back up, and/or use alarm signals (Table G4-1).
- Use appropriate protective clothing and equipment.
- Eliminate ignition sources and shut down operations.
- Immediately notify EC (Table G2-1).
- Use portable pumps to remove excess water from sumps and/or secondary containment areas; pump to appropriate storage/treatment tank or tank truck.
- Assess damage to equipment and containment structures.
- If necessary, transfer wastes to an authorized off-site facility.
- Determine notification requirements per Table G3-1.

In the event Stericycle is notified of impending worst case flooding, the following actions will be taken depending on severity:

- Place light-weight containers that could be subject to movement by flood waters (e.g., labpacks, loosepacks, aerosols, debris in supersacks, etc.) and container types that could be compromised by water saturation (e.g., fiber drums or cardboard boxes) onto trailers for direct shipment to end disposal facilities.
- Store all dangerous when wet material in a centralized location that is protected from the weather (e.g., under cover or in a van). The inventory will be monitored and outbound profiles will be in place so that this material can be quickly prepared for out bound shipment to final disposal.
- Any contents in Tanks 5305 and 5306 will be removed, placed in transportation containers and shipped off-site for disposal.

- Any contents of oil/water separators will be pumped to an appropriate tank within the wastewater treatment system. Wastewater tanks are securely affixed with seismic anchoring, and are expected to need no special attention during flooding situations.
- A prep crew of four technicians and two administrative personnel will be on call in the event of an off-shift notification. In the event this team is assembled, four to five drivers will be dispatched to Kent as well.
- Electrical power to critical sources will be cut (e.g., pumps, heat tracing, wastewater treatment plant, etc.).

G4.3.10. Freezing Conditions

- Purge all piping with air to displace liquids and prevent freezing of pipes.
- Close valves at tanks and close valves throughout system to isolate as much of the piping system as possible in the event of breakage due to freezing.
- Wrap insulation (e.g., fiberglass, cloth) around tank valves for protection against freezing.
- Make empty tankage on site available, or arrange for temporary portable tankage, to receive any spilled material as a result of freezing.
- If a spill or release appears likely despite the foregoing preventive measures, notify EC (Table G2-1). Also notify EC of a resulting spill or release of any kind.
- Should a spill/release occur as a result of freezing conditions, follow spill/release response procedures described in the preceding scenarios.
- Determine notification requirements per Table G3-1.

G4.3.11. Damaged Shipments

Damaged or leaking shipment control procedures will be initiated when:

G4.3.11.1. Further transportation would present a hazard to public health or the environment.

G4.3.11.2. The shipment presents an unreasonable hazard to facility operations or to facility personnel.

G4.3.11.3. Control procedures are as follows:

- Alert others who may be endangered, call for back up, and/or use alarm signals (Table G4-1).
- Use appropriate protective clothing and equipment.

- Determine if leak can be stopped readily.
- Immediately notify EC (Table G2-1) who will call in contractor clean-up/control assistance as needed. The contractor will repackage the material to make it suitable for transport with an appropriately-licensed transporter.
- Attempt to contain spills or runoff by use of absorbent materials.
- Contain and prevent further migration of any visible release to the environment outside of containment, provide for removal and proper disposal of visibly contaminated soil or surface water.
- Determine notification requirements per Table G3-1.

G4.3.12. Power Outage

- Discontinue any operation which requires electricity to power engineered exposure controls (e.g., fume hood).
- Discontinue any operation that requires pneumatic actuation except if needed to close up open containers.
- Discontinue any operation that requires illumination.
- Determine notification requirements per Table G3-1.

G4.4. Prevention of Recurrence

WAC 173-303-360(2)(f),(g), 360(2)(i)(i)

G4.4.1. The EC will take all necessary measures to ensure that releases, fires, or explosions do not occur, recur or spread to other parts of the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste and removing and isolating containers. The EC will ensure that no wastes that may be incompatible with the released material will be treated or stored in the affected area. Waste compatibility is determined in accordance with Section C, Waste Analysis Plan.

G4.4.2. If the facility stops operations in response to an emergency (e.g. fire, explosion, or release), then the EC will monitor associated tanks for leaks, pressure build up, gas generation, or leaks and for ruptures in valves, pipes, or other equipment until the emergency has ended and normal operations can resume. Monitoring of affected tanks and equipment may be done visually, or through use of handheld equipment (e.g., FID, PID, LEL, or infrared temperature sensor).

G4.4.3. The EC together with the assistance of Engineering, Operations, and EH&S Departments will evaluate the incident to understand why and how the incident occurred and what future modifications can be initiated to prevent a recurrence of the same or a similar situation. Evaluations will include equipment design, operational procedures, response tactics, and personnel safety. Evaluation will be recorded in a report which includes root cause, contributing causes, and corrective actions. The evaluation report will be submitted to Ecology within 2 months of the incident. This evaluation report is in addition to the 15-day report discussed in Section G9 and will include a more comprehensive evaluation of measures needed and implemented to prevent recurrence of the incident.

G5. EMERGENCY EQUIPMENT

WAC 173-303-340(1), (2), 350(3)(e)

G5.1. Table G5-1 lists the type, location, and description of emergency equipment maintained at the facility. Figure G4-2 shows the locations of emergency equipment and Figure G4-3 shows the locations of fire control equipment. Quantities of emergency equipment listed in Table G5-1 represent minimum stock quantities.

G6. POST-EMERGENCY PROCEDURES

G6.1. Storage and Treatment of Released Materials

WAC 173-303-360(2)(h), 360(2)(i)(i)

G6.1.1. Once the emergency situation has ended the EC will initiate the proper clean up, storage, and treatment of the released material and residues. This will occur as soon as possible in order to minimize potential danger to public health or the environment. The EC also will check to be sure that incompatible wastes are not treated or stored in the affected area while clean up and decontamination procedures are underway.

G6.1.2. Released materials within the secondary containment areas of the facility and loading/unloading pads will be pumped to compatible storage or treatment tanks. Leaking containers will be segregated and placed in overpack drums if

necessary. Refer to Section D3.1.6.7 for management of tanks involved in spills or releases. The released material and the contents of the leaking drums will be transferred to appropriate containers for storage.

G6.1.3. All spill residues and clean-up materials, (including absorbents, diking material, and protective clothing), will be characterized per Section C and consolidated for storage and sent off-site for proper disposal. Water from fire control or flooding will be characterized per Section C and analyzed for discharge permit limits and any additional constituents that are suspected or known to be present prior to processing. A determination of the appropriate management method will be made based on the results of these analyses. If discharge limits are met, and King County has given authorization to discharge, then the liquid will be discharged directly to the sewer system. If discharge limits are not met, or if King County will not authorize discharge, the material will be treated on-site or transported off-site for treatment and/or disposal.

G6.2. Equipment Decontamination and Maintenance

WAC 173-303-360(2)(h)(i)(ii)

G6.2.1. The EC is responsible for initiating and overseeing post-emergency equipment replenishment, maintenance, and inspection prior to resuming operations in the affected area. The entire facility will be inspected after a seismic event.

G6.2.2. All equipment used during the emergency will be decontaminated and readied for future use. Decontamination will be done by steam cleaning and/or triple washing with an appropriate cleaner. All rinsate will be contained and treated on site. Fire extinguishers will be recharged and personnel protective equipment and absorbent materials replenished.

G6.2.3. The emergency equipment available on site is listed in Table G5-1. The inspection of the emergency equipment will be conducted using standard in-plant inspection forms for both emergency and facility-wide equipment (see Section F2.3).

G6.3. Reactivation of Activities in the Affected Area

WAC 173-303-360(2)(j)

G6.3.1. Prior to resuming operations and upon consultation with the EH&S Department, the EC will notify the Washington Department of Ecology that the facility is in compliance with WAC 173-303-360(2)(j). Before operations are resumed in the affected area(s) of the facility all emergency equipment used for the emergency must be cleaned and fit for its intended use and no waste that may be incompatible with the released material may be treated, stored, or disposed of until clean-up procedures are completed.

G6.3.2. Depending on the nature of the incident, Engineering Department personnel will assess whether the incident may have impacted the integrity of any affected containment, tanks, or processing equipment.

G6.4. Personnel Debriefing

The EC, together with the assistance of the facility's Engineering, Operations, and EH&S Departments, will conduct debriefings of plant personnel and local authorities to assess the effectiveness of the preparedness and prevention measures, response activities, control, and evacuation procedures related to the incident. Based on this review the Contingency Plan will be evaluated and updated as needed.

G7. COORDINATION AGREEMENTS

WAC 173-303-340(4), 350(3)(c), 350(4)(b)

G7.1. The Kent Facility has established coordination agreements with local emergency response providers and with state and local emergency response teams. Public agencies and emergency service providers that have entered into coordination agreements are listed below along with their addresses, telephone numbers, and summary statements regarding terms of each coordination agreement.

G7.2. The City of Kent Fire Department will have the most significant role in emergency response and is kept familiar with the Kent Facility operations through several site visits per year, at discretion of the Kent Fire Department.

G7.3. As required in Sections 311 and 312 of SARA Title III, the Kent Facility submits Tier II Emergency and Hazardous Chemical Inventory forms annually to the State and Local Emergency Planning Committees and the Kent Fire Department. The information includes type, quantity, location, physical characteristics, and safety and health information of hazardous materials (product only) stored on site. This information is available to local hospitals, police, and paramedics through the Local Emergency Response Committee.

G7.4. Included in Appendix G-3 is an example letter of arrangement inviting the emergency response agencies/organizations listed below to tour the facility.

G7.5. The agencies/organizations listed below are provided with current copies of the Contingency Plan to familiarize them with the properties of the dangerous waste handled at the facility, the associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes.

Kent Fire Department	DIAL 911 - EMERGENCY
Main Fire Station 24611 116th Avenue SE Kent, WA 98031	(253) 859-3322

The Kent Fire Department is kept familiar with this facility through several site visits per year, including an annual inspection per WAC 173-303-395(1)(d). The Kent Fire Department is capable of assisting in hazardous materials response and has general fire fighting capabilities. Medical response, hospital, and police are contacted as needed via the 911 system for injury or evacuation emergencies. In the event of an emergency requiring evacuation, such decisions will be made and implemented by the fire department after consultation with the Emergency Coordinator.

Kent Police Department	DIAL 911 - EMERGENCY
Kent City Hall 220 South 4th Avenue Kent, WA 98032	(253) 856-5800

The Kent Police Department will provide assistance with traffic and security control in the event of an emergency and will assist in the evacuation of neighboring areas should evacuation be necessary.

Valley Medical Center 400 S. 43rd Street Renton, WA 98055	EMERGENCY:	(425) 228-3450 (425) 228-3450

Valley Medical Center provides emergency medical care to facility personnel exposed to dangerous waste or injured as a result of accidental spills or fire. Valley Medical Center is the primary facility for anyone in need of immediate emergency care 24 hours a day, 7 days a week.

The Work Clinic Highline Medical Plaza 13030 Military Road South Suite 100 Tukwila, Washington 98168	(206) 243-9675

The Work Clinic provides first aid (non emergency) medical care to facility personnel exposed to dangerous waste or injured as a result of accidental spills or fire. The Work Clinic is familiar with the operations at the Kent Facility and with the types of hazardous chemicals treated/stored on site.

Washington Department of Ecology	(425) 649-7000
Northwest Regional Office 3190 160th Avenue S.E. Bellevue, WA 98008	24-HOUR EMERGENCY: (800) 258-5990

The Washington Department of Ecology will be contacted immediately in the event of a reportable spill or release to the environment. All necessary information will be provided as per WAC 173-303-360.

Puget Sound Clean Air Agency	(206) 343-8800
1904 Third Avenue, Suite 105 Seattle, WA 98101	(800) 552-3565

PSCAA will be notified in writing in the event of a reportable hazardous gas release to the ambient air.

King County Industrial Waste Program	
201 S Jackson St, Suite 513 Seattle, WA 98104	(206) 477-5300
1. Renton Treatment Plant Emergency contact after 5:00 p.m.	206-263-1760
2. West Point Treatment Plant Alternate emergency contact after 5:00 p.m.	(206) 263-3801

King County will be immediately notified of any unpermitted, unapproved, and/or accidental discharge to the sanitary sewer. Within five days of the occurrence, a written notification discussing circumstances and remedies will be submitted to King County.

NRC Environmental Services	(206) 607-3000
9520 10th Avenue South, Suite 150 Seattle, WA 98108	24-HOUR EMERGENCY: (800) 899-4672

NRC Environmental Services has agreed to provide emergency response services in the event of an incident beyond the response capabilities of the Kent Facility personnel and equipment.

G8. EVACUATION PLAN

WAC 173-303-350(3)(f)

G8.1. In the event a fire or release of a hazardous material which could endanger the lives of persons inside and/or outside the facility premises occurs, evacuation will proceed according to procedures outlined below. Figure G8-1 shows exit routes and assembly areas to be used during evacuation. Maps indicating the exit routes and assembly areas are posted throughout the facility.

G8.2. The following steps are taken for an evacuation:

G8.2.1. All personnel will be immediately notified of an emergency requiring evacuation to the primary or secondary assembly area (see Table G4-1, Alarm Signals).

G8.2.1.1. The primary assembly area is by the south gate (by South 206th Street);

G8.2.1.2. if primary assembly area is downwind of potentially hazardous emissions, or if the way is blocked by releases of hazardous waste or by fire, the secondary assembly area by the northeast gate (by 77th Avenue South) will be utilized (Figure G8-1).

G8.2.2. At the assembly area, the EC or designee will account for all persons by employee head count and visitor logs.

G8.2.3. Call 911 - Emergency.

G8.2.4. The Kent Fire Department, in conjunction with the EC, will determine the need to evacuate beyond the facility premises.

G8.2.5. Stericycle personnel are stationed at facility access points to prevent unauthorized site access. No one will re-enter the facility during evacuation conditions without the permission of the EC and without the proper protective clothing and equipment.

G8.2.6. Approval of the safe re-occupancy of the facility will be determined by the EC in consultation with the responding emergency service agencies.

G9. INCIDENT REPORTS

WAC 173-303-145, 360(2)(j),(k), 640(7)(d)

G9.1. After an emergency episode requiring the implementation (Section G3) and notification (Section G4.2) outlined in the Contingency Plan occurs, the Kent Facility will complete the following notification requirements:

G9.1.1. The Emergency Coordinator in conjunction with the EH&S Department will immediately notify appropriate agencies of a reportable release, following procedures described in Section G4.2. This includes required notification of a reportable quantity release to the Local Emergency Response Committee and the State Emergency Response Commission as required by 40 CFR 355.

G9.1.2. As required by WAC 173-303-360(2)(k), the Emergency Coordinator will note in the operating record the time, date, and details of any incident that requires implementing the Contingency Plan. The Kent Facility will submit to the Washington Department of Ecology, within 15 days of the incident, a written report detailing the following:

- Name, address, and telephone number of facility owner or operator.
- Name, address, and telephone number of facility.
- Date, time, and type of incident (e.g. fire, explosion).
- Cause of the incident.
- Name and quantity of material(s) involved.
- Extent of any injuries.
- An assessment of actual or potential hazards to human health or the environment, where applicable.
- Estimated quantity and disposition of recovered material(s) that result from the incident.
- Description of corrective action taken to prevent reoccurrence of the incident.

G9.1.3. The Kent Facility will submit in writing as soon as possible, information as outlined in 40 CFR 355.40(b)(1) to the Local and State Emergency Planning Committees. The information shall include an update regarding:

- The chemical name of substance released.
- Whether or not the substance is an Extremely Hazardous Substance.
- An estimate of the quantity released into the environment.
- The time and duration of the release.
- The medium or media into which the release occurred.
- Any known or anticipated acute or chronic health risks associated with the emergency and (where appropriate) advice regarding medical attention necessary for exposed individuals.

- Proper precautions to take as a result of the release, including evacuation.
- Names and phone numbers of persons to contact.
- Summary of actions taken to respond to and contain the release.
- Summary of any known acute or chronic health risks.
- Any advice regarding medical attention necessary for exposed individuals.

G9.1.4. As described in Section G6.3, prior to resuming operations and upon consultation with EH&S Department, the EC will notify the Washington Department of Ecology that the facility is in compliance with WAC 173-303-360(2)(j).

G9.1.5. The Kent Facility will submit a written report to King County Industrial Waste within five days of an unpermitted discharge. The report will contain the following information:

- Circumstances of release.
- Remedies taken.

G9.1.6. In accordance with WAC 173-303-640(7)(d), within 30 days of detection of a release to the environment from the failure of a tank system or secondary containment system, a report will be submitted to the Washington Department of Ecology containing the following information:

- Likely route of migration of the release.
- Characteristics of the surrounding soil (soil composition, geology, hydrogeology, and climate).
- Results of any monitoring or sampling conducted in connection with the release (if unavailable within 30 days, data to be submitted as soon as becomes available).
- Proximity to down gradient drinking water, surface water, and populated areas.
- Description of response actions taken or planned.

Note, this report is in addition to the report required by WAC 173-303-360(2)(k) for an incident resulting in implementation of the contingency plan.

G9.1.7. Stericycle-Kent maintains a log of all incidents, accidents, spills, and releases, including investigations of such an event. This log includes all incidents that trigger notification or implementation of the contingency plan.

G10. AMENDMENTS TO CONTINGENCY PLAN

WAC 173-303-350(5)

G10.1. The Contingency Plan will be reviewed and amended for the following reasons:

G10.1.1. Applicable regulations or the facility permit are revised;

G10.1.2. The plan fails in an emergency;

G10.1.3. The facility changes (in its design, construction, operation, maintenance, or other circumstances) in a way that materially increases the potential for fires, explosions, or releases of dangerous waste or dangerous waste constituents, or in a way that changes the response necessary in an emergency;

G10.1.4. The list of Emergency Coordinators changes;

G10.1.5. The list of emergency equipment changes; or

G10.1.6. Based on review of responses and corrective actions related to incidents.

G10.2. Amendments to the contingency plan will be made according to procedures for permit changes in WAC 173-303-830.

G10.3. Copies of the updated Contingency Plan will be distributed to the emergency agencies listed in Section G7, Coordination Agreements, and to the Kent Facility personnel responsible for its implementation. A master distribution list is maintained at the Stericycle regional office for verification that each agency or facility has the most recent version of the plan.

G11. RECORD KEEPING

The following items will be maintained in the facility operating record:

A copy of the contingency plan and all revisions;

A written record of all incidents that resulted in the implementation of the contingency plan (including time, date, details of incident, and associated response activities);

Signed copies of coordination agreements with emergency response providers, as described in Section G7 (or documentation of refusal of authorities to enter into such arrangements);

Copies of reports submitted to WDOE in response to the detection of a release to the environment from the failure of a tank system or secondary containment system, as required by WAC-173-303-640(7);

LIST OF TABLES

Table G2-1 Emergency Coordinator List

Table G3-1 Agency Notification Matrix

Table G4-1 Alarm Signals

Table G5-1 Emergency Equipment List

TABLE G2-1
EMERGENCY COORDINATOR LIST

Emergency Coordinators	Telephone Numbers: Work	Telephone Numbers: Cellular	Address
Primary			
1. Jerremmy Miller Kent Plant Manager	(253) 872-8030	(253) 778-5791	20245 77th Avenue South Kent, WA 98032
Alternate			
2. Adam Meier Production Plant Supervisor	(253) 872-8030	(253) 709-2856	20245 77th Avenue South Kent, WA 98032
3. Robert Moaalii Environmental Technician	(253) 872-8030	(253) 243-5715	20245 77th Avenue South Kent, WA 98032
4. Chance Guiberson Environmental Technician	(253) 872-8030	(253) 993-6140	20245 77th Avenue South Kent, WA 98032

Note: The Primary EC home address is within approximately 20-30 minutes of driving time from the facility. The Primary and Alternate ECs must be able to direct emergency response activities remotely (e.g., via cell phone, e-mail, or other means).

Table G 3-1 AGENCY NOTIFICATION MATRIX

Incident (as described in Sections G3. 1 and G4.2.)	KFD [1]	NRC [2]	SERC [3]	LEPC [4]	WDOE Spill Line [5]	WDOE HWTR & SKCDPH [6]	PSCAA [7]	KCIW [8]	KPD [9]
Fire/Explosion	Notify regardless of extent or location	Notify only if RQ release to environment	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify regardless of extent or location	Notify only if DW or hazardous substances discharged to air	Notify only if unauthorized discharge to the sanitary sewer	Notify only if evac-uation is needed
Release of DW or hazardous substance that poses a threat to HH/E* regardless of quantity	Notify	Notify only if RQ release to environment	Notify	Notify	Notify	Notify	Notify only if DW or hazardous substances discharged to air	Notify only if unauthorized discharge to the sanitary sewer	Notify only if evac-uation is needed
A spill, release, discharge, or incidence of noncompliance with this permit which has the potential for contamination of soil, surface water, or groundwater, regardless of size	Notify	Notify only if RQ release to environment	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify			Notify only if evac-uation is needed
Release of DW or hazardous substance > 100 lb (12 gallons) or the RQ (whichever is less) when any portion of the release extends beyond secondary containment	Notify	Notify only if RQ release to environment	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify	Notify only if DW or hazardous substances discharged to air	Notify only if unauthorized discharge to the sanitary sewer	Notify only if evac-uation is needed

Table G 3-1 AGENCY NOTIFICATION MATRIX

Incident (as described in Sections G3. 1 and G4.2.)	KFD [1]	NRC [2]	SERC [3]	LEPC [4]	WDOE Spill Line [5]	WDOE HWTR & SKCDPH [6]	PSCAA [7]	KCIW [8]	KPD [9]
Release of DW or hazardous substance >10 lb (1.2 gallons) or RQ (whichever is less) outside of secondary containment	Notify only if threat to HH/E*	Notify only if RQ release to environment	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify	Notify only if DW or hazardous substances discharged to air	Notify only if unauthorized discharge to the sanitary sewer	Notify only if evac-uation is needed
Release of DW or hazardous substance >100 lb (12 gallons) or RQ (whichever is less) inside secondary containment	Notify only if threat to HH/E*	Not required	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify	Notify only if DW or hazardous substances discharged to air	Notify only if unauthorized discharge to the sanitary sewer	Notify only if evac-uation is needed
Natural Disaster at the facility that could threaten human health or the environment	Notify	Notify only if RQ release to environment	Notify	Notify	Notify	Notify	Notify only if DW or hazardous substances discharged to air	Notify only if unauthorized discharge to the sanitary sewer	Notify only if evac-uation is needed
Damaged / Unacceptable shipment resulting in a spill, release, or other discharge of DW or hazardous substance	Notify only if threat to HH/E*	Notify only if RQ release to environment	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify only if threat to HH/E*	Notify	Notify only if DW or hazardous substances discharged to air	Notify only if unauthorized discharge to the sanitary sewer	Notify only if evac-uation is needed

Table G 3-1 AGENCY NOTIFICATION MATRIX

Notes:

*HH/E: human health or environment

(1) KFD: Kent Fire Department	911(emergency) or 253-859-3322 (non-emergency incident notifications only)
(2) NRC: National Response Center	1-800-424-8802
(3) SEPC: State Emergency Response Commission	1-800-258-5990
(4) LEPC: Local Emergency Planning Committee	911
(5) WDOE Spill Line	425-649-7000
(6) WDOE HWTR (Andy Rippert)	360-407-6342
(6) SKCDPH: Seattle King Co. Dept. of Public Health	206-263-9566 (Solid Waste Office)
(7) Puget Sound Clean Air Agency	1-800-552-3565 or 206-343-8800
(8) King County Industrial Waste	206-477-5300 (8a-5p weekdays) or 206-263-1760 (weekends; after 5p weekdays)
(9) Kent Police Department	911 (emergency) or 253-856-5800

TABLE G4-1. ALARM SIGNALS Sheet 1 of 1

METHOD/DEVICE	ACTION/REACTION
Verbal Instruction - Telephone/Intercom (PA)	
- dial 320 on com-line; state location and nature of problem (e.g., fire in solvent area)	- go to area to assist
- dial 320 on com-line; declare evacuation, state which assembly area (primary or secondary) is to be used	- evacuate plant; shut down equipment, proceed to designated assembly area
Audible Signal - Alarm Horn	
-several short (2-3 sec) signals	- need help, come quickly e.g. spill, fire, injury
-one long (10-15 sec) signal; repeat	-evacuate plant; shut down equipment, proceed to primary assembly area
-one short (2-3 sec) signal followed by one long (10-15 sec) signal; repeat	-evacuate plant; shut down equipment, proceed to secondary assembly area
Visual/Verbal Instruction - Hand Signal/Voice	
- hand pulled quickly under chin, shout instructions	- shut down equipment
- directional waving of arms, pointing, shouting of instructions	- emergency situation, e.g., spill, fire, injury, evacuation; proceed as directed

TABLE G5-1 EMERGENCY EQUIPMENT LIST

EQUIPMENT	DESCRIPTION	LOCATION	QUANTITY
Absorbent Material			
1) absorbent pads	-oil absorbent/water repellent or liquid absorbent (20"x 20")	Warehouse	stock 100 total
2) floor sweep	-"super fine," free liquid adsorption, diking, spill containment (50 lb. bags)	Warehouse	stock 10 total
3) floating booms	-absorption, containment of spilled liquid	Warehouse	stock 150 ft
Overpack Drums	- contain leaking drums (85 gal)	Warehouse	stock 10 total
Hand Tools			
1) squeegees	- corral free liquids (18" to 24" blade)	Warehouse	stock 2 total
2) shovels	-spreading, digging -spade and flat blades	Warehouse	stock 4 total
Visqueen (plastic)	-lining boxes, covering piles, diaper trucks -6 mil, 24 x 100 ft rolls	Warehouse	stock 2 rolls
Personal Protective Equipment			

TABLE G5-1 EMERGENCY EQUIPMENT LIST (continued) Sheet 2 of 3

EQUIPMENT	DESCRIPTIONS	LOCATION	QUANTITY
- cartridges	- -acid/organic vapor protection (e.g., 3M 8725), disposable	Warehouse	stock 10 total
- fully enclosed protective suits	-protection from exposures -butyl, disposable	Warehouse	stock 4 total
-) gloves	- protection from exposures (100% nitrile, disposable)	Warehouse	20 pair
Portable Transfer Pumps	-1 to 3 inch air-powered diaphragm -liquid removal and transfer	various locations throughout facility	stock 1 total
Portable Transfer Hoses	-liquid removal and transfer -2 to 4 inch cross-link polyethylene	various locations throughout facility	stock 100 feet total
Fork Lifts	-general use, equipped with a drum handling attachment and rotating platform for inverting/dumping tub skids	container storage areas, tank system	stock 2 total
Fire Blankets	suppression of fires	Warehouse	stock 1 total
First Aid Kits	-on site first aid, minor injuries	see Fig. G4-4	see Fig. G4-4
Emergency Showers and Eye Wash Stations	-decontamination, emergency aid -located at potential exposure areas	see Fig. G4-4	see Fig. G4-4
Fire Hydrants	- fire control water supply	see Fig. G4-5	see Fig. G4-5

TABLE G5-1 EMERGENCY EQUIPMENT LIST (continued) Sheet 3 of 3

EQUIPMENT	DESCRIPTION	LOCATION	QUANTITY
Sprinkler System	-fire suppression	Warehouse	
Fire Extinguishers	-portable, multi-purpose size and type: A=ordinary combustible, B=flammable liquids, C=electrical, D=combustible metals	see Fig. G4-5	see Fig. G4-5
Plant Phone/Intercom and Public Address (PA) Speakers	-plant wide voice communications -warnings and directions -all phones capable of intercom access and outside dialing	see Fig. G4-1	see Fig. G4-1
Alarm Horns	-air supply horns -audible up to one mile away	see Fig. G4-1	see Fig. G4-1
Emergency Lighting and Lanterns	-AC/battery units in enclosed bldgs, lanterns outside throughout plant	enclosed bldgs. and throughout plant	
Spill Kits	-each kit contains the following: • 2 bags absorbent • 1 bag absorbent pads • 1 bag rags • 1 shovel • 1 broom and dust pan	see Fig. G4-4	see Fig. G4-4
Barrier Tape	-sealing off areas; day-glow, high visibility, printed with caution warning	Warehouse	stock 200 feet
Handheld Monitoring Equipment	photoionization detector (PID) or flame ionization detector (FID) LEL meter infrared temperature sensor	Plant Manager's Office Plant Manager's Office Plant Manager's Office	1 unit 1 unit 1 unit

LIST OF FIGURES

Figure G1-1 Facility Access Routes

Figure G1-2 Facility Site Plan

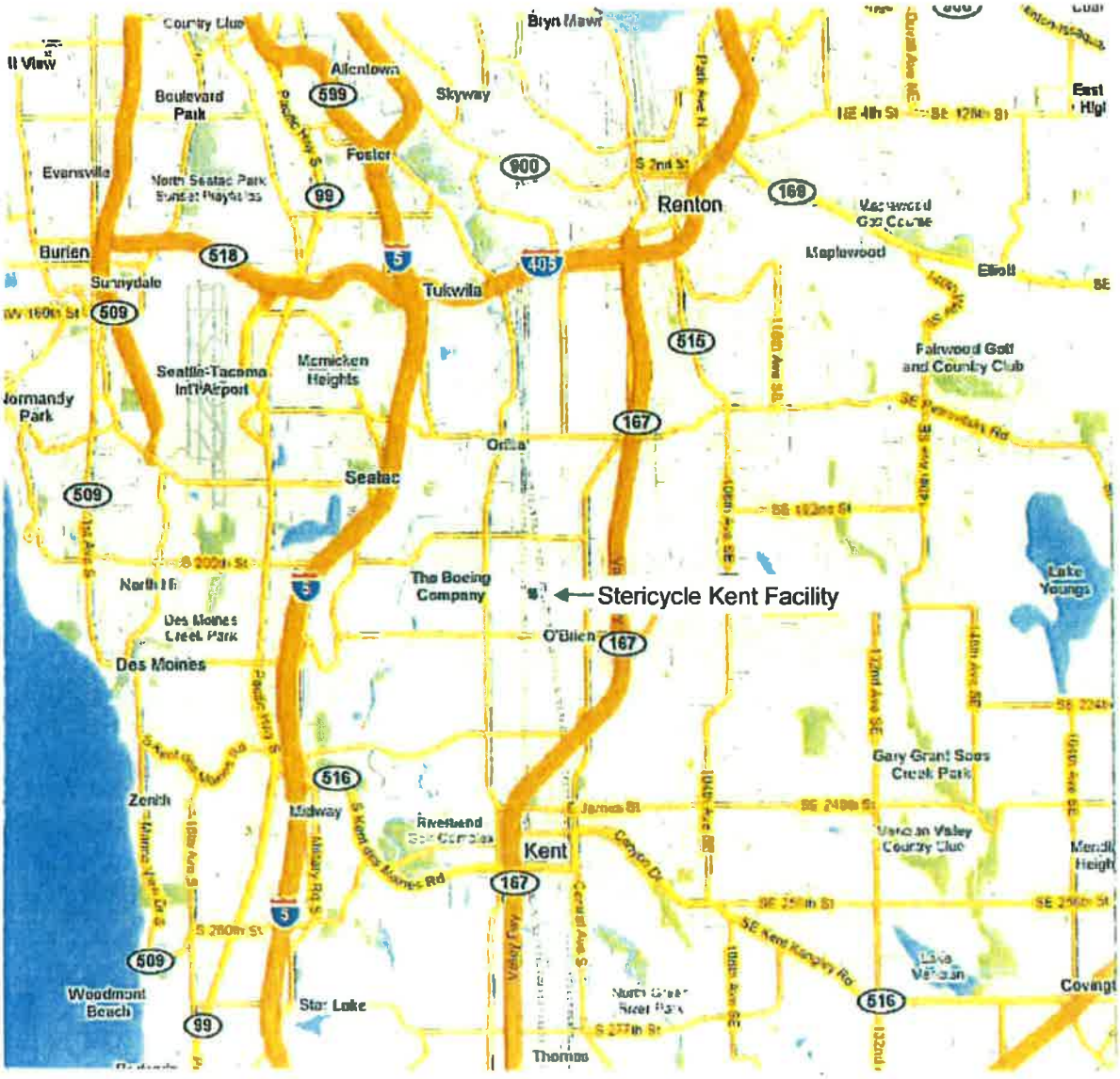
Figure G1-3 DW Management Areas

Figure G4-1 Location of Telephones, Intercoms and Alarm Horns

Figure G4-4 Location of Emergency Equipment

Figure G4-5 Fire Control Equipment

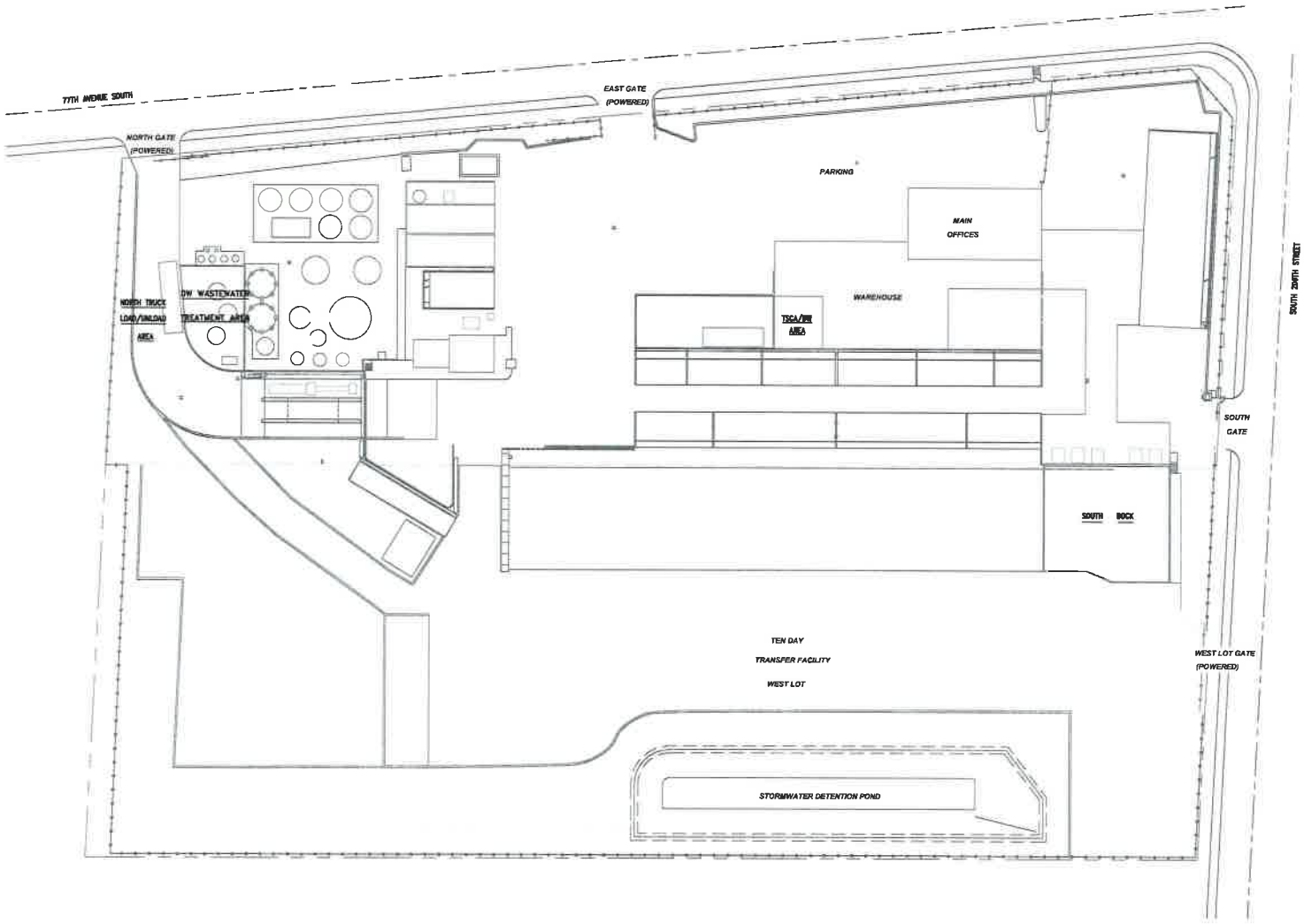
Figure G8-1 Facility Exits and Assembly Areas



North

(not to scale)

Stericycle Kent Facility
Facility Access Routes
Figure G1-1

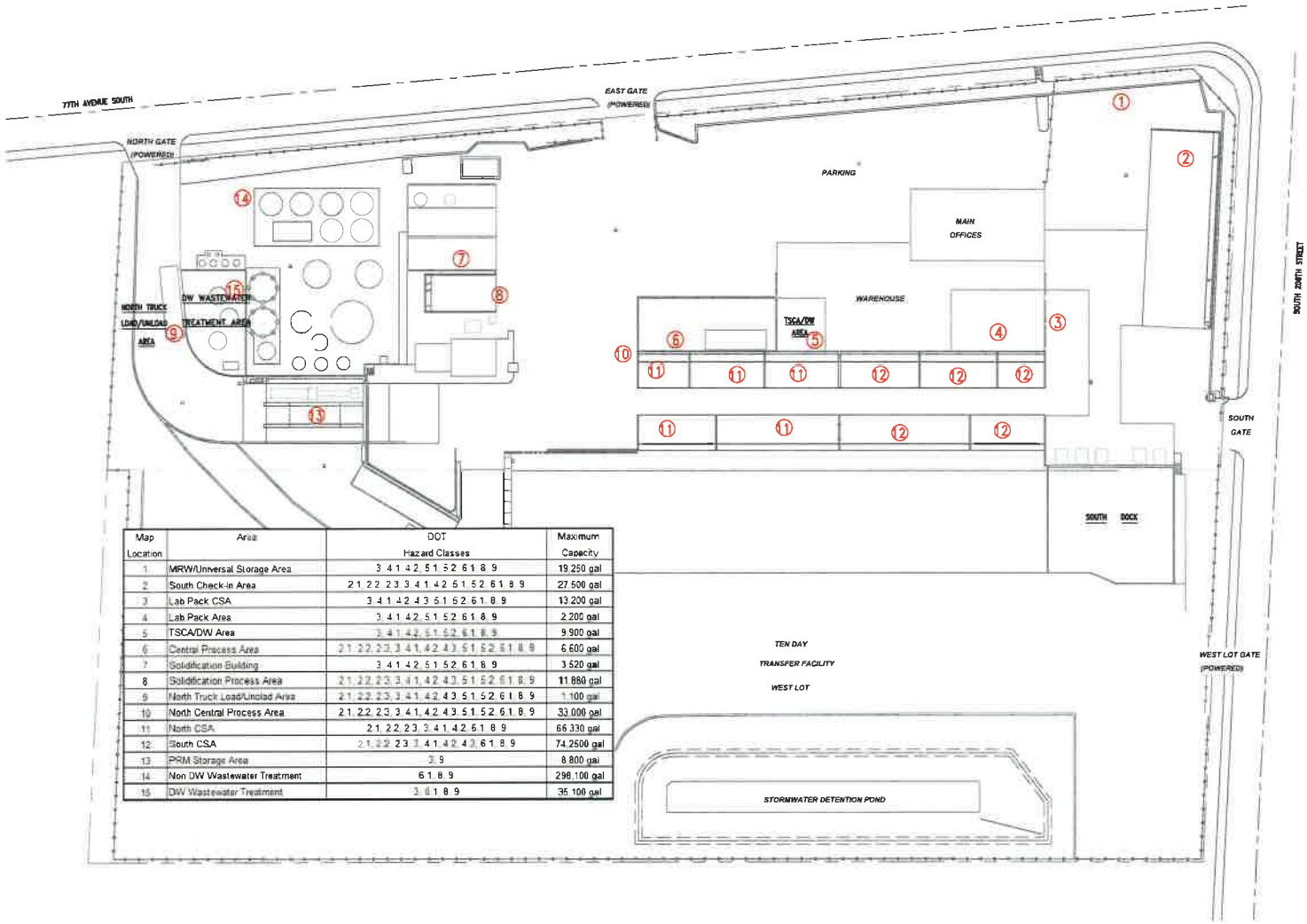


Stericycle

TITLE:
Facility Site Plan

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: G1-2	
DATE: 8/6/15	REV.:		



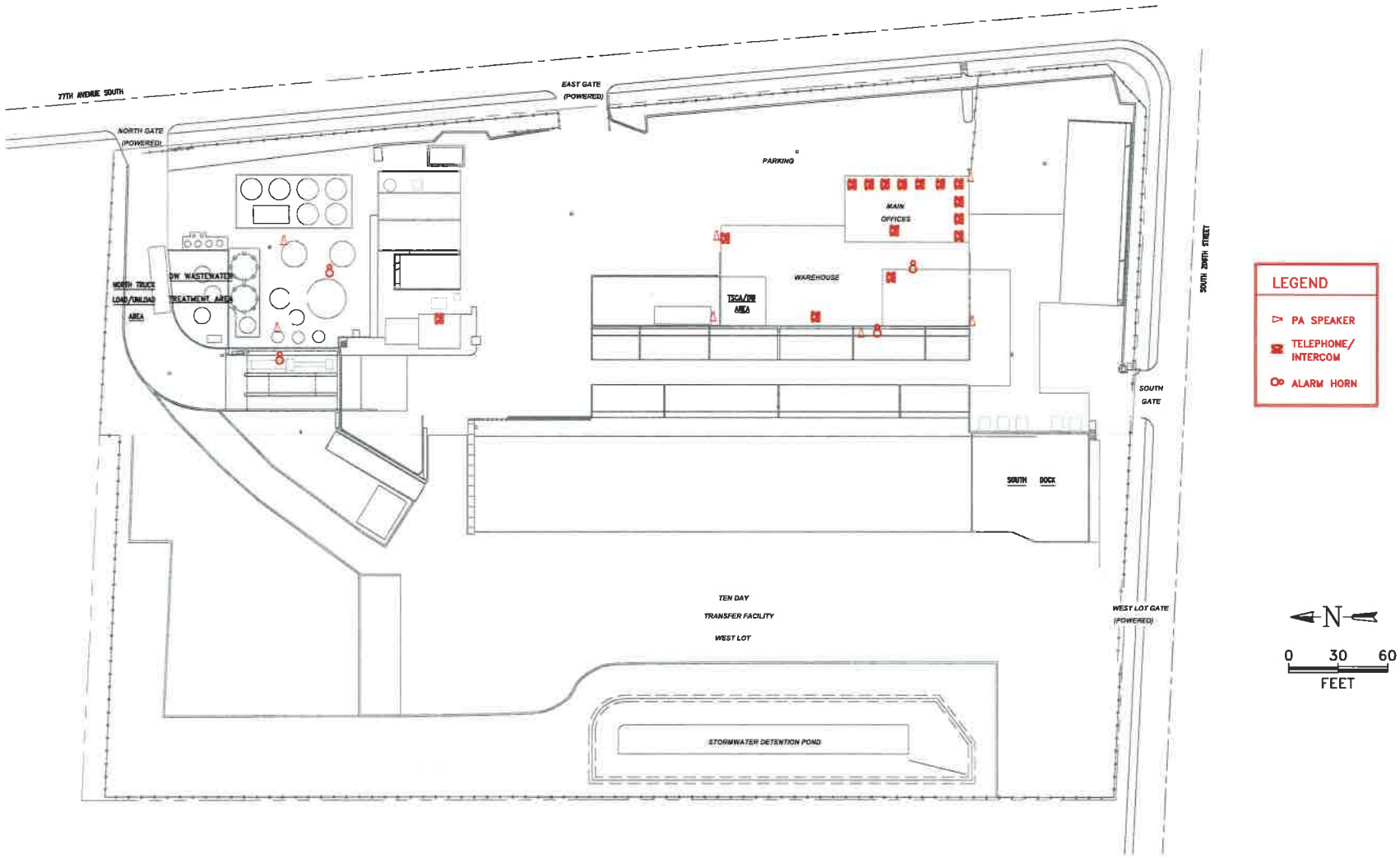
Map Location	Area	DOT Hazard Classes	Maximum Capacity
1	MRW/Universal Storage Area	3, 4.1, 4.2, 5.1, 5.2, 6.1, 8, 9	19,250 gal
2	South Check-In Area	2.1, 2.2, 2.3, 3, 4.1, 4.2, 5.1, 5.2, 6.1, 8, 9	27,500 gal
3	Lab Pack CSA	3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8, 9	13,200 gal
4	Lab Pack Area	3, 4.1, 4.2, 5.1, 5.2, 6.1, 8, 9	2,200 gal
5	TSCA/DW Area	3, 4.1, 4.2, 5.1, 5.2, 6.1, 8, 9	9,900 gal
6	Central Process Area	2.1, 2.2, 2.3, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8, 9	6,600 gal
7	Solidification Building	3, 4.1, 4.2, 5.1, 5.2, 6.1, 8, 9	3,520 gal
8	Solidification Process Area	2.1, 2.2, 2.3, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8, 9	11,880 gal
9	North Truck Load/Unload Area	2.1, 2.2, 2.3, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8, 9	1,100 gal
10	North Central Process Area	2.1, 2.2, 2.3, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8, 9	33,000 gal
11	North CSA	2.1, 2.2, 2.3, 3, 4.1, 4.2, 6.1, 8, 9	66,330 gal
12	South CSA	2.1, 2.2, 2.3, 3, 4.1, 4.2, 4.3, 6.1, 8, 9	74,2500 gal
13	PRM Storage Area	8, 9	8,800 gal
14	Non DW Wastewater Treatment	6.1, 8, 9	298,100 gal
15	DW Wastewater Treatment	3, 6.1, 8, 9	35,100 gal

Stericycle

TITLE:
DW and MRW Management Areas

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: G1-3	
DATE: 8/6/15	REV.:		

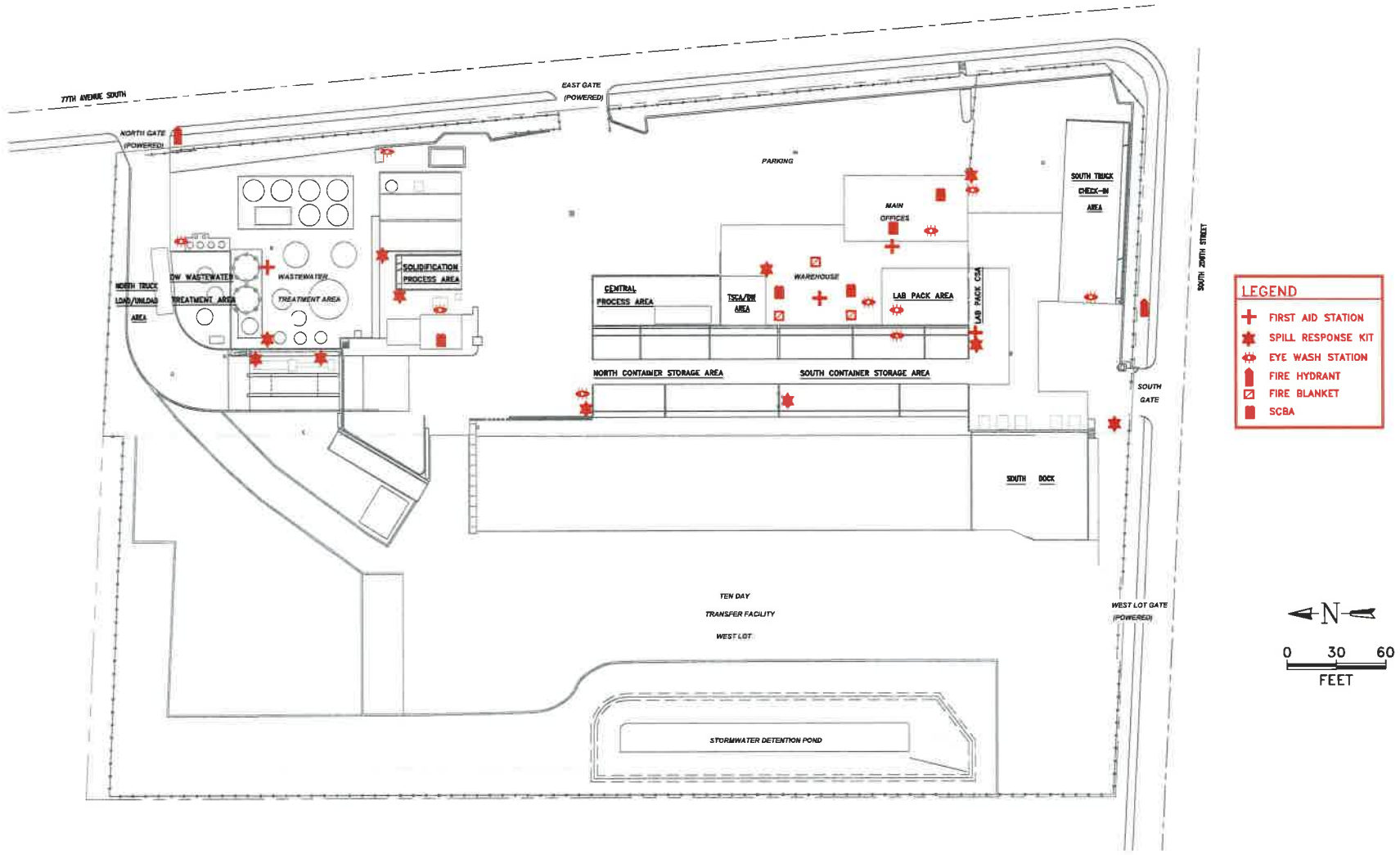


Stericycle

TITLE:
Facility Locations of Telephones, Intercoms, and Alarm Horns

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: G4-1	
DATE: 8/6/15	REV.:		

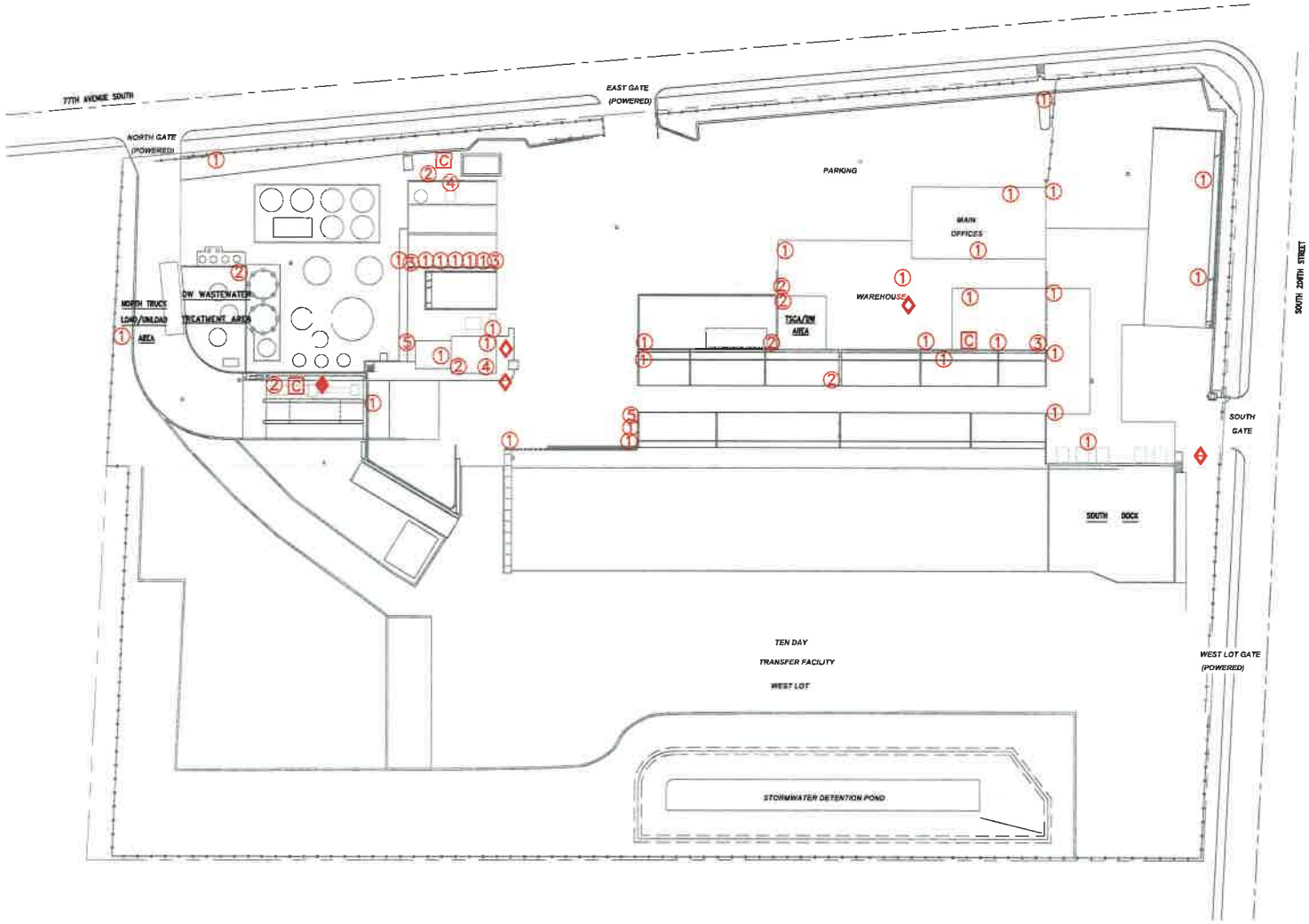


Stericycle

TITLE:
Facility Locations of Emergency Equipment

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:		
DATE: 8/6/15	REV.:	FIGURE NO.: G4-4	



LEGEND

- (1) 10LB 'ABC' FIRE EXTINGUISHER
- (2) 20LB 'ABC' FIRE EXTINGUISHER
- (3) 20LB 'D' FIRE EXTINGUISHER
- (4) 20LB CO2 FIRE EXTINGUISHER
- (5) 27LB 'PK' FIRE EXTINGUISHER
- ◇ PORTABLE AFFF FOAM SYSTEM
- ◆ FIXED AFFF FOAM SYSTEM
- [C] FIXED CO2 SYSTEM
- ◈ FIXED H2O CANNON (FIRE DEPARTMENT USE ONLY)

N

0 30 60

FEET

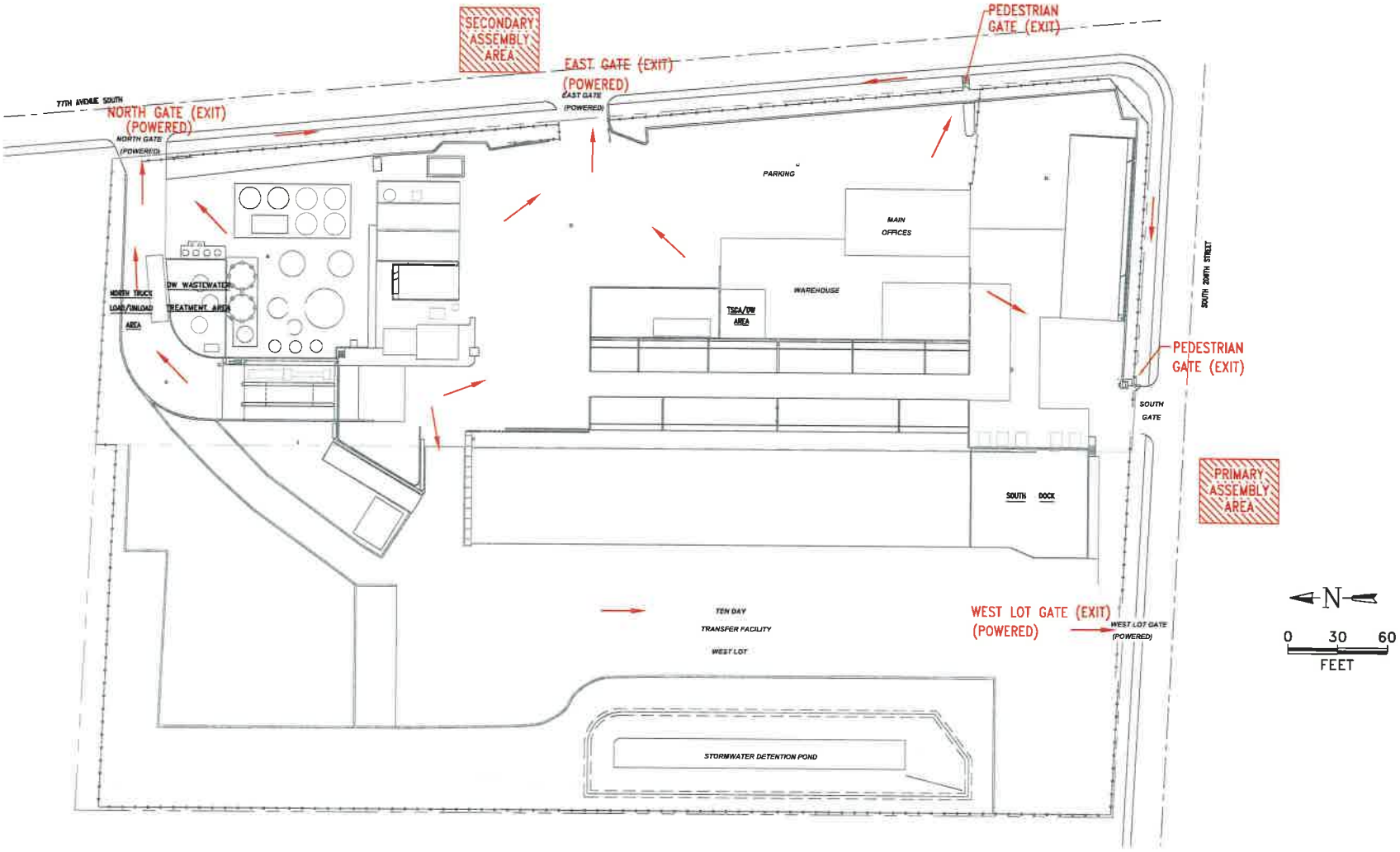
Stericycle

TITLE:

Facility Locations of Fire Control Equipment

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APPD:	FIGURE NO.: G4-5	
DATE: 8/6/15	REV.:		



Stericycle

TITLE:
Facility Exits and Assembly Areas

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:	
CHKD:	APP'D:		
DATE: 8/6/15	REV.:	FIGURE NO.: G8-1	

APPENDIX G-1

LETTER OF AUTHORIZATION - EMERGENCY COORDINATORS

July 2019
To Whom it May Concern:

Stericycle Environmental Solutions, Inc. (Stericycle) LLC hereby grants to the individuals designated as "Emergency Coordinators" or their designees for the control of regulated waste(s) emergencies in the approved Contingency Plan of the Kent Facility, authority to commit such resources of Stericycle as are needed to carry out the Contingency Plan.

James Treloar
Vice President of Plant Operations
Stericycle Environmental Solutions, Inc.

APPENDIX G-2

GENERIC CLEAN-UP PLAN FOR RELEASE TO SOIL

APPENDIX G-2

Generic Clean-up Plan
for Release to Soil

a. Contain and remove excess released material.

b. Based on visual observation of area extent, remove contaminated soil.

c. Take representative samples of spill and background area (as applicable), and of spilled material if necessary.

d. Analyze the samples for appropriate parameters and characteristics of the spilled material (i.e., those believed to be present in the spilled material or associated breakdown products).

e. Based on analysis of the representative samples from spill and background areas, determine if the released material has contaminated the soil beyond the initial excavation and if further excavation of the spill area is needed.

f. If further excavation is necessary, repeat analytic procedures until extent of contamination is determined and further clean-up measures decontaminate the area.

g. Excavated soil will be analyzed to determine the appropriate storage, treatment or off-site disposal measures.

Standard sampling methods (i.e., consistent with WAC 173-303-110), labeling, chain of custody and analytic procedures will be used. Test Methods for Evaluating Solid Waste, SW-846, U.S. Environmental Protection Agency, November 1986, will be used as a guideline.

The spill area will be cleaned up in accordance with the requirements of WAC 173-303-145(3).

APPENDIX G-3

LETTERS OF ARRANGEMENT, COORDINATION AGREEMENTS

The letter provided in this appendix is an example only.

Date

Emergency Service Provider
Address
City, State, Zip

Enclosed is the Stericycle Environmental Solutions, Inc. revised Emergency Contingency Plan for our Kent hazardous waste storage and treatment facility (located at 20245 77th Avenue South, Kent, WA 98032) per WAC 173-303-350 (4)(b). This plan provides information for mitigating and controlling the effects of an uncontrolled fire, explosion or spill originating from the Kent Facility.

You are invited to tour the facility at your earliest convenience. Please indicate that you have received this plan by signing and returning this letter in the addressed envelope provided.

If you have questions, please contact the Kent facility at (253) 872-8030.

Sincerely,

---insert name---
Vice President of Plant Operations
Stericycle Environmental Solutions, Inc.

_____ has received a copy of the Contingency Plan. We have reviewed the capabilities described in Section G7, and agree that we are capable of providing these services.

_____ _____
Date Signature

_____
Title

SECTION H

PERSONNEL TRAINING

SECTION H. PERSONNEL TRAINING

TABLE OF CONTENTS

SECTION			PAGE
H1.	**INTRODUCTION AND GENERAL DESCRIPTION**		**1**
H2.	**ORIENTATION TRAINING**		**3**
H3.	**TASK/PROCESS SPECIFIC TRAINING**		**4**
H4.	**CONTINUING TRAINING**		**5**
	H4.3.	Proficiency Refresher Training	5
	H4.4.	Task/Process Specific Refresher Training	6
	H4.5.	Quarterly Refresher Training	6
	H4.6.	Training Content Review	6
H5.	**TRAINING PROGRAM ADMINISTRATION**		**7**
	H5.1.	General	7
	H5.2.	Training Personnel Qualifications	7
	H5.3.	Training Format	8
	H5.4.	Training Effectiveness Evaluation	8
H6.	**DOCUMENTATION OF TRAINING**		**9**
	H6.2.	Competency Evaluation	9
	H6.3.	Class Roster	10
	H6.4.	Employee Training History	10
H7.	**PERSONNEL DUTIES, JOB DESCRIPTIONS, AND REQUISITE QUALIFICATIONS**		**11**

Tables, Figures, and Appendices are presented
in separate sections following the main body of the text.

LIST OF TABLES

Table H1-1 Training Matrix

LIST OF FIGURES

Figure H7-1 Facility Organization Chart

LIST OF APPENDICES

Appendix H-1 Training Forms

Appendix H-2 Training Course Outlines

H1. INTRODUCTION AND GENERAL DESCRIPTION

WAC 173-303-330, 806(4)(a)(xii)

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as “Stericycle”.

H1.1. The training program conducted by Stericycle prepares personnel to maintain and operate the Kent Facility in a safe manner and in compliance with regulatory requirements, including the dangerous waste permit. The program also prepares personnel to respond effectively in emergency situations.

H1.2. All personnel employed at the Kent Facility undergo training according to this plan. In addition, all personnel who support waste management operations and requirements of the dangerous waste permit (e.g. materials management staff, sales representatives, etc.) must undergo training according to this plan.

H1.3. A copy of the complete training plan meeting the requirements in WAC 173-303-330(2) is kept at the facility at all times. This includes:

H1.3.1. The name of the employee(s) filling each job title listed on Table H1-1.

H1.3.2. The curriculum for each of the required training courses by class title as presented in Table H1-1 is kept in the operating record.

H1.3.3. An outline of training courses listed on Table H1-1 is provided in Appendix H-2.

H1.3.4. Records documenting employees have received and completed the training required by the training plan.

H1.3.5. Documentation and results of annual evaluations of the training programs as outlined in H5.4.2.

H1.4. Stericycle will review the personnel and responsibilities outlined in the training plan annually. Any updates identified during this review will be distributed as required by the Part B Permit.

H1.5. The Kent Facility training plan addresses the following types of training:

- Orientation training (Section H2)
- Task/Process Specific training (Section H3)
- Continuing training (Section H4)

H1.5.1. All new employees involved in the handling and management of wastes receive Orientation training (applicable for the job title as identified in Table H1-1) which introduces a new employee to the management and operations of the Kent Facility and provides an understanding of health and safety principles, applicable permit requirements and environmental regulations.

H1.5.2. Task/Process Specific training is training related to the specific duties of each job title at the Kent facility. Materials Management and Sales personnel not assigned to the Kent facility also receive training relative to waste preacceptance functions.

H1.5.3. In addition, as specified in Table H1-1, every employee involved in or support of the dangerous waste operations of the facility will participate in regularly scheduled continuing training. Employees receive continuing training to maintain proficiency, learn new techniques and procedures, reinforce safety, quality, and compliance consciousness (including current facility permit conditions), and retain accumulated knowledge.

H1.6. Employees with new job duties will also receive Orientation and Task/Process Specific training courses applicable for the new job title within the timeframes outlined in Table H1-1. The employee will not work unsupervised in the new job title/job duty until training courses relevant to those titles/duties are completed.

H1.7. During non-operational hours (holidays, Saturday and Sunday nights, etc.) a private security guard may patrol the perimeter of the facility. To ensure effective emergency response, the private security person is required to receive training on the orientation of the facility and the contingency plan emergency reporting procedures identified in Table H1-1.

H1.8. The training program is designed to provide employees with training relevant to performance of their respective job activities, as summarized in Section H7, Personnel Duties, Job Descriptions, and Requisite Qualifications. Documentation to demonstrate that employees have completed training sessions is maintained using procedures described in Section H6. Training program administration is discussed in Section H5. Refer to Table H1-1, for a description of the training requirements applicable to each job title.

H1.9. Employees that sign Dangerous Waste manifests must receive training in the following classes:

- Check-In Procedures and Discrepancies (AC-0002)
- Incoming Manifest / Problem Manifest (AC-0001)
- Waste Tracking (incl. 45-Day Outbound Manifest) (WT-0005)
- Waste Analysis Plan (LB-0008)
- DOT Shipper (TD-0008)

H2. ORIENTATION TRAINING

WAC 173-303-330(2)(b), 806(4)(a)(xii)

H2.1. All new employees including all personnel who support waste management operations and requirements of the dangerous waste permit receive Orientation training regarding facility operations, regulatory requirements, applicable Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act (WISHA) standards, and health and safety policies. Employees are trained on those Orientation topics which pertain to the specific duties of each job title as outlined under Orientation Training in Table H1-1.

H2.2. The Orientation training has been designed to enable employees to perform their assigned duties in a safe and healthful manner and in compliance with the regulatory requirements including the dangerous waste permit, so as not to endanger themselves or other employees.

H2.3. No employee covered by this plan is permitted to work unsupervised on a task until all required Orientation training and all Task/Process Specific training for that job title is completed per Table H1-1. Employees may only perform the job duties that

they have been trained for per Table H1-1. This training must be completed within the timeframes specified in Table H1-1.

H2.3.1. Prior to beginning any activity at the Kent facility, all new employees are trained in the contingency plan, including emergency procedures, the location and use of emergency equipment, evacuation routes, and emergency systems that relate to their area of responsibility.

H2.3.2. Operations staff receive additional training in specific emergency procedures required in their work area which includes, but is not limited to:

- Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;
- Key parameters for automatic waste feed cut-off systems;
- Communications or alarm systems;
- Response to fires or explosions;
- Response to ground-water contamination incidents;
- Operation shutdown;
- Use of facility emergency equipment; and,
- Response to flammable liquid spills.

H2.3.3. At least annually, a drill based on the contingency plan will be conducted to evaluate facility readiness and provide additional training based on possible emergencies. The Kent Fire Department will be encouraged to participate in these emergency drills.

H3. TASK/PROCESS SPECIFIC TRAINING

WAC 173-303-330(1)(a)(c)(ii) & (d), (2)(b), 806(4)(a)(xii)

H3.1. In addition to Orientation training, all new employees and employees assuming new duties must successfully complete Task/Process Specific training relevant to their job title in the areas of waste identification and record keeping, dangerous waste management/facility operations, lab procedures and protocols, and release prevention and emergency response. Task/Process Specific training correspond to Job Titles/Job Duties in Table H1-1.

H3.2. No employee covered by this plan is permitted to work unsupervised on a task until all relevant Orientation training and all Task/Process Specific training for that job title is completed per the schedule in Table H1-1.

H3.3. Competency is evaluated by the employee's immediate supervisor or other qualified employee through any or all of the following as applicable to the training topic: oral and written testing, practical exercise, and/or observation and supervised demonstration of ability. While task-oriented topics require physical demonstration of competency to be approved by an authorized employee (Plant Supervisor, etc.), concept based topics require the employee to demonstrate a comprehensive understanding of concepts during the training course, (quiz, etc.). Additional information regarding the evaluation of competency is provided in Section H6.2.

H4. CONTINUING TRAINING

WAC 173-303-330(1)(b) & (2)(b), 806(4)(a)(xii)

H4.1. The Kent Facility also conducts a continuing training program. Continuing training is designed to maintain proficiency in job skills, increase safety, quality, compliance consciousness, ensure employee knowledge retention, and teach new skills. Training topics are selected based on the particular needs of the facility employees. The required continuing training Class Titles/Training Courses are presented in Table H1-1.

H4.2. Continuing Training requirements are also based on the employee's job title as outlined in the previous section. Should an employee change job title, work-site or department, additional training requirements will be added according to the initial schedule, and refresher training is provided according to the needs of the new job title. The Kent Facility has instituted a refresher training schedule similar to the introductory training schedule outlined in the previous section. Under this schedule, training topics are required per the schedule outlined in Table H1-1.

H4.3. Proficiency Refresher Training

H4.3.1. General training topics initially covered in Orientation Training (Section H2) are refreshed in Proficiency Refresher Training. Orientation training topics and associated refresher schedules are listed in Table H1-1.

H4.3.2. Every employee involved in dangerous waste treatment or storage operations receives eight hours of annual refresher training in compliance with 29 CFR 1910 (OSHA) and WAC 296-843-20030 (WISHA). This training updates previous 40 Hour HAZWOPER training, and is based on the sub-topics listed under 8-Hour HAZWOPER Refresher Training in Appendix H-2.

H4.4. Task/Process Specific Refresher Training

Topics initially covered in Task/Process Specific training are periodically refreshed as indicated by the schedule column in Table H1-1. Some of the topics may repeat material covered in the 8-hour refresher but are covered in more depth in refresher training.

H4.5. Quarterly Refresher Training

For purposes of emergency preparedness and safety, key training topics are refreshed at least quarterly. These topics are:

- Contingency Plan (w/ Fire Training, Emergency Equipment, On-site Spill Management) (ER-0001)
- Personal Protective Equipment (HS-0007)
- PUSO (“Process Under Supervision Only”) (HS-0017)

Table H1-1 identifies the required training courses for each job title.

H4.6. Training Content Review

H4.6.1. As changes in pertinent regulations are identified, and/or changes in operations procedures occur, current compliance status and procedures are reviewed. If necessary, course curriculums including relevant SOPs is revised and employees are retrained on the pertinent topics.

H4.6.2. At a minimum, all current course curriculum including relevant SOPs are reviewed by the Operations and EH&S Departments on an annual basis. Significant revisions require timely retraining while minor corrections will be covered under the regular refresher schedule.

H5. TRAINING PROGRAM ADMINISTRATION

WAC 173-303-330(1)(a)

H5.1. General

H5.1.1. The Plant Manager has overall responsibility for directing the training program. The Plant Manager is knowledgeable in dangerous waste management procedures, as required by WAC 173-303-330 (1)(a), and with the assistance of the Plant Supervisor and EH&S, will oversee the administration of the training including training record maintenance, coordination of trainers, and competency evaluation. Responsible EH&S or Operations Management personnel designate qualified instructors, approve the training program content and format, and provide the necessary resources to ensure an effective training program is maintained.

H5.1.2. The selection of qualified trainers, use of effective training formats, and establishment of meaningful methods for evaluating employee's learning are described in the following sections.

H5.2. Training Personnel Qualifications

WAC 173-303-330(1)(a)

H5.2.1. Introductory and Refresher training conducted by management level personnel or an in-house expert with broad experience in the specific field and who is skilled in the current methods of performing the task. These in-house experts may include plant operators, plant managers and supervisors, safety specialists, engineers, chemists or other professionals. For example, training sessions related specifically to waste management are directed by a person trained in dangerous waste management procedures.

H5.2.2. In some cases, training may be performed by off-site experts. An example of this would be 40-Hour HAZWOPER training (OP-0002). Upon request, Stericycle-Kent will provide Ecology qualifications of any prospective trainer.

H5.3. Training Format

H5.3.1. Training is conducted in meetings, small discussion groups, classroom settings or at the employee's work-site. Lectures, plant tours, visual media and field demonstrations are also used as training methods. Much of the training is on-the-job training performed at the site, using actual equipment under actual job conditions with close supervision.

H5.3.2. Most training courses (especially Task/Process Specific topics) have an associated Standard Operating Procedures (SOP) document which serves as the primary training document with detailed procedural descriptions and references to additional training material and permit requirements. SOPs and the complete training curriculum for each class will be maintained in the operating record, and an outline showing the key elements of training courses is provided in Appendix H-2. Applicable federal, state, local regulatory and permit requirements are accessible. Programmed instruction such as video tapes or printed materials are sometimes used, in which case a representative of Operations or EH&S management is present or accessible to answer questions. Such supplemental material is listed on the main SOP document. For some training, courses and teaching materials developed by experts in the field are used. In addition, some of this training is accomplished by attending seminars, short-courses or college courses.

H5.4. Training Effectiveness Evaluation

H5.4.1. Various evaluation techniques are used to measure a trainee's proficiency level. Examples of evaluation techniques are performance in written and oral exams and careful observation of on-the-job performance. Periodically, employees critique formal training sessions using a training evaluation form. The supervisor determines whether the trainee has mastered the skills at the competency level necessary to perform the tasks described in the job description. The Plant Manager is responsible for ensuring all employees receive all required training in the timeframes specified.

H5.4.2. In addition, the training program itself is evaluated annually by EH&S and Operations Management personnel. This review will address the effectiveness of training materials, instructional methods, and subject matter, and will

determine if revisions to the training curriculum are required as a result of changes to operations, emergency procedures, waste types handled, permit conditions, or regulations. As needed, new and useful instructional material is incorporated to improve the quality and effectiveness of the training program.

H5.4.3. An evaluation of training effectiveness will also be conducted as part of any incident investigation, or in the event of any significant non-compliance issues identified. An assessment will be made as to whether the incident or non-compliance was the result of the responsible employee's lack of knowledge or lack of concern. If lack of knowledge is found to be a root cause of the incident, the relevant training material will be assessed for adequacy by EH&S and Operations Management personnel, and modified as needed.

H6. DOCUMENTATION OF TRAINING

WAC 173-303-330(2)(b)(c)&((3)

H6.1. Training records of employees at the facility and other positions described in Table H1-1, are maintained in the operating record. Training records of former employees are kept at least three years from the date the employee last worked at the facility. Training records of current personnel are kept at the site until closure of the facility. For at least three years after closure of the facility, personnel training records will be kept at the corporate offices.

H6.2. Competency Evaluation

H6.2.1. The level and amount of training for each employee is tailored to the duties and responsibilities of that employee, the employee's education, job-experience and other qualifications. Employees are trained in all orientation class titles specified for their particular job title, and are trained in specific job titles/job duties prior to being allowed to perform such job titles/job duties unsupervised (see Table H1-1). Each employee is appropriately trained and competency evaluated on each topic. Competency evaluation may include testing for comprehension relating to a conceptual topic (e.g., regulatory training), or for a manual operation, supervision by a worker skilled in that specific operation would be required prior to allowing the employee to work unsupervised.

H6.2.2. Facility management level personnel (e.g. Plant Manager and Plant Supervisor) have a responsibility to train personnel in facility operations and procedures. Task/Process Specific training is conducted by operations personnel who have demonstrated experience and expertise in the particular task.

H6.3. Class Roster

Documentation of completed training is provided by a class sign-in roster that is distributed during each meeting which records attendance at training sessions. The roster contains the class title of the training topic (which for required training corresponds to a class title (training course) in Table H1-1), the instructor, date, and a list of attendees, their job titles, attendees' signatures, and the authorization signature of a person qualified to approve the training and its evaluation of competency. When the training has been completed, the form is approved by the Plant Manager or his/her designee. This form is shown in Appendix H-1, and completed forms are kept in the operating record.

H6.4. Employee Training History

H6.4.1. A personal training history for each facility employee is kept at the facility. All training outlined in Table H1-1 (including Orientation, Task/Process Specific introductory and continuing training), is recorded. The personal training history is accessible from records and lists all the training completed by the employee from hire date forward. This history is updated quarterly in each employee's file at the facility to include recent training.

H6.4.2. Training history and records for Materials Management, Private Security Guard, EH&S, and Technical Sales Representative positions must be furnished upon request and made available at all reasonable times for inspection.

H6.4.3. In addition to the Employee Training History, training records include copies of certificates of attendance at seminars. The electronic and physical training records, supported by signatures kept in the master class roster file serve as documentation that the required training for each employee has been satisfactorily completed.

H7. PERSONNEL DUTIES, JOB DESCRIPTIONS, AND REQUISITE QUALIFICATIONS

WAC 173-303-330(2)(a)

This section contains the job descriptions for positions involved with the handling and/or management of dangerous wastes at the Kent Facility. These job descriptions identify the responsibilities, duties, and requisite qualifications of each position. The facility organization chart shown in Figure H7-1 depicts the reporting relationships of all job positions related to the management of dangerous wastes at the facility. A list of the names of each person filling each position is kept with the written training plan in the facility operating record.

JOB TITLE: Regional Vice President of Facility Operations

REPORTS TO: Vice President of Facility Operations

FUNCTION: Direct the overall operations of the plants to ensure facilities are safe, are in compliance with all applicable federal, state and local regulations and are operated as efficiently and profitable as possible.

DUTIES:

Ensure adequate personnel and resources are available to support Stericycle principles by providing direction and support to plant management and continually assess the plants' processes, expenses, procedures, equipment and personnel needs.

Conduct periodic facility inspections and evaluate present procedures and processes to ensure compliance with all applicable federal, state and local regulations as well as all Company policies, directives, standards, procedures, and commitments.

Review regulations and assist EH&S in the drafting and review of permits affecting the facilities to continuously improve all aspects of our health, safety, and environmental performance.

Provide cost analysis of material treatment and disposal methods including review of charges and billings to ensure accuracy.

Assist with the research and purchase of equipment to improve the efficiency of operations and provide instruction, equipment and training to ensure employees have the skills and equipment to perform their jobs safely and in a compliant manner.

Assist with the research, development and implementation of new treatment processes to ensure employees are knowledgeable about any potential or known hazards and take all necessary precautions.

Review profiles and recommend treatment methods and charges.

Conduct our activities in a manner, which protects the well being of our employees, the public, and the environment, by focusing on preventative measures and interact with regulatory agencies and community representatives to promote the services and reputation of the company.

Oversee the plants' training program to ensure all employees are properly trained and encourage employees to identify health, safety, and environmental risks and participate in the development of appropriate solutions.

Direct the plant operations to ensure equal opportunity is provided to all employees and applicants for employment and that the Affirmative Action goals are actively supported.

SPECIFIC SKILLS REQUIRED:

Thorough working knowledge of all facility operations. Good knowledge of federal, state and local regulations. Ability to express self effectively, both verbally and in writing. Ability to establish effective working relationships with operational groups and regulators.

EDUCATION AND EXPERIENCE REQUIRED:

Bachelor's degree in a related field or equivalent training and experience. Minimum 5 years progressively responsible experience with a minimum of 3 years management experience in the hazardous waste industry. Extensive training in all related regulations required.

WORKING CONDITIONS:

Outdoor industrial plant environment where there is exposure to dirt, dust, noise, odors, heat and cold, machinery and where there is potential exposure to hazardous chemicals and fumes: 25%

Normal office environment: 75%

OTHER REQUIREMENTS:

Facial hair must conform to requirements for proper fit, seal and function of respiratory equipment.

JOB TITLE: Plant Manager

REPORTS TO: Regional Vice President of Facility Operations

FUNCTION: Manage the day-to-day operations of the plant to ensure the plant operates safely, efficiently and in compliance with company policy and all applicable local, state and federal regulations.

DUTIES:

Manage and control personnel requirements and scheduling to ensure maximum productivity by providing instruction, equipment and training to ensure employees have the skills and equipment to perform their jobs safely and in a compliant manner.

Conduct and/or coordinate plant tours for customers, regulatory agencies, employees and other approved visitors.

Coordinate material flow including scheduling, receiving, sampling and analysis, treatment, transfer, sewer discharge and off-site disposal to meet the requirements of all Company policies, directives, standards, procedures, and commitments as well as all applicable laws and regulations and Facility Operating Permits.

Ensure adequate personnel and resources are available to support Stericycle principles to issue routine operating reports to sales/operations departments as needed.

Assist in design, modification and implementation of new or existing material handling equipment and treatment processes to improve both the efficiency of the plant operations and all aspects of our health, safety, and environmental performance.

With assistance and input from other department personnel, develop and implement a personnel training program that will prepare personnel to perform dangerous waste management operations in a safe manner and in compliance with regulatory requirements to ensure employees are knowledgeable about any potential or know hazards and take all necessary precautions. With assistance from other department personnel, maintain employee-training records in the facility operating record.

Oversee compliance with the Hazard Communication Standard including training, availability of safety data sheets (SDS) and proper storage, labeling and handling techniques to conduct plant activities in a manner which protects the well being of our employees, the public, and the environment, by focusing on preventative measures.

Encourage employees to identify health, safety, and environmental risks to develop and enforce job safety practices including use of personal protective equipment, good housekeeping techniques, lock out/tag out procedures, mobile equipment operation, etc. to ensure a safe and healthy work environment for all employees.

Conduct plant inspections to ensure compliance with all permit requirements and applicable local, state and federal regulations and identify and implement corrective action when necessary to continuously improve all aspects of our health, safety, and environmental performance.

Develop the plant operating budget and monitor on an ongoing basis by comparing actual expenses to budget and account for variances.

Maintain all required documents and records in a current, accessible and orderly manner. This includes maintaining training records, reconciling manifest discrepancies, developing waste profile sheets on in-plant generated wastes and other related information. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

Implement and coordinate published Contingency Plan emergency response procedures, as needed, and act as Primary Emergency Coordinator or alternate as appointed. When accidents or incidents occur, identify the cause, review and amend procedures as necessary, and communicate findings with employees.

Direct the operations of the plant ensuring all policies and practices are in compliance with Equal Opportunity regulations and Affirmative Action commitments.

SPECIFIC SKILLS REQUIRED:

Knowledge of chemistry with an emphasis in dangerous waste treatment and handling. Thorough knowledge of all plant operations and equipment. Ability to express self effectively, both orally and in writing. Ability to establish effective working relationships with operational groups, customers and regulators.

EDUCATION AND EXPERIENCE REQUIRED:

Bachelor’s degree or 5-10 years experience in dangerous waste and/or chemical handling procedures. Chemical plant experience desirable. Supervisory experience required. First aid and safety training required.

WORKING CONDITIONS:

Outdoor plant environment where there is exposure to dirt, dust, noise, odors, temperature extremes, machinery and a potential exposure to hazardous chemicals and fumes: 20%

Normal office environment: 80%

OTHER REQUIREMENTS:

Facial hair must conform to requirements of proper fitting and sealing of respiratory equipment.

JOB TITLE: Plant Supervisor

REPORTS TO: Plant Manager

FUNCTION: Responsible for supervising shift supervisors and production personnel and managing daily plant operations to ensure the proper handling of all waste streams and to assist the Plant Manager in ensuring that the plant operates safely, efficiently and in compliance with company policy and all applicable federal, state and local regulations.

DUTIES:

Coordinate material flow including scheduling, receiving, sampling and analysis, treatment, transfer, sewer discharge and off site disposal in a manner, which protects the well being of our employees, the public, and the environment, by focusing on preventative measures.

Ensure adequate personnel and resources are available to support Stericycle principles. Plan, schedule and monitor, daily activities of plant production personnel including the coordination of work assignments between shifts, plant maintenance, troubleshooting operational problems, completion of paperwork, and customer, contractor and inter-department communications.

Provide instruction, equipment and training to ensure employees have the skills and equipment to perform their jobs safely and in a compliant manner.
Encourage employees to identify health, safety, and environmental risks and participate in the development of appropriate solutions. Ensure employees are knowledgeable about any potential or known hazards and take all necessary precautions. Assist in monitoring and presenting the personnel-training program including orientation, on the job training and ensuring that job safety practices are enforced.

Ensure regulatory compliance in all areas of plant by reviewing regulatory certifications and keeping abreast of regulatory requirements, Company policies, directives, standards, procedures, and commitments as well as all applicable laws and regulations and Facility Operating Permits.

Conduct and/or coordinate plant tours for customers, regulatory agencies, employees and other approved visitors.

Report and respond to plant emergencies, as needed. Perform published Contingency Plan emergency response procedures and act as Emergency Coordinator or Alternate as appointed for Stericycle. When accidents or incidents occur identify the cause, review and amend procedures as necessary, and communicate findings with employees.

Assist in the maintenance of all required documents and records in a current, accessible and orderly manner. This includes maintaining training records, reconciling manifest discrepancies, developing waste profile sheets on in-plant generated wastes and other related information to continuously improve all aspects of our health, safety, and environmental performance. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

Perform miscellaneous projects as required.

SPECIFIC SKILLS REQUIRED:

A knowledge of math and science with emphasis in chemistry. Good problem solving and analytical skills. Ability to express self effectively, both orally and in writing. Ability to assume responsibility. Ability to establish effective working relationships with others.

EDUCATION AND EXPERIENCE REQUIRED:

Bachelor's degree in related field or equivalent combination of education and experience. Minimum of 3 years experience in related field. Supervisory experience required. First aid and safety training required.

WORKING CONDITIONS:

Outdoor plant environment where there is exposure to dirt, dust, noise, odors, heat, cold, machinery and potential exposure to hazardous chemicals and fumes: 60%

Normal office environment: 40%

OTHER REQUIREMENTS:

Able to work any shift. Facial hair must conform to requirements of proper fitting and sealing of respiratory equipment.

JOB TITLE: Maintenance Supervisor

REPORTS TO: Plant Manager

FUNCTION: Maintain, install and repair all plant facilities, machinery and equipment.

DUTIES:

Maintain, inspect, test, install, adjust, remove, disassemble, repair and replace plant facilities, machinery and equipment. Report any deficiencies or malfunctions to plant manager

Maintain inventory of repair supplies and requisition materials as needed.

Perform routine service and repairs on mobile equipment including checking oil, fuel, water, tires, brakes, lights, horns. Report defects to plant managerr

Inspect, maintain and repair emergency equipment such as fire extinguishers, spill stations, safety showers, eyewash stations, etc. daily and after use. Report defects and deficiencies to plant manager.

Perform routine maintenance on all equipment including oiling and lubrication of all motors and pumps/agitators and packing on agitator shafts.

Assist in planning modifications and additions to plant facilities and processes. Implement, construct and install related modified or new equipment and processes as planned.

Maintain logs, records and all required forms including daily maintenance log in a current, accessible and orderly manner.

Conform to all safe operating procedures including keeping equipment and work area in a clean and orderly condition, using personal protective equipment, and proper chemical handling, storage and labeling.

Report and respond to emergencies, as needed and in accordance with the Contingency Plan.

Also performs administrative tasks. These tasks include both their standard work (maintenance, preventive maintenance, ordering equipment, etc.) and state, federal and company safety, health and environmental regulatory compliance. These administrative tasks may take a majority or all of the technicians' time during a certain work period. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

EDUCATION AND EXPERIENCE REQUIRED:

High school diploma or equivalent training and experience. Previous experience in welding, machine shop or other industrial maintenance preferred. Chemical plant experience desirable.

SPECIFIC SKILLS REQUIRED:

Good communication and mechanical problem solving skills. Capable of climbing ladders and stairs and able to stand for several hours at a time. Able to lift 100 pounds.

WORKING CONDITIONS:

Outdoor plant environment and normal office environment in an industrial plant where there is exposure to dirt, dust, noise, odors, heat and cold, machinery and where there is potential exposure to hazardous chemicals and fumes: 100%

OTHER REQUIREMENTS:

Facial hair must conform to requirements for proper fit, seal and function of respiratory equipment.

JOB TITLE: Environmental Technician

REPORTS TO: Plant Supervisor

FUNCTION: Perform a variety of duties related to processing and shipping hazardous materials.

DUTIES:

Ship and receive materials in compliance with operational procedures and regulatory requirements. Report discrepancies to supervisory personnel.

Sample all materials, as required, to verify waste stream identification and assure safe and appropriate consolidation, transfer and shipment for disposal operations.

Distribute materials to proper storage and treatment areas.

This includes operating industrial mobile equipment such as forklifts, sweepers, etc. and selecting, inspecting and operating pumps, hoses, fittings, gaskets, and compressors.

Perform segregation, transfer and compacting procedures according to company policies, job safe practices, quality assurance guidelines and in compliance with all applicable regulatory requirements.

Conform to all job safe operating procedures including keeping equipment and work area in a clean and orderly condition, using proper chemical storage, labeling and handling techniques and using personal protective equipment.

Inspect work area for proper storage, labeling, leaks, equipment and material deficiencies and process malfunctions. Report discrepancies to supervisory personnel.

Report and respond to plant emergencies, as needed, and in accordance with the Contingency Plan.

Also performs administrative tasks. These tasks include both their standard work and state, federal and company safety, health and environmental regulatory compliance. These administrative tasks may take a majority or all of the technicians' time during a certain work period. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

EDUCATION AND EXPERIENCE REQUIRED:

High school diploma or equivalent training and experience. Chemical plant experience desirable.

SPECIFIC SKILLS REQUIRED:

Good problem solving and communication skills. Capable of climbing ladders and stairs and able to stand for several hours at a time. Able to lift 100 pounds.

WORKING CONDITIONS:

Outdoor plant environment and normal office environment in an industrial plant where there is exposure to dirt, dust, noise, odors, heat and cold, machinery and where there is potential exposure to hazardous chemicals and fumes: 100%

OTHER REQUIREMENTS:

Facial hair must conform to requirements for proper fit, seal and function of respiratory equipment.

JOB TITLE: Environmental Technician – Waste Water Treatment

REPORTS TO: Plant Supervisor

FUNCTION: Perform a variety of duties related to processing and handling hazardous materials.

DUTIES:

Ship, receive and process materials in compliance with operational procedures and regulatory requirements to meet the requirements of all Company policies, directives, standards, procedures, and commitments as well as all applicable laws and regulations and Facility Operating Permits. Report discrepancies to supervisory personnel.

Sample all materials, as required, to verify waste stream identification and assure safe and appropriate consolidation, transfer and shipment for disposal operations to protect the well being of our employees, the public, and the environment, by focusing on preventative measures.

Participate fully in training to expand knowledge and understanding of EH&S policies and SOPs to distribute materials to proper storage and treatment areas. This includes operating industrial mobile equipment such as forklifts, sweepers, etc. and selecting, inspecting and operating pumps, hoses, fittings, gaskets, and compressors.

Perform segregation and transfer procedures according to company policies, job safe practices, and quality assurance guidelines and in compliance with all applicable regulatory requirements to continuously improve all aspects of our health, safety, and environmental performance.

Understand job responsibilities and comply with all Stericycle EH&S policies and Stericycle SOPs to conform to all job safe-operating procedures including keeping equipment and work area in a clean and orderly condition, using proper chemical storage, labeling and handling techniques and using personal protective equipment.

Inspect work area for proper storage, labeling, leaks, equipment and material deficiencies and process malfunctions. Report both discrepancies and any unsafe act or working condition to supervisory personnel.

Be on the lookout for any risks, equipment, or conditions that may endanger employees or the environment. Report and respond to plant emergencies, as needed, and in accordance with the Contingency Plan.

Also performs administrative tasks. These tasks include both their standard work and state, federal and company safety, health and environmental regulatory compliance. These administrative tasks may take a majority or all of the technicians' time during a certain work period. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

EDUCATION AND EXPERIENCE REQUIRED:

High school diploma or equivalent training and experience. Chemical plant experience desirable.

SPECIFIC SKILLS REQUIRED:

Good problem solving and communication skills. Must be capable of climbing ladders and stairs and able to stand for several hours at a time. Also, be able to lift 100 pounds.

WORKING CONDITIONS:

Outdoor plant environment and normal office environment in an industrial plant where there is exposure to dirt, dust, noise, odors, heat and cold, machinery and where there is potential exposure to hazardous chemicals and fumes: 100%

OTHER REQUIREMENTS:

Facial hair must conform to requirements for proper fit, seal and function of respiratory equipment.

JOB TITLE: Laboratory Manager

REPORTS TO: Plant Manager

FUNCTION: Manage the day-to-day operations of the plant laboratory to ensure the laboratory operates safely, efficiently and in compliance with company policy and all applicable local, state and federal regulations.

DUTIES:

Manage laboratory analytical functions and other facility laboratory operations including sample tracking, records keeping, result communication, and proper sample disposal in accordance with the facility Waste Analysis Plan, Chemical Hygiene Plan, and all other applicable Environmental and Health & Safety regulations.

Manage laboratory staff including scheduling daily work activities, overseeing operations to ensure required work is completed in a timely manner.

Assist facility and other department personnel with the development and implementation of the personnel training program, to prepare personnel to perform dangerous waste management operations in a safe manner that is in compliance with regulatory requirements.

Assist Operations, Sales, and Materials Management department personnel by providing material information and treatability assessment information. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

Provide assistance as needed conducting plant tours for customers, regulatory agencies, employees and other approved visitors.

Oversee compliance with the Hazard Communication Standard including training, availability of safety data sheets (SDS) and proper storage, labeling and handling techniques to conduct plant activities in a manner which protects the well being of our employees, the public, and the environment, by focusing on preventative measures.

Encourage employees to identify health, safety, and environmental risks to develop and enforce job safety practices including use of personal protective equipment, good housekeeping techniques, lock out/tag out procedures, mobile equipment operation, etc. to ensure a safe and healthy work environment for all employees.

Develop the laboratory operating budget and monitor on an ongoing basis by comparing actual expenses to budget and account for variances.

SPECIFIC SKILLS REQUIRED:

Knowledge of chemistry with an emphasis in dangerous waste treatment and handling. Thorough knowledge of all plant operations and equipment. Ability to express self effectively, both orally and in writing. Ability to establish effective working relationships with operational groups, customers and regulators.

EDUCATION AND EXPERIENCE REQUIRED:

Bachelor's degree or 5-10 years experience in dangerous waste and/or chemical handling procedures. Chemical plant experience desirable. Supervisory experience required. First aid and safety training required.

WORKING CONDITIONS:

Outdoor plant environment where there is exposure to dirt, dust, noise, odors, temperature extremes, machinery and a potential exposure to hazardous chemicals and fumes: 20%

Normal office environment: 80%

OTHER REQUIREMENTS:

Facial hair must conform to requirements of proper fitting and sealing of respiratory equipment.

JOB TITLE: Laboratory Technician

REPORTS TO: Laboratory Manager

FUNCTION: Sampling, analysis, data reporting and treatment recommendations based on analytical results.

DUTIES:

Sample, analyze and record analytical data to verify waste stream identification and assure safe and appropriate consolidation, treatment, transfer and disposal operations to meet the requirements of all Company policies, directives, standards, procedures, and commitments as well as all applicable laws and regulations and Facility Operating Permits.

Determine and recommend optimum treatment, storage and disposal operations based on analytical data to continuously improve all aspects of our health, safety, and environmental performance.

Prepare and maintain all applicable records, paperwork and reports as required by the job to be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

Understand job responsibilities and comply with all Stericycle policies and SOPs to conform to all job safe operating procedures including keeping equipment and work area in a clean and orderly condition, using proper chemical storage, labeling and handling techniques and using personal protective equipment.

Conduct our activities in a manner that protects the well being of our employees, the public, and the environment, by focusing on preventative measures. Inspect work area for proper storage, labeling, leaks, equipment and material deficiencies and process malfunctions. Report discrepancies to supervisor.

Be on the lookout for any risks, equipment, or condition that may endanger employees or environment. Report any unsafe act or working condition. Report and respond to plant emergencies, as needed, and in accordance with the Contingency Plan.

Also performs administrative tasks. These tasks include both their standard work and state, federal and company safety, health and environmental regulatory compliance by fully participating in training to expand knowledge and understanding of Stericycle EH&S policies and SOPs.

EDUCATION AND EXPERIENCE REQUIRED:

Bachelor’s degree in chemistry or related field. Dangerous waste or chemical handling experience. At least 1 year laboratory experience.

SPECIFIC SKILLS REQUIRED:

Good written and verbal communication skills. Good problem solving skills. Demonstrated knowledge of job safe practices.

WORKING CONDITIONS:

Industrial plant laboratory and normal office environment in an industrial plant and field work where there is exposure to dirt, dust, noise, odors, varying temperatures, machinery and a potential exposure to hazardous chemicals and fumes: 100%

OTHER REQUIREMENTS:

Facial hair must conform to requirements of proper fitting and sealing of respiratory equipment.

JOB TITLE: Admin Supervisor

REPORTS TO: Plant Manager

FUNCTION: Supervise administrative staff; maintain files and data entry required for plant operating records and regulatory agency reports.

DUTIES:

Manage administrative staff including scheduling daily work activities, overseeing operations to ensure required work is completed in a timely manner.

Prepares reports as required by plant and corporate personnel. Maintains records and data entry for waste tracking system. Enters data from waste process forms, manifests and checkout sheets into operating records on computer to meet the requirements of all Company policies, directives, standards, procedures, and commitments as well as all applicable laws and regulations and Facility Operating Permits.

Understand job responsibilities and comply with all Stericycle EH&S policies and Stericycle SOPs by preparing all necessary paperwork for outgoing shipments, in accordance with all applicable federal, state and local regulations.

Coordinates production reporting with Accounting Department to insure correct and timely invoicing.

Receives incoming manifests and completes waste receipts.

Answer telephones, take and relay messages. Operates miscellaneous office equipment, including computers, as required by the position. Be on the lookout for any risks, equipment, or conditions that may endanger employees, the public, or the environment. Report any unsafe act or working condition.

Organizes and maintains filing system for all manifests, process forms, waste profiles, inspection reports and other plant operating records. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

Prepares reports as required by plant and corporate personnel.

Participate fully in training to expand knowledge and understanding of Stericycle EH&S policies and SOPs.

Strive to continuously improve all aspects of our health, safety, and environmental performance. Endeavor to conduct our activities in a manner, which protects the well being of our employees, the public, and the environment, by focusing on preventative measures.

EDUCATION AND EXPERIENCE REQUIRED:

High school graduate plus related work experience. Chemical plant experience desirable.

SPECIFIC SKILLS REQUIRED:

Good organizational skills (information management and filing). Qualified typist, familiarity with computers, office equipment operation and data entry. Good sentence structure, grammar and spelling. Proficiency for accuracy. Secretarial and clerical office procedures.

WORKING CONDITIONS:

Normal office environment in an industrial plant environment where there may be exposure to dirt, dust, noise, odors, heat and cold, machinery and where there is potential exposure to hazardous chemicals and fumes: 100%

OTHER REQUIREMENTS:

Facial hair must conform to requirements for proper fit, seal and function of respiratory equipment.

JOB TITLE: Waste Tracking Specialist

REPORTS TO: Admin Supervisor

FUNCTION: Maintains files and enters data required for plant operating records and regulatory agency reports.

DUTIES:

Prepares reports as required by plant and corporate personnel. Maintains records and data entry for waste tracking system. Enters data from waste process forms, manifests and checkout sheets into operating records on computer to meet the requirements of all Company policies, directives, standards, procedures, and commitments as well as all applicable laws and regulations and Facility Operating Permits.

Understand job responsibilities and comply with all Stericycle EH&S policies and Stericycle SOPs by preparing all necessary paperwork for outgoing shipments, in accordance with all applicable federal, state and local regulations.

Coordinates production reporting with Accounting Department to insure correct and timely invoicing.

Receives incoming manifests and completes waste receipts.

Answer telephones, take and relay messages. Operates miscellaneous office equipment, including computers, as required by the position. Be on the lookout for any risks, equipment, or conditions that may endanger employees, the public, or the environment. Report any unsafe act or working condition.

Organizes and maintains filing system for all manifests, process forms, waste profiles, inspection reports and other plant operating records. Be truthful, accurate and timely in maintaining records, submitting documents, and making reports to Stericycle personnel and government agencies.

Prepares reports as required by plant and corporate personnel.

Participate fully in training to expand knowledge and understanding of Stericycle EH&S policies and SOPs.

Strive to continuously improve all aspects of our health, safety, and environmental performance. Endeavor to conduct our activities in a manner, which protects the well being of our employees, the public, and the environment, by focusing on preventative measures.

EDUCATION AND EXPERIENCE REQUIRED:

High school graduate plus related work experience. Chemical plant experience desirable.

SPECIFIC SKILLS REQUIRED:

Good organizational skills (information management and filing). Qualified typist, familiarity with computers, office equipment operation and data entry. Good sentence structure, grammar and spelling. Proficiency for accuracy. Secretarial and clerical office procedures.

WORKING CONDITIONS:

Normal office environment in an industrial plant environment where there may be exposure to dirt, dust, noise, odors, heat and cold, machinery and where there is potential exposure to hazardous chemicals and fumes: 100%

OTHER REQUIREMENTS:

Facial hair must conform to requirements for proper fit, seal and function of respiratory equipment.

TABLE H1-1. TRAINING MATRIX

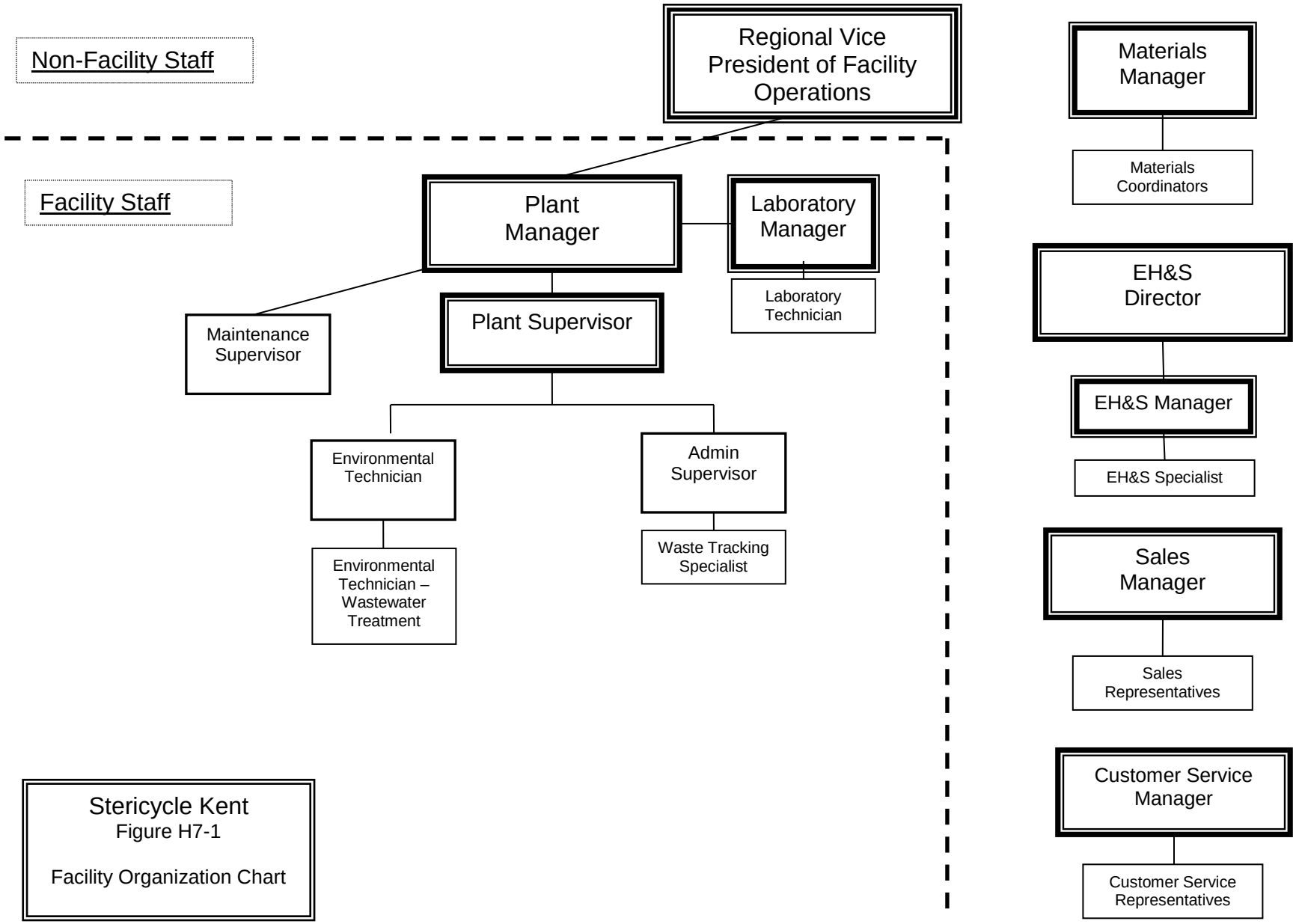
NOTE: This table reflects the minimum content of the Orientation, and Task/Process Specific training required. All of the training courses and frequency are required per Table H1-1. Changes to this matrix require a permit modification per WAC 173-303-830.

Job Titles /Job Duties

Class Title/Training Course	Class ID#	Initial Schedule (Days)	Refresher Schedule (Days)	Waste Tracking Specialist	Admin Supervisor	Environmental Tech	Maintenance Supervisor	Environmental Tech - WWT	Lab Technician	Plant Supervisor	Plant Manager	Laboratory Manager	Materials Management	Private Security Guard**	EHS	Technical Sales Representative
Orientation Training																
40hr HAZWOPER Training	OP-0002	90	NA			X	X	X	X	X	X	X				
8-Hour HAZWOPER Refresher Training	OP-0003	90	365	X	X	X	X	X	X	X	X	X	X		X	X
Part B Permit Training	RG-0018	90	365	X	X	X	X	X	X	X	X	X			X	
Contingency Plan (incl Emergency Response)	ER-0001	7	Q*	X	X	X	X	X	X	X	X	X		X	X	
PPE	HS-0007	90	Q*	X	X	X	X	X	X	X	X	X			X	
PUSO	HS-0017	90	Q*			X		X	X	X	X	X	X		X	
Pressurized Container Management	OP-0023	180	365			X	X	X		X	X					
Inspection Plan Requirements	EM-0003	180	365			X	X	X	X	X	X	X			X	
DOT -Shipper	TD-0008	180	1095	X	X	X				X	X	X	X		X	X
RCRA / WAC overview	RG-0006	180	365	X	X	X	X	X	X	X	X	X	X		X	X
TSCA	RG-0007	180	365	X	X	X	X	X	X	X	X	X	X		X	X
Waste Analysis Plan	LB-0008	180	365	X	X	X		X	X	X	X	X	X		X	X
Record Keeping Training	RG-0010	180	365	X	X		X		X	X	X	X	X		X	
Hot Work	HS-0011	180	365				X			X	X					
Forklift Operation/Certification	TD-0001	180	1095			X	X	X		X	X					
Task / Process Specific Training																
Check In Proc and Discrepancies	AC-0002	180	365	X	X			X	X	X	X	X				
Incoming Manifest/Problem Manifest	AC-0001	180	365	X	X			X	X	X	X	X			X	X
Waste Tracking (incl 45 Day Outbound Manifest)	WT-0005	180	365	X	X						X				X	
Sampling Training	OP-0034	180	365			X		X	X	X	X	X				
Profile Creation	WT-0006	180	365								X	X	X		X	X

*Quarterly refresher training as described in Section H4.5

Task / Process Specific Training (cont)	Class ID#	Initial Schedule (Days)	Refresher Schedule (Days)	Waste Tracking Specialist	Admin Supervisor	Environmental Tech	Maintenance Supervisor	Environ. Tech / Supv. - WWTP	Lab Technician	Plant Supervisor	Plant Manager	Laboratory Manager	Materials Management	Private Security Guard**	EHS	Technical Sales Representative
				Job Titles/Job Duties												
Chemical Segregation and Storage	WS-0002	180	365			X		X	X	X	X	X	X		X	
Chemical Compatibility	WS-0001	180	365			X		X	X	X	X	X	X		X	
Container Pump-up	OP-0012	180	365			X		X		X	X					
Storing Product Chemical Drums	WS-0003	180	365			X		X	X	X	X	X				
Triple Rinse	OP-0007	180	365			X		X		X	X					
PCB Management	OP-0036	180	365	X	X	X			X	X	X	X				
Transfer Facility Procedures	TD-0013	180	365	X	X	X				X	X				X	
Disposal of Lab Wastes	LB-0009	180	365						X	X	X	X			X	
Mandatory Verification Analysis	LB-0012	180	365			X		X	X	X	X	X				
FID/PID Calibration/Operation	LB-0024	180	365						X	X	X	X				
PCB Management for Kent Lab	LB-0018	180	365						X	X	X	X				
Waste Water Treatment & Permit Conditions	TT-0011	180	365					X	X	X	X	X				
Tanker Truck Load/Unload incl Vac Truck	OP-0035	180	365			X		X		X	X					
Container Integrity	WT-0002	180	365			X		X		X	X					
Outbound Load Procedures	OB-001	180	365	X	X	X				X	X					



Stericycle Kent
Figure H7-1

Facility Organization Chart

APPENDIX H-1

TRAINING FORMS

The forms included in this Appendix are for example only. The forms themselves may change in appearance. The information contained on the forms will remain the same on any version used for the same purposes.

Stericycle
Environmental Solutions

Class Attendance Sign-in

Date: **Time:** **Instructor:**

Course #: **Course Title:**

Auxiliary Training: Yes / No **Part of Weekly Safety Meeting: Yes / No**

Location: **Environmental Services Division**

Level: ___ **Job Knowledge** ____ **Work Without Assistance** ____ **Able to Train**

Employee Name (print)	Job Title	Signature

Training Authorization Signature:

Instructor Approval:

Print Name Signature Date

Plant Manager:

Print Name Signature Date

Rev: Jan 22, 2015

Stericycle
Environmental Solutions

Class Evaluation Sheet

Date: **Instructor:**

Course #: _____ **Course Title:** _____

A. For each of the following areas of the course, Please indicate your reaction:

Course Content	**Exceeded Expectations**	**Met Expectations**	**Needs Improvement**	**Not Applicable**
Material well organized	____	____	____	____
Delivered at the right level	____	____	____	____
Practicality of material to my job	____	____	____	____
Effective small group activities	____	____	____	____
FACILITATION				
Effective Style	____	____	____	____
Course leaders' knowledge of subject	____	____	____	____
Course leader(s) covered the material clearly	____	____	____	____
Course leader(s) responded well to questions	____	____	____	____

B. What suggestions for improvement do you have?

_____

_____

_____

C. Other comments: Please elaborate on any areas that "needs improvement."

_____

_____

_____

Please indicate the rating that best reflects your overall evaluation of this program.

Excellent **Good** **Fair** **Poor**

APPENDIX H-2

TRAINING COURSE OUTLINES

Orientation Training

40 Hour HAZWOPER Training (OP-0002)

All new employees directly involved in the handling and management of wastes must successfully complete an orientation training session that fulfills the requirements outlined in 29 CFR 1910.120 (e)(3)(i) (OSHA Hazardous Waste Operations and Emergency Response training regulations) and WAC 296-843-20010 (WISHA). Under OSHA and WISHA, employees involved in dangerous waste operations at treatment, storage, and disposal facilities are currently required to complete 40 hours of introductory training and three days of supervised work experience prior to working without direct supervision. 40 Hour HAZWOPER training is normally provided by an outside consulting firm.

8 Hour HAZWOPER Refresher Training (OP-0003)

All Kent facility employees attend an annual in-house 8 Hour HAZWOPER refresher class. Topics are presented in a way to maximize relevance to plant operations and are taught by experienced Stericycle employees. The following list of topics represents the normal curriculum:

- Accident Statistics Overview
- Ethics and the Cost of Non-Compliance
- Incident Reporting
- Substance Abuse
- Medical Surveillance
- "Safe on Purpose" Accident Prevention Program
- Security Plan
- Exposure Controls -- Engineering, Administrative, PPE / Decon
- Respiratory Protection / Respirator Cleaning
- Toxicology / Industrial Hygiene
- Drum Handling
- Job Safety Analysis
- Confined Space Entry Requirements
- Lock-Out/Tag-Out/Hot Work
- Housekeeping
- Bloodborne Pathogens
- Chemical Principles and Hazards

- Hazard Communication
- Fire / Emergency Response

Part B Permit Training (RG-0018)

- Role of EPA and WDOE
- Overview of the permitting process
- Overview of Part A and B Application
- Section C – Waste Analysis Plan
- Section D – Process Information
- Section E – Groundwater Monitoring
- Section F – Procedures to Prevent Hazards
- Section G – Contingency Plan
- Section H – Training Plan
- Section I – Closure Plan
- Part B Permit Conditions
- Modifying a permit

Contingency Plan (ER-0001)

WAC 173-303-330(1)(d)

As part of Orientation training, all employees involved in facility operations are instructed in their specific duties and responsibilities as they relate to emergency response and the Contingency Plan. Orientation and refresher Contingency Plan training (and corresponding class ID numbers) includes:

- Incident Reporting Hierarchy (ER-0003)
- Emergency Equipment (ER-0002)
- Fire Training/Fire Extinguishers/Foam Cannon (ER-0008 / ER-0009)
- On-Site Spill Management (ER-0006)

Additionally, Contingency Plan training incorporates emergency evacuation procedures and routes, in addition to the use of emergency systems (alarms, etc.).

PPE (HS-0007)

- Applicability – when to use it
- PPE Design

- Hazard assessment and equipment selections
  - Level A
  - Level B
  - Level C
  - Level D
- Defective and damaged equipment
- Training
- Hearing Conservation Program

Process Under Supervision Only (PUSO) (HS-0017)

Process Under Supervision Only (PUSO) is an operating procedure that details precautions for the treatment, storage or consolidation of potentially reactive or unstable waste. PUSO training covers the following:

- Identification of applicable waste streams by a qualified chemist or Materials Management personnel
- Operations procedures managing identified PUSO waste streams
- Use of the PUSO form including management review and authorization.

Pressurized Container Management (OP-0023)

- Identification of potentially pressurized containers
- Methods to address pressurized containers
- Plant management notification
- Risk assessment
- Environmental, Safety & Health requirements

Inspection Plan Requirements (EM-0003)

- Container Storage / Staging / Process Areas
- DW wastewater tank systems
- Safety and Emergency Equipment
- Security Equipment
- Operational Equipment – General
- Operational Equipment – Treatment Plant
- Priority Levels
- Corrective Measures
- Documentation / Recordkeeping

DOT –Shipper (TD-0008)

- General Awareness Requirements
- Shipping Requirements
  - Hazardous Materials Table
  - Reportable Quantity Table
  - List of Marine Pollutants
  - Special Provisions
- Shipping Papers
- Marking and Labeling
- Packaging
- Placards and Segregation

RCRA / WAC overview (RG-0006)

- History of environmental regulations
- Waste designation – Characteristic, criteria, and listed waste codes
- Generator, transporter and facility requirements
- Land disposal restrictions

TSCA (RG-0007)

- History and authorization
- Applicability and classification (PCBs)
- Shipping and storage requirements
- Marking requirements
- Disposal requirements
- Record keeping

Waste Analysis Plan (LB-0008)

- Waste pre-acceptance procedures
- Waste acceptance procedures
- Sampling methodologies
- Analytical techniques
- Waste tracking systems

Record Keeping Training (RG-0010)

Training includes record keeping and retention requirements including those for the following:

- Manifests
- Annual Reports
- Records of test results and waste analyses
- Reports of incidents requiring implementation of the contingency plan
- Inspection Records
- Unmanifested Waste Reports and Exception Reports.

Hot Work (HS-0011)

- PPE required
- Hot Work Permit form completion
- Confined Space Permit requirements
- Fire Prevention requirements
  - Combustible / Flammable materials
  - Fire extinguishers
  - Fire watch
- LEL and Oxygen monitoring requirements
- Contractor Hot Work procedures

Forklift Operation/Certification (TD-0001)

- Pre-Operational Safety Check
  - Brakes
  - Wheels and Tires
  - Steering
  - Clutch
  - Horn
  - Control Levers
  - Seat Belt
- Starting Procedures
- Know the Area of Travel
- Know the Load
  - Stability and Center of Gravity
  - Capacity (Weight and Load Center)
- Container Stacking Requirements
- Training Re-certification Requirements

Task / Process Specific Training

Check-In Procedures with Discrepancies (AC-0002)

- Incoming Waste Paperwork Review
- Identification of Discrepancies
- Administrative Verification Form
- “Hold Do Not Process” Label
- Drum Jail Procedures
- Discrepancy Resolution Procedures
- Recordkeeping and Reporting Requirements

Incoming Manifest / Problem Manifest (AC-0001)

- Incoming Waste Paperwork Review
- Definition of Manifest Discrepancy
- Manifest Discrepancy Resolution Procedures
- Unmanifested Waste Load Procedures
- Rejected Shipment Procedures
- Unmanageable, Non-transportable Shipment Procedures
- Recordkeeping and Reporting Requirements

Waste Tracking (incl 45 Day Outbound Manifest) (WT-0005)

Describes the procedures to be used by administrative personnel (waste tracking specialists, etc.) to provide documentation relating to the movement of waste from manifesting through disposal. Includes procedures to be taken in the event manifests bearing the signature of the receiving facility are not returned within timeframes allowed.

Sampling Training (OP-0034)

- Representative Sampling Techniques
- Container Selection
- Visual Confirmation
- Sampling Equipment Selection and Decontamination
- Labeling and Recordkeeping Requirements

Profile Creation (WT-0006)

Course provides a step-by-step guide to entering profile information in the profile database, primarily intended for use by salespeople and customer service representatives. Includes instructions on how to populate the fields within the profile module of the profile database.

Chemical Segregation and Storage (WS-0002)

- Container Integrity Requirements
- Container Labeling Requirements
- Aisle Spacing and Stacking Patterns
- Table D1-2 Segregation / International Fire Code (IFC) Compliance
- Applicability to Lab Packs
- Explanation of Dispositioning Markings
- Procedures for Managing Incompatibles in Storage

Chemical Compatibility (WS-0001)

- Overview of Chemical Compatibility and Reactivity
- Flammables, Dangerous When Wet
- Anions / Cations
- Exothermic Reactions
- Acids / Alkalines / Neutralization
- Oxidizers / Reducing Agents
- Organic Peroxides
- PPE Requirements
- Safety Equipment / Emergency Response Procedures

Container Pump-up (OP-0012)

- PPE Requirements
- Identification of Key Points / Hazards in Process
- Review of Work Order
- Verify Proper Connections and Grounding
- Conduct Compatibility Testing
- Proper Pump Operation Procedures
- “RCRA Empty” Standard
- Cleanup Procedures
- Recordkeeping Requirements

Storing Product Chemical Drums (WS-0003)

- PPE Requirements
- Identification of Key Points / Hazards
- Table D1-2 Segregation Compatibility Chart
- HMIS Labels
- Selection of Proper Storage Location

Triple Rinse (OP-0007)

- PPE Requirements
- Identification of Key Points / Hazards
- "RCRA Empty" Standard
- Triple Rinse Procedures

PCB Management (OP-0036)

- PPE Requirements
- Identification of Key Points / Hazards
- TSCA Storage Area
- PCB Check-in Procedures
- PCB Receiving Report
- PCB Markings Required
- PCB Log Procedures
- Recordkeeping Requirements

Transfer Facility Procedures (TD-0013)

- Inbound Load Procedures
- Admin Staff Paperwork Review
- "Live Offload" vs. Staging in West Lot (10-day) Procedures
- Driver Completion of Drop Sheet
- Requirements for Signing Manifests
- Time Limits for Inbound Staging
- Time Limits for Outbound Staging
- Inspection Procedures

Outbound Load Procedures (OB-001)

- Load Disposition and Staging Procedures

- Completion of Scan Sheet
- Preparation of Outbound Manifest
- Loading Procedures
- Requirements for Generator Signature on Manifest
- Transporter Signature on Manifest
- Time Limits for Outbound Staging
- Recordkeeping Requirements

Disposal of Lab Wastes (LB-0009)

- Management of Samples vs. Wastes
- Satellite Accumulation Area Management Standards
- Labeling / Marking Requirements
- Disposition of Lab Wastes
- Recordkeeping Requirements

Mandatory Verification Analysis (LB-0012)

- PPE Requirements
- Identification of Key Points / Hazards
- Representative Sampling Procedures
- Sampling Frequency
- Overview of WAP Requirements for MVAs
- Identification of Discrepancies
- Administrative Verification Form
- Recordkeeping Requirements

FID/PID Calibration/Operation (LB-0024)

- Step-by-Step FID/PID Calibration Procedures
- PID Operating Instructions
- FID Operating Instructions

PCB Management for Kent Lab (LB-0018)

- Overview of TSCA Applicability to Lab Samples
- Chain of Custody
- Satellite Accumulation / PCB Marking Requirements
- TSCA Disposal Requirements

Kent Wastewater Treatment and Permit Conditions (TT-0011)

This training describes operational procedures for the treatment of wastewater received at the Stericycle Kent facility including:

- Sampling
- Verification
- Offloading
- Process analysis
- Full-scale treatment
- Conformance with King County Department of Natural Resources and Parks Pre-treatment discharge permit.

Training also addresses records associated with discharges and other conditions as specified in the discharge permit.

Tanker Truck Load/Unload incl Vac Truck (OP-0035)

- PPE Requirements
- Identification of Key Points / Hazards
- Inbound Paperwork Review
- Representative Sampling
- Authorized Offloading Locations
- Proper Offloading Procedures
- Tanker Rinsing Procedures
- Recordkeeping Requirements

Container Integrity (WT-0002)

- DW Container Labeling Requirements
- Visual Inspection for Integrity Issues
- Correcting Deficiencies
- Recordkeeping Requirements

SECTION I

CLOSURE PLAN AND CLOSURE COST ESTIMATES

SECTION I. CLOSURE PLAN AND CLOSURE COST ESTIMATES

TABLE OF CONTENTS

SECTION PAGE

I1. CLOSURE PLAN 1
I1.1. Facility Description 1
I1.2. Closure Performance Standards 2
I1.3. Maximum Waste Inventory 7
I1.4. Closure Schedule 7
I1.5. Closure Activities 7
I1.5.1. Inventory Elimination 9
I1.5.2. Decontamination Procedures 9
I1.5.2.1. Decontamination of Containment Pads 10
I1.5.2.2. Decontamination of Tank Systems 11
I1.5.2.3. Decontamination / Disposal of Ancillary Equipment 12
I1.5.2.4. Decontamination of Pumps and Forklifts 12
I1.5.2.5. Decontamination of Miscellaneous Equipment 13
I1.5.3. Sampling and Analysis 13
I1.5.3.1. Containment Pad Sampling and Analysis 16
I1.5.3.2. Soil Sampling and Analysis 18
I2. POST-CLOSURE PLAN 19
I3. CLOSURE COST ESTIMATES 20
I3.1. Regulatory Requirements 20
I3.2. Unit Costs for Closure Activities 20
I3.3. Inventory Elimination Costs 21
I3.4. Facility Decontamination Costs 21
I3.5. Sampling and Analytical Costs 21
I4. POST-CLOSURE COST ESTIMATE REQUIREMENTS 21
I5. NOTICE IN DEED REQUIREMENTS AND SURVEY PLAT REQUIREMENTS 22
I6. FINANCIAL ASSURANCE MECHANISM 22
I7. LIABILITY REQUIREMENTS 22

Tables, Figures, and Appendices are presented
in separate sections following the main body of the text.

LIST OF TABLES

Table I1-1	Closure Schedule
Table I1-2	Concrete and Soil Sampling and Analysis Summary
Table I1-3	Container Staging / Storage Units Summary
Table I1-4	DW Tank Summary
Table I3-1	Cost Estimates for Closure at Maximum Waste Inventory

LIST OF FIGURES

Figure I1-1	Kent Facility Site Plan

LIST OF APPENDICES

Appendix I-1	Unit Costs and Assumptions
Appendix I-2	Closure Cost Calculations for Maximum Waste Inventory
Appendix I-3	Financial Assurance for Closure
Appendix I-4	Certificate of Liability Insurance

SECTION I. CLOSURE PLAN AND CLOSURE COST ESTIMATES

WAC 173-303-806(4)(a)(xiii), 610

I1. CLOSURE PLAN

WAC 173-303-806(4)(a)(xiii), 610(3)

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as "Stericycle".

This closure plan describes the procedures that will be followed to close the dangerous waste (DW) management units at the Stericycle-Kent Facility. Closure activities will be performed in accordance with requirements in WAC 173-303-806, -610, -630 and -640 and 40 CFR 264 Subparts G and H. This closure cost estimate for activities under this closure plan will be updated as necessary as new DW management units are constructed, or when DW management units are closed. This document will also be updated when regulations or regulatory guidance dictates new closure requirements that may affect the cost of closing the facility.

I1.1. Facility Description

Facility Operator

Stericycle-Kent Facility
20245 77th Avenue South
Kent, Washington 98032
Phone (253) 872-8030
EPA ID No. WAD 991281767

Facility Owner

Burlington Environmental, LLC
18000 72nd Avenue S., Suite 201
Kent, Washington 98032
Phone (425) 227-0311

The Kent Facility is located on a 6.25 acre site at 20245 77th Avenue South in Kent, King County, Washington. Waste management units are shown on Figure I1-1, Kent Facility Site Plan.

The facility receives a broad range of DWs for management, and utilizes the following waste management options:

- Solvent Recycling (off-site

- Alternative Fuel Blending (off-site)
- Water Treatment
- Incineration (off-site)
- Landfill (off-site)
- Stabilization (off-site)

The facility's waste management units and corresponding capacities are discussed in Section I1.3, Maximum Waste Inventory. DW management units and operations are discussed in detail in Section D, Process Information.

I1.2. Closure Performance Standards

WAC 173-303-610(2)(a)(i)-(iii), (2)(b), (6)

Closure activities at the Stericycle-Kent Facility are designed to meet Federal and State closure performance standards. The closure activities will accomplish the following performance standards identified in WAC 173-303-610(2)(a), -(2)(b), (6):

- Minimize the need for further maintenance;
- Control, minimize, or eliminate to the extent necessary to protect human health and the environment, post-closure escape of DW, dangerous constituents, leachate, contaminated run-off, or DW decomposition products to the ground, surface water, ground water, or atmosphere; and
- Return the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous DW activity.

Where removal or decontamination of DW management units, equipment, DWs or residues, or other materials is done, the removal or decontamination will assure that the levels of DW or DW residues do not exceed:

1) For soils, ground water, surface water, and air, the numeric cleanup levels calculated using unrestricted exposure assumptions according to the Model Toxics Control Act regulations (WAC 173-340). Primarily, these will be numeric cleanup levels calculated according to MTCA Method B, although MTCA Method A may be used as appropriate; and

2) For structures, equipment, bases, liners, etc. clean closure standards shall be set by the department on a case by case basis in accordance with the closure performance standards (WAC 173-303-610(2)(a)(ii)) and in a manner that minimizes or eliminates post-closure escape of DW constituents.

Generally, these standards will be met by removing all regulated waste from the facility and by decontaminating or removing all contaminated equipment, containment system components, structures, and soil. Decontamination of tanks and secondary containment structures will achieve a “clean debris surface” using an appropriate treatment method in Table 1 of 40 CFR 268.45 (Alternative Treatment Standards for Hazardous Debris).

Concrete secondary containment structures will not be decontaminated according to the alternative treatment standards for hazardous debris outlined in Table 1 of 40 CFR 268.45. Stericycle will instead use a site-specific alternative treatment method for equivalent technology under the requirements of 40 CFR 268.42(b) that is protective of human health and the environment and consistent with federal, state, and local requirements. Concrete secondary containment structures will be decontaminated by high-pressure washing with water. Concrete chip samples will be collected from all secondary containment pads and analyzed to confirm that no residual contamination is present. Details describing the procedures are outlined in Section I1.5.2, Decontamination Procedures, and Section I1.5.3, Sampling and Analysis.

Additional closure requirements, policies, and procedures that must be followed include:

- A copy of the approved Closure Plan, and subsequent authorized amendments, will be maintained at the facility until closure is complete and certified.
- Changes in facility plans, operations or scheduling may result in an amended Closure Plan. Amended versions will be submitted to the Washington Department of Ecology (“Ecology”) with a written request for a change to the approved Closure Plan.
- Stericycle will notify Ecology in writing at least 45 days prior to the date final or partial closure is expected to begin, and at least seven days prior to any closure performance sampling. Sampling will not be required for a partial closure due to a routine tank replacement.

- At least eight weeks in advance of scheduled collection of samples to support final or partial closure, Stericycle will submit a sampling and analysis plan, including the operating record entries of cracks and eroded portions of concrete, if applicable, (Section I1.5.2.1), to Ecology that will describe the specific locations of all soil and concrete samples to be taken and provide a detailed quality assurance project plan. Certain relevant information needed to develop the sampling and analysis plan, including current analytical procedures and facility operating history, will not be available until this time. The detailed sampling and analysis plan will be subject to Ecology review and approval prior to initiation of sampling activities.
- Sequential closure of the DW management units will be followed for closing the entire facility. Refer to Section I1.4, Closure Schedule, for the timing of these activities and Section I1.5, Closure Activities, for a description of the closure procedures for individual waste management units.
- All DWs within the facility and DW management units will be processed in the same manner as they would be under normal operating circumstances. DWs and process residues will continue to be segregated and stored according to their compatibility.
- Stericycle intends to use trained employees for closing the various units. However, facility closure cost estimates are based on third party costs (refer to Appendices I-1 and I-2).
- During partial or final closure, all the required daily, weekly, and monthly inspections in Section F of the permit application will be performed for each waste management unit or area until removal of dangerous waste is complete from that individual unit or area according to procedures in this closure plan.
- At all times during closure activities, the required and applicable standard operating procedures for proper waste management, worker health and safety, site security will be followed.
- All mobile or fixed equipment that has been used to process or handle DWs will be cleaned, decontaminated and re-used or salvaged, or if necessary disposed of off-site at a RCRA-permitted facility.
- The requirements of the U.S. Department of Transportation (USDOT) 49 CFR will be followed for transporting any wastes or other equipment or materials off-site.
- An independent qualified registered professional engineer will monitor all closure activities to ensure they are conducted in accordance with the approved closure

plan. Closure activities to be monitored by the independent engineer include tank system decontamination, secondary containment decontamination, soil sampling and analysis, and any related soil excavation and off-site removal following sampling and analysis. The independent engineer will visit the facility at least weekly for approximately three hours. These inspections will be part of the facility's operating record.

- Stericycle will submit to Ecology certification that the final or partial closure of the facility has been conducted in accordance with the specifications of the approved closure plan. This certification will be signed by Stericycle and by an independent, qualified registered professional engineer. Within 60 days of closure of each DW management unit and within 60 days of completion of final or partial closure, Stericycle will submit to Ecology by registered mail, certification that the DW management unit or facility, as applicable, has been closed in accordance with the specifications of the approved closure plan. The certification will be signed by Stericycle and by an independent, qualified registered professional engineer. Stericycle will make the following certification:

  I certify under of penalty of the law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Activities of the independent qualified registered engineer shall include, but not be limited to, field observation and review of records of the following:

1. Sampling procedures;
2. Locations of concrete and soil sampling to ensure locations were as specified in the sampling and analysis plan;
3. Sample labeling and handling, including chain of custody procedures;

4. Tank decontamination procedures to ensure that the closure plan requirements for decontamination and rinsate management were followed and tanks were adequately cleaned; and

5. Procedures to achieve a “clean debris surface” were as specified in Table 1 of 40 CFR 268.45 for metal.

6. Waste, wastewaters and debris were properly contained, treated, and/or transported off site.

Documentation supporting the final or partial closure certification will be provided to Ecology on request. Ecology requires the following documentation and information to support a clean closure certification:

1. All field notes and photographs related to closure activities.
2. A description of any minor deviations from the approved closure plan and justification for these deviations.
3. Documentation of the final disposition of all DWs and DW residues, including contaminated media, debris and all treatment residuals.
4. All laboratory and/or field data, including sampling procedures, sampling locations, chain of custody procedures, quality assurance/quality control data, for all samples and measurements, including samples and measurements taken to determine background conditions and/or to determine background conditions and/or to determine or confirm clean closure; and
5. A summary report, which itemizes the data reviewed by the independent, qualified registered professional engineer and tabulates the analytical results of samples taken to determine and confirm clean closure.
6. A description of what the unit looks like at completion of closure, including a description of what parts of the former unit, if any, remain after closure.

I1.3. Maximum Waste Inventory

WAC 173-303-610(3)(a) (ii) & (iii)

The maximum waste inventory includes all DW management units and is based on the current S01 capacity (containers), and S02 capacity (tanks) listed in Section A2.0, Part A Form 3.

Units that are used for waste processing only (e.g., drum crusher, baler, etc.), and non-DW tanks are not included in the maximum waste inventory. The maximum waste inventory at the time of closure plan approval is provided in Appendix I-2.

I1.4. Closure Schedule

WAC 173-303-610(3)(a)(vii), (4)(b)

This section discusses the anticipated closure schedule for the final closure of the facility. Stericycle will notify Ecology in writing at least 45 days prior to the date final or partial closure is expected to begin, and at least seven days prior to any closure performance sampling. At that time, Stericycle will provide a draft Sampling and Analysis Plan for Ecology review.

Sequential closure within the container storage areas and the DW tank system will include all areas listed in Table I1-3. Figure I1-1 shows the container storage areas and tank areas listed in Table I1-3 with DW tanks 9A, 9B and 9C clearly labeled, as well as the area of the former stabilization tanks T5305 and T5306. Table I1-1, Closure Schedule, presents the anticipated time required to complete each closure step.

I1.5. Closure Activities

WAC 173-303-610(3)(a)(i),(iv) & (v), 630(10), and 640(5)

This section describes closure activities for the DW management units at the facility. Section I1.5.1, describes the inventory elimination procedures, Section I1.5.2 describes the decontamination procedures, and Section I1.5.3 describes the sampling and analysis procedures. Stericycle has provided costs for soil sampling and analysis; however, if soil and/or groundwater contamination from past practices is present, it may be addressed separately under a RCRA corrective action or post-closure activities.

Stericycle will close the facility sequentially to allow for use of the various waste management units during inventory elimination and decontamination. After receiving the final volume of waste into the facility, the container inventory will be eliminated first through on-site treatment and off-site disposal or shipped directly off-site for treatment and disposal. Empty containers will be salvaged, reconditioned, or disposed at an off-site RCRA-permitted facility.

Inventory elimination and decontamination of the non-DW wastewater treatment tanks is not included in this closure plan. A separate closure plan addresses the used oil processing facility at Kent. That closure plan was dated October 28, 2007, was revised by PSC-Kent letter dated December 07, 2007 and was approved by Ecology letter dated January 10, 2008.

Stericycle intends to utilize the DW wastewater treatment system (tanks 9A, 9B, and 9C) and the non-DW wastewater treatment system for treatment of wastewaters and rinsate generated from closure activities. However, DW wastewaters and rinsate from these activities may only be treated in the DW tanks. Therefore, the final or partial closure of the DW tanks will occur after all container inventory has been completed and the majority of the site-wide containment area decontamination and confirmation sampling and analysis has been completed.

If the containment areas cannot be successfully decontaminated, they may require removal and disposal at an off-site RCRA-permitted facility. An alternate procedure will be to break up the containment areas prior to any decontamination and dispose of them at an off-site RCRA-permitted facility. To avoid disturbance of sub-concrete soil or fill and volatilization of organics from these media, sampling beneath the containment structures will take place prior to breakup, removal and off-site disposal if necessary. Additionally, the sampling and analysis plan will specify a concrete pad sampling protocol to ensure the concrete meets land disposal restriction requirements. If the concrete fails to meet land disposal restriction requirements, it will be macroencapsulated for disposal.

After the containment areas have been decontaminated or removed, soils will be sampled and analyzed for contaminants as described in Section I1.5.3, Sampling and Analysis.

I1.5.1. Inventory Elimination

WAC 173-303-610(3)(a)(iv)

The DW inventory processed during closure will be managed in the same manner as they would be under normal operating circumstances. However, closure costs reflect the cost associated with sending all inventory off-site for treatment and/or disposal. The elimination scenarios are described in detail in Appendix I-2. Remaining treatment chemicals will be sold for beneficial re-use, or will be transported for use at another Stericycle facility.

I1.5.2. Decontamination Procedures

WAC 173-303-610(2)(b), (3)(a)(v), (5)

This section describes the decontamination procedures to be used for closure activities at the facility. The decontamination policies and/or requirements listed below are based on federal and state regulations, Ecology and USEPA closure guidance manuals, and Stericycle company policies and standard operating procedures. The decontamination policies and/or requirements are designed to ensure that all federal and state requirements for decontamination during closure will be met. Decontamination procedures to be used during closure activities are as follows:

- All equipment, including mobile equipment and earth moving equipment, which has come in contact with DW constituents during closure activities, will be decontaminated before use outside the contaminated area or removed from the site.
- During closure, contaminated equipment, containment system components, structures, and soils will be decontaminated for salvage or beneficial use, or disposed at an off-site RCRA-permitted facility in accordance with the results of waste designation.
- Any residues generated during decontamination activities will be handled in accordance with all applicable requirements of WAC 173-303-170 through 173-303-230. Decontamination rinsate will be appropriately treated on site or shipped off site for treatment and disposal.
- Tanks will be decontaminated to achieve a “clean debris surface” in accordance with Table 1 of 40 CFR 268.45 or may be cut up, macroencapsulated and disposed of in a permitted hazardous waste landfill.

- Piping and ancillary equipment may be decontaminated to achieve a “clean debris surface” in accordance with Table 1 of 40 CFR 268.45 or may be macroencapsulated and disposed of in a permitted hazardous waste landfill.
- Concrete secondary containment will be decontaminated by high-pressure washing and sampled. After analysis, if the concrete contamination is determined to be below the applicable MTCA Standards; and the containment is also determined by Ecology to not impede the progress of subsurface sampling, analysis, and cleanup of soils or groundwater, then it may be left in place. If the concrete secondary containment is above the applicable MTCA Standards, or is determined by Ecology to impede the cleanup process, then it must be removed and properly disposed off site.

During the final decontamination stage, a small temporary decontamination area (approximately 10 by 20 feet) may be established on site once all containment areas have been decontaminated. This area will be constructed of Visqueen or an equivalent protective material, and will be used for decontamination of sampling equipment, personal protective equipment, and other miscellaneous small equipment used during decontamination and sampling efforts.

After the final high-pressure washing has been completed and decontamination rinsate collected, the Visqueen or equivalent material and rinsate will be removed for off-site treatment and disposal at an approved/permitted RCRA facility.

Appendix I-2 present cost estimates for the decontamination and/or disposal activities described below.

I1.5.2.1. Decontamination of Containment Pads

The decontamination procedures discussed in this section cover all containment surfaces including, but not limited to, the check-in areas, container staging, processing, and storage areas, the loading/unloading pads, the treatment areas, and the tank system pads. These procedures also apply to the sump systems throughout the facility. Table I1-3 provide a summary of container management units to be decontaminated, including surface area, number of sumps, and maximum inventory.

The containment surfaces will be inspected for cracks or gaps prior to decontamination to determine possible bias soil sampling locations. Cracks, determined to be non-

surface drying in nature, will be temporarily sealed prior to decontamination. Stericycle will maintain a record of the location and dimension of all cracks or other openings identified during closure because these areas are considered to have a higher potential for allowing releases of DW from the closing unit and may require more focused sampling and analysis during closure. The records will be kept in the operating record. Stericycle will investigate and evaluate all cracks and other openings. Those cracks or openings that penetrate through the concrete pad will be investigated with subslab soil sampling and analysis during closure to determine if releases of DW or DW constituents have occurred at or from the closing unit.

The containment pads then will be decontaminated by high-pressure washing. Following the high-pressure washing concrete chip samples will be taken and analyzed to determine whether clean closure has been achieved and whether the alternative treatment method for equivalent technology under the requirements of 40 CFR 268.42(b) has been met. Rinsate will be designated per WAC 173-303-070, and managed accordingly.

I1.5.2.2. Decontamination of Tank Systems

The decontamination procedures discussed in this section will be used for the DW tanks. Table I1-4 provide a summary of the DW tanks to be decontaminated, including type and volume of waste stored, internal tank surface area, and concrete containment surface area.

Decontamination will be achieved using a hydroblasting/waterwashing method following guidelines described in USEPA document 600/2-85/028 "Guide for Decontaminating Building, Structures and Equipment at Superfund Sites". Hydroblasting will achieve a “clean debris surface” as defined in the treatment standards for hazardous debris in Table 1 of 40 CFR 268.45. Verification will be made by an independent, qualified, registered professional engineer.

Rinsate and cleaning residue from all washings will be designated per WAC 173-303-070, and managed accordingly. All rinsate will be removed by a vacuum truck or equivalent means. Incompatible rinsate and cleaning residues will not be commingled. The collected rinsate will be treated appropriately on-site, or when necessary, sent off-site for treatment and disposal at a RCRA-permitted facility.

Decontaminated tanks may be re-used, sold for re-use, or scrapped. Decontaminated tanks may also be left in place on the containment pad unless removal of concrete or soil under the containment system becomes necessary, either under closure or Part 2 (Corrective Action) of Kent's DW management permit. As an alternative to decontamination and leaving tanks in place, tanks may be decontaminated and scrapped.

Decontaminated tanks to be scrapped will be rendered unusable prior to leaving the facility. This will be accomplished by cutting the tanks in half, or by cutting the ends off of the tanks. Prior to removal of decontaminated tanks, written proof of decontamination will be obtained from the independent qualified registered professional engineer monitoring closure activities.

As an alternative to tank decontamination, tanks may be rinsed once and disposed as hazardous waste at an off-site RCRA-permitted facility.

I1.5.2.3. Decontamination / Disposal of Ancillary Equipment

Ancillary equipment includes piping, valves, flanges and soft hoses. Decontamination of this equipment is limited to rinsing of the equipment followed by macroencapsulation and disposal at an off-site RCRA permitted facility. The piping associated with the DW tanks consists of 300 feet of 3" metal pipe. The piping, with all valves and flanges, will be cut into three-foot lengths prior to macroencapsulation. Approximately 100 cuts will be required; labor hours required for this task equate to one hour. Disposal costs for piping and ancillary equipment is based on the volume of debris generated, which is assumed to be less than 20 yards.

I1.5.2.4. Decontamination of Pumps and Forklifts

Before transport off-site or use elsewhere on site, all pumps and forklifts used for closure will be decontaminated via scraping and rinsing with high pressure water, steam, or a caustic type industrial cleaning solution until no visible evidence of contamination is present. This activity may be performed in a specific decontamination staging area with adequate containment. All rinsate from pump and forklift decontamination will be collected and treated appropriately at the facility or, when necessary, sent off-site to a RCRA-permitted facility.

ITEM	Number
forklifts	3
pumps	3

I1.5.2.5. Decontamination of Miscellaneous Equipment

Other equipment used in closure activities (including sampling equipment, PPE, shovels, Visqueen, and cleaning and decontamination equipment) will be disposed as hazardous waste debris at an off-site RCRA-permitted facility. This material will be placed in the same 20-yard roll-off box as the cut up piping.

I1.5.3. Sampling and Analysis

WAC 173-303-610(3)(a)(v), (5)

This section generally describes the sampling and analysis procedures to be used for closure activities at the facility. At least eight (8) weeks in advance of scheduled collection of samples to support final or partial closure, Stericycle will submit a sampling and analysis plan to Ecology for review and approval. The plan will include the following:

- Statement of purpose and objectives of data collection;
- Organization and responsibility for sampling and analysis activities;
- Project schedule;
- Detailed procedures for sample collection and handling;
- Identity of chemical constituents that will be quantified;
- Analytical techniques and procedures consistent with this closure plan and Chapter 173-303 WAC, modified, if necessary, to meet data quality objectives;
- Specific sampling locations and a unique identification number for all random and bias soil samples that were selected in accordance with this closure plan;
- Procedures for personnel and equipment decontamination;
- Procedures for management of waste materials generated by sampling activities;
- Protocols for sample labeling and chain of custody;
- Detection or quantification limits sufficiently low to determine compliance with clean closure standards;

- Description and number of quality assurance and quality control samples, including blanks, spikes, and duplicates;
- Complete quality control and quality assurance procedures;
- Provisions for splitting samples with Ecology, when appropriate;
- Confirmational sampling to demonstrate clean closure;
- Procedures for reporting results; including:
    - Selection of an Ecology accredited laboratory to perform analysis
    - Identification and justification of parameters to be sampled and analyzed
    - Physical and chemical properties of the materials to be sampled
    - Data validation procedures, where appropriate
- Other information specified in this closure plan.

Ecology may require additional investigation after Stericycle implements the approved sampling and analysis plan if Ecology determines that the plan has not adequately demonstrated whether clean closure has been achieved. Additional sampling and analysis may be required for the following reasons:

1. Specialized sample collection or analytical techniques are required to ensure adequate quantification limits for chemicals of concern;
2. Results indicate additional constituents should be analyzed at certain locations;
3. Results indicate additional sampling is required at certain locations of the facility; and
4. Other reasons, as determined by Ecology, indicate the sampling and analysis plan has not adequately demonstrated whether clean closure has been achieved.

If the value from a soil sample analysis is above the clean closure level for any constituent, then the area represented by the sample will be considered to be above the standard for clean closure and Stericycle shall propose additional actions. Ecology will determine whether the additional actions proposed are adequate. If Ecology determines actions proposed by Stericycle are not adequate, Ecology will specify additional actions to be taken. Examples of additional actions include, but are not limited to:

1. Removing or remediating soil that has contamination above the clean up level followed by confirmational sampling to ensure clean closure standards are met.

2. Reanalyzing soils of the entire area represented by the sample that has contamination above the clean up levels using other samples taken within the area and approved statistical methods. Approved statistical methods include the upper 95% confidence interval about the mean for sample data. If this parameter is lower than the MTCA soil level for the constituent in question, no single sample level is greater than two times the soil clean closure level, and less than 10% of all samples are above the clean closure levels; then the area will be considered to meet the clean closure standards for that constituent. Samples included in the statistical analysis must be randomly selected and the distribution of their concentrations must fit a lognormal or normal distribution;

3. Establishing post closure care or incorporation of similar requirements into the facility CAP for the areas not able to attain clean closure standards.

In the case where hazardous substances may have migrated to the unit from another, unrelated source, clean closure of individual units may occur provided:

1. All DWs, constituents and waste residues which originated from the unit or waste management activities associated with the unit are removed to appropriate clean closure levels; and

2. Stericycle demonstrates to Ecology's satisfaction that the remaining contamination did not emanate from the closing unit and was not in any way caused by waste management activities at the closing unit.

Stericycle's obligations for closure at any given unit are fulfilled when Ecology accepts a unit specific clean closure certification. If contamination remains at the clean-closed unit in concentrations above appropriate MTCA clean up levels, the unit is subject to additional remediation under post closure or Part 2 (Corrective Action) of Kent's DW management permit.

I1.5.3.1. Containment Pad Sampling and Analysis

All concrete secondary containment pads will be sampled and analyzed to confirm that no residual contamination is present by analysis of concrete chips taken from secondary containment areas. The purpose of the concrete chip sampling and analysis is to identify areas where additional decontamination may be necessary.

Random and bias samples will be collected by chipping the surface concrete and/or coating of each secondary containment system. Samples will be collected using either concrete coring equipment, rotohammer, or chisel. Sample collection, documentation, and handling will be in accordance with standard procedures described in SW-846.

Concrete chips from all sumps in secondary containment areas will be sampled as biased sampling locations, since the sumps would be the most likely location for collection and longer-term residence of any contaminants. Locations of cracks or stains in the secondary containment system also will be priority locations for biased concrete chip sampling. Visual observation of past repair locations and repair records maintained as part of the facility's operating log will be used to determine selective locations for bias soil sampling during closure. Additional samples are included for this purpose.

Random sample locations will be selected in accordance with procedures described in "Test Methods for Evaluating Solid Waste", SW-846, U.S. Environmental Protection Agency, November 1986. Random sampling locations within five feet of the biased sampling locations will be reassigned to another randomly selected location.

To select random sample locations, a grid pattern is superimposed over the respective containment areas listed in Tables I1-3, and I1-4 and shown on Figure I1-1. Each container storage cell, loading area, and tank system are counted as a grid system for selecting random sampling locations. Samples from each of the areas listed in Tables

I1-3 and I1-4 will be taken. The grid system will determine where each sample is to be taken. One random sample is taken for every 3,000 square feet of surface area in the unit, and sample numbers are rounded up (e.g., <3,000 sf = one random sample; 3,350 sf = 2 random samples, etc.).

Prior to sampling containment pads, the numeric cleanup levels for soil calculated using residential or unrestricted exposure assumptions according to the MTCA regulations will be compared to the PQLs existing at the time of closure for the constituents to be analyzed.

Analytical results from chip samples taken during unit closure will be compared to MTCA Method B cleanup levels to determine whether clean closure has been achieved for the secondary containment. Ecology will be provided with all analytical results and included in discussions to determine when closure has been successfully completed.

If the analytical result from a concrete chip sample is above the clean closure level for any constituent, then the area represented by the sample will be considered above the standard for clean closure and Stericycle will propose additional actions to Ecology. Ecology will determine whether the additional actions are appropriate. If Ecology determines the actions proposed by Stericycle are not adequate, then Ecology will specify additional actions to be taken.

Stericycle will use approved analytical methods capable of achieving quantification limits that are adequate for demonstrating whether compliance with clean closure standards defined in this closure plan and MTCA is met. For example, the following methods, or approved methods that replace them, shall be used:

- SW-846 Method 8260 for volatile organic constituents;
- SW-846 Method 8270 for semi-volatile organic constituents; and
- SW-846 6010C for metals.

Concrete chip sampling is summarized in Table I1-2, Concrete and Soil Sampling and Analysis Summary.

I1.5.3.2. Soil Sampling and Analysis

The soil underlying secondary containment pads will be sampled and analyzed to confirm that no residual contamination is present. The purpose of soil sampling and analysis is to determine if clean closure is achieved. It is also needed to identify areas where post closure or additional corrective action under Part 2 (Corrective Action) of Kent's DW permit may be necessary as a result of past practices and to support such activity.

Random and bias samples will be collected at a depth of up to 15 feet below the soil surface (or the water table, whichever is shallower), through holes bored in the overlying containment systems. Samples will be collected one at the surface of the boring and then at three-foot intervals. Sample collection, documentation, and handling will be in accordance with standard procedures described in SW-846. Table I1-2 describes soil sampling locations and analysis.

In addition to current dangerous waste management units, the Kent facility has non-DW tank systems previously used for DW management. These include former DW Wastewater Tanks T-1, T-2, T-3, T6A, T6B, T-8, T-10 and T-5603, and former DW Stabilization Tanks T-5305 and T-5306. Above ground portions of these tank systems (including the tanks, ancillary equipment, and their concrete secondary containment areas) were clean closed and then converted to non-DW activities. However, soils and ground water below these systems have not been clean closed, and they are still subject to requirements in this closure plan. To close, soil sampling is required beneath these areas to a depth of 15 feet or the water table, whichever is shallower. One sample will be taken at the surface and then at 3-foot intervals as specified in Table I1-2. If soil or groundwater beneath these areas do not meet closure performance standards in Section I1.2 at the time of final closure, additional action will be required through ongoing corrective action and post-closure permitting.

Soils beneath all sumps in secondary containment areas will be sampled as biased sampling locations, since the sumps would be the most likely location for collection and longer-term residence of any contaminants. Locations of cracks or stains in the secondary containment system and known spills or releases also will be priority locations for biased sampling. Visual observation of past repair locations and repair records maintained as part of the facility's operating log will be used to determine

selective locations for bias soil sampling during closure. Additional samples are included for this purpose.

Random sample locations will be selected in accordance with procedures described in Test Methods for Evaluating Solid Waste, SW-846, U.S. Environmental Protection Agency, November 1986, and subsequent updates. Random sampling locations within five feet of the biased sampling locations will be reassigned to another randomly selected location.

To select random sample locations, a grid pattern is superimposed over the respective containment areas. Each container storage cell, loading area, and tank system are counted as a grid for selecting random sampling locations.

Analytical results from soil samples taken during unit closure will be compared to MTCA Method B cleanup levels to determine whether contamination is present in soils under DW management units. Ecology will be provided with all analytical results in order for Ecology to determine when closure has been successfully completed.

Stericycle will use approved analytical methods capable of achieving quantification limits that are adequate for demonstrating whether compliance with clean closure standards defined in this closure plan and MTCA is met. For example, the following methods, or approved methods that replace them, shall be used:

- SW-846 Method 8260 for volatile organic constituents;
- SW-846 Method 8270 for semi-volatile organic constituents; and
- SW-846 6010C for metals.

Soil sampling is summarized in Table I1-2.

I2. POST-CLOSURE PLAN

WAC 173-303-610(8)(a), -650(6)(b) and (6)(c)(i)(B), -655(6)(b), (8)(c), -660(9)(b) and (9)(c)(i)(B)

Stericycle has not operated DW disposal units at the Kent Facility. At the time of closure of the tank systems (partial or full closure), the soils underneath the secondary containment will be investigated. Contaminated soils may be removed as part of closure

to achieve clean closure or be addressed under Part 2 (Corrective Action) of Kent's DW management permit.

It is expected that the corrective action mechanism to address contamination in soil and groundwater for all but the soils under concrete pads and secondary containment will be completed prior to final closure of the facility. Financial Assurance and cost estimates for corrective action are included in Part 2 (Corrective Action) of Kent's DW management permit. Should ongoing corrective action measures not fully address soil and groundwater contamination, a post-closure permit could be required.

I3. CLOSURE COST ESTIMATES

WAC 173-303-806(4)(a)(xv), 620(3)

I3.1. Regulatory Requirements

- Stericycle will prepare a closure cost estimate for activities included in this closure plan in accordance with 40 CFR 264.142(a) and WAC 173-303-610(1)(d) and -620(3)(a);
- Stericycle will adjust the closure cost estimate for inflation in accordance with 40 CFR 264.142(b) and WAC 173-303-620(3)(c);
- Stericycle will revise the closure cost estimate as necessary in accordance with 40 CFR 264.142(c) and WAC 173-303-620(3)(b); and
- Stericycle will maintain at the facility a copy of the most current cost estimate in accordance with 40 CFR 264.142(d) and WAC 173-303-620(3)(d).

Detailed cost estimates for closing the facility at maximum waste inventory are provided in Appendix I-2.

I3.2. Unit Costs for Closure Activities

Unit costs for closure activities, and specific information regarding the assumptions and procedures used to develop them, are provided in Appendix I-1.

I3.3. Inventory Elimination Costs

The costs associated with eliminating the remaining waste inventory at final or partial facility closure are presented in Appendix I-2. Cost estimates are based on maximum waste inventory, and are broken down by specific inventory elimination scenarios.

I3.4. Facility Decontamination Costs

The closure costs for decontamination of facility equipment, waste management units, and rinsate management are included in Appendix I-2. Tanks and equipment will be salvaged to the extent possible. However, salvage value has not been incorporated into the closure cost estimate.

I3.5. Sampling and Analytical Costs

Detailed cost estimates for sampling and analytical procedures are included in Appendix I-2.

I4. POST-CLOSURE COST ESTIMATE REQUIREMENTS

WAC 173-303-806(4)(xvi), 620(5)

Stericycle has not operated DW disposal units at the Kent Facility. At the time of closure of the tank systems (partial or full closure), the soils underneath the secondary containment will be investigated. If contaminants in the soils fail to meet the MTCA Standards set forth in the CAP, then the cleanup of these soils will be incorporated into a re-opened CAP. The areas incorporated into the legal mechanism for the CAP will not be subject to the contingent post-closure care cost estimate requirements of 40 CFR 264.197(c)(3) and (5).

It is expected that corrective action will be completed prior to final closure of the facility. Therefore, post-closure cost estimates are not provided. Financial Assurance and cost estimates for corrective action are included in Part 2 (Corrective Action) of Kent's DW management permit. Should ongoing corrective action measures not fully address soil and groundwater contamination, a post-closure permit could be required.

I5. NOTICE IN DEED REQUIREMENTS AND SURVEY PLAT REQUIREMENTS

WAC 173-303-806(4)(a)(xiv), 610(7)(d), (8), (10) & (11)

If procedures in this closure plan fail to demonstrate clean closure is achieved at final closure, a notice in deed regarding restrictions on the use of land used to manage DWs will be required for all areas left with contaminated soils and groundwater in the subsurface. Similarly, a survey plat indicating the location of landfill cells or other areas with DW disposed in soil or groundwater remaining on site will be required. If applicable clean-up standards, including the MTCA clean-up standards of WAC 173-340, are not met, a notice will be made in the property deed in compliance with WAC 173-340-440(a).

I6. FINANCIAL ASSURANCE MECHANISM

WAC 173-303-806(4)(a)(xv) and (xvi), 620(4) and (6)

Stericycle will demonstrate continuous compliance with 40 CFR 264.143 by providing documentation of financial assurance, as required by 40 CFR 264.151, in at least the amount of the current cost estimate. Wording of the mechanisms will be modified in accordance with WAC 173-303-620(10). A copy of the current financial assurance mechanism is provided in Appendix I-3. Changes in the financial assurance mechanism must be approved by the Director or their designee pursuant to 40 CFR 264.143.

I7. LIABILITY REQUIREMENTS

WAC 173-303-806(4)(a)(xvii), 620(8) and (9)

Stericycle will demonstrate continuous compliance with the requirements of 40 CFR 264.147(a) to have and maintain liability coverage for sudden accidental occurrences in the amount of at least $1 million per occurrence, with an annual aggregate of at least $2 million, exclusive of legal defense costs. A copy of the required documentation is provided in Appendix I-4.

Stericycle shall comply with 40 CFR 264.148, whenever necessary.

LIST OF TABLES

Table I1-1 Closure Schedule

Table I1-2 Concrete and Soil Sampling and Analysis Summary

Table I1-3 Container Storage / Staging Units Summary

Table I1-4 Tank Units Summary

Table I3-1 Cost Estimates for Closure at Maximum Waste Inventory

TABLE I1-1 CLOSURE SCHEDULE

CLOSURE STEP	EST. TIME REQUIRED	EST. COMP. DATE
Inventory elimination	6 weeks	Week 6
Container storage area decontamination	4 weeks	Week 10
Tank systems decontamination	2 weeks	Week 12
Soil sampling/analysis	6 weeks	Week 18

TABLE I1-2. CONCRETE AND SOIL SAMPLING AND ANALYSIS SUMMARY [1]

AREA	DESCRIPTION	ANALYTES [2]
**South Check-In Area	5 bias	VOCs, SVOCs, total metals, PCBs pesticides, cyanides, sulfides, pH
	3 random	same
**North CSA	8 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	2 random	same
**South CSA	6 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	2 random	same
**Lab Pack CSA	2 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	1 random	same
**Central Process Area	2 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	1 random	same
**Solidification Process Area	2 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	1 random	same
**Lab Pack Area	2 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	1 random	same
TSCA/DW Area	2 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	1 random	same
North Truck Load/Unload Area	2 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	1 random	same
**Dangerous Wastewater Area [3]	9 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	12 random	same

Stabilization Tank Area [4]	6 bias	VOCs, SVOCs, total metals, PCBs, pesticides, cyanides, sulfides, pH
	9 random	same [5]

# of bias concrete samples	40	# of bias soil samples	46
# of random concrete samples	25	# of random soil samples	34
TOTAL CONCRETE SAMPLES:	65	TOTAL SOIL SAMPLES:	80

Notes:

(1) One soil and one concrete sample will be taken at each identified bias and random sample location, except as noted. One additional bias sample is required for each unit to address potential cracks in containment or spill/release. One random sample is taken for every 3,000 square feet of surface area in the unit, and sample numbers are rounded up (e.g., <3,000 sf = one random sample; 3,350 sf = 2 random samples, etc.).

(2) Includes analysis for constituents that may be present in waste streams at levels too low for inclusion as a DW characteristic, but high enough to be of interest when evaluating whether the closure performance standard has been met. Additional constituents may be analyzed if results indicate the need for supplementary investigation.

(3) The Dangerous Wastewater Area includes the area where Tanks 9A, 9B, and 9C are currently located; it also includes the subsurface below former Tanks T-1, T-2, T-3, T6A, T6B, T-8, T-10 and T-5603 where cleanup of the below-ground portions of the facility were transferred to final closure of the facility. Soil sampling in the Dangerous Wastewater Area will be to a depth of 15' or the water table, whichever is shallower. One sample will be taken at the surface and then at 3-foot intervals.

(4) Soil samples only. In 2011, Tanks 5305 and 5306 were decontaminated and removed from RCRA service through a partial closure. However, soil sampling in this area was deferred until final facility closure. Soil sampling in the Stabilization Tank Area will be to a depth of 15' or the water table, whichever is shallower. One sample will be taken at the surface and then at 3-foot intervals.

(5) If sampling and analysis of concrete and soils indicate that results are above the MTCA Standards set for the site in the agreed order for corrective action, then removal may be required by Ecology. In this event, the concrete and soils will be designated for off-site treatment and/or disposal.

**As these units will remain in service as Moderate Risk Waste units after relocation of operations to Stericycle-Tacoma, destructive concrete chip and soil sampling will not be conducted until final facility closure. These units will be decontaminated with a high pressure wash procedure.

TABLE I1-3 CONTAINER STAGING / STORAGE UNITS SUMMARY Kent Facility (July 2015)

Area	Cells	App D-3 Reference	Length ft	Width ft	Total sq ft	Sumps	Maximum[1] Inventory
South Check-In Area							n/a[2]
	Flammable		38.00	38.00	1,444.00	1	
	Corrosive		36.00	38.00	1,368.00	1	
	Toxics		16.25	38.00	617.50	1	
	Oxidizers		16.75	38.00	636.50	1	
					4,066.00	4	
North CSA							n/a
	NE 1	Area III	10.50	20.00	210.00	1	
	NE 2-3	Area III	17.00	20.00	340.00	1	
	NE 4-9	Area IV	43.00	20.00	860.00	1	
	NE 10-15	Area V	40.25	20.00	805.00	1	
	NW 1	Area VI	10.50	20.00	210.00	1	
	NW 2-4	Area VI	32.00	20.00	640.00	1	
	NW 5-11	Area VII	68.75	20.00	1,375.00	1	
					4,440.00	7	
South CSA							n/a
	SE 1-4	Area X	28.42	19.50	554.19	1	
	SE 5-10	Area IX	43.00	19.50	838.50	1	
	SE 11-16	Area VIII	42.33	19.50	825.44	1	
	SW 1-6	Area XII	42.75	19.50	833.63	1	
	SW 7-13	Area XI	70.83	19.50	1,381.19	1	
					4,432.94	5	
Lab Pack Area			52.00	28.00	1,456.00	0	n/a
Lab Pack CSA			22.00	38.00	836.00	0	n/a
TSCA/DW Area			42.25	23.50	992.88	0	180 drums
Solidification Process Area			30.00	20.00	600.00	1	n/a
Central Process Area		Area II	77.33	29.50	2,281.24	1	n/a
North Truck Load/Unload Area			55.00	12.00	660.00	1	n/a[3]

(1) Container inventory has been assigned to off-site disposal method scenarios based on expected quatities of IFC-compatible hazard classes in each cell, as outlined in Section D2.2.2.4.

(2) No storage; Part A S01 does not include this area.

(3) No container storage allowed; unit remains in this table to account for secondary containment decomamination costs.

Note: South Dock is not a staging storage, or processing area,; costs for decontamination are not included. Maximum overall container storage capacity for porpose of closure cost assureance is 9,900 gallons (i.e., 180 55-gallon containers).

Table I1-4 DW Tank Summary

Kent Facility
Relocation Modification (July 2015)

Tank Number	*Inside Diameter*		*Tank Body Height*		*Cone Height*		*Working Volume*	*Inside Surface Area*	*Tank Contents*
	ft	in	ft	in	ft	in	gallons	sq ft	
T9A	12	0	16	0	0	0	12,700	641	ww storage
T9B	10	6	18	0	2	0	11,400	670	ww treatment
T9C	9	0	20	0	0	0	9000	593	ww storage/discharge

Total DW tanks internal surface area **1,904 sq ft**

Total concrete containment surface area **1,940 sq ft**
(DW tanks)

Total DW tank working volume (S02) **33,100 gal**
(the maximum overall tank storage volume for purposes of estimating closure cost assurance)

Container summary

DW fuel (liq.)							
DW fuel (sol.)							
incineration (liq.)							
incineration (sol.)							
incineration (ox./react.)							
stabilization (liq.)							
stabilization (sol.)							
direct landfill							
aqueous treatment							
corrosives treatment							
subtotals	0			0		0	
Total							

concrete surface area	0			0		0	
1,653							
Note: this table provides background info on inventory elimination scenarios, and is not intended for in							
Total S01 container storage capacity is 11,000 gallons (200 drums indoor and outdoor areas).							

0		0		0		0	
clusion in Section I.							

Container summary

TSCA/DW Area				**N. Truck Load/Unload**		
drums	location			drums	location	
20						
30						
30						

Container summary

993		0		660		

totals	
20	
0	
0	20
0	
0	
0	
0	0
30	
0	
0	
0	30
30	
0	
0	
0	
0	30
0	
0	
0	0
0	
0	
0	
0	
0	
0	
0	0
0	
0	
0	
0	
0	
0	
0	0
100	
0	
0	
0	
0	100
0	
0	
0	0
0	
0	
0	0
	180

Table I1-5 Inventory Elimination Scenarios for DW Tanks

Kent Facility
August 2011

	DW Tank No.	**gallons**	**tanks**		
DW fuel (liq.)					
				subtotal	0
DW fuel (sol.)		0			
				subtotal	0
incineration (liq.)					
				subtotal	0
incineration (sol.)		0			
				subtotal	0
incineration (ox./react.)		0			
				subtotal	0
stabilization (liq.)					
				subtotal	0
stabilization (sol.)					
				subtotal	0
direct landfill		0		subtotal	0
aqueous treatment	**T9A**	33,100	T9A-C		
	T9B			subtotal	33,100
	T9C				
corrosives treatment		0			
				subtotal	0
				Total	33,100
Note: this table provides background info on inventory elimination scenarios, and is not intended fo					

Table I1-5 Inventory Elimination Scenarios for DW Tanks

Kent Facility
August 2011

					Bias Concrete	Bias Soil
S Check In					5	5
N CSA					8	8
S CSA					6	6
~~Ox CSA~~					0	0
Lab Pack CSA					2	2
C Process					2	2
Solid Process					2	2
Lab Pack Area					2	2
TSCA/DW					2	2
~~NC Process~~					0	0
N Truck Load					2	2
DW wastewater					9	9
Stab Tank (soil only)					0	6
					40	46
	65	Total concrete samples				
	80	Total soil samples				
	145					
Note: this table provides background info on inventory elimination scenarios, and is not intended fo						

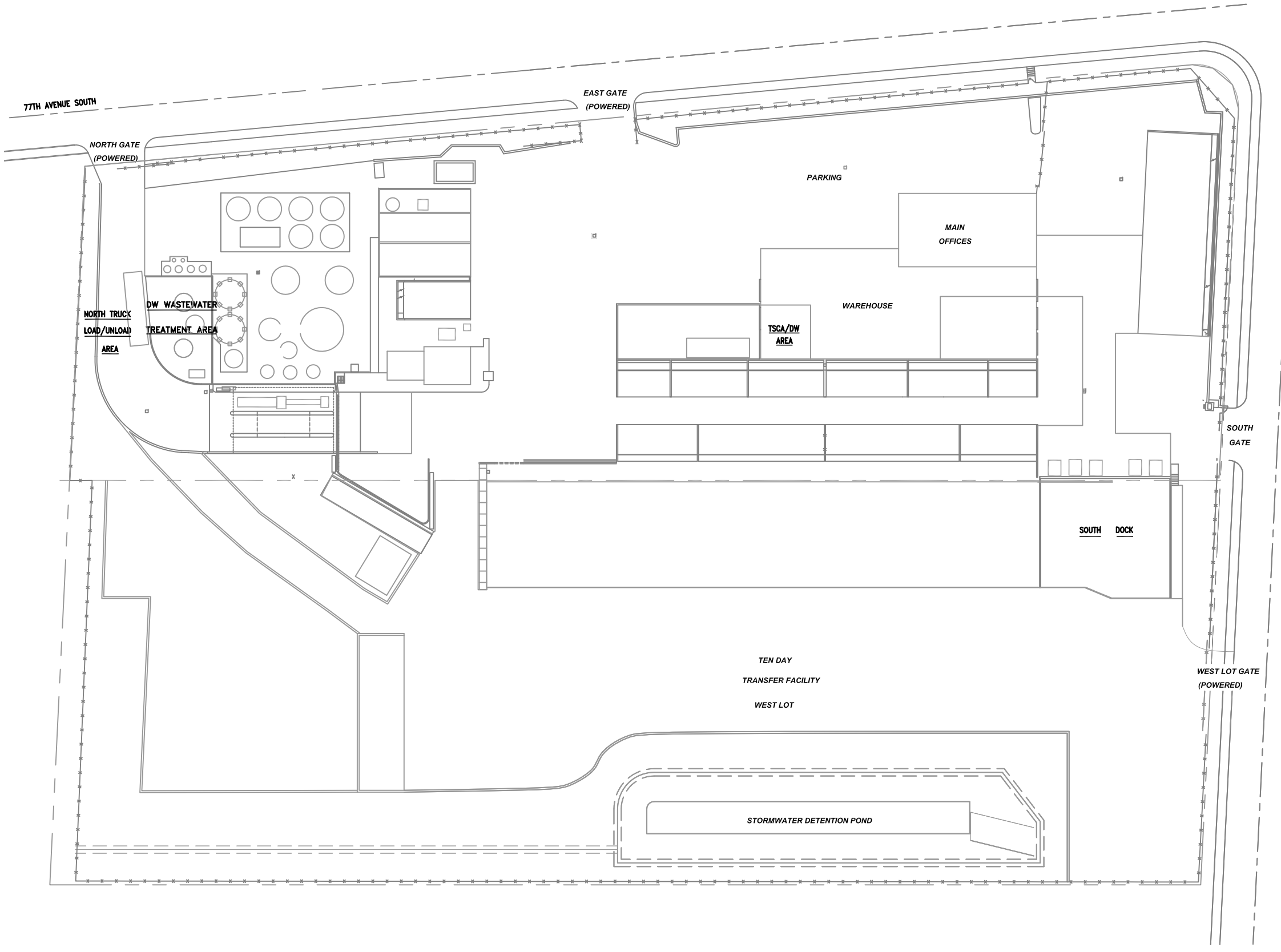
Random Concrete	Random Soil
3	3
2	2
2	2
0	0
1	1
1	1
1	1
1	1
1	1
0	0
1	1
12	12
0	9
25	34
r inclusion in Section I.	

TABLE I3-1 COST ESTIMATES FOR CLOSURE AT MAXIMUM WASTE INVENTORY

ITEM DESCRIPTION (detail provided in Appendix I-2)	COST (2011 $)
A. Maximum Waste Inventory Elimination	$63,625
B. Facility Decontamination / Equipment Disposal	$40,183
C. Soil and Concrete Sampling and Analysis	$123,250
D. Miscellaneous (P.E. certification, PPE)	$13,060
SUBTOTAL	$240,118
Contingency (20%)	$48,024
TOTAL CLOSURE COST ESTIMATE (2011 $)	**$288,142**
Update with 1.083 inflation factor (2015 $)	**$312,058**

LIST OF FIGURES

Figure I1-1 Kent Facility Site Plan



Dangerous Waste Units Closure Status		
	Unit	Status
1	South Check-in Area	Inactive/Closing
2	North CSA	Inactive/Closing
3	South CSA	Inactive/Closing
4	Lab Pack CSA	Inactive/Closing
5	Central Process Area	Inactive/Closing
6	Solidification Process Area	Inactive/Closing
7	Lab Pack Area	Inactive/Closing
8	TSCA/DW Area	Active
9	North Truck Load/Unload Area	Active
10	Dangerous Wastewater Area	Inactive/Closing
11	Stabilization Tank area	Inactive/Closing

N

0 30 60

FEET

Stericycle®

TITLE:

Facility Site Plan

Stericycle Kent Facility

DWN: dtb	DES.:	PROJECT NO.:
CHKD:	APPD:	FIGURE NO.: I1–1
DATE: 8/6/15	REV.:	

APPENDIX I-1

UNIT COSTS AND ASSUMPTIONS

APPENDIX I-1
UNIT COSTS AND ASSUMPTIONS

The unit costs associated with closure of the facility are based on the following assumptions and procedures:

- The unit costs for all closure activities are based on the cost of hiring a third party to close the facility. A third party is someone other than the parent or subsidiary of the owner or operator. However, it is intended that trained site personnel will be used to conduct closure activities to the greatest extent possible in order to maintain continuity of facility operation.
- Unit costs were obtained, where possible, from actual operating costs and experience, and contractor estimates. Other sources used include Ecology's Closure Cost Estimating Tool (CCET) Version 1.3 (August 2009) and prevailing wages rates are provided by Washington Dept. of Labor and Industries (see notes following Unit Cost table below.
- Supplies and equipment will be salvaged to the extent possible. However, salvage value has not been incorporated into the closure cost estimate. On-site equipment will be used where possible to close the facility. Outside contractor's equipment will be used as necessary.
- Cost for decontaminating sampling equipment between samples is considered to be negligible.

APPENDIX I-1 UNIT COSTS FOR CLOSURE ACTIVITIES

ITEM DESCRIPTION	2010 UNIT COST	SOURCE
Operator labor	$50/hr	WA Dept. of L&I [1]
Drum consolidation into bulk container	$5.00/drum	Operating exp. and L&I
Consolidation of bulk material into drums	$40/drum	Operating exp. And L&I
Truck loading (drums)	$2.50/drum	Operating exp. and L&I
Truck loading (bulk)	5,000 gal/hr = $0.01/gal	Operating exp. and L&I
Drum transport by truck	$1,200-$2,500/80 drums	Operating experience[2]
Transferring bulk trucks to rail	$250/5,000 gal	Operating experience
Bulk liquid transport by truck	$1,200-$2,500/5,000 gal	Operating experience
Bulk solid transport by truck	$1,900/roll-off or $99/ton	Operating experience
Bulk liquid transport by rail	$10,000/22,000 gal	Ecology (BNSF)
Empty drum crushing	$4.17/drum	Operating experience
Empty crushed drum transport (non DW by rail)	$900/43,000 lbs	Operating experience
Empty crushed drum disposal (non-DW landfill)	$18.50/ton	Operating experience
DW Fuel (bulk liquids) treat/disposal	$0.11/gal	Operating experience
DW Fuel (drummed solids) treat/disposal	$70/drum	Operating experience
Incineration (bulk liquids) treat/disposal	$1.60/gal	Operating experience
Incineration (drummed solids) treat/disposal	$189/drum	Operating experience
Incineration (drummed oxidizers/react.) treat/disposal	$650/drum	Operating experience
Stabilization (bulk liquids) treat/disposal	$0.89/gal	Operating experience
Stabilization (bulk solids) treat/disposal	$93.50/ton	Operating experience
Direct landfill disposal (DW)	$64.13/ton	Operating experience
Aqueous treatment (bulk liquids)	$1.23/gal	Operating experience
Corrosives treatment (bulk liquids)	$1.23/gal	Operating experience
Pumps & piping decontamination	$152/pump	Operating experience
High-pressure washing (tanks, concrete and equip.)	$1.25/sq ft	CCET[3]
Rinsate generated from high-pressure washing	4 gals/sq ft	CCET[4]
Equipment decontamination (forklift)	$85/forklift	CCET[5]
Soil and concrete sample collection and analytical	$850/sample	Operating experience[6]
Personal Protective Equipment	$140 or $365/person	Operating experience
Professional Engineer	$100/hour	CCET[7]
Macroencapsulation of debris	$152/cubic yard	Operating Experience

Notes:

1) Prevailing wages rates provided by Washington Dept. of Labor and Industries website at https://fortress.wa.gov/lni/wagelookup/PrvWageLookUp.aspx ($41/hour, adjusted $49.20/hr to include O&P at 10% each, rounded up).

2) Operating experience means that these costs are based on current standard pricing from third-party vendors.

3) WA Department of Ecology Closure Cost Estimating Tool (CCET) Version 1.3 August 2009. Cost calculated for high pressure washing by applying 0.027 hours/ft^2 work rate x $46/hr for labor and equipment costs = $1.24 / sq ft. Apply inflation factor of 1.01 (2009$ to 2010$) = 1.25 / sq ft.

4) Rinsate generation rate from Ecology Closure Cost Estimating Tool (CCET) Version 1.3 August 2009 (tab TS-10A line 7).

5) CCET assumes one unit per hour is cleaned (at $41/hr) = total cost of $84 / forklift (Tab CS-7C). Apply inflation factor of 1.01 (2009$ to 2010$) = $85 / forklift.

6) Sample collection ($34) plus analytical ($800) = $834 in 2009$; apply inflation factor of 1.01 (2009$ to 2010$) = $842 / sample (round up to $850 to reflect higher labor rates).

7) CCET Unit Cost tab.

APPENDIX I-2

CLOSURE COST CALCULATIONS FOR MAXIMUM WASTE INVENTORY

The costs for treating, disposing off site, and transporting the remaining inventory after wastes are no longer accepted at the facility are included in this appendix. Inventory elimination cost estimates are based on the maximum waste inventory. It is assumed that all inventory will be sent off-site for treatment and/or disposal.

Unit costs for transportation and off-site disposal used for estimating inventory elimination costs are based on current standard pricing from third-party vendors.

Appendix I-2

Closure Cost Calculations for Maximum Waste Inventory

A. Maximum Waste Inventory Elimination Costs

Inventory elimination costs are based according to the treatment/disposal method applicable to a given waste. Selection of off-site treatment/disposal scenarios (and associated volumes) is based on facility operating experience.

Off-site Treatment / Disposal Method	**Drums***	**Tanks****
A1. DW Fuel (liquids)	20	0
A2. DW Fuel (solids)	0	0
A3. Incineration (liquids)	30	0
A4. Incineration (solids)	30	0
A5. Incineration (oxidizers/reactives)	0	0
A6. Stabilization (liquids)	0	0
A7. Stabilization (solids)	0	0
A8. Direct landfill	100	0
A9. Aqueous treatment	0	33,100
A10. Corrosives treatment	0	0
TOTAL	**180**	**33,100**

* 55-gallon drums; total is based on SO1 in Part A;
typical mix of wate types based on segregation requirements and operating experien

** In gallons; total is based on S02 in Part A (working volume in Table D2-2).

A. Inventory Elimination Costs

A1. Dangerous Waste Fuel (liquids)
Material in containers will be pumped into trucks and transferred to railcars for off-site treatment/disposal as DW fuel. Waste transport cost is based on a 1,500 mile trip. Empty drums will be crushed on-site and sent off-site via bulk railcar for disposal at Subtitle D landfill. Transportation cost includes approx. $2,500 decon charge per railcar.

quantity:

20 drums = 1,100 gal

unit costs:

$5.00 /drum - drum pump-up to bulk truck (10 drums/hr at $50/hr)
$4.17 /drum - empty drum crushing (12 drums/hour at $50/hr)
$1.05 /drum - empty crushed drum transport to landfill ($900/43,000 lb; 50 lb/drum)
$0.46 /drum - empty crushed drum disposal ($18.50/ton at 50 lb/drum)
$10.68 total unit cost per drum

$0.05 /gal - transferring from tanker trucks to railcars ($250/5,000 gal)
$0.45 /gal - railcar transport to TSDF ($10,000 / 22,000 gal)
$0.11 /gal - off-site disposal of liquid DW fuel
$0.61 total unit cost per gallon of bulked liquids

inventory elimination calculation:

20 drums x	$10.68 / drum =			$214
1,100 gal x	$0.61 / gal =			$671
		A1 subtotal		$885

A2. Dangerous Waste Fuel (solids)
Material will be shipped off-site in drums for treatment/disposal as DW fuel. Waste transport cost is based on a 1,500 mile trip.

quantity:

0 drums = 0 gal

unit costs:

$2.50 /drum - load drums onto truck (20 drum/hr at $50/hr)
$31.25 /drum - truck transport to treatment/disposal facility ($2500 / 80 drums)
$70.00 /drum - off-site treatment/disposal (dangerous waste fuel solids)
$103.75 total unit cost per drum

inventory elimination calculation:

0 drums x	$103.75 / drum =			$0
		A2 subtotal		$0

A3. Incineration (liquids)
Material in containers will be pumped into trucks and transferred to railcars for off-site incineration as DW. Waste transport cost is based on a 1,500 mile trip. Empty drums will be crushed on-site and sent off-site for Subtitle D land disposal. Transportation cost includes approx. $2,500 decon charge per railcar.

quantity:

30 drums = 1,650 gal

unit costs:

$5.00 /drum - drum pump-up to bulk truck (10 drums/hr at $50/hr)
$4.17 /drum - empty drum crushing (12 drums/hour at $50/hr)
$1.05 /drum - empty crushed drum transport to landfill ($900/43,000 lb; 50 lb/drum)
$0.46 /drum - empty crushed drum disposal ($18.50/ton at 50 lb/drum)
$10.68 total unit cost per drum

$0.05 /gal - transferring from tanker trucks to railcars ($250/5,000 gal)
$0.45 /gal - railcar transport to TSDF ($10,000 / 22,000 gal)
$1.60 /gal - off-site disposal (incineration of bulk liquids)
$2.10 total unit cost per gallon of bulked liquids

inventory elimination calculation:

30 drums x	$10.68 / drum =			$320
1,650 gal x	$2.10 / gal =			$3,465
		A3 subtotal		$3,785

A4. Incineration (solids)
Material will be shipped off-site in drums as DW for treatment/disposal by incineration. Waste transport cost is based on a 1,500 mile trip.

quantity:

30 drums = 1,650 gal

unit costs:

$2.50 /drum - load drums onto truck (20 drum/hr at $50/hr)
$31.25 /drum - truck transport to treatment/disposal facility ($2500 / 80 drums)
$189.00 /drum - off-site treatment/disposal (incineration of solids)
$222.75 total unit cost per drum

inventory elimination calculation:

30 drums x	$222.75 / drum =			$6,683
		A4 subtotal		$6,683

A5. Incineration (oxidizers/reactives)

Material will be shipped off-site in drums for treatment/disposal by incineration as DW. Waste transport cost is based on a 1,500 mile trip.

quantity:

0 drums = 0 gal

unit costs:

$2.50	/drum - load drums onto truck (20 drum/hr at $50/hr)
$31.25	/drum - truck transport to treatment/disposal facility ($2500 / 80 drums)
$650.00	/drum - off-site treatment/disposal (incineration of oxidizers/reactives)
$683.75	total unit cost per drum

inventory elimination calculation:

0 drums x	$683.75	/ drum =		$0
			A5 subtotal	$0

A6. Stabilization (liquids)

Material in containers will be pumped into bulk truckloads for off-site treatment/disposal by stabilization as DW. Waste transport cost is based on a 500 mile trip. Empty drums will be crushed on-site and sent off-site for Subtitle D land disposal.

quantity:

0 drums = 0 gal

unit costs:

$5.00	/drum - drum pump-up to bulk truck (10 drums/hr at $50/hr)
$4.17	/drum - empty drum crushing (12 drums/hour at $50/hr)
$1.05	/drum - empty crushed drum transport to landfill ($900/43,000 lb; 50 lb/drum)
$0.46	/drum - empty crushed drum disposal ($18.50/ton at 50 lb/drum)
$10.68	total unit cost per drum

$0.24	/gal - bulk truck transport to TSDF ($1,200/5,000 gal)
$0.89	/gal - off-site treatment/disposal (stabilization of liquids)
$1.13	total unit cost per gallon of bulked liquids

inventory elimination calculation:

0 drums x	$10.68	/ drum =		$0
0 gal x	$1.13	/ gal =		$0
			A6 subtotal	$0

A7. Stabilization (solids)
Material in containers will be consolidated into bulk truckloads for off-site treatment/disposal by stabilization as DW. Waste transport cost is based on a 500 mile trip. Empty drums will be crushed on-site and sent off-site for Subtitle D land disposal.

quantity:

0 drums = 0 gal
0 CY = 0 gal (I CY = 202 gallons)
0 gal total = 0 tons (at 9 lb/gal)

unit costs:

$5.00 /drum - drum pump-up to bulk truck (10 drums/hr at $50/hr)
$4.17 /drum - empty drum crushing (12 drums/hour at $50/hr)
$1.05 /drum - empty crushed drum transport to landfill ($900/43,000 lb; 50 lb/drum)
$0.46 /drum - empty crushed drum disposal ($18.50/ton at 50 lb/drum)
$10.68 total unit cost per drum

$0.24 /gal - bulk truck transport to TSDF ($1,200/5,000 gal)
$93.50 / ton (at 9 lb/gal) - off-site treatment/disposal (stabilization of solids)

inventory elimination calculation:

0 drums x	$10.68	/ drum	=		$0
0 gal x	$0.24	/ gal	=		$0
0 tons x	$93.50	/ ton	=		$0
				A7 subtotal	$0

A8. Direct landfill
Material in containers will be consolidated into bulk truckloads as DW for off-site Subtitle C land disposal. Waste transport cost is based on a 500 mile trip. Empty containers will be crushed on-site and sent off-site for Subtitle D land disposal.

quantity:

100 drums = 5,500 gal = 25 tons (at 9 lb/gal)

unit costs:

$5.00 /drum - drum pump-up to bulk truck (10 drums/hr at $50/hr)
$4.17 /drum - empty drum crushing (12 drums/hour at $50/hr)
$1.05 /drum - empty crushed drum transport to landfill ($900/43,000 lb; 50 lb/drum)
$0.46 /drum - empty crushed drum disposal ($18.50/ton at 50 lb/drum)
$10.68 total unit cost per drum

$99.00	/ ton (at 9 lb/gal) - bulk transport to landfill	
$64.13	/ ton (at 9 lb/gal) - off-site disposal (direct landfill)	
$163.13	total cost per ton	

inventory elimination calculation:

100	drums x	$10.68	/ drum	=		$1,068
25	tons x	$163.13	ton	=		$4,078
					A8 subtotal	$5,146

A9. Aqueous treatment

Material in containers and tanks will be pumped into bulk truckloads for off-site treatment/disposal as DW. Waste transport cost is based on a 1,500 mile trip. Empty drums will be crushed on-site and sent off-site for Subtitle D land disposal.

quantity:

0	drums =	0	gal
vol. in	tanks =	33,100	gal
		33,100	gal total

unit costs:

$5.00	/drum - drum pump-up to bulk truck (10 drums/hr at $50/hr)
$4.17	/drum - empty drum crushing (12 drums/hour at $50/hr)
$1.05	/drum - empty crushed drum transport to landfill ($900/43,000 lb; 50 lb/drum)
$0.46	/drum - empty crushed drum disposal ($18.50/ton at 50 lb/drum)
$10.68	total unit cost per drum
0.010	/ $ gal - loading material from tanks to bulk truck (5,000 gal/hr at $50/hr)
$0.50	/gal - truck transport to treatment/disposal facility ($2,500/5,000 gal)
$1.23	/gal - off-site treatment/disposal (aqueous treatment)
$1.73	total unit cost per gallon of bulked liquids

inventory elimination calculation:

0	drums x	$10.68	/ drum	=		$0
33,100	gal x	$0.010	/ gal	=		$331
33,100	gal x	$1.73	/ gal	=		$57,263
					A9 subtotal	$57,594

A10. Corrosives treatment

Material in containers will be pumped into bulk truckloads for off-site treatment/disposal as DW. Waste transport cost is based on a 1,500 mile trip. Empty drums will be crushed on-site and sent off-site for Subtitle D land disposal.

quantity:

0 drums = 0 gal

unit costs:

$5.00	/drum - drum pump-up to bulk truck (10 drums/hr at $50/hr)
$4.17	/drum - empty drum crushing (12 drums/hour at $50/hr)
$1.05	/drum - empty crushed drum transport to landfill ($900/43,000 lb; 50 lb/drum)
$0.46	/drum - empty crushed drum disposal ($18.50/ton at 50 lb/drum)
$10.68	total unit cost per drum

$0.50	/gal - truck transport to treatment/disposal facility ($2,500/5,000 gal)
$1.23	/gal - off-site treatment/disposal (corrosives treatment)
$1.73	total unit cost per gallon of bulked liquids

inventory elimination calculation:

0 drums x	$10.68	/ drum	=		$0
0 gal x	$1.73	/ gal	=		$0
				A10 subtotal	$0

TOTAL MAXIMUM WASTE INVENTORY ELIMINATION COSTS **$63,625**

B. Facility Decontamination / Equipment Disposal Costs

B1. Concrete Secondary Containment Decontamination (high pressure washing)

Rinsate generated is 4 gal/sq ft (CCET and EPA guidance). Rinsate will be pumped to storage tanks, then placed into bulk tankers for off-site treatment/disposal as DW.

unit costs:

$1.25 / sq ft - labor/equip for high pressure wash (40 sq ft/hr at $50/hr)

0.010 / $ gal - loading material from tanks to bulk truck (5,000 gal/hr at $50/hr)

$1.23 / gal (aqueous treatment)

surface area:

1,653 sq ft total container units concrete surface area (see Table I1-3)

1,940 sq ft DW tank system concrete surface area (see Table I1-4)

3,593 sq ft total concrete to be decontaminated

rinsate quantity:

3,593 x 4 gal/sq ft = 14,372 gal

cost calculation:

3,593 sq ft x	$1.25 / sq ft =		$4,491
14,372 gal x	0.010 $ / gal =		$144
14,372 gals x	$1.23 / gal =		$17,678
		B1 subtotal	$22,313

B2. Tank Decontamination

Rinsate generated is 4 gal/sq ft (CCET and EPA guidance). Rinsate will be pumped to storage tanks, then placed into bulk tankers for off-site treatment/disposal as DW.

unit costs:

$1.25 / sq ft - labor/equip for high pressure wash (40 sq ft/hr at $50/hr)

0.010 / $ gal - loading material from tanks to bulk truck (5,000 gal/hr at $50/hr)

$1.23 / gal (aqueous treatment)

surface area:

1,904 sq ft (based on DW tank internal dimensions as shown in Table I1-4)

rinsate quantity:

1,904 x 4 gal/sq ft = 7,616 gal

cost calculation:

1,904 sq ft x	$1.25 / sq ft =		$2,380
7,616 sq ft x	0.010 $ / gal =		$76
7,616 gals	$1.23 / gal =		$9,368
		B2 subtotal	$11,824

B3. Pump Decontamination / Misc. Equipment Disposal Pumps are flushed. Piping is cut into three foot lengths, and placed with miscellaneous items (e.g., shovels, PPE, sampling equipment) in a 200-CY roll-off box for transport off-site for macroencapsulation at a RCRA Subtitle C landfill.

quantity:

3 pumps
1 20-CY roll-off box
1 labor hours for cutting piping

unit costs:

$152.00 / pump - labor equipment and rinsate disposal
$1,900.00 / roll-off box (bulk transport to landfill)
$50.00 / hour labor
$152.00 / CY macroencapsulation of debris

cost calculation:

3	pumps x	$152	/ pump =	$456
1	roll-off x	$1,900	/ roll-off trans. =	$1,900
20	CY x	$152	/ CY macro. =	$3,040
1	hours x	$50	/ hour labor =	$50
			B3 subtotal	$5,446

B4. Heavy Equipment Decontamination Forklifts will be decontaminated with a high pressure wash. Rinsate handling costs are assumed to be negligible and are incorporated into tank/equipment rinsate disposal costs.

quantity:

3 forklifts

unit costs:

$200.00 / forklift - labor and equipment for forklift decon

cost calculation:

3	units x	$200	/ unit =	$600
			B5 subtotal	$600

TOTAL DECON. & EQUIPMENT DISPOSAL COSTS **$40,183**

C. Sampling and Analytical Costs

C1. Soil and Concrete Sampling and Analysis (See Table I1-2)

unit costs:

$850.00 / sample (labor for sample collection; analytical)

quantity:

65	concrete samples
80	soil samples
145	total samples

cost calculation:

145	samples x	$850	/ sample =	$123,250

TOTAL SAMPLING AND ANALYTICAL COSTS **$123,250**

D. Miscellaneous Costs

D1. Personal Protective Equipment (PPE)

Assume 10 workers will need basic PPE including total body overalls, gloves, goggles, respirator (half-mask), and hard hat at a cost of $140 per worker. Assume 4 workers will need PPE sufficient for confined space entries (normal PPE plus SCBA).

unit costs:

$140.00 / worker (basic)

$365.00 / worker (confined space)

cost calculation:

10	workers x	$140	/worker =	(basic)	$1,400
4	workers x	$365	/ worker =	(confined)	$1,460
			D1 subtotal		$2,860

D2. Engineering Certification

unit costs:

$100.00 / hour - rate for independent P.E.

quantity:

102 hours (3 hrs/visit, 1 visit/wk for 30 weeks; + 12 hrs final review)

cost calculation:

102	hours x	$100	/ hour =	$10,200

TOTAL MISCELLANEOUS COSTS **$13,060**

APPENDIX I-3

FINANCIAL ASSURANCE FOR CLOSURE

---Refer to Appendix I-3i (Interim) for current closure financial assurance info. This appendix will be updated to reflect revised costs after relocation to Tacoma is complete.

APPENDIX I-4

CERTIFICATE OF LIABILITY INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 06/04/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
MARSH USA INC. 540 W. MADISON CHICAGO, IL 60661 Attn: Chicago.CertRequest@marsh.com	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A :	Lexington Insurance Company	19437
INSURER B :	Hartford Fire Insurance Company	19682
INSURER C :	Hartford Insurance Company of the Midwest	37478
INSURER D :	Twin City Fire Insurance Company	29459
INSURER E :	Allied World National Assurance Company	10690
INSURER F :		

INSURED
Stericycle Environmental Solutions
28161 N. Keith Drive
Lake Forest, IL 60045

COVERAGES **CERTIFICATE NUMBER:** CHI-006222014-16 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
A	X COMMERCIAL GENERAL LIABILITY			EG 1932356	06/01/2015	06/01/2016	EACH OCCURRENCE	$	1,000,000
	CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$	300,000
							MED EXP (Any one person)	$	25,000
							PERSONAL & ADV INJURY	$	1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$	2,000,000
	X POLICY [X] PRO-JECT [X] LOC						PRODUCTS - COMP/OP AGG	$	2,000,000
	OTHER:							$	
B	AUTOMOBILE LIABILITY			83 CSE S13402 (AOS)	06/01/2015	06/01/2016	COMBINED SINGLE LIMIT (Ea accident)	$	5,000,000
B	X ANY AUTO			21 CSE S13403 (PR)	06/01/2015	06/01/2016	BODILY INJURY (Per person)	$	
B	ALL OWNED AUTOS / SCHEDULED AUTOS			83 CSE S13404 (HI)	06/01/2015	06/01/2016	BODILY INJURY (Per accident)	$	
	HIRED AUTOS / NON-OWNED AUTOS			"PHYSICAL DAMAGE - SELF INSURED"			PROPERTY DAMAGE (Per accident)	$	
								$	
E	X UMBRELLA LIAB X OCCUR			0305-0836	06/01/2015	06/01/2016	EACH OCCURRENCE	$	5,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$	5,000,000
	DED RETENTION $							$	
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N			83 WN S13400 (AOS)	06/01/2015	06/01/2016	X PER STATUTE / OTH-ER		
D	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N / N/A (Mandatory in NH)			83 WBR S13401 (WI)	06/01/2015	06/01/2016	E.L. EACH ACCIDENT	$	1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$	1,000,000
							E.L. DISEASE - POLICY LIMIT	$	1,000,000
A	Contractors Pollution Liab/E&O			COPS 1309044	06/01/2015	06/01/2016	Per Incident/Agg		10,000,000
A	Pollution Legal Liability			PLS 13187560	06/01/2014	06/01/2017	Each Occur/Gen Agg		10,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

Stericycle Environmental Solutions
28161 N. Keith Drive
Lake Forest, IL 60045

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE
of Marsh USA Inc.

Manashi Mukherjee Manashi Mukherjee

© 1988-2014 ACORD CORPORATION. All rights reserved.

The ACORD name and logo are registered marks of ACORD

AGENCY CUSTOMER ID: 350208
LOC #: Chicago

ACORD

ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
MARSH USA INC.	Stericycle Environmental Solutions 28161 N. Keith Drive Lake Forest, IL 60045
POLICY NUMBER	
CARRIER / NAIC CODE	EFFECTIVE DATE:

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: 25 FORM TITLE: Certificate of Liability Insurance

Named Insured Includes:

21st Century Environmental Management of Nevada, LLC, a Nevada limited liability company
21st Century Environmental Management, Inc., a Delaware corporation
21st Century Environmental Management, LLC of Rhode Island, a Rhode Island limited liability company
21st Century Environmental Management of California, LP, a California limited partnership
Allworth, LLC, an Alabama limited liability company
Burlington Environmental, LLC, a Washington limited liability company
Chemical Pollution Control of Florida, LLC, a Florida limited liability company
Chemical Pollution Control, LLC of New York, a New York limited liability company
Chemical Reclamation Services, LLC, a Texas limited liability company
General Environmental Management of Rancho Cordova, LLC, a California limited liability company
Luntz Acquisition (Delaware), LLC, a Delaware limited liability company
Northland Environmental, LLC, a Delaware limited liability company
Nortru, LLC, a Michigan limited liability company
Philip Holdings, LLC, a Delaware limited liability company
Philip Reclamation Services, Houston, LLC, a Texas limited liability company
PSC Environmental Management, Inc., a Delaware corporation
PSC Environmental Services of Pomona, LP, a Delaware limited partnership
PSC Environmental Services, LLC, a Delaware limited liability company
PSC Holdings, Inc. Subsidiaries
PSC Holdings, Inc., a Delaware Corporation
PSC Recovery Systems, LLC, a Georgia limited liability company
PSC, LLC, a Delaware limited liability company
Republic Environmental Recycling (New Jersey), Inc., a New Jersey corporation
Republic Environmental Systems (Pennsylvania), LLC, a Pennsylvania limited liability company
Republic Environmental Systems (Transportation Group), LLC, a Pennsylvania limited liability company
Rho-Chem, LLC, a California limited liability company
Solvent Recovery, LLC, a Missouri limited liability company
Stericycle Environmental Solutions

© 2008 ACORD CORPORATION. All rights reserved.
The ACORD name and logo are registered marks of ACORD

SECTION J

OTHER FEDERAL AND STATE LAWS

SECTION J. OTHER FEDERAL AND STATE LAWS

TABLE OF CONTENTS

SECTION PAGE

J1.0 FEDERAL REQUIREMENTS 1
J1.1 Wild and Scenic Rivers Act 1
J1.2 National Historic Preservation Act of 1966 1
J1.3 Endangered Species Act 1
J1.4 Coastal Zone Management Act 2
J1.5 Fish and Wildlife Coordination Act 2
J1.6 RCRA Corrective Action Program 2
J1.7 Toxic Substances Control Act 5
J2.0 STATE REQUIREMENTS 6
J2.1 National Emission Standard for Asbestos 6
J2.2 State Water Pollution Control Standards 6
J2.3 Minimum Functional Standards for Solid Waste Handling 7
J2.4 State Environmental Policy Act 7
J2.5 Puget Sound Clean Air Agency 7
J2.6 Model Toxics Control Act 8
J3.0 LIST OF PERMITS 8

LIST OF TABLES

Table J3-1 Kent Facility Permits

SECTION J. OTHER FEDERAL AND STATE LAWS

40 CFR 270.14(b)(20)
WAC 173-303-395(2) & (3)

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as “Stericycle”.

J1.0 FEDERAL REQUIREMENTS

40 CFR 270.3

Environmental Protection Agency (EPA) regulations require that EPA follow the procedures under certain federal laws before granting or denying a Resource Conservation and Recovery Act (RCRA) permit. The discussion which follows provides a description of how these laws currently apply to existing and future operations at the Stericycle Kent facility.

J1.1 Wild and Scenic Rivers Act

40 CFR 270.3(a)

The Kent Facility does not affect any rivers designated under the Wild and Scenic Rivers Act.

J1.2 National Historic Preservation Act of 1966

40 CFR 270.3(b)

The Kent Facility is not listed, nor is eligible for listing on the national or local Registers of Historic Places.

J1.3 Endangered Species Act

40 CFR 270.3(c)
RCW 77.12.020

No threatened or endangered species are known to exist on the plant site or in areas adjacent to the site. Facility operations are not expected to affect other critical habitat areas where endangered species might be present.

J1.4 Coastal Zone Management Act

40 CFR 270.3(d)

The State of Washington Shoreline Management Act (SMA) of 1971, under the jurisdiction of the Washington Department of Ecology (Ecology), is the approved implementation vehicle for the Coastal Zone Management Act. The SMA is implemented at the local level by individual shoreline master programs, which are prepared by local agencies and approved by Ecology.

The Kent Facility is not located within a designated shoreline area as defined in the State of Washington Shoreline Management Act.

J1.5 Fish and Wildlife Coordination Act

40 CFR 270.3(e)

Burlington Environmental, LLC does not propose to impound, divert, control, or modify any body of water in the vicinity of the Kent Facility site as part of existing or planned facility operations. Consultation with state agencies having authority over wildlife resources potentially affected by such actions is not anticipated to be necessary. Ecology has requested (Feasibility Study Work Plan, May 13, 2015) whether surface waters may have the potential to support fish or shellfish populations and also whether there exists any surface water connectivity to Mill Creek.

J1.6 RCRA Corrective Action Program

Chapter 173-303 WAC, Dangerous Waste Regulations & Chapter 173-340 WAC, Model Toxics Control Act Cleanup Regulations.

The Corrective Action Program outlined in the applicable sections of the regulations listed above requires corrective action for all releases of hazardous waste or constituents from hazardous waste treatment, storage, or disposal facilities, where necessary to protect human health and the environment.

A RCRA Facility Assessment (RFA) Report for the Kent facility was issued in January, 1996.[1] This report identified forty two solid waste management units (SWMUs) and one area of concern (AOC). A summary of the conclusions regarding release potential from these units is presented in Section 5.0 of the RFA Report.

Since the (RFA) report was issued, the SWMUs have been grouped into 5 AOCs.

In December of 2007, PSC (now Stericycle) submitted the Final Remedial Investigation Report[2] for the site to Ecology. In July of 2010, Ecology received the work plan for a Feasibility Study[3] and commented in writing on May 13, 2015. A revised Feasibility Study Work Plan was produced by Stericycle and was approved by Ecology on August 4, 2015. Additionally, Ecology reported in writing to Stericycle on February 12, 2015 a change in Ecology's project managers for the Corrective Action work at the site.

The Final Remedial Investigation Report indicates that the Tank Farm, AOC 2, has had releases which have resulted in contamination of groundwater and soil. Some of the hazardous constituents whose most recent data exceeds the site screening levels for soil and/or groundwater are arsenic, cyanide, hexavalent chromium, and vinyl chloride.

In July 2009, PSC (now Stericycle) reported discovery of a release to secondary containment at Tank T5305 in the sump area in AOC 3. Later tank inspection revealed that portions of the secondary containment had holes in it preventing recertification of Tank T5305 as primary containment for dangerous waste. Because of the potential for historical leaks from T5305's secondary containment in the stabilization area in AOC 3, and its adjacency to the tank farm AOC 2, the contamination found in groundwater is likely to be from more than one source.[4]

In addition, in the late 1990's, a large concrete vault which held a truck scale was converted to manage moderate risk waste (MRW) in the AOC 3 area. This SWMU also may have leaked in the past (benzo(a)pyrene was detected above MTCA C soil cleanup levels), contributing to the contaminants found in groundwater at the site. The releases to groundwater beneath the active units could be from the regulated tanks in the tank

[1] SAIC (Science Applications International Corporation), 1996, RCRA Facility Assessment
[2] Geomatrix, 2007, Final Remedial Investigation Report
[3] AMEC Geomatrix, 2010, Feasibility Study Work Plan
[4] In the spring of 2011, Tanks T5305 and T5306 underwent closure of the primary tank surfaces and were placed into use for moderate risk waste management.

farm, from the former hazardous waste stabilization tanks, or from the vault that managed MRW. Therefore, the groundwater contamination for the site will be cleaned up under the requirements for corrective action, WAC 173-303-646, -64610, -64620 and -64630.

The groundwater monitoring system and other groundwater requirements are described in Section E of the permit renewal application. The permit requirements addressing groundwater contamination will be included in Part 2 of the renewed permit.

During the Feasibility Study, Stericycle will propose cleanup action alternatives that remediate soil contamination (outside currently active areas), groundwater, surface water and sediments to meet the cleanup standards set for the site. Once Ecology reviews and approves the feasibility study (which will include the RI (i.e. a combined RI/FS)), Stericycle will prepare a draft cleanup action plan (CAP) which incorporates the selected remedy, approved by Ecology. Ecology will then issue the draft CAP by modifying the permit to incorporate the Agreed Order for the CAP. After public notice and consideration of public comment, Ecology will issue the Final CAP. Stericycle Kent will implement the CAP following the schedule in the approved CAP, WAC 173-340-350(8), -360, -370, -380, -400.

If at final facility closure, or during the first 5-year review period after implementation of the CAP, WAC 173-340-420, the groundwater is unable to meet the cleanup standard set for the site (i.e., if the concentrations of hazardous constituents are not decreasing over time at the point of compliance for the site), including meeting the requirements of WAC 173-303-646 and WAC 173-340-700 through -760; then Ecology may require that cleanup of soils underneath AOC2 and AOC3 be addressed at or before final closure of the facility. In addition, Ecology may also require additional cleanup action be taken for groundwater through modification of the approved cleanup action plan for the site WAC 173-340-420(6).

The lack of access to soils directly underneath Tanks T5305 and T5306, and the active status of both the tank farm and the former stabilization tanks (now used to manage moderate risk waste) are preventing full investigation and cleanup of the subsurface soils and final closure of these units. Ecology is not requiring Stericycle to address closure of the subsurface soils at this location until final closure of the facility, or if it is

determined that the cleanup standard set for the facility is not being met at the first five-year review period, WAC 173-303-610(4)(a)(ii) and WAC173-340-420.

Upon issuance of this permit, Tanks 9A, 9B and 9C will be in active status managing hazardous wastes. When either Tanks T5305 and T5306 or 9A, 9B and 9C undergo final closure, remediation of the subsurface soils under the tank units will occur. The work to be done at final closure is outlined in the closure plan to the renewed permit.

If, after completion of final closure of any unit or of the facility as a whole, contaminated soils need to be left in place with concentrations of hazardous constituents above the MTCA cleanup levels set for the site, then the approved cleanup action plan for groundwater remediation will be modified to include any additional cleanup work, monitoring, and institutional controls needed to meet the cleanup standards for the site. If the cleanup action plan cannot be modified to add this work at that time, then the facility permit will be modified to include requirements for post-closure of the unit or units, WAC 173-303-640(8)(b).

Further corrective action obligations will be included in the final RCRA permit using Ecology's Alternative Authorities Initiative.

J1.7 Toxic Substances Control Act

40 CFR Part 761

Section 6(e) of the Toxic Substances Control Act directs the promulgation of rules governing the manufacturing, processing, distribution in commerce, use, and disposal of polychlorinated biphenyls (PCBs). These rules are established in 40 CFR Part 761, PCB manufacturing, processing, distribution in commerce, and use prohibitions.

The PCB waste storage area (TSCA/DW Area) at the Kent Facility meets the requirements for storage and disposal of PCBs as identified in 40 CFR Part 761 Subpart D. PCB Articles or PCB containers are stored in compliance with storage conditions identified in 40 CFR 761.65. A Commercial PCB Storage Facility Permit Application for the Kent Facility was formally submitted to EPA for consideration on August 1, 1990. The Kent Facility has received an interim status permit from EPA for the commercial storage of PCBs at the Kent Facility.

J2.0 STATE REQUIREMENTS

WAC 173-303-395(2) and (3)

Ecology regulations require that a facility that stores or handles dangerous waste comply with all applicable federal, state, and local environmental protection laws and regulations. In addition to the federal laws cited above, Ecology requires compliance with other state and local laws and regulations before approving a RCRA permit. The discussion which follows provides a description of how these laws currently apply to operations at the Kent Facility.

J2.1 National Emission Standard for Asbestos

Ecology regulations [WAC 173-303-395(3)] require that all waste material containing asbestos be disposed at a facility operated in accordance with 40 CFR Part 61 Subpart M, National Emission Standard for Asbestos. Waste material containing asbestos is not disposed at the Kent Facility. The storage of asbestos-contaminated waste material may occur at the facility. All federal, state, and local requirements regarding the handling and storage of this material are observed. Asbestos which may be stored on site is sent off site to an approved disposal facility operated in accordance with 40 CFR Part 61 Subpart M.

J2.2 State Water Pollution Control Standards

The Revised Code of Washington (RCW) 90.48 designates Ecology as the State Water Pollution Control Agency for the purposes of the Federal Clean Water Act, to establish and administer state programs for water pollution control. State regulations require a waste disposal permit for industries discharging waste materials into public sewerage systems which discharge into public waters of the state. Discharges of industrial and sanitary wastewater from the Kent Facility are regulated under King County Wastewater Discharge Permit No. 7159. The Kent Facility has authorization from King County to operate under this Permit.

Run-off from unpaved areas outside the facility follows natural drainage patterns, flowing to local storm drains or low-lying areas (northwest ditch at the northwest corner of the site). On site surface water has been tested (2000), indicating some impacts, and follow-up testing has been requested by Ecology as part of the Feasibility Study.

Stormwater from containment and paved areas is collected in on-site sumps and routed to the facility's wastewater treatment system. The Kent Facility's wastewater discharge permit incorporates provisions for compliance with federal, state, and local laws and regulations addressing water pollution control standards.

J2.3 Minimum Functional Standards for Solid Waste Handling

Regulations contained in WAC 173-350 establish minimum functional performance standards for solid waste handling, and operation of solid waste handling facilities. The Kent Facility is a dangerous waste management facility. Dangerous wastes are exempt from the requirements of the Solid Waste Handling Standards, per WAC 173-350-020(13).

The facility does manage moderate risk wastes (MRW), including household hazardous wastes (HHW) and small quantity generator (SQG) wastes, which are considered to be solid wastes regulated under WAC 173-350. The Kent facility's MRW operations are regulated under a solid waste permit issued by King County in accordance with WAC 173-350.

J2.4 State Environmental Policy Act

In accordance with the State Environmental Policy Act (SEPA) (WAC 197-11-704), the City of Kent is the lead agency for the limited construction required under this permit, and a SEPA checklist was not required as part of the building permit. Ecology will be the lead agency for the purposes of Corrective Action activities at the site, and a completed SEPA checklist will be required in conjunction with the Cleanup Action Plan.

J2.5 Puget Sound Clean Air Agency

The requirements and purposes of the Washington Clean Air Act and the Federal Clean Air Act are implemented by the Puget Sound Clean Air Agency (PSCAA). PSCAA has issued an Order of Approval of operation for the Kent Facility. The authorization, No. 2911, was issued May 29, 1987, and is effective for an unspecified length of time.

Current operations at the Kent Facility are in compliance with PSCAA regulations.

J2.6 Model Toxics Control Act

Relevant portions of the Model Toxics Control Act as codified under WAC 173-340 will be applied to closure activities at the Kent Facility.

J3.0 LIST OF PERMITS

The following table lists the major permits issued to the Kent Facility by state and local regulatory agencies. Additional permits and registrations are and will be obtained as needed for activities such as construction on site or installation of additional treatment tanks and equipment.

TABLE J3-1 KENT FACILITY PERMITS

AGENCY	PERMIT TITLE	PERMIT NUMBER(S)
Puget Sound Air Pollution Control Agency	Order of Approval to Operate	10154
King County Dept. of Natural Resources	Wastewater Discharge Permit	7159
Seattle – King County Dept. of Public Health	Moderate Risk Waste Permit	PR0063893

SECTION K

CERTIFICATION

SECTION K. CERTIFICATION

40 CFR 270.11
WAC 173-303-810(13)

Burlington Environmental, LLC is the legal owner of the facility and is a wholly-owned subsidiary of PSC Environmental Services, LLC which is a wholly-owned subsidiary of Stericycle Environmental Solutions, Inc., hereafter referred to as “Stericycle”.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Burlington Environmental, LLC



Signature

Kevin O’Neil
Name

Vice President of Facility Operations
Title

October 23, 2015
Date

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

June 20, 2012

Keith Lund
Director of Permitting
Burlington Environmental, LLC
1701 E. Alexander Avenue
Tacoma, WA-98421

RE: Kent Final Permit (WAD 991281767)

Dear Mr. Lund:

I am enclosing the final dangerous waste management facility permit being issued to Burlington Environmental, LLC (PSC) Kent facility, located at 20245 77th Avenue South in Kent, WA 98032. This permit will go into effect on June 25, 2012.

Washington State Department of Ecology (Ecology) gave public notice of their tentative decision to issue this dangerous waste permit for public comments from April 5 through May 21, 2012. Burlington Environmental, LLC submitted comments on the draft permit and requested minor edits. Ecology incorporated the edits as requested.

Also, Section 1.10.2, Notification of the Tribe on page 10 of the draft permit (Standard Conditions) for the Burlington Environmental facility in Kent was edited to include the Muckleshoot Indian Tribe Fisheries Division.

I appreciate the hard work and cooperation from you and your coworkers while developing the application for this permit. If you have any questions, please contact Pallavi Mukerjee at (360) 407-7018 Pallavi.Mukerjee@ecy.wa.gov; or Lisa Perle @ (360) 407-7553 or Lisa.Perle@ecy.wa.gov.

Sincerely,

Dennis Johnson
Northwest Regional Office
Hazardous Waste & Toxics Reduction Program
Washington State Department of Ecology

Enclosure

cc: Keith Lund, Philip Services Corps
Laura Castrilli, Environmental Protection Agency
Dave Misko, Ecology
Michelle Underwood, Ecology
Pallavi Mukerjee, Ecology
Lisa Perle, Ecology
Nancy Farman, Ecology
Kimberly Goetz, Ecology
Robin Harrover, Ecology

PERMIT
FOR THE STORAGE AND TREATMENT OF DANGEROUS WASTE

Department of Ecology
PO Box 47600
Olympia, Washington 98504-7600
Telephone: (360) 407-6700

Issued in accordance with the applicable provisions of the Hazardous Waste Management Act, Chapter 70.105 Revised Code of Washington (RCW), and the regulations promulgated there under in Chapter 173-303 Washington Administrative Code (WAC).

ISSUED TO: Burlington Environmental, LLC.
20245 77th Avenue South
Kent, Washington 98032

WAD 991281767

This Permit is effective **June 25, 2012** and will remain in effect until **June 25, 2022**, unless revoked and reissued, or terminated under WAC 173-303-830 or continued in accordance with WAC 173-303-806(7) or as provided at condition 1.2.3 of this Permit.

ISSUED BY: WASHINGTON DEPARTMENT OF ECOLOGY

Northwest Regional Office Section Manager
Hazardous Waste & Toxics Reduction Program
Washington Department of Ecology

6/18/12
Date

TABLE OF CONTENTS

PAGE

Signature Page 1
Introduction 3
List of Attachments 4
Definitions 4
Part 1 Standard Conditions 5
Part 2 Corrective Action 12

INTRODUCTION

Permittee: Burlington Environmental, LLC.

EPA/state identification number: WAD 991281767

Pursuant to:

Chapter 70.105 Revised Code of Washington (RCW), the Hazardous Waste Management Act of 1976, as amended, and regulations codified in Chapter 173-303 Washington Administrative Code (WAC); and the Solid Waste Disposal Act (SWDA), as amended

A Permit is issued to Burlington Environmental, LLC (hereinafter called the Permittee), to operate a dangerous waste storage and treatment facility located at 20245 77th Avenue South, Kent, Washington, 98032, latitude 47 degrees, 24 minutes, and 45 seconds North and longitude 122 degrees, 14 minutes, and 08 seconds West. Pursuant to RCW 70.105D.030(1)(d), the Washington State Department of Ecology (Ecology) is designated by the Washington State Legislature to carry out all State programs authorized by the United States Environmental Protection Agency (EPA) pursuant to the federal Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et. seq., as amended. Pursuant to Section 3006 of RCRA, 42 U.S.C. Section 6926, the hazardous waste program in the State of Washington and revisions to that program were authorized as specified by EPA. Ecology has authority to issue this Permit in accordance with the authorized program and with RCW 70.105.130 and is responsible for enforcement of all conditions of this Permit.

The Permittee must comply with all terms and conditions set forth in this Permit, including all of the "ATTACHMENTS INCORPORATED BY REFERENCE."

Chapter 173-303 WAC state regulations specified in the Permit are those state regulations in effect on the date of permit issuance

The Permittee must also comply with requirements identified at WAC 173-303-810(8)(a)(i) through (iv) that are not included in the Permit, including but not limited to, self implementing statutory and regulatory requirements.

This Permit is based upon the administrative record, as required by WAC 173-303-840. The Permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts or the Permittee's misrepresentation of any relevant facts at any time are grounds for the termination, revocation and reissuance, or modification of this Permit and/or initiation of an enforcement action, including criminal proceedings.

The Department will enforce all conditions of this Permit. Any challenge of a permit condition must be appealed to the Pollution Control Hearings Board in accordance with WAC 173-303-845.

The Agency has the authority to enforce any condition in this Permit that is based on federal regulations for which the State of Washington's dangerous waste management program is authorized.

ATTACHMENTS INCORPORATED BY REFERENCE

The following documents are incorporated by reference into this Permit. Except for Chapter 173-303 WAC and the Public Participation Plan, these documents are from Burlington Environmental, LLC, Dangerous Waste Permit Application (most recently amended 12.01.2011). These incorporated documents are enforceable conditions of this Permit.

Part A of Permit Application - Dangerous Waste Permit Forms, including topographic map, figures, photographs, and Facility Location Map.

Section C of Permit Application - Waste Analysis Plan, including tables and figures and Appendices C 1 through C 6.

Section D of Permit Application - Process Information, including tables and figures and Appendices D-1 through D-13.

Section F of Permit Application - Inspection Plan, including tables and figures and Appendices F-1 and F-2.

Section G of Permit Application – Contingency Plan, including tables and figures and Appendix G1 through G3.

Section H of Permit Application - Training Plan, including tables and figures and Appendix H1 and H 2.

Section I of Permit Application - Closure Plan, including tables and figures, and Appendix I1 through I 4.

Chapter 173-303 WAC (June 30, 2009).

Public Participation Plan

DEFINITIONS

All definitions in WAC 173-303-040 are incorporated by reference into this Permit. If any definition in WAC 173-303-040 differs from the following definition in this Permit, the Permit's definition prevails. Any term used in this Permit which has not been defined in the Permit or in WAC 173-303-040 shall have the same meaning as set forth in Title 40 CFR Parts 260, 264, 270, and 124. All other terms shall have their standard, technical meaning.

Some terms are specifically defined in Part 2, Corrective Action, for the purposes of that section of the Permit only.

For this Permit, except where a specific definition applies under Part 2, Corrective Action, the following definitions apply:

"**Agency**" means the United States Environmental Protection Agency, Region 10.

"**Days**" means calendar days unless otherwise defined for a condition or section of this Permit.

"**Tribe**" means the Puyallup Tribe of Indians or a designated representative.

1. STANDARD CONDITIONS

1.1. EFFECT OF PERMIT

1.1.1. The Permittee is authorized to store and treat dangerous waste in accordance with the conditions of this Permit which include applicable requirements of Chapter 173-303 WAC specified in the Permit, and any self-implementing regulations in Chapter 173-303 WAC, and self-implementing statutory provisions and related regulations which are automatically applicable to the Permittee's dangerous waste management activities according to the Hazardous Waste Management Act, as amended, or other laws.

1.1.2. Any storage, treatment, or disposal of dangerous waste that requires a permit under Chapter 173-303 WAC is prohibited at this facility unless that activity is authorized by this Permit, including any temporary authorization by the Department under WAC 173-303-830(4)(e).

1.1.3. Conducting an activity at the facility that requires a permit under Chapter 173-303 WAC and is not authorized by this Permit or a temporary authorization under WAC 173-303-830(4)(e) is subject to enforcement of all applicable state and federal laws and regulations.

1.1.4. The Permittee is authorized to continue to manage newly regulated dangerous wastes or to continue to use newly regulated dangerous waste management units subject to all limits, conditions and procedures in WAC 173-303-830(4)(g)(i)(A) through (E). For this condition to apply, the unit must have been in existence as a dangerous waste facility with respect to the newly listed or identified waste or newly regulated waste management unit on the effective date of the final rule listing or identifying the wastes, or regulating the unit according to WAC 173-303-830(4)(g)(i)(A).

1.1.5. Pursuant to WAC 173-303-810(8), compliance with this Permit during its term constitutes compliance for the purpose of enforcement with Chapter 173-303 WAC for waste management activities covered under this Permit except as provided for in WAC 173-303-810(8)(a)(i) through (iv). Compliance with this Permit does not constitute a defense to any order issued or any action brought under other state or federal laws or regulations.

1.1.6. The Permittee is subject to requirements in Chapter 173-303 for any activity not authorized by this Permit or for activities not subject to a permit under Chapter 173-303 WAC, including but not limited to generator and transporter requirements at WAC 173-303-170 through -270.

1.1.7. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege.

1.1.8. Issuance of this Permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations.

1.2. PERMIT ACTIONS

1.2.1. Permit Modification, Revocation, Re-issuance, and Termination

1.2.1.1. The Department may modify, revoke and reissue, or terminate this Permit if there is cause as specified in WAC 173-303-830(3) and (5).

1.2.1.1.1. When a permit is modified only the conditions subject to modification are reopened. All other aspects of the existing permit remain in effect for the duration of the permit.

1.2.1.1.2. If a permit is revoked and reissued the entire permit is reopened and subject to revision and the permit is reissued as a new permit. The Permittee must comply with all conditions of the existing permit until a new final permit is reissued.

1.2.1.1.3. If the Department tentatively decides to terminate the permit it will issue a notice of intent to terminate and follow procedures in WAC 173-303-840(2).

1.2.1.2. Permit modifications at the request of the Permittee must comply with procedures and other requirements of the three-tiered modification system specified in WAC 173-303-830(4).

1.2.1.3. The filing of a request by the Permittee for a permit modification, revocation and re-issuance, termination, notification of planned changes, or anticipated noncompliance does not stay any permit condition.

1.2.2. Transfer of Permit

1.2.2.1. In accordance with WAC 173-303-810(14)(c), this Permit is not transferable to any person except after notice to the Department.

1.2.2.2. This Permit may be transferred to a new owner or operator only if it has been modified or revoked and reissued in accordance with WAC 173-303-830(2)(a) and (b) or WAC 173-303-830(3) to identify the new permittee and incorporate such other requirements as may be necessary.

1.2.2.3. Before transferring ownership or operation of the Facility, the Permittee must notify the new owner or operator in writing of the requirements of this Permit and Chapter 173-303 WAC in accordance with WAC 173-303-290(2).

1.2.2.4. In accordance with WAC 173-303-830(2), the Permittee must maintain financial assurance conforming to the requirements of WAC 173-303-620 until the Department notifies the Permittee that the new owner or operator has demonstrated compliance with the financial requirements.

1.2.3. Duty to Reapply and Permit Continuation

1.2.3.1. If the Permittee wishes to continue an activity regulated by this Permit after its expiration date, the Permittee must apply for and obtain a new permit. In addition, the Permittee must apply for and obtain a new permit if corrective action or closure required by this Permit has not or will not be completed by this Permit's expiration date. Department review of any application for a permit re-issuance will consider improvements in the state of control and measurement technology, as well as changes in applicable regulations.

1.2.3.1.1. To continue an activity allowed by this Permit after the Permit's expiration date or to complete closure or corrective action, the Permittee must submit to the Department a new permit application at least 180 days before this Permit's expiration date, unless the Department grants a later date provided that such date will never be later than the expiration date of the effective permit.

1.2.3.1.2. In accordance with WAC 173-303-806(7), if the Permittee submits a timely, complete application and the Department has not made a final permit determination as set forth in WAC 173-303-840, this Permit will remain in effect beyond this Permit's expiration date until the Department does make a final permit determination (issuing or denying a new permit).

1.2.3.2. If the Permittee fails to submit a timely, complete application as required under Permit Condition 1.2.3.1, then those permit terms and conditions necessary to conduct and complete closure and corrective action will remain in effect beyond this Permit's expiration date until the Department terminates the terms and/or conditions or the permit is revoked and reissued.

1.3. DUTIES AND REQUIREMENTS

1.3.1. Duty to Comply

The Permittee must comply with all conditions of this Permit except to the extent, and for the duration, such noncompliance is authorized by an Emergency Permit issued under WAC 173-303-804. Other than as authorized by an Emergency Permit, any permit noncompliance constitutes a violation of Chapter 173-303 WAC and/or Chapter 70.105 RCW and is grounds for: a) enforcement action; b) termination of permit; c) revocation and re-issuance of permit; d) modification of permit; or e) denial of a permit renewal application.

1.3.2. Need to Halt or Reduce Activity Not a Defense

If any enforcement action is taken because of Permittee's noncompliance with this Permit, the necessity to halt or reduce the permitted activity to maintain compliance with the conditions of this Permit is not a defense for the Permittee.

1.3.3. Duty to Mitigate

The Permittee must take all steps required by the Department to minimize or correct any adverse impact on the environment resulting from noncompliance with this Permit. That the Permittee took such mitigation is not a defense to enforcement for noncompliance with this Permit.

1.3.4. Proper Operation and Maintenance

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures (this includes quality assurance and quality control). This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit.

1.3.5. Duty to Provide Information

The Permittee must furnish to the Department, within a reasonable time, any information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit or for determining compliance with this Permit. The Permittee must also furnish to the Department, upon request, copies of records required to be kept by this Permit.

1.3.6. Inspection and Entry

1.3.6.1. Pursuant to WAC 173-303-810(10), the Permittee must allow authorized representatives of the Department upon the presentation of credentials to:

1.3.6.1.1. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;

1.3.6.1.2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

1.3.6.1.3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

1.3.6.1.4. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by Chapter 173-303 WAC any substances or parameters at any location.

1.3.7. Reporting Planned Changes

1.3.7.1. In accordance with WAC 173-303-810(14)(a), the Permittee must give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Such physical alterations or additions must be in compliance with this Permit. The Permittee must not manage dangerous waste in the new or physically changed portions of the facility until:

1.3.7.1.1. The Permit has been modified or the Permittee has obtained a temporary authorization for the physical change and for any change in the way waste is managed.

1.3.7.1.2. The Permittee has submitted to the Department by certified mail or hand delivery a letter signed by the Permittee and a registered professional engineer stating the facility has been constructed or modified in compliance with the Permit, and either

1.3.7.1.3. The Department has inspected the modified or newly constructed facility and finds it in compliance with the Permit, or

1.3.7.1.4. Within fifteen days of the date of the submission of the certified mail or hand delivered letter specified in Permit Condition 1.3.7.1.2, the Permittee has not received notice from the Department of its intent to inspect.

1.3.8. Reporting Noncompliance with the Permit and Reporting Emergencies

1.3.8.1. The Permittee must meet requirements for immediate reporting and written submissions in WAC 173-303-810(14)(f) for noncompliance which may endanger health or the environment.

1.3.8.2. In accordance with WAC 173-303-810(14)(g), the Permittee must report instances of noncompliance not reported under WAC 173-303-810(14)(d), (e), and (f) (as specified in permit conditions 1.3.11.1, 1.3.10, and 1.3.8.1) at the time of the next monitoring report or within six months of the date of noncompliance, whichever is sooner.

1.3.8.3. The Permittee must give advance notice to the Department as soon as possible of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements. Such changes require a permit modification pursuant to WAC 173-303-830 before they can be implemented.

1.3.8.4. In the event of spills, releases and other emergencies, the Permittee must meet requirements for reporting and written submissions in Section G of the Permit Application.

1.3.9. Reporting Relevant Facts and Incorrect Information

Pursuant to WAC 173-303-810(14)(h), if the Permittee becomes aware that he/she failed to submit any relevant facts in the permit application, or submitted incorrect information in the permit application or in any report to the Department, the Permittee must promptly submit the relevant and correct information.

1.3.10. Reporting Compliance Schedules

Reports of permit compliance or noncompliance or any progress reports on interim and final permit requirement contained in any compliance schedules must be submitted no later than 14 days following each scheduled compliance date.

1.3.11. Other Reporting

1.3.11.1. Monitoring Reports: Monitoring results must be reported at intervals specified elsewhere in this Permit.

1.3.11.2. The following reports are required:

a. Manifest discrepancy report as specified at WAC 173-303-370(4).
b. Unmanifested waste report as specified at WAC 173-303-390(1).
c. Annual report as specified at WAC 173-303-390(2).
d. Additional reports as specified at WAC 173-303-390(3).

1.3.12. Information Repository

The Permittee must establish and maintain an information repository at any time the Department requires based on the factors set forth in WAC 173-303-281(6)(b). The information repository will be governed by the provisions in WAC 173-303-281(6)(c) through (f).

1.4. MONITORING AND RECORDS

1.4.1. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.

1.4.2. As provided at WAC 1730-303-810(11)(c) , the Permittee must retain records of all monitoring information for a minimum of three years from the date of the sample, measurement, report or application. The record retention period may be extended by request of the Department at any time.

1.4.2.1. The Permittee must maintain specific monitoring records for longer than three years when that is specified in other parts of this Permit.

1.4.2.2. The Permittee must maintain records from all ground water monitoring wells and associated ground water surface elevations for the active life and post closure period of the facility.

1.4.3. Pursuant to WAC 173-303-810(11)(d), records of monitoring information must include all of the following:

a. The dates, exact place, and times of sampling or measurements.
b. The individuals who performed the sampling or measurements.
c. The dates analyses were performed.
d. The individuals who performed the analyses.
e. The analytical techniques or methods used.
f. The results of such analyses.

1.4.4. In addition, the Permittee must meet specific monitoring and record keeping requirements when those are specified in other parts of this Permit.

1.5. SIGNATURE AND CERTIFICATION REQUIRMENTS

1.5.1. All applications, reports, or information submitted to the Department must be signed in accordance with WAC 173-303-810 (12) and must be certified according to WAC 173-303-810 (13).

1.5.2. Except as otherwise specified in this Permit, all applications, reports, notifications or other submissions that are required by this Permit to be submitted to the Department must be sent by certified mail to the following address or other address as specified by the Department:

Supervisor/Section Manager, Hazardous Waste and Toxics Reduction Section
Department of Ecology
Northwest Regional Office
3190 - 160th Ave. SE
Bellevue, WA 98008-5452

Or hand delivered to the following address or other address as specified by the Department:

Supervisor/Section Manager, Hazardous Waste and Toxics Reduction Section
Department of Ecology
Northwest Regional Office
3190 - 160th Ave. SE
Bellevue, WA 98008-5452

A change in this address does not require a permit modification under WAC 173-303-830.

1.6. CONFIDENTIAL INFORMATION

1.6.1. Information submitted by the Permittee to the Department identified as confidential by the Permittee will be treated in accordance with applicable provisions of WAC 173-303-810(15), Chapter 42.17 RCW, and RCW 43.21A.160.

1.7. WASTE MINIMIZATION

1.7.1. In accordance with WAC 173-303-380(1)(q), the Permittee must place a certification in the operating record on an annual basis that:

1.7.1.1. A program is in place to reduce the volume and toxicity of hazardous waste generated to the degree determined by the Permittee to be economically practicable.

1.7.1.2. Proposed methods of treatment, storage or disposal are those practicable methods currently available to the Permittee which minimize the present and future threat to human health and the environment.

1.7.2. The Permittee must report waste minimization efforts in their annual report as required by Permit Condition 1.3.11.2.

1.8. PERFORMANCE STANDARDS

The Permittee shall design, construct, operate and maintain the facility to the maximum extent practicable given the limits of technology in a manner to ensure performance standards in WAC 173-303-283 are met.

1.9. DOCUMENTS AND RECORDS TO BE MAINTAINED AT THE FACILITY SITE

1.9.1. The following documents must be maintained at the facility:

a. This Permit, including all of its attachments and addendums and all amendments, revisions, and modifications to these documents.

b. Records required by this Permit (commonly called the operating record).

c. Other permits and approvals that authorize actions which affect safety and environmental protection (including, but not limited to, Air Quality Program registrations, Toxic Substance Control Act (TSCA) authorizations, State Environmental Policy Act (SEPA) decision documents).

1.10. NOTIFICATION OF THE TRIBE

1.10.1. The Permittee must notify the Tribe, in addition to the Department, for the following permit conditions: 1.2.1.2, 1.2.2.1, 1.3.7.1, 1.3.8, 1.3.9, 0, 2.3.12.3, and 2.6.15.1.

1.10.2. Notification to the Tribe must be sent or hand delivered to the following address:

Glen St. Amant
Habitat Program Manager
Muckleshoot Indian Tribe Fisheries Division
39015 172nd Ave SE
Auburn, WA 98092

1.11 PSC will provide financial assurance in accordance with WAC 173-303-620.

2. CORRECTIVE ACTION

2.1 The Department is the lead for corrective action at the Burlington Environmental Inc., LLC, Kent Facility, herein referred to as "the Permittee, or "the Facility." The Facility is generally located at 20245 77th Avenue South, Kent, Washington 98032-1362. The Facility is described in the Facility Diagram (Attachment A). Subsequent to the Agency's authorization of the Department's corrective action program, all corrective action requirements of this Part (Part 2, Corrective Action) of the RCRA Permit ("Permit") are now state requirements and are enforceable by the Department.

The state corrective action statutes and regulation authorized by the Department include Chapter 70.106 RCW (Hazardous Waste Management Act); Chapter 173-303 WAC (Dangerous Waste Regulations); Chapter 70.105D RCW (Model Toxics Control Act); and Chapter 173-340 WAC (The Model Toxics Control Act Cleanup Regulations). These statutes and regulations meet the requirements of Section 3004(u) of RCRA (Section 206 of HSWA), 42 USC Section 6924(u), and regulations codified at 40 CFR 264.101.

2.2. LIST OF ATTACHMENTS

The following listed documents are hereby incorporated, in their entirety, by reference into this Permit.

Attachment A	Diagram of the Facility showing Solid Waste Management Units (SWMUs), and Areas of Concern (AOC)
Attachment B	List of SWMUs and AOC
Attachment C	Well Construction, Maintenance, and Replacement

2.3. DEFINITIONS

Unless otherwise specified, the definitions set forth in Chapter 70.105 RCW, Chapter 173-303 WAC (Dangerous Waste Regulations), Chapter 70.105D RCW, and Chapter 173-340 WAC (Model Toxics Control Act), shall control the meanings of the terms used in Part 2 of the Permit. Additional or modified definitions for this Part are as follows:

2.3.1. **Agreed Order or Order**: Means any Order and each of the exhibits to any Order incorporated by reference into this Permit. All exhibits are integral and enforceable parts of this Order. The terms "Agreed Order" or "Order" shall include all exhibits to the Order.

2.3.2. **Area of Concern (AOC):** Means any area of the Facility where a release of dangerous constituents (including dangerous waste and hazardous substances) has occurred, is occurring, is suspected to have occurred, or threatens to occur.

2.3.3. **Cleanup Action Plan (CAP):** Means the document issued by the Department under WAC 173-340-360, which selects Facility-specific corrective measures and specifies cleanup standards (cleanup levels, points of compliance, and other requirements for the

corrective measures).

2.3.4. **Cleanup Standards:** Means the standards promulgated under RCW 70.105D.030(2)(e) and include: (1) hazardous substance concentrations (cleanup levels) that protect human health and the environment; (2) the location at the Facility where cleanup levels must be attained (points of compliance); and (3) additional regulatory requirements that apply to a corrective action because of the type of action and/or the location of the Facility.

2.3.5. **Consent Decree:** Means any Decree and each of the exhibits to any Decree incorporated by reference into this Permit. All exhibits are integral and enforceable parts of this Decree. The terms "Consent Decree" or "Decree" shall include all exhibits to the Decree.

2.3.6. **Corrective Action:** Means any activities including investigations, studies, characterizations, and corrective measures, including actions taken pursuant to Chapter 70.105D RCW and Chapter 173-340 WAC, undertaken in whole or in part to fulfill the requirements of WAC 173-303-64620.

2.3.7. **Corrective Measure:** Means any measure or action to control, prevent, or mitigate releases and/or potential releases of dangerous constituents (including dangerous waste and hazardous substances) reviewed and approved by the Department for the Facility and set forth in a Facility-specific CAP prepared in compliance with the requirements of Chapter 173-340 WAC, including WAC 173-340-360. Corrective measures may include interim actions as defined by Chapter 173-340 WAC. Interim actions will not necessarily be set forth in a Facility-specific CAP.

2.3.8. **Dangerous Constituent or Dangerous Waste Constituent:** Means any constituent identified in WAC 173-303-9905 or 40 CFR Part 264 Appendix IX, any constituent which caused a waste to be listed or designated as dangerous under the provisions of Chapter 173-303 WAC, and any constituent defined as a hazardous substance at RCW 70.105D.020(10).

2.3.9. **Dangerous Waste:** Means any solid waste designated in WAC 173-303-070 through -100 as dangerous or extremely hazardous or mixed waste. Dangerous wastes are considered hazardous substances under RCW 70.105D.020(10).

2.3.10. **Dangerous Waste Management Unit (DWMU):** Means a contiguous area of land on or in which dangerous waste is placed, or the largest area in which there is a significant likelihood of mixing dangerous waste constituents in the same area, as defined in WAC 173-303-040, e.g., a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area.

2.3.11. **Day:** Means calendar day, unless otherwise noted.

2.3.12. **Facility:** Under this Permit and any Agreed Order or Consent Decree incorporated by reference into this Permit, for the purposes of implementing corrective action under WAC 173-303-64620 or WAC 173-303-64630, "Facility" means all contiguous property under control of the Permittee under the provisions of Chapter 70.105 RCW or Chapter 173-303 WAC. "Facility" also includes the definition of facility found in RCW 70.105D.020(5).

2.3.13. **Feasibility Study (FS):** Means the investigation and evaluation of potential corrective

measures performed in accordance with the FS requirements of WAC 173-340-350, which includes the substantive requirements of a RCRA corrective measures study, undertaken in whole or in part to fulfill the corrective action requirements of WAC 173-303-64620.

2.3.14. **Interim Action:** Means a remedial action conducted under WAC 173-340-430.

2.3.15. **Parties:** Means the Department and the Permittee.

2.3.16. **Permit or Permitting Requirement:** Means the requirements of Chapter 173-303 WAC for applying for, obtaining, maintaining, modifying, and terminating Dangerous Waste Management Facility permits.

2.3.17. **RCRA:** Means the Resource Conservation and Recovery Act, 42 U.S.C. § 6901 et seq.

2.3.18. **RCRA Facility Assessment (RFA):** Means the investigation conducted by the Agency of releases and potential releases at the Facility and the information contained in the report entitled SAIC Technology Services Co., for U.S. EPA, Region 10, Seattle, Washington, January, 1996; *RCRA Facility Assessment, Preliminary Review/VSI Report, Burlington Environmental Inc., Kent, Washington; EPA ID No. WAD 991281767.*

2.3.19. **Release:** Means any intentional or unintentional spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous substances, including dangerous waste and dangerous constituents into the environment. It also includes the abandonment or discarding of barrels, containers, and other receptacles containing dangerous waste or dangerous constituents and includes the definition of release at RCW 70.105D.020(25).

2.3.20. **Remedial Action or Remedy:** Means any action or expenditure consistent with the purposes of Chapter 70.105D RCW to identify, eliminate, or minimize any threat or potential threat posed by hazardous substances to human health or the environment including any investigative and monitoring activities with respect to any release or threatened release of a hazardous substance and any health assessments or health effects studies conducted in order to determine the risk or potential risk to human health.

2.3.21. **Remedial Investigation (RI):** Means a facility-wide investigation and characterization performed in accordance with the requirements of Chapter 173-340 WAC, which includes the substantive requirements for a RCRA facility investigation, undertaken in whole or in part to fulfill the corrective action requirements of WAC 173-303-64620.

2.3.22. **Site:** Under this Permit and any Agreed Order or Consent Decree incorporated by reference into this Permit, means the Burlington Environmental Inc., LLC, Kent Facility according to the definition of "Facility" above. For the purposes of implementing corrective action under WAC 173-303-64620 or 173-303-64630, Site also means all contiguous property under the control of Burlington and includes the definition of Facility at RCW 70.105D.020(5)

2.3.23. **Solid Waste Management Unit (SWMU):** Means any discernible location at the Dangerous Waste Management Facility where solid wastes have been placed at any time, irrespective of whether the location was intended for the management of solid or dangerous waste. Such locations include any area at the Dangerous Waste Management

Facility at which solid wastes, including spills, have been routinely and systematically released and include regulated units as defined by Chapter 173-303 WAC.

2.4 OBJECTIVES

2.4.1. The Permittee shall complete a Remedial Investigation (RI) and a Feasibility Study (FS) to be approved by the Department in accordance with the requirements of WAC 173-340-350 (State Remedial Investigation and Feasibility Study). The purpose of the RI and the FS is to concurrently satisfy the State corrective action requirements for a RCRA facility investigation (RFI), and a RCRA corrective measures study (CMS), WAC 173-303-646 (Corrective Action).

The RCRA Facility Assessment (RFA)[1] and the RI Report[2] identified SWMUs and AOCs to be included in the RI. The SWMUs and AOCs are identified in Part 2, Attachment A and Attachment B. The SWMUs in Attachment B have been divided into five (5) AOCs. By cleaning up the dangerous waste constituents identified in the soils, sediment, surface water and groundwater of each AOC, the Permittee will also have addressed the spills and releases from the SWMUs listed in Attachment B. The tanks that managed dangerous waste and that have completed closure of their aboveground structures and secondary containment are T1, T2, T3A, T6A, T6B, T8, T9A, T9B, T10 and T5603. The soils beneath these tanks must complete closure at the time that the tank farm above them is no longer in active use for either dangerous waste or solid waste. The tanks are identified with both their tank number and SWMU number in Attachment B.

The Permittee completed the RI Report in December of 2007.[3] The Department, during its review of the RI Report, found data gaps and requested that the Permittee address the need for additional information. The Permittee completed a Revised Data Gaps Work Plan in September of 2009[4] which the Department approved in December of 2009.[5] The Permittee completed groundwater sampling and analysis following the approved Revised Data Gaps Work Plan, and submitted the results along with a summary of historical soil and groundwater data in the Feasibility Study (FS) Work Plan, which was submitted in July of 2010.[6] The Department has not yet approved the FS Work Plan.

---

[1] *RCRA Facility Assessment, Preliminary Review/VSI Report, Burlington Environmental, Inc., Kent Washington*; SAIC (Science Applications International Corporation), prepared for EPA Region X, January 1996.

[2] *Final Remedial Investigation Report, PSC Kent Facility, Kent, Washington*; Prepared for Philip Services Corporation by Geomatrix Consultants, Inc; December 2007.

[3] *Final Remedial Investigation Report, PSC Kent Facility, Kent, Washington*; Prepared for Philip Services Corporation by Geomatrix Consultants, Inc; December 2007.

[4] *Revised 2009 Data Gaps Work Plan, PSC Kent Facility, Kent, Washington*; Prepared for Burlington Environmental, LLC, by AMEC Geomatrix, Inc; September 2009.

[5] *Comment and Approval of the Amendment to the 2009 Data Gaps Work Plan, and the Revised 2009 Data Gaps Work Plan, PSC Kent Facility, Burlington environmental, LLC WAD991281767*; Ecology Letter to Mr. William Beck; December 17, 2009.

[6] *Feasibility Study Work Plan, PSC Kent Faciliity, Kent Washington*; Prepared for Burlington Environmental, LLC, by AMEC Geomatrix, Inc; July 2010.

Future work for completion of the RI and the FS is outlined in Permit Condition 2.5, "Work to be Performed." The Department will approve the RI Report and the FS Report after public notice and public comment, prior to development of the draft CAP.

2.4.2. After completion and Department approval of the RI and FS, the Department will require that the Permittee draft a Cleanup Action Plan ("CAP") to satisfy the requirements of WAC 173-340-400 (Cleanup Actions) and to concurrently satisfy the corrective action requirements of WAC 173-303-646.

2.4.3. After public review and comment, the draft CAP will be finalized and the Permittee will be required to design, construct, operate, and monitor the selected cleanup or corrective actions via a consent decree, agreed order, or Class 2 or 3 permit modification, as agreed to by the Department and the Permittee, or an enforcement order, if determined to be necessary by the Department.

2.4.4. The Permittee shall devise and implement an Interim Action to the Department's satisfaction if the Department or Permittee determines that there is an imminent and substantial threat to human health and the environment from: (1) any release, suspected release, or potential release of hazardous substances, including dangerous waste and dangerous constituents, at or from the facility are creating or have the potential to create an imminent and substantial threat to human health and/or the environment and/or 2) actions are necessary to reduce a threat to human health and/or the environment by eliminating or substantially reducing one or more pathways for exposure to hazardous substances at or from the facility.

2.5 WORK TO BE PERFORMED

Based on the foregoing Objectives, it is hereby required that the Permittee take the following actions and that these actions be conducted in accordance with Chapter 173-340 WAC (MTCA Cleanup Regulation) and applicable provisions of Chapter 173-303 WAC (Dangerous Waste Regulations), unless otherwise specifically provided for herein.

2.5.1. PROGRESS REPORTS

2.5.1.1. Progress reports shall continue to be submitted by the Permittee on a semi-annual basis, unless another time interval is agreed upon by the Permittee and the Department. The semi-annual reporting periods shall be January – June, and July – December. Progress reports shall be submitted in both hard copy and electronic format by the 15th of the month following the end of the reporting period. The next progress report shall be submitted in July 2012. The semi-annual progress reports shall include, at a minimum:

a. Corrective action activities completed during the current reporting period;
b. Corrective action activities planned for the next reporting period;
c. Occurrence of any problems, how problems were resolved, deviations from any work plans in effect, and a justification for all deviations;
d. Summary of significant findings,
e. Changes in personnel, and significant contacts with all federal, state, local, community and public interest groups

f. All laboratory analyses (in a mutually agreed upon electronic format and as hard copies of the original laboratory data) in tabulated data format for which quality assurance procedures were completed during the current reporting period
g. All field measurements
h. Tabulated groundwater data showing specific groundwater monitoring well, sample collection date, constituent concentrations, screening levels and MTCA cleanup levels.
i. A summary table and discussion of constituent concentrations which exceed the screening levels and MTCA Cleanup Levels for the site.
j. Groundwater level contour maps for each zone of the aquifer being monitored.
k. Tables and graphs for the presentation of analytical data for groundwater monitoring wells;
l. Hydrographs for each groundwater monitoring well showing date of measurement and groundwater elevation;
m. Graphs of precipitation data from the facility or from the closest rain gauge monitoring station;
n. Evaluation of the seasonal effect on the groundwater data, contaminant plume characteristics, constituents that are migrating off site from the facility, and an estimate of the rate of transport and any revisions to the conceptual model;

2.5.1.2. If both the Permittee and the Department agree that such a change is necessary, the frequency of the progress report submittals may be revised.

2.5.2. GROUNDWATER MONITORING

2.5.2.1. The Permittee shall collect and analyze periodic groundwater samples from existing and future groundwater monitoring wells. The frequency of groundwater sampling and the list of parameters shall be jointly determined by the project managers. The current groundwater monitoring wells, groundwater monitoring parameters, and frequency of groundwater sampling is described in the Groundwater Monitoring Plan, Appendix E-1 to Section E of the Permit Application which is incorporated by reference into this permit. Groundwater sampling and analysis shall also be conducted in accordance with Permit Condition 2.6.16 (Quality Assurance, Sampling, Data Submittal, and Availability).

2.5.2.2. The frequency of water level elevation measurements shall be jointly determined by the project managers. Currently, water level elevations are taken semi-annually at the time of groundwater sampling and analysis. A groundwater elevation contour diagram for each of the zones in the shallow aquifer is required and will be submitted with each semi-annual sampling and analysis event.

2.5.2.3. Any monitoring jointly agreed to in Permit Conditions 2.5.3.1 and 2.5.3.2. above shall continue until altered by a permit modification under WAC 173-303-830 (Permit Changes).

2.5.3. FINAL REMEDIAL INVESTIGATION REPORT

The Department will approve the RI Report at the time that the Department also approves the FS Report. Based on the Department's evaluation of the Data Gaps Work Plan results, which are included in the FS Work Plan, see 2.4.1, the Department could require additional remedial investigation work as part of developing the Feasibility Study Work Plan and Feasibility Study Report. Because of potential revisions to the December 2007 RI Report, Ecology does not yet consider the 2007 RI Report "Final." Upon the Department's approval of the current or the revised December 2007 RI Report, it will be considered "Final." The Final RI Report becomes incorporated by reference into this permit and is an enforceable part of the permit.

2.5.4. FINAL FEASIBILITY STUDY WORK PLAN

2.5.4.1. The Department has received the 2010 FS Work Plan.[7] Within sixty (60) days of receiving the Department's comments on the 2010 FS Work Plan, the Permittee must submit a revised FS Work Plan for the Facility to the Department for review and comment. The work plan will be consistent with requirements in Permit Condition 2.6.16, WAC 173-340-350 and WAC 173-340-360, and include a schedule for implementation. If sampling and analysis is included as part of the revised FS Work Plan, then, the revised FS Work Plan shall include a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP).

2.5.4.2. Within thirty (30) days of receipt of the Department's comments on the revised FS Work Plan, the Permittee must submit for review, comment and approval a Final FS Work Plan incorporating the Department's comments.

2.5.5. FEASIBILITY STUDY

Following the Department's approval of the Final FS Work Plan, the Permittee must complete the FS according to the schedule in the approved work plan.

2.5.6. DRAFT FEASIBILITY STUDY REPORT

2.5.6.1. Within sixty (60) days of completion of field work or receipt of all laboratory data, whichever comes first, the Permittee must submit the Draft FS Report to the Department in accordance with WAC 173-350 (State Remedial Investigation and Feasibility Study), WAC 173-340-840 (General Submittal Requirements), and the schedule set forth in the Department-approved Final FS Work Plan.

2.5.6.2. The Draft FS Report shall include an analysis of potential remedial alternatives and recommendations regarding a preferred remedial action to be implemented.

2.5.7. FINAL FEASIBILITY STUDY REPORT

2.5.7.1. Within (30) days after receipt of the Department's written comments on the Draft FS Report, the Permittee must submit for review, comment, and approval a Draft Final FS Report incorporating the Department's comments.

2.5.7.2 The Department will then publish notice of the RI and FS Reports and allow (30) days for public comment. The Department will send a request for incorporation

[7] *Feasibility Study Work Plan, PSC Kent Facilitiy, Kent Washington*; Prepared for Burlington Environmental, LLC, by AMEC Geomatrix, Inc; July 2010.

of any necessary changes from the public comment period or from the Agency to the RI and/or FS Reports to the Permittee.

2.5.7.3. Within (30) days of receipt of the Department's request for incorporation of any necessary changes to the RI and FS Reports, the Permittee will incorporate those changes and submit the Final RI Report and Final FS Report to the Department. Within (15) days of receipt of the Final RI Report and Final FS Report, the Department will strive to approve the final reports. .Upon the Department's approval of the RI Report and FS Report, they will be considered "Final." The Final RI Report and FS Report become incorporated by reference into this permit and are an enforceable part of the permit.

2.5.8. DRAFT CLEANUP ACTION PLAN

2.5.8.1. Within ninety (90) days after the Final FS Report is issued, the Permittee must prepare and submit in paper and electronic format a draft cleanup action plan (Draft CAP). The Draft CAP must be prepared in accordance with WAC 173-340-380 that details the proposed cleanup action for addressing the contamination present on the Facility, and addresses the requirements for developing a cleanup action in WAC 173-340-350 through -390, including the Department's expectations for cleanup alternatives in WAC 173-340-370. The Draft CAP shall also meet the requirements of WAC 173-340-360 (Selection of Cleanup Actions), WAC 173-340-400 (1) through (7) (Cleanup Actions), WAC 173-340-410 (Compliance Monitoring Requirements), and WAC 173-303-646 (Corrective Action).

2.5.8.2. The scope of the Draft CAP required by the Department shall be subject to the Additional Work provisions of Permit Condition 2.6.11.

2.5.8.3. The Permittee is encouraged to seek and include in the Draft CAP any feasible pollution prevention opportunities that do not interfere with the final cleanup objectives of the facility.

2.5.8.4. The Department will modify the Draft CAP, as necessary, and then hold a sixty (60) day public comment period for the proposed Draft CAP, the permit modification language, and the legal mechanism (Agreed Order or Consent Decree) to incorporate the Final CAP into the Permit. Such public comment period shall be combined with public notice, including, but not limited to, mailed fact sheets, notice in the site register, and notice in the appropriate local newspaper.

2.5.8.5. The Department will also review the Permittee's SEPA checklist and make a threshold determination of significance or non-significance.

2.5.9. FINAL CLEANUP ACTION PLAN

After review and consideration of the comments received during the public comment period, the Department shall issue the Final Cleanup Action Plan (Final CAP), and the Permit modification and Agreed Order incorporating the Final CAP into the Permit; and shall publish their availability in the Site Register.

2.5.10. INTERIM ACTION

2.5.10.1. During the corrective action process, the Permittee shall continuously consider and evaluate information regarding releases, suspected releases, or potential releases of hazardous substances, including dangerous waste and dangerous constituents, at the facility. If the Permittee identifies an imminent and substantial threat to human health and/or the environment, or a threat to human health and/or the environment that requires action to reduce the threat, the Permittee shall immediately (as soon as is safely possible to do so) notify the Department by telephone. The Permittee shall also notify the Department in writing within seven (7) days, summarizing the immediacy and magnitude of such identified threat.

2.5.10.2. If the Department determines that any release, suspected release, or potential release of hazardous substances, including dangerous wastes and dangerous constituents at or from the Facility, presents a threat as identified in Permit Condition 2.5.1.1 above, the Permittee shall devise and perform an Interim Action to mitigate the threat. This determination shall be based on the Permittee's evaluation and/or an independent evaluation by the Department of current and historical investigation and data reports. To the maximum extent practicable, any Interim Action shall be consistent with and capable of being integrated into the overall corrective action process at the facility.

2.5.10.3. Within thirty (30) days of notification by the Department, or by such earlier or later date as may be required by the Department, the Permittee shall prepare and submit a Draft Interim Action Work Plan addressing the threat. The Draft Interim Action Work Plan shall be prepared in accordance with the requirements of WAC 173-340-430 (Interim actions). A schedule for completion of all tasks shall be included. In addition, the Permittee shall submit with the work plan copies of all past RI reports of SWMUs associated with the identified threat.

2.5.10.4. After receiving the Department's comments on the Draft Interim Action Work Plan, the Permittee shall, within thirty (30) days, or by such earlier or later date as may be required by the Department, incorporate the Department's comments and submit a Draft Final Interim Action Work Plan for approval.

2.5.10.5. Following public review and comment on the Draft Final Interim Action Work Plan, the Permittee must complete the interim action according to the schedule in the approved work plan. Within sixty (60) days of completion of the interim action field work or receipt of all laboratory data, whichever comes first, the Permittee must submit a Draft Interim Action Report to the Department for review and comment.

2.5.10.6. Within thirty (30) days of receipt of the Department's written comments on the Draft Interim Action Report, and before the public comment period, the Permittee must submit a Final Interim Action Report incorporating the Department's comments.

2.5.11. SCHEDULE OF DELIVERABLES

Deliverable	Schedule
Progress Report	On the 15th day of the month following the end of the reporting period
Revised Draft FS Work Plan, including (if sampling and analysis is proposed) a sampling and analysis plan (SAP) and Quality Assurance Project Plan (QAPP)	Within 60 days of receipt of the Department's comments on the Draft 2010 FS Work Plan
Final FS Work Plan	Within 30 days of receipt of the Department's written comments on the revised draft FS Work Plan
Complete field work under FS work plan	According to the schedule shown in the Final FS Work Plan
Draft FS Report	Within 60 days of completion of field work or receipt of all laboratory data, whichever comes first
Draft Final FS Report	Within 30 days of receipt of the Department's written comments on the Draft FS Report
Final FS Report	Within 30 days of the Department's request for incorporation of changes based on Agency and public comment
Draft CAP (paper and electronic format)	Within 90 days after the Final FS Report is issued
Draft Interim Action Work Plan	Within 30 days after notification by the Department that one is required
Final Interim Action Work Plan	Within 30 days after receipt of the Department's written comments on the draft interim action work plan
Complete interim remedial action	According to the schedule shown in the Final Interim Action Work Plan
Draft Interim Action Report	Within 60 days of completion of field work or receipt of all laboratory data
Final Interim Action Report incorporating the Department's comments	Within 30 days of receipt of the Department's written comments, and after public comment, on the Draft Interim Action Report
Public Participation Plan	Within 60 days of issuance of this Permit

2.5.12. SEPA

For any proposal under Part 2 of this Permit that includes activities requiring preparation of a State Environmental Policy Act (SEPA) checklist, the Permittee must prepare a SEPA checklist, per Chapter 197-11 WAC (SEPA Rules). Such activities may include demolishing or constructing structures, excavation or filling, and capping contaminated soils. Changes to procedure usually will not require compliance with SEPA. SEPA compliance must occur before the Department makes its first decision on the proposal.

2.6 TERMS AND CONDITIONS

2.6.1. PUBLIC INVOLVEMENT

2.6.1.1. Public Notices and Participation

The Permittee must comply with the public notice and participation requirements of WAC 173-303-900 and WAC 173-303-830 (Permit Changes). For Part 2 of this Permit, the Permittee must also comply with public notice and participation requirements of WAC 173-340-600. For Part 2 of this Permit, the Department will take responsibility for the facility mailing list, the production and distribution of fact sheets, and the publication of notices in the appropriate local newspaper and the site register.

2.6.1.2. Public Participation Plan

A Public Participation Plan is required for this Facility for activities under Part 2 of this Permit. The Department will review the Public Participation Plan, prepared by the Permittee, to determine its appropriateness and compliance with WAC 173-900 and WAC 173-340-600. The Permittee will submit the Public Participation Plan to the Department's Project Manager within 60 days of issuance of this Permit.

The Department will maintain the responsibility for public participation at the Facility under Part 2 of this Permit. However, the Permittee must cooperate with the Department and must:

2.6.1.2.1. If agreed to by the Department, develop appropriate mailing lists, prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, RI/FS reports, cleanup action plans, and engineering design reports. As appropriate, the Department will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of the Department's presentations and meetings.

2.6.1.2.2. Notify the Department's Project Manager prior to the preparation of all press releases and fact sheets, and before major meetings with the interested public and local governments. Likewise, the Department will notify the Permittee 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 the Permittee that do not receive prior approval from the Department, the Permittee must clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by the Department.

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

2.6.1.2.4. When requested by the Department under Part 2 of the Permit, arrange and/or continue information repositories to be located at the following locations:

Kent Public Library
212 2nd Avenue N.
Kent, WA 98032
Phone: 253-859-3330

Department of Ecology
Northwest Regional Office
3160 160th Avenue SE
Bellevue, WA 98008-5452
Phone: 425-649-7239

The Permittee must promptly place in these repositories, at a minimum, copies of all public notices, fact sheets, and press releases; all quality-assured monitoring data; remedial action plans and reports; supplemental remedial planning documents; and all other similar documents relating to performance of the remedial action required by this Permit.

2.6.2. REMEDIAL ACTION COSTS

The Permittee must adhere to the independent agreement, Payment Agreement #8R16, between the Department and the Permittee, dated June 1, 2001 for recovery of the Department's costs reasonably attributable to corrective action activities at a facility per WAC 173-340-550 and WAC 173-303-64630. Permit termination or satisfaction of all corrective action requirements is necessary to terminate the agreement.

In addition to other available relief, pursuant to RCW 19.16.500, the Department may utilize a collection agency and/or, pursuant to RCW 17.105D.055, file a lien against real property subject to the remedial action to recover unreimbursed remedial action costs.

2.6.3. IMPLEMENTATION OF CORRECTIVE ACTION

In the event that the corrective actions performed pursuant to this Permit fail to meet the requirements of Chapter 173-303 WAC or of Chapter 173-340 WAC, the Department reserves the right to require the Permittee to submit a permit modification to ensure that the Facility continues to comply with the corrective action requirements under Chapter 173-303 WAC and Chapter 173-340 WAC. If the permit modification represents a substantial change to the work to be performed, the Department will provide public notice and opportunity to comment in accordance with Permit Condition 2.6.1 (Public Involvement).

If the Department determines that the Permittee has failed without good cause to implement corrective action, in whole or in part, the Department may perform any or all portions of corrective action that remain incomplete. The Department will provide prior written notice of the bases for the Department's determination, unless an emergency prevents such notice.

If the Department performs all or portions of corrective action because of the Permittee's failure to comply with its obligations under this Permit, the Permittee must reimburse the Department for the costs of doing such work.

Except where necessary to abate an emergency situation, the Permittee must not perform any remedial actions outside those remedial actions required by this Permit, unless the Department concurs in writing with such remedial actions.

2.6.4. FINANCIAL ASSURANCE FOR CORRECTIVE ACTION

2.6.4.1. Financial assurance for corrective action is required by WAC 173-303-64620. The Department's Financial Assurance Officer shall determine when the Permittee's actions and submissions meet the requirements of WAC 173-303-64620.

2.6.4.2. The Permittee must submit the original executed or otherwise finalized financial assurance instruments or documents to the Department's Financial Assurance Officer, facsimiles or photocopies are not acceptable to meet this requirement. In addition, the Permittee must also submit copies of financial assurance instruments or documents to the Department's Project Manager.

2.6.4.3. 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 CFR 264.141, 40 CFR 264.142, 40 CFR 264.143, 40 CFR 264.145, 40 CFR 264.148, 40 CFR 264.151, and WAC 173-303-620) will be the definitions and requirements for allowable financial assurance for corrective action under this Permit. It is the intention of the Parties that these definitions and requirements will apply to this corrective action, and the words "corrective action" are hereby substituted for the words "closure," "post closure," "post-closure," or "postclosure" in the above-listed regulations as needed to produce this result.

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

a. The Financial Assurance for Corrective Action Proposed Rule, 51FR 37853 (October 24, 1986);
b. The financial assurance provisions of Corrective Action for Releases from Solid Waste Management Units Advance Notice of Proposed Rulemaking, 61 FR 19432 (May 1, 1996): and
c. The Interim Guidance on Financial Responsibility for Facilities Subject to RCRA Corrective Action (U.S.EPA, September 30, 2003); and/or
d. 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 FR 30798 (July 27, 1990), may be used as secondary guidance at the discretion of the Department. Unless otherwise specified herein, where the language of this Permit conflicts with these rules, proposed rules, notices, and guidance documents, the language of this Permit will prevail.

2.6.4.5. Within thirty (30) days from the effective date of an Agreed Order or Consent Decree incorporated by reference into this Permit, the Permittee must submit to the Department for review and approval a written cost estimate to cover the cost of the Permittee's activities in the Permit. If the Department rejects the Permittee's cost estimate as submitted, the Department shall provide to the Permittee a revised cost estimate amount that will be the approved cost estimate. The Department will, if requested by the permittee in writing, provide a written explanation of the variance between the Permittee's proposed cost estimate and the Department's approved cost estimate. Within thirty (30) days after the Department's final approval of the Permittee's cost estimate amount or the Permittee's receipt of the Department's approved cost estimate amount, the Permittee must establish and maintain continuous coverage of financial assurance in the amount of the approved cost estimate and submit the applicable financial assurance documentation per Permit Condition 2.6.4.2. If the Department does not accept, reject, or revise the Permittee's cost estimate within sixty (60) days after submittal, the Permittee's cost estimate will be deemed approved for purposes of this Permit condition. The Department reserves the right to review and revise the Permittee's cost estimate after the 60-day review period. If the Department revises the Permittee's cost estimate after the 60-day review period, the Permittee must provide an updated financial assurance instrument within (60) days after the revision. If the Permittee disagrees with the Department's cost estimate, they may enter into "Resolution of Disputes" procedures pursuant to Permit Condition 2.6.9.

2.6.4.6 If the Permittee is required to submit an additional work plan(s) under this Permit or the incorporated Agreed Order or Consent Decree; or to conduct activities related to corrective action not previously part of the original cost estimate, the process outlined in Permit Condition 2.6.4.5 will apply in the submission process of an additional work plan(s).

2.6.4.7. If the Permittee believes that the estimated cost of work to complete activities under this Permit or the incorporated Agreed Order or Consent Decree has diminished below the amount covered by existing financial assurance provided under this Permit, the Permittee may submit a written proposal to the Department to reduce the amount of the financial assurance provided under this Permit Condition so that the amount of the financial assurance is equal to the estimated cost of the remaining work to be performed. The written proposal must specify, at a minimum, the cost of the remaining work to be performed and the basis upon which such cost was calculated. If the Department decides to accept such a proposal, the Department will notify the permittee of its decision in writing. After receiving the Department's written decision, the Permittee may reduce the amount of financial assurance only in accordance with and to the extent permitted by such written decision. Within thirty (30) days after receipt of the Department's written decision, the Permittee must submit the applicable financial assurance documentation per Permit Condition 2.6.4.2. No change to the form or terms of any financial assurance provided under Permit Condition 2.6.4, other than a reduction in amount, is authorized under this Permit condition.

2.6.4.8. Within thirty (30) days of written notice that the Department has selected a final remedy, the Permittee must prepare a detailed written notice that the Department has selected a final remedy, the Permittee must prepare a detailed written

estimate of the cost for the remaining amount of work to be completed by the Permittee under this Permit or the incorporated Agreed Order or Consent Decree including, but not limited to, the final remedy, and submit the same to both the Department's Financial Assurance Officer and Project Manager for review and approval. The process outlined in Permit Condition 2.6.4.5 will apply in the submission of cost estimates.

2.6.4.9. 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 the Permittee. On a case-by-case basis, the Department may also determine that a company which 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. The Permittee may also not incorporate a zero cost for wastes that might have economic value.

2.6.4.10. The Permittee must annually adjust all cost estimates for inflation. Adjustments for inflation must be calculated in accordance with the procedure outlined in WAC 173-303-620(3)(c).

2.6.4.11. Acceptable financial assurance mechanisms are trust funds, surety bonds, letters of credit, insurance, the financial test, and the corporate guarantee. The Department may allow other financial assurance mechanisms if they are consistent with the laws of Washington and if the Permittee demonstrates to the satisfaction of the Department that those mechanisms provide adequate financial assurance.

2.6.4.12. If the Permittee is using the financial test or corporate guarantee to meet their financial assurance obligation, the annual inflationary adjustment must occur within ninety (90) days after the close of the Permittee's fiscal year. If the Permittee is using any mechanism other than the financial test or corporate guarantee, this adjustment must occur each year within thirty (30) days after the anniversary of the effective date of this Permit or the incorporated Agreed Order or Consent Decree.

2.6.4.13. If the Permittee seeks to establish financial assurance by using a surety bond for payment or a letter of credit, the Permittee must at the same time establish and thereafter maintain a standby trust fund acceptable to the Department into which funds from the other financial assurance instrument can be deposited, if the financial assurance provider is directed to do so by the Department, pursuant to the terms of this Permit.

2.6.4.14. The Permittee must notify the Department's Project Manager and Financial Assurance Officer by certified mail of the commencement of a voluntary or involuntary bankruptcy proceeding, naming the Permittee 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.

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

a. In the event of bankruptcy of the trustee or issuing institution; or
b. If the authority of the trustee institution to act as trustee has been suspended or revoked; or
c. If the authority of the institution issuing the surety bond, letter or credit, or insurance policy has been suspended or revoked.

2.6.4.14.2. 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, the Permittee must establish a replacement financial assurance mechanism by any means specified in WAC 173-303-620 or other financial instrument as approved by the Department within sixty (60) days after such an event.

2.6.4.15. The Department's Financial Assurance Officer is:

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: kimberly.goetz@ecy.wa.gov

2.6.5 DESIGNATED PROJECT MANAGERS:

The Project Manager for the Department is:

Robin Harrover
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5492
360/407-6359
robin.harrover@ecy.wa.gov

The Project Manager for the Permittee is:

William Beck
PSC Environmental Services, LLC
1800 – 72nd Avenue S, Suite 217
Kent, WA 98032-1035
425/227-6149
w.beck@pscnow.com

The project managers will be responsible for overseeing the implementation of Part 2 of this Permit. To the maximum extent possible, communications between the Department and the Permittee, and all documents, including reports, approvals, and other correspondence concerning activities performed pursuant to the conditions of Part 2 of this Permit, will be directed through the project managers. These phone numbers and addresses may change and such changes will not require a permit modification. Should the Department or the Permittee change project managers, written notification by certified mail or other means establishing proof of delivery will be provided to the

Department or the Permittee at least ten (10) days prior to the change, if possible. A revised page(s) of this Permit must also be prepared. If these provisions are met within reason, a permit modification following the procedures of WAC 173-303-830(3) or (4) and 40 CFR §§ 270.41 and 270.42 will not be required.

2.6.6. PERFORMANCE

2.6.6.1. Once approved in writing by the Department, all submittals to the Department as required by Part 2 of this Permit become enforceable parts of this Permit. During the performance of work under an approved submittal, field modifications may be agreed to verbally by the Department's and the Permittee's project managers. In such a case, the Permittee must submit a description of the modification to the Department's Project Manager in writing within seven (7) days after the verbal agreement. The Department's Project Manager will confirm in writing that the Permittee's description conforms to the agreed-upon modification.

2.6.6.1 The Permittee must provide this Permit and any incorporated Agreed Order or Consent Decree to all agents, contractors, and subcontractors retained to perform work required by Part 2 of this Permit and must ensure that all work undertaken by such agents, contractors, and subcontractors will be in compliance with Part 2 of this Permit.

2.6.6.2 All geologic and hydrogeologic work performed pursuant to Part 2 of this Permit shall 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.

2.6.6.3 All engineering work performed pursuant to Part 2 of this Permit shall 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.

2.6.6.4 All construction work performed pursuant to Part 2 of this Permit shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of professional engineer. The professional engineer must be registered in the State of Washington, except as otherwise provided for by RCW 18.43.130.

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

2.6.6.6 The Permittee must notify the Department in writing of the identity of any engineer(s), geologist(s), contractor(s), and subcontractor(s), and others to be used in carrying out the terms of Part 2 of this Permit, seven (7) days in advance of their involvement at the Facility.

2.6.6.7 The Permittee must provide seven (7) days notice to the Department's Project Manager prior to conducting work activities that the Department identifies at the Facility, including sampling activities and installation(s) of new monitoring wells. The Permittee must provide seven (7) days notice of all excavation activities conducted by the Permittee at the Facility and on neighboring properties. Without limitation of the Department's rights under Permit Condition 2.6.7 (Access), the

Department will attempt to notify the Permittee prior to any sample collection activity at the Facility unless an emergency prevents such notice.

2.6.7 ACCESS

In addition to Permit Condition 1.3.6. (Inspection and Entry), the Permittee must grant the Department or any of the Department's authorized representatives full authority to enter and freely move about the Facility that the Permittee 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 Part 2 of this Permit; reviewing the progress in carrying out the provisions of Part 2 of this Permit; conducting such tests or collecting samples as the Department or the Department's Project Manager may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to Part 2 of this Permit; and verifying the data submitted to the Department by the Permittee. The Permittee shall make all reasonable efforts to secure access rights for those properties within the Facility not owned or controlled by the Permittee where remedial activities or investigations will be performed pursuant to Part 2 of this Permit. This permit condition constitutes reasonable notice of access, and the Permittee must allow access to the Facility at all reasonable times for purposes of overseeing work performed under Part 2 of this Permit.

2.6.8 RETENTION OF RECORDS:

In addition to Permit Condition 1.4 (Monitoring and Records), during the pendency of this Permit and any incorporated Agreed Order or Consent Decree and for ten (10) years from the date of issuance by the Department of written notification that all requirements of Part 2 of this Permit and the incorporated Agreed Order or Consent Decree have been satisfactorily completed, the Permittee must preserve in a readily retrievable fashion, all records, reports, documents, and underlying data in its possession relevant to the implementation of Part 2 of this Permit and the incorporated Agreed Order or Consent Decree. The Permittee must insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of the Department, the Permittee must make all records available to the Department and allow access for review within a reasonable time.

2.6.9 RESOLUTION OF DISPUTES

2.6.9.1 In the event a dispute arises as to an approval, disapproval, proposed change or other formal opinion or action by the Department's Project Manager under Part 2 of this Permit, the Department and the Permittee will utilize the dispute resolution procedure set forth below.

a. Upon receipt of the Department Project Manager's written decision, the Permittee has fourteen (14) days within which to notify in writing the Department's Project Manager of its objection to the decision.

b. The Department's and the Permittee's project managers will then confer in an effort to resolve the dispute. If the project managers cannot resolve the dispute within fourteen (14) days of the Department's receipt of the written objection, the Department's Project Manager will issue a written decision.

c. The Permittee may then request regional management review of the decision. This request must be submitted to the Supervisor of the Hazardous Waste and Toxics Reduction (HWTR) Section at the Department's Northwest Regional

Office within seven (7) days of receipt of the Department Project Manager's written decision.

d. The Section Supervisor will conduct a review of the dispute and endeavor to issue a written decision regarding the dispute within thirty (30) days of the Permittee's request for review. The Section Supervisor's decision will be the Department's final opinion on the disputed matter.

2.6.9.2 The Department and the Permittee 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.

2.6.9.3 Implementation of these dispute resolution procedures must not provide a basis for delay of any activities required in Part 2 of this Permit, unless the Department agrees in writing to a schedule extension.

2.6.10 EXTENSION OF SCHEDULE:

2.6.10.1. The Department may grant an extension of schedule if the Permittee submits a request for an extension 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 must be requested in writing. The request must specify:
a. The deadline that is sought to be extended;
b. The length of the extension sought;
c. The reason(s) for the extension; and
d. Any related deadline or schedule that would be affected if the extension were granted.

2.6.10.2. The burden shall be on the Permittee to demonstrate to the satisfaction of the Department 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:
a. Circumstances beyond the reasonable control and despite the due diligence of the Permittee including delays caused by unrelated third parties or the Department, such as (but not limited to) delays by the Department in reviewing, approving, or modifying documents submitted by the Permittee;
b. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or
c. Endangerment as described in Permit Condition 2.6.12.
However, neither increased costs of performance of the terms of this Permit nor changed economic circumstances will be considered circumstances beyond the reasonable control of the Permittee.

2.6.10.3. The Department will act upon any written request for extension in a timely fashion. The Department will give the Permittee written notification of any extensions granted pursuant to this Permit. A requested extension will not be effective until approved by the Department. Such revisions to the schedules will not require a permit modification, except when required by WAC 173-303-830(4)(i)(N)(5) to incorporate a substantial change requiring public comment under WAC 173-340-600.

2.6.10.4. The Department will grant an extension only for such period of time as the Department determines is reasonable under the circumstances. The Department may grant schedule extensions exceeding ninety (90) days only as a result of:

a. Delays in the issuance of a necessary permit which was applied for in a timely manner;
b. Other circumstances deemed exceptional or extraordinary by the Department; or
c. Endangerment as described in Permit Condition 2.6.12. Copies of all correspondence pursuant to this permit condition must be kept in the Facility's operating record.

2.6.11. ADDITIONAL WORK

The Department may determine or the Permittee may propose that additional work, beyond the scope of the performance requirements of Part 2 of the Permit, is or may be necessary to implement Part2 of the Permit. If the Permittee proposes the additional work, the Department will respond to the proposal in writing within an appropriate time period, no longer than thirty (30) days. If the Department requires the additional work, then the Department will specify in writing the basis for its determination that the additional work is necessary. Within fifteen (15) days after receipt of such written determination, the Permittee shall notify the Department of its willingness to perform the additional work or may request a meeting with the Department to discuss the additional work. If the Permittee is willing to perform the additional work, the Permittee shall submit a work plan incorporating the additional work for review by the Department. The work plan shall be submitted within thirty (30) days (or more, if approved by the Department) after either submitting notice of willingness to perform or of the date of the meeting with the Department, whichever is applicable. The work plan shall be submitted as a Class 1 permit modification request. Upon written approval of the permit modification, the Permittee shall implement the work plan in accordance with the schedule contained therein.

2.6.12. ENDANGERMENT:

2.6.12.1. In the event the Department determines that any activity being performed at the Facility is creating or has the potential to create a danger to human health or the environment, the Department may order the Permittee to stop such activities of Part 2 of this Permit for such period of time as it deems necessary to abate the danger. The Permittee must immediately comply with such directions.

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

2.6.12.3. If the Department concurs with or orders a work stoppage pursuant to Part 2 of this Permit, the Permittee's obligations with respect to the ceased activities will be suspended until the Department 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 Permit Condition 2.6.10 (Extensions of Schedule) for such period of time as the Department determines is reasonable under the circumstances.

2.6.12.4. Nothing in this Permit limits the authority of the Department, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

2.6.13. TRANSFER OF INTEREST IN PROPERTY:

2.6.13.1. The Permittee must not consummate any voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Facility without provision for continued implementation of all requirements of Part 2 of this Permit and implementation of any remedial actions found to be necessary as a result of this Permit.

2.6.13.2. In addition to the requirements of Permit Condition 1.2.2. (Transfer of Permit), prior to transfer of any interest in all or any portion of the Facility, the Permittee must provide a copy of Part 2 of this Permit and any incorporated Agreed Order or Consent Decree to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest. Upon transfer of any interest, the Permittee must restrict uses and activities to those consistent with this Permit and notify all transferees of the restrictions on use of the property.

2.6.13.3. At least thirty (30) days prior to any transfer, the Permittee must notify the Department and the Agency of the said transfer and provide the Department and the Agency with a plan for continued implementation of Part 2 of this Permit. The Permittee must also submit a request for modification of the permit per WAC 173-303-830(2), (3) and (4) and 40 CFR §§ 270.41 and 270.42.

2.6.13.4. If there is a lessee(s) on the Facility at the effective date of this Permit, the Permittee must serve a copy of this Permit and any incorporated Agreed Order or Consent Decree upon any current lessee(s) within fifteen (15) days of the effective date of this Permit. Within thirty (30) days of the effective date of this Permit, the Permittee must amend the current lease(s), if necessary, to ensure that the Department, any authorized representative of the Department, or any party or entity directed or authorized by the Department, has access to all property at the Facility that the Permittee either owns, controls, or has access rights to at all reasonable times for the purpose of investigating and remediating the release of hazardous substances at the Facility, consistent with Permit Condition **Error! Reference source not found.** (Access).

2.6.14. COMPLIANCE WITH OTHER APPLICABLE LAWS:

All actions carried out by the Permittee pursuant to this Permit must be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits.

2.6.15. NEWLY IDENTIFIED RELEASES

2.6.15.1. Notification

The Permittee must continuously consider and evaluate information regarding releases, suspected releases, or potential releases, at the Facility of hazardous substances, including dangerous waste and dangerous constituents as defined by WAC 173-303-64610(4). The Permittee must notify the Department's Project Manager, in writing, of any newly-identified SWMU(s), newly-discovered releases from previously identified or newly identified SWMU(s), and newly-discovered AOC(s) at or from the Facility, no later than fifteen (15) days after discovery. The Permittee must provide information specified in WAC 173-303-806(4)(a)(xxiii) and 806(4)(a)(xxiv)(A).

2.6.15.2. Corrective Action

After receiving notification of any newly identified releases at the Facility, the Department will determine whether the Permittee must fulfill corrective action responsibilities as required by Chapter 173-303 WAC. The Department will specify in writing the basis for its determination that the additional work is necessary. Any such corrective action will be incorporated into this Permit by a permit modification or into any incorporated Agreed Order or Consent Decree by an order amendment. Upon written approval of the permit modification or Agreed Order or Consent Decree amendment, the Permittee must implement the work plan in accordance with the schedule contained therein. The actions taken must meet or exceed all substantive corrective action requirements of Chapter 70.105 RCW and Chapter 173-303 WAC.

To ensure that corrective action will be conducted as necessary to protect human health and the environment, the Permittee must conduct corrective action in a manner that is consistent with the following provisions of Chapter 173-340 WAC:

a. As necessary to select a cleanup action in accordance with WAC 173-340-360, WAC 173-340-350 State Remedial Investigation and Feasibility Study.
b. WAC 173-340-360 Selection of Cleanup Actions.
c. WAC 173-340-400 Cleanup Actions.
d. WAC 173-340-410 Compliance Monitoring Requirements.
e. WAC 173-340-420 Periodic Site Reviews.
f. WAC 173-340-440 Institutional Controls.
g. WAC 173-340-700 through -760 Cleanup Standards.

2.6.16. QUALITY ASSURANCE, SAMPLING, DATA SUBMITTAL, AND AVAILABILITY

2.6.16.1. For all sampling activities and analytical procedures performed pursuant to Part 2 of this Permit, the Permittee must use quality assurance, quality control, and chain-of-custody procedures as identified in relevant Department- or Agency-approved guidance documents. Specifically, the Permittee must follow the provisions specified in WAC 173-340-820 (Sampling and analysis plans), WAC 173-340-830 (Analytical procedures), Guidance on Sampling and Data Analysis Methods (Ecology Publication No. 94-049), Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology Publication No. 04-03-030) and any revisions or amendments thereto), or other guidance approved by the Department.

2.6.16.2. Groundwater monitoring wells must be designed, constructed, maintained, and abandoned in accordance with Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Wells) and the *RCRA Ground-Water Monitoring: Draft Technical Guidance* (EPA/530-R-93-001, PB93-139350, November 1992) and any revisions and amendments thereto. The Department and the Permittee may also use as guidance the publication *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* (EPA/530-R-09-007, March 2009). Groundwater monitoring well design, construction material, installation, and development methods must be documented.

2.6.16.3. In accordance with WAC 173-340-830(2)(a), for all hazardous substances analyses under Part 2 of this Permit, the Permittee must use a laboratory accredited by the Department under Chapter 173-50 WAC for the specific analyses to be conducted, unless otherwise approved by the Department.

2.6.16.4. In preparing any work plan and/or report for this Facility, the Permittee may use information and analytical data from previous investigations at the Facility, with the condition that the previous information and data are in accordance with the above mentioned regulations and Department or Agency guidance documents for sampling and analytical procedures.

2.6.16.5. The Permittee must report all laboratory methods, detection limits, and practical quantitation limits (PQLs) for all constituents included in the analyses pursuant to WAC 173-340-830. With respect to the implementation of Part 2 of this Permit, the Permittee must make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to the Department. Pursuant to WAC 173-340-840(5), all sampling data must be submitted to the Department in both printed and electronic formats in accordance with the Department's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by the Department for data submittal. Additionally, the Department may request raw laboratory data to be submitted. All other provisions specified in WAC 173-340-840 (General submittal requirements) must also be followed.

2.6.16.6. If requested by the Department, the Permittee must allow the Department and/or the Department's authorized representative to take split or duplicate samples of any collected by the Permittee pursuant to implementation of Part 2 of this Permit. The Department may, upon request, allow the Permittee and/or the Permittee's authorized representative to take split or duplicate samples of any samples collected by the Department pursuant to implementation of Part 2 of this Permit, provided that doing so does not interfere with the Department's sampling.

2.6.17. LAND USE RESTRICTION

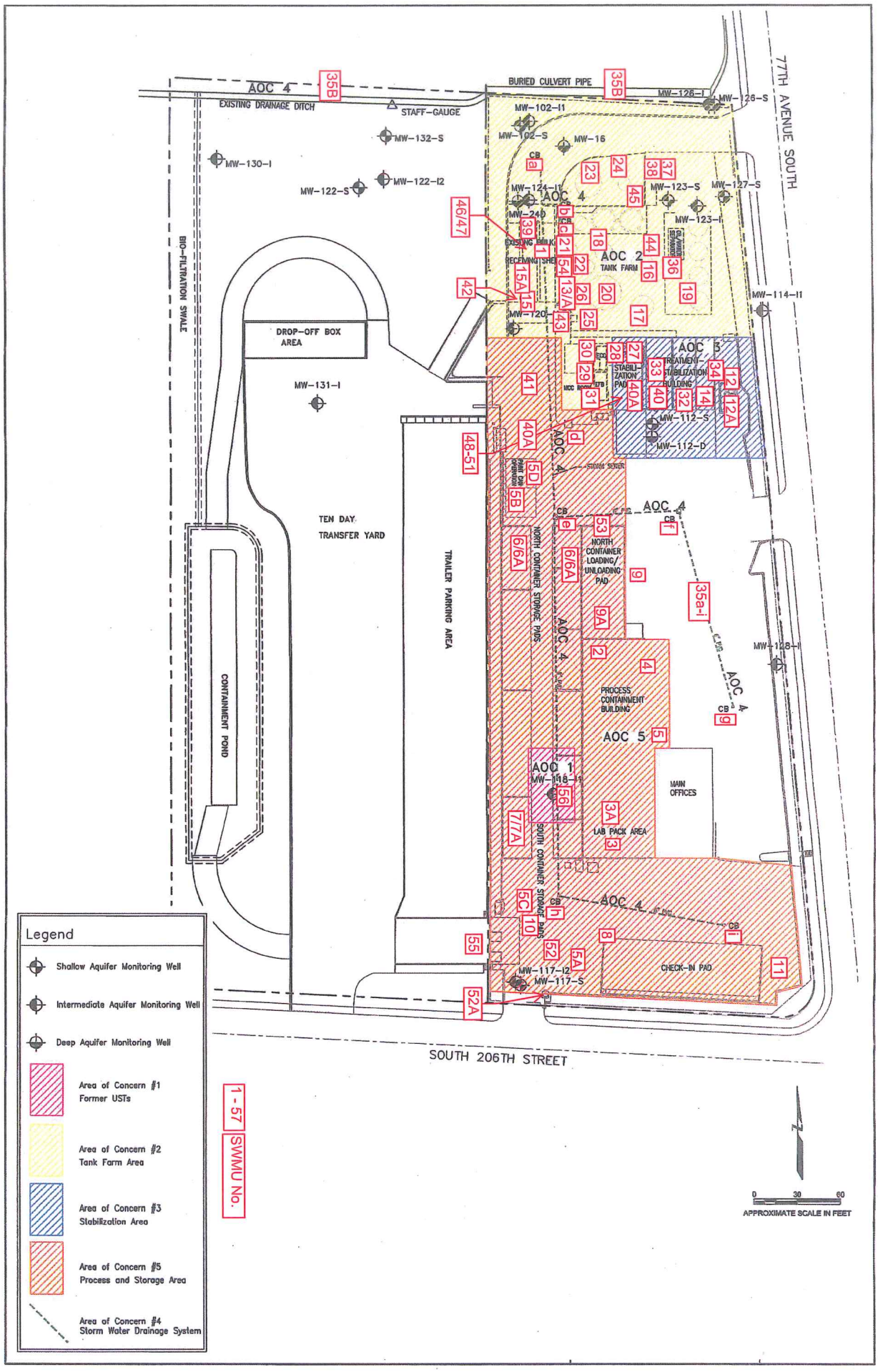
If a restrictive covenant is required under WAC 173-340-440(4), the Permittee must record a restrictive covenant meeting the requirements of WAC 173-340-440(9) with the office of the King County Auditor within ten (10) days of completion of the remedial action. The Permittee must provide the Department with a copy of the recorded Restrictive Covenant within thirty (30) days of the recording date. The Permittee must also comply with the requirements of WAC 173-303-610(9) and -610(10).

2.6.18. PERIODIC REVIEW

After initiation of the cleanup action required by the (Final CAP), and in accordance with WAC 173-340-420(2), the Department will conduct periodic reviews at least every five years. At least ninety (90) days prior to each periodic review, the Permittee must submit a report to the Department that documents whether human health and the environment are being protected based on factors set forth in WAC 173-340-420(4). The Department reserves the right to require the Permittee to conduct further corrective action to comply with the corrective action requirements under Chapter 173-303 WAC. After reviewing information obtained from the Permittee and other sources, if the Department determines that substantial changes in the cleanup action are necessary to protect human health and the environment, the Permittee must submit a revised draft cleanup action plan for Department review and approval. The Department will provide opportunities for public review and comment on the draft cleanup action plan in accordance with WAC 173-340-830 and WAC 173-340-600. Approved corrective action plans will be incorporated into this Permit in accordance with the permit modification procedures under WAC 173-303-830.

ATTACHMENT A

Diagram of the Facility showing Solid Waste Management Units (SWMUs), and Areas of Concern (AOC)


AOC 4
EXISTING DRAINAGE DITCH
STAFF-GAUGE
BURIED CULVERT PIPE
77TH AVENUE SOUTH
BIO-FILTRATION SWALE
DROP-OFF BOX AREA
TEN DAY TRANSFER YARD
TRAILER PARKING AREA
CONTAINMENT POND
NORTH CONTAINER STORAGE PADS
SOUTH CONTAINER STORAGE PADS
NORTH CONTAINER LOADING/ UNLOADING PAD
PROCESS CONTAINMENT BUILDING
AOC 5
AOC 1
MW-118-I
MAIN OFFICES
LAB PACK AREA
CHECK-IN PAD
AOC 2
TANK FARM
AOC 3
TREATMENT STABILIZATION BUILDING
STABILI-ZATION PAD
SOUTH 206TH STREET
MW-102-I1
MW-102-S
MW-16
MW-132-S
MW-130-I
MW-122-I2
MW-122-S
MW-124-I1
MW-240
MW-123-S
MW-123-I
MW-127-S
MW-126-I
MW-126-S
MW-114-I1
MW-120
MW-131-I
MW-112-S
MW-112-D
MW-128-I
MW-117-I2
MW-117-S
Legend
Shallow Aquifer Monitoring Well
Intermediate Aquifer Monitoring Well
Deep Aquifer Monitoring Well
Area of Concern #1 Former USTs
Area of Concern #2 Tank Farm Area
Area of Concern #3 Stabilization Area
Area of Concern #5 Process and Storage Area
Area of Concern #4 Storm Water Drainage System
1 - 57 SWMU No.
0 30 60
APPROXIMATE SCALE IN FEET

ATTACHMENT B

List of SWMUs and AOC

Attachment B
Resolution of SWMUs and AOCs for Corrective Action

Red Highlight – RCRA Facility Assessment High Priority[1]
Orange Highlight – RCRA Facility Assessment Medium Priority[1]
Red Text – Tank certified closed and placed back in service as part of the Wastewater Treatment Plant

SWMUs Incorporated Into AOCs 1-5

Cleanup of soil and groundwater at the AOC to meet the Facility cleanup standards addresses cleanup of the incorporated SWMUs
[Unit may also be included in Facility Closure Plan]

AOC 1 – Former USTs	
SWMUs	STATUS
56 Former USTs (Three tanks removed, one was a 5000 gallon tank. Tanks held diesel, leaded gasoline, and unleaded gasoline)	Tanks and soil removed in 1991, soil sampling, and subsequent groundwater monitoring shows NFA is warranted. Still included in groundwater monitoring.

AOC 2 – Tank Farm	
SWMUs	STATUS
1 Bulk Receiving Area	Active
13 Former Roto Strainer Accumulation Area	Not Active
13A Roto Strainer Screen	Active – part of wastewater treatment (WWT) system
15 Former Solidification Area	Removed. Included in RI investigation.
15A Solidification and Bulk Receiving Area Sump	Active. Included in RI Investigation
16 T5302 (T6B) Sludge Treatment Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.

[1] ***RCRA Facility Assessment, Preliminary Review/VSI Report, Burlington Environmental, Inc., Kent Washington***; SAIC (Science Applications International Corporation), prepared for EPA Region X, January 1996.

[2] These tanks and their secondary containment have been certified closed. At the time of closure the tanks and secondary containment were decontaminated and either removed or placed back in service to treat only non-dangerous waste liquids. These tanks are **not covered by this permit and must treat non-dangerous wastes only.** The investigation and cleanup of contaminated soils underneath the tanks will take place at the time that the units are no longer in active service. The closure will take place according to the closure plan, Section I of the Permit Application incorporated by reference into this permit (see Part 1), and will comply with the regulations for closure, WAC 173-303-806(4)(a)(xiii), -610.

AOC 2 – Tank Farm	
SWMUs	STATUS
17 T-5301 (T6A) Sludge Treatment Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
18 T-5401 (T-2) Wastewater Storage Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
19 T-5402 (T-3A) Wastewater Storage Tank[2]	Hole in tank discovered at closure. The tank was removed. Subsequent sampling of the sub-base material (SBM) below the tank did not find evidence of a release
20 T-5101 (T-1) Primary Separator Treatment/Storage Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
21 T-5102 (T-10) Batch Wastewater Treatment/Storage[2]	This tank was removed and the unit is closed. A hole was discovered during an inspection, and subsequent sampling of the SBM did not find evidence of a release.
22 T-5201 (T-8) Oily Waste Treatment/Storage Tank[2]	This unit was closed and is no longer treating dangerous waste. The tank is still in use in the wastewater treatment area for non-dangerous waste only.
23 T-5202 (T-9A) Oily Waste Treatment/Storage Tank[2]	This tank was closed and removed.
24 T-5203 (T-9B, moved to location of T-9A) Oily Waste Treatment/Storage Tank[2]	This tank was closed and moved to the former location of T-9A. The SBM was sampled and no evidence of a release was found. This tank is now DW Tank T-9B.
25 F5100 Air Scrubber	Removed
26 H-5100 Roto Strainer Screen	Active – part of wastewater treatment (WWT) system
29 T-5405 (T-5) Electro-Flotation Basin Treatment Tank	Removed
30 T-5407 Coagulation cell Electroclear (ECC) Wastewater Treatment Tank	Removed
31 T-5408 Electro-Flotation Basin Wastewater Treatment/Storage Tank (EFB)	Removed
36 Former T5406 (T-7) Recycled Water Storage Tank	Removed
37 Former TEB Pretreatment Tank (Baker Tank)	Removed
38 Former TWB Pretreatment Tank (Baker Tank)	Removed
39 Former Reactor Tank (T-21)	Formerly located under Bulk Receiving Area west of Tank Farm.

AOC 2 – Tank Farm	
SWMUs	STATUS
	Tank was removed.
42 Former Storage Tank (T-22)	Formerly located west of the former Solidification Area. Tank was removed.
43 Sump	Active. Located in Tank Farm Area
44 Sump	Active. Located in Tank Farm Area
45 Sump	Active. Located in Tank Farm Area
46 Former T504	Formerly under Bulk Receiving Area west of Tank Farm. Tank was removed
47 Former T537	Formerly under Bulk Receiving Area west of Tank Farm. Tank was removed
54 T-5603 Mercury Treatment Tank[2]	This unit was closed and the tank was removed.

AOC 3 – Stabilization Area	
SWMUs	STATUS
12 Centrifuge Drop Box Satellite Accumulation Area	Not Active
12A Former Moderate Risk Waste (MRW) Sump	Not Active. This sump was formerly the containment for a truck scale which was removed and converted to MRW handling including liquid solid waste. This waste process has been moved to Tanks T-5305 and T-5306. This area is being closed.
14 Stabilization Area	Active. The stabilization area includes the MRW Area, the area under cover, and the stabilization pad. It includes Tanks T-5305 (SWMU 32) and T-5306 (SWMU 40), and all related sumps
27 T-5403 (T4A) Wastewater Treatment Tank	Removed
28 T-5404 (T-4B) Electro-Flotation Basin Treatment Tank	Removed
32 T-5305 Stabilization Receiving Treatment Pit	Above-ground portion closed and converted to MRW use
33 C-5301 Centrifuge	Removed
34 C-5301 Centrifuge Conveyor	Removed
40 T-5306 Stabilization Receiving Treatment Pit	Above-ground portion closed and converted to MRW use
40A Former Drum/Truck Washing Area	Not Active.
48-51 Old Centrifuge	Removed. Formerly located by T-22 (SWMU 42) and Solidification Area (15)

AOC 4 – Stormwater Drainage System	
SWMUs	STATUS
35 Stormwater Drainage System	Active. Includes the ditch at the northern property boundary, Oil/Water Separator by MW-16 (35a) and Sumps (35b – i).
35B Stormwater Drainage Ditch	Active. The stormwater drainage system includes the ditch at the northern property boundary.

AOC 5 – Process and Storage Areas		
SWMUs		STATUS
2	Indoor Flammable Waste Storage Area (PCB Facility)	Active
3	Indoor Lab Pack & Household DW Storage Area	Active
3A	Indoor Lab Pack & Household DW Storage Area SUMP	Active
4	Compactor Area	Active
5	Aerosol Can Depressurization Area	Not Active
5A	Former Can crush canopy area in SW Corner of Facility	Not Active
5B	Former Can crush canopy area located between MW-15 and North Container Storage Area	Not Active
5C	Can crusher area in south check-in area	Active
5D	Can crusher area in new North Staging Area	Active
6	North Container Storage Area	Active
6A	North Container Storage Area SUMP	Active
7	South Container Storage Area	Active.
7A	South Container Storage Area SUMP	Active
8	South Staging Area	Active
9	North Staging Area	Active

AOC 5 – Process and Storage Areas		
SWMUs		STATUS
9A	North Staging Area Located North of Warehouse	Active
10	Household hazardous waste dumpster	Active
11	Solid Waste Dumpster	Active
40A	Former Drum/Truck Washing Area	Active
41	Former Container Management Area	Not Active
52	South Container Loading/Unloading Area	Active
52A	South Unloading Area SUMP	Active
53	North Container Loading/Unloading Area	Active
55	Drum Dock, West side of facility	Active

ATTACHMENT C

Well Construction, Maintenance, and Replacement

ATTACHMENT C

WELL CONSTRUCTION, MAINTENANCE, AND REPLACEMENT

New and existing wells operated for the purposes of this Pennit shall meet all applicable state and federal laws. In addition, the Permittee shall specifically meet requirements 1-6 below, or propose equivalent or superior methods for Department approval. For minor deviations from the stated methods deemed necessary by the Permittee due to unforeseen events in the field, the Permittee shall notify the Department by telephone and a notation describing and explaining the deviation must be logged in the facility's Operation Record.

1. Monitoring, observation, and recovery wells shall be inspected quarterly and maintained in good working order. The Permittee shall maintain an adequate supply of replacement parts and repair equipment as necessary to ensure that repairs may be undertaken in a timely manner, and that wells may continue to perform their stated functions.

2. Visual evidence of damage to or deterioration of wells, and all well maintenance activities, must be logged in the facility's Operating Record. The Permittee shall also notify the Department by telephone or in writing of any visual damage to or deterioration of wells.

3. The Permittee shall maintain the borehole integrity at each well. One of the following three methods will be consistently used to maintain that integrity:

   a) Annual comparisons of specific capacity. With this method the Permittee shall redevelop any well to within 5% of the original specific capacity if that well's annual capacity measurement is less than 80% of the original measured capacity;

   b) Annual sounding. With this method the Permittee shall develop any well which has an annually measured build-up of at least one (1) foot of sediment; or,

   c) Biennial comparisons of hydraulic conductivity. With this method the Permittee shall redevelop any well to within 5% of the original hydraulic conductivity if that well's biennial conductivity measurement is less than 80% of the original measured conductivity. Hydraulic conductivity shall be determined through consistently performed slug tests.

4. If any well must be decommissioned and replaced for any reason during the term of this Permit, the Permittee shall, if possible, replace that well prior to the next scheduled sampling event. At least fifteen (15) days prior to decommissioning, the Permittee shall give notice in writing to the Department explaining the rationale for the decision.

   In such a case, the replacement well shall be installed as close as practicable to the well being replaced. The Permittee shall provide information regarding the new well in the facility's Operating Record, and shall submit this information to the Department as stated in Item 6 below.

   The Permittee shall close each well being replaced no later than ninety (90) days after installation of the replacement well. Unless analytical data from the well being closed shows that hazardous constituent concentrations have been below MTCA Method B groundwater cleanup levels or more conservative proposed cleanup levels for at least three (3) consecutive years, closure shall be accomplished by pulling the casing or drilling out the casing and screen, re-drilling the borehole, and backfilling the entire depth of the borehole through a tremie pipe

with a 3% to 5% bentonite/cement grout. In the case where a well to be closed is separated from contaminated zones by what the Department considers to be a continuous, well-defined aquitard, abandonment may proceed by ripping the well casing below the seal, destroying the screen and filter pack. The well may then be pressure grouted from the bottom up.

5. A qualified geologist shall perfom1 inspection of drilling and well construction. The geologist shall prepare and maintain a detailed log of each well, describing the geologic strata encountered during drilling. The logs and descriptions shall include:

   a. Date and time of construction;

   b. Drilling method and any fluid used;

   c. Well location (surveyed to within 0.5');

   d. Borehole and well casing diameter;

   e. Well depth (surveyed to within 0.1');

   f. Field drilling logs and lithologic logs, including a description of soil or rock types, color, weathering, texture, structure, and fractures;

   g. Casing materials;

   h. Screen material, design, length, and slot size;

   i. Casing and screen joint type;

   j. Filter pack material (including size, placement method, and approximate volume);

   k. Composition and approximate volume of sealant material, and method of placement;

   l. surface seal design and construction;

   m. Well development procedures;

   n. Ground surface elevation (to within O.01')

   o. Top of casing elevation (to within 0.01'); and,

   p. Detailed drawing of the well, including dimensions.

6. The Permittee shall submit the logs and descriptions prepared pursuant to Item 5 above, as-built drawings, and location information for any new well(s) to the Department within thirty (30) days after completion of the well(s). Such a submission shall not be considered a modification of the Permit.