



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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September 27, 2017

Electronic Copy

Robert Shea
Sound Mattress and Felt Company
7424 Bridgeport Way, Suite 206
Lakewood, WA 98499-8134

Re: Review of March 1, 2017 Draft for Ecology Review Feasibility Study Report

- **Site Name:** Sound Mattress and Felt Company Site (Site)
- **Site Address:** 1940 East 11th Street, Tacoma, WA (Property)
- **Facility/Site No.:** 1232087
- **Cleanup Site ID No.:** 1615
- **VCP Project No.:** SW0857

Dear Mr. Shea:

The Washington State Department of Ecology (Ecology) has received the *Draft for Ecology Review Feasibility Study Report*, dated March 1, 2017 (the 2017 Draft FS), submitted by Pacific Crest Environmental, LLC (Pacific Crest; Consultant) on behalf of Sound Mattress and Felt Company (Sound Mattress). This letter provides a summary of that review and presents Ecology's evaluation of the activities, assessments, and proposed remedial strategies as presented in the 2017 Draft FS.

Description of the Site

The **Site** is defined by the nature and extent of impacts relating to the following contaminants of concern (COCs):

- The chlorinated volatile organic compounds (CVOCs) tetrachloroethylene (PCE), trichloroethylene (TCE), and related partial-breakdown products; and
- The metals cadmium, nickel, and zinc.

Portions of the former Sound Mattress and Felt Company property, located at 1940 East 11th Street in Tacoma, Washington (Pierce County Tax Parcel 2275200661) and the Shaub-Ellison property, located at 1132 Thorne Road (Pierce County Tax Parcel 6965000502), are collectively referred to as the Site (**Attachment 1**). The Sound Mattress and Felt and Shaub-Ellison parcels are currently owned by the Port of Tacoma (the Port), who purchased these properties in 2006 and 2007, respectively.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Additionally, the parcel(s) of real property associated with this Site are also located within the projected boundaries of the Tacoma Smelter Plume facility (# 62855481). At this time, we have no information that those parcel(s) are actually affected. This opinion does not apply to any contamination associated with the Tacoma Smelter Plume facility.

Basis for the Opinion

The opinions and evaluations presented herein are based on the information contained in the following documents:

1. Port of Tacoma letter to Ecology, dated May 31, 2017, regarding the *Draft for Ecology Review Feasibility Study Report (Dated March 1, 2017) Sound Mattress and Felt Site* (attached);
2. Pacific Crest Environmental, LLC. *Draft for Ecology Review Feasibility Study Report*, dated March 1, 2017 (2017 Draft FS);
3. Ecology letter to Robert Shea, dated November 8, 2010, regarding *Further Action at the Sound Mattress and Felt Company*, dated November 8, 2010; and
4. Pacific Crest Environmental, LLC. *Data Gap Investigation Report, Former Sound Mattress and Felt Property*, dated August 4, 2010 (2010 Data Gap Report).

The above documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

The opinions and evaluations presented herein are void if any of the information contained in those documents is materially false or misleading.

Analysis of Site Cleanup Activities

Ecology has reviewed the 2017 Draft FS, along with the additional documentation described above, and is presenting the following opinions, comments, and requests for additional information under authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW. These opinions, commentary, and requests are presented under the three following general categories: 1) characterization of the nature and extent of COCs beneath the Site, 2) establishment of Site cleanup standards, and 3) selection of cleanup actions proposed for implementation at the Site. These items are discussed in greater detail in the following sections.

1. Characterization of the Site.

- 1.1. Review of both the 2017 Draft FS and 2010 Data Gap Report reveal conflicting statements and presentations regarding potential CVOC-impacts to the Sitcum Waterway. For example, Figure 8 in the 2017 Draft FS (attached) depicts the “*estimated extent of groundwater with CVOC COC concentrations exceeding applicable Site Specific Cleanup Levels*” as extending into the Sitcum Waterway. Conversely, Section 2.3 of the 2017 Draft FS states that unspecified “*empirical data*” indicates that both PCE and TCE in groundwater do “*not currently and is unlikely in the future to ever ‘reach’ surface water*”. Additionally, Section 4.2 of the 2010 Data Gap Report included the statement that the “*groundwater sample from well MW-15 indicates concentrations of cis-1,2-DCE and VC in groundwater are likely impacting surface water in the Sitcum Waterway*” (Ecology’s emphasis). As indicated above, no specificity was provided regarding the “empirical data” referenced as supporting the conclusion that CVOCs have not impacted the Sitcum Waterway. Ecology concurs with the assessment provided in the 2010 Data Gap Report indicating that CVOCs have likely reached surface water within the Sitcum Waterway.

While Ecology acknowledges that deployment of passive diffusion bag (PDB) samplers during October of 2014 did not detect concentrations of CVOCs above their respective reporting limits in surface water within the Sitcum Waterway, an evaluation of sediment at the associated groundwater/surface-water interface has not been performed, thus representing a significant data gap in terms of Site characterization.

To resolve the uncertainties regarding whether CVOCs have reached the Sitcum Waterway and whether these constituents are present within the groundwater-surface water interface, please provide a proposal to further evaluate sediment within the Sitcum Waterway. Ecology acknowledges that the presence of rip-rap along the submerged margins of the Sitcum Waterway present challenging physical conditions, however, further evaluation of submerged media beneath this area of the Site is warranted. Ecology recommends evaluating the use of push-probe or angled-boring techniques to access sediment immediately beneath the rip-rap. The presence of seeps beneath the rip rap cover during low tidal stages should also be evaluated in this area of the Site. If observed, it is further recommended that seep samples be collected for CVOC analysis.

Additionally, as part of the evaluation regarding potential receptors of CVOCs emanating from the Site, Section 2.5 of the 2017 Draft FS states that “*upland ecological receptors are not considered plausible receptors under current or future land use*”, however, no explicit, corresponding discussion of downgradient ecological receptors (i.e. within the Sitcum Waterway), was presented in that document. Ecology is therefore requesting an evaluation of potential, downgradient ecological receptors relative to CVOCs emanating from the Site. Regarding “future land use” determinations for the Site, further discussion of Ecology’s concerns regarding this issue is presented in Section 2.1 of this document.

- 1.2. The 2017 Draft FS also asserts that cadmium and nickel are “*not likely to “reach” surface water in the future*” based on “*geochemical groundwater conditions*” present in the Site subsurface. Ecology was able to locate only a single groundwater data set related to dissolved-phase metals beneath the Site (September 2014). Further monitoring data will be needed to establish the seasonal nature and extent of these dissolved-phase metals in groundwater beneath the Site. Additionally, discussion of supporting evidence for the geochemical control of these metals was not provided in the 2017 Draft FS.

Ecology is, therefore, requesting that further evaluation of the seasonal nature and extent of dissolved-phase metals and associated, detailed discussion of groundwater redox conditions be provided to support the contention that such conditions are currently providing sufficient control on the fate and transport of metals beneath the Site. This discussion should also include an analysis regarding the potential for the proposed in-situ chemical reduction (ISCR) strategies to mobilize metals as a result of the manipulation of Site groundwater redox conditions.

- 1.3. Section 2.5 of the 2017 Draft FS indicates that “*volatilization of CVOCs to indoor air is considered only a potential future exposure pathway because there are no current buildings on Tax Parcel No. 2275200661, and since soil, soil vapor, and groundwater in the Upper Sand do not appear to be impacted in the northwestern portion of the Site.*”

Based on the results of previous Gore-Sorber soil-vapor sampling surveys (May 2006 and August 2009) and documented presence of CVOCs in indoor air collected from the former warehouse building prior to demolition, the shallow nature and ability of CVOC vapors to migrate into indoor air within on-Site structures has been demonstrated. Further, Section 2.3 of the 2017 Draft FS (pg. 2-8), noted that “*due to the presence of VC in groundwater, vapor intrusion is a potential source of VC in air.*”

While there are currently no structures on Tax Parcel No. 2275200661 at this time, additional buildings are currently in use in downgradient areas of the Site (i.e. Port of Tacoma Administration Building, located at 1 Sitcum Way; Port Administration Building). Ecology is expressing concerns over the lack of soil and soil-vapor data collected from the latter area of the Site. This concern was also expressed by the Port in their May 31, 2017 Port Letter. In light of the limited soil-assessment performed in the vicinity of the Port Administration Building and documented presence of vinyl chloride in deeper groundwater [i.e. borings B-6 (180 micrograms per liter [$\mu\text{g}/\text{l}$] and B-12 (3 $\mu\text{g}/\text{l}$)], further consideration should be given to the potential for vapor intrusion in the immediate vicinity of the Port Administration Building. Ecology is requesting additional evaluation in the immediate vicinity of the Port Administration Building to evaluate potential CVOC-impacts to shallow groundwater, soil, and soil-vapor beneath this down-gradient area of the Site.

2. Establishment of Cleanup Standards.

- 2.1. In light of the uncertainty regarding the Port's willingness to limit future use of the Site to industrial uses or accept placement of a restrictive covenant on the property (see May 31, 2017 Port Letter), Site-specific cleanup levels cannot be fully evaluated at this time. As such, indication from the current property owner (i.e. Port) regarding potential future uses of the Site should be obtained and documented before Ecology can evaluate the appropriate and applicable cleanup standards for the Site. Similarly, the application of institutional controls, such as the recording of an environmental covenant on a property, are predicated on the owner's acceptance of such legal mechanisms. Agreement from the Port regarding acceptance of such institutional controls at their properties should also be obtained and documented before Ecology can consider the applicability of such controls at the Site.
- 2.2. Section 2.3 of the 2017 Draft FS cites revisions to Site cleanup levels, specifically the elimination of surface-water cleanup values for those constituents that "*do not 'reach' surface water*", in terms of WAC 173-340-720 (6) (c) (i) (F). It should be noted that this chapter refers to cleanup levels established as part of a site-specific risk assessment and thereby only applicable following Ecology approval of a site-specific remedial action and associated Method B cleanup levels; therefore, the use of less stringent cleanup levels, based on the likelihood of whether Site COCs may reach surface-water, is inappropriate at this time.

3. Selection of Cleanup Action

As part of the 2017 Draft FS, four remedial alternatives were evaluated for implementation in addressing COCs beneath the Site. The following text presents Ecology's comments and requests for additional information and clarification regarding the remedial alternatives presented in the 2017 Draft FS.

- 3.1. Section 3.3.2 of the 2017 Draft FS (*Alternative 1- Institutional Controls and MNA*) asserts that "*attenuation of CVOC concentrations in groundwater as a result of reductive dechlorination is occurring*". Other than a brief statement regarding the presence of "*daughter products generated by reductive dechlorination*", the basis for this assessment is unclear. Further, Table 15 of the 2017 Draft FS states that "*decreasing concentrations of the COCs in groundwater due to reductive dechlorination are occurring...*" This assertion is also lacking supporting evidence or appropriate discussion of COC trends through time.

As proposed in the 2017 Draft FS, Alternative 1 does not meet the minimum requirements for a cleanup action as provided for in WAC 173-340-360 (2) (b) (ii), which calls for such actions to provide for a reasonable restoration timeframe. The 2017 Draft FS states that the estimated timeframe to achieve cleanup objectives using natural attenuation processes alone is between "*50 and 100 years*". The 2017 Draft FS appears to consider this a "reasonable" period despite noting it as both a "*considerable amount of time*" (Section 3.3.2) and "*an extended timeframe*" (Table 15), basing the assertion on a number of factors, including current health risks as well as current and future use of the Site and surrounding areas.

As previously noted, the current health risks posed to both downgradient ecological receptors within the Sitcum Waterway groundwater-surface water interface, as well as risks to human health associated with potential vapor intrusion by CVOCs in downgradient areas of the Site, has yet to be fully characterized. Also, as noted above, uncertainty regarding the Port's willingness to limit future use of the Site to industrial uses or accept placement of a restrictive covenant on the property further undermines the argument for a protracted remedial timeframe. Finally, it should also be noted that Ecology considers natural attenuation a remedial strategy best implemented alongside, or as a "polishing step" following the completion of, more active remedial methods.

3.2. Appendix A (Post Remedial Investigation Activities - Methods) provides a summary of recent remedial investigation and pilot testing activities conducted at the Site, including the following:

- Performance of underground vault testing and inspections (September 10, 2014);
- Performance of slug testing at select Site monitoring locations (September 11, 2014); and
- Pilot testing of enhanced anaerobic bioremediation (EAB) methods (September and December 2012).

Though general information regarding the scope of work of these activities was provided, a sufficient discussion of related results was absent from the 2017 Draft FS. Please note that Ecology does not consider tabulation of pilot testing results alone as a sufficient presentation of such results. Ecology is therefore requesting a sufficiently detailed analysis and discussion of the results of these previously performed remedial investigation and pilot testing activities.

3.3. According to the 2017 Draft FS, the selected remedial alternative for the Site consists of "*SVE to remediate the soil; ISCR to address COCs in groundwater; and MNA to address recalcitrant compounds.*" Because a "permanent" cleanup alternative was not provided as part of the 2017 Draft FS, Ecology is requesting that the following additional cleanup alternatives be considered:

- Targeted excavation of source-area soil, along with the ISCR and natural attenuation already proposed in the 2017 Draft FS;
- Targeted excavation of source-area soil, along with a "zoned" remedial approach using ISCR for "Area A" (i.e. source area) groundwater, ISCO for "Area B" (i.e. downgradient) groundwater, and natural attenuation as a polishing step.

These cleanup alternatives should be presented in a revised version of the 2017 Draft FS. Cleanup alternative should be presented with detailed and accurate cost estimates related to their implementation. A thorough and appropriate weighted ranking of this alternative should also be prepared and included.

Additionally, Section 3.3.5 of the 2017 Draft FS states that MNA would “*consist of performance monitoring to verify that conditions are conducive to reductive dechlorination and that naturally occurring bacteria are continuing to degrade the CVOCs...*” It should be noted that Ecology’s acceptance of an MNA approach will be based on additional detailed analyses, consistent with the guidance and lines of evidence noted below, and demonstrating the appropriateness of this remedial alternative for the Site. Such analyses should also include further evaluation regarding the potential presence of “*naturally occurring bacteria*” within, and assimilative capacity of, groundwater beneath the Site.

As presented in EPA’s *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water* (EPA/600/R-98/128; September 1998), three primary lines of evidence have been identified to support the documentation of natural attenuation of chlorinated solvents. These lines of evidence are: 1) stable to decreasing contaminant concentration trends over time at appropriate locations; 2) geochemical indicator parameter data consistent with ongoing attenuation through either abiotic (e.g. advection, dilution, dispersion, and adsorption) or biological (i.e. biodegradation) processes and associated ability for Site groundwater to facilitate such processes (i.e. assimilative capacity); and 3) the direct demonstration of biologically-mediated attenuation processes under existing Site conditions (i.e. microcosm studies or environmental molecular diagnostic and related molecular biological tools).

- 3.4. Because the selected remedial action (Alternative No. 4 – SVE and ISCR), as presented in the 2017 Draft FS, is intended to further promote reductive dechlorination of CVOCs through the manipulation of redox conditions in Site groundwater, Ecology is requesting a detailed discussion regarding the potential effects of such actions on metals beneath the Site, as previously noted. Please note that any pilot testing or implementation of ISCR at the Site will need to be done so concurrently with monitoring for geochemical groundwater parameters and dissolved metals to evaluate for mobilization of redox-sensitive constituents. Further, information on the presence of native sulfur should be evaluated to assess the Site’s capacity to immobilize/precipitate metal cations as metallic sulfides. If this capacity is deemed insufficient, consideration should be given to the use of a sulfur-amended reductant formulation.

As noted in Section 4.2 of the 2010 Data Gap Report states that “*the natural attenuation of the HVOC plume in groundwater at the Site is not proceeding beyond cis-1,2-DCE and VC, resulting in a buildup of these compounds in the downgradient portion of the plume.*” As such, future selection of an ISCR formulation should give preference to those compounds best suited to mitigate further formation of vinyl chloride.

Mr. Robert Shea
September 27, 2017
Page 8

Closing and Contact Information

If you have any questions about this transmittal, please contact me by phone at (360) 407-0276 or at Jeremy.Hughes@ecy.wa.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. Hughes", with a long horizontal flourish extending to the right.

Jeremy Hughes, L.G.
SWRO Toxics Cleanup Program
Washington State Department of Ecology

JJH: kb

Attachments:

1. May 31, 2017 letter from Port of Tacoma to Ecology RE: *Draft for Ecology Review Feasibility Study Report (Dated March 1, 2017) Sound Mattress and Felt Site – 1940 E. 11th Street (VCP SW0857)*
2. Figure 8 from March 1, 2017 Draft for Ecology Review Feasibility Study Report

By certified mail: [91 7199 9991 7037 0277 7637]

cc: Jason Jordan, Port of Tacoma
Robert Healy, Port of Tacoma
William Carroll, Pacific Crest Environmental, LLC
Nicholas M. Acklam, Ecology
Rebecca S. Lawson, Ecology



May 31, 2017

Jeremy Hughes
Department of Ecology Southwest Region
Toxics Cleanup
300 Desmond Drive
Olympia, WA 98503

**RE: Draft for Ecology Review Feasibility Study Report (Dated March 1, 2017)
Sound Mattress and Felt Site – 1940 E. 11th Street (VCP SW0857)**

Dear Mr. Hughes,

The Port of Tacoma (Port) is hereby requesting that Ecology reject the *Draft for Ecology Review Feasibility Study Report*(FS) dated March 1, 2017 that was prepared by Pacific Crest Environmental for Sound Mattress and Felt Company (Sound Mattress). The Port is the current owner of the 1940 E. 11th Street property and is also the owner of a downgradient property within the Site impacted by the historical releases of interest in the FS. Under the 2006 purchase and sale agreement for the property, Sound Mattress is responsible to perform cleanup of the Site. In the past, the Port was provided the opportunity to review and comment on Sound Mattress work products. This FS was prepared and submitted without Port input. This FS does not comply with MTCA content requirements (WAC 173-340-350(8)(c)) and none of the remedial alternatives considered comply with the minimum requirements for cleanup actions (WAC 173-340-360(2)). The Port has many concerns with the FS. For your consideration, we present a few examples to demonstrate how the FS does not comply with MTCA.

The FS Does Not Include Cleanup Alternatives that Protect Human Health and the Environment (WAC 173-340-350(c)(i)(A) and 173-340-360(2)(a)(i))

There are two current potential exposure pathways that are not adequately addressed in the FS. First, the risk of vapor intrusion on downgradient properties has not been fully evaluated. These properties include the East 11th Street right-of-way and the Port of Tacoma Administration Building. It states in Section 2.5 of the FS that this pathway is considered a “potential future exposure pathway...since soil, soil vapor, and groundwater in the Upper Sand do not appear to be impacted in the northwestern portion of the Site”. No vapor samples have been collected from either of these properties and only 2 direct push shallow groundwater samples have been collected from the vicinity of the Port Administration Building.

Second, it states in Section 2.5 of the FS that “Human ingestion of aquatic biota exposed to contaminants in surface water or in groundwater discharging to surface water is considered only a potential future exposure pathway”. This incorrect assertion is based on Puget Sound-wide fish and shellfish consumption advisories (for PCBs and mercury). Human consumption of seafood is a current potential exposure pathway since fishing for salmon and flatfish is allowed in the Sitcum Waterway, as is harvesting of Dungeness crab and spot prawns.

The FS Does Not Include Cleanup Alternatives that Comply with Cleanup Standards (WAC 173-340-360(2)(a)(ii))

The Port has two examples of how the cleanup alternatives in the FS do not comply with cleanup standards. First, it states in Section 2.5 of the FS that “PCE, TCE, and metals in groundwater do not “reach” the Sitcum Waterway”, a misapplication of the language in MTCA (WAC 173-340-720(6)(c)(i)(F)) that has a threshold of “not likely to reach”. The data are not definitive that PCE and TCE do not currently “reach” surface water, let alone being able to demonstrate that PCE and TCE are “not likely to reach” surface water. Furthermore, PCE and TCE are the parent compounds of vinyl chloride, a more toxic byproduct that is acknowledged to “reach” surface water.

Second, the FS proposes the use of Method C cleanup levels for soil, air, and groundwater protective of indoor air. The use of Method C requires institutional controls to be placed on properties within the Site. The Site includes the East 11th Street right-of-way and associated manholes and utility vaults. Current, and potential future, site use includes commercial office space, which is not consistent with the use of Method C cleanup levels. Further, the FS states that the Port is willing to limit future land use to industrial purposes, which is not the case. Any future landuse restrictions on the property would need to be fully vetted and would require final approval by Port Commission.

The FS does Not Include Cleanup Alternatives that Achieve Reasonable Restoration Time Frames.

The FS identifies restoration time frames for the remedial alternatives that are either unreasonable or overly optimistic. The restoration time frame identified for Alternative 1 is 50 to over 100 years, which is not reasonable and should result in Alternative 1 being eliminated from consideration. The restoration time frames for the remaining alternatives are not supported by technical analysis and appear unreasonably optimistic. In our opinion, none of the cleanup alternatives will achieve cleanup standards in a reasonable restoration time frame.

Beyond the above stated concerns that none of the remedial alternatives presented in the FS are capable of achieving the threshold criteria under MTCA, the Port has numerous concerns with other aspects of the FS, including:

- Remaining data gaps and data quality concerns, such as the representativeness of groundwater samples
- Mischaracterization of site hydrogeology
- Misrepresentation of previous site demolition and cleanup actions
- Incomplete COC list for which cleanup standards were developed
- Questionable cleanup technology screening and selection
- Lack of a permanent cleanup alternative, including omission of source area removal (Former Plating Area) from all cleanup alternatives
- Inadequate cleanup alternatives evaluation, such as poorly documented cost estimates and improperly developed and applied remediation levels

May 31, 2017

Draft for Ecology Review Feasibility Study Report (Dated March 1, 2017) – Sound Mattress and
Felt Site – 1940 E. 11th Street (VCP SW0857)

Page 3

The Port would be happy to discuss any questions you have regarding this letter or provide any further detail regarding our comments. Please feel free to contact me at 253-428-8643.

Sincerely,

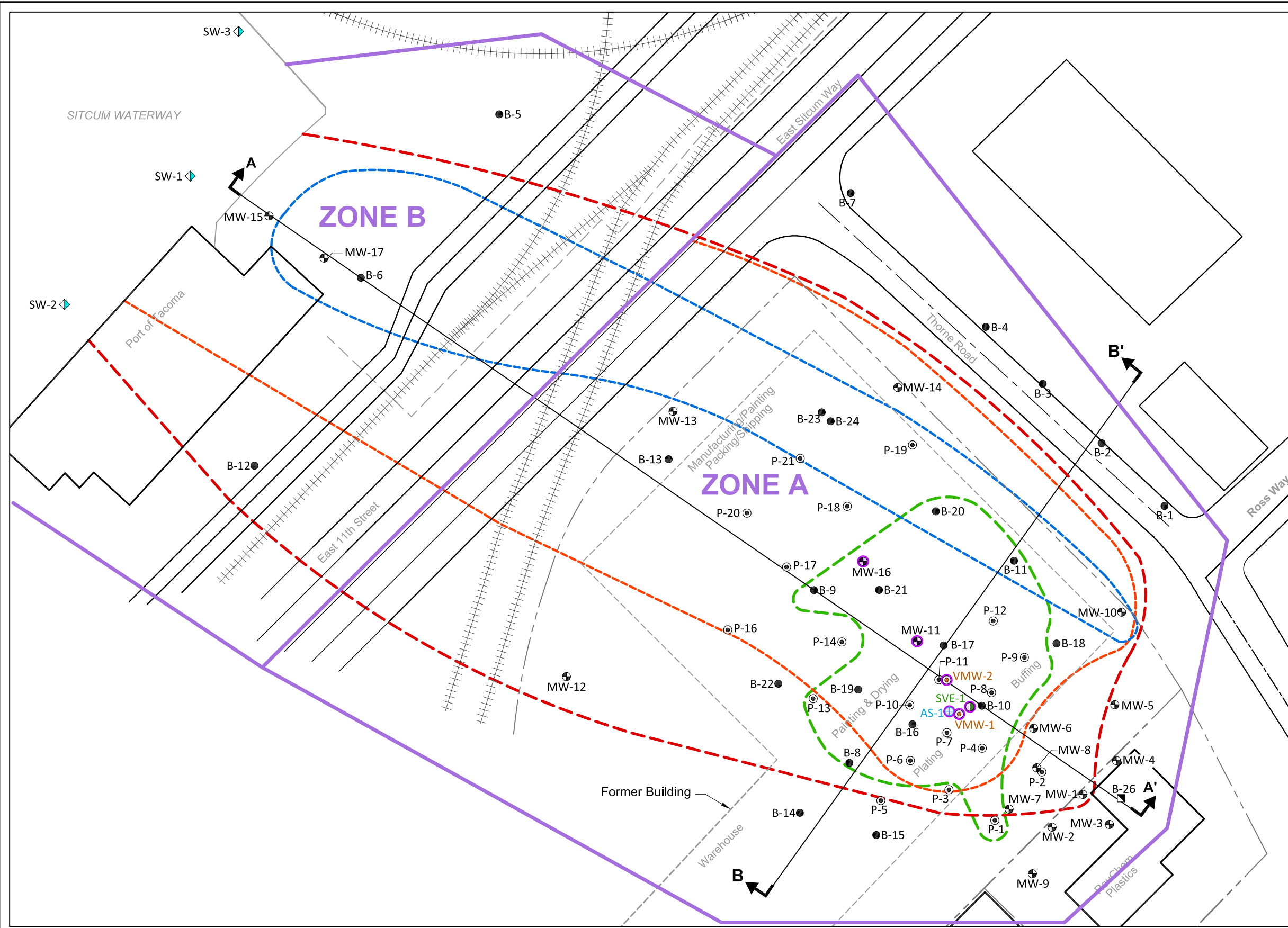
PORT OF TACOMA

A handwritten signature in cursive script that reads "Robert Healy". The signature is written in black ink and is positioned below the typed name and title.

Robert Healy
Senior Environmental Manager

cc: Nicolas Aklam – Ecology
Jason Jordan – Port of Tacoma

2/28/2017 110-001-069.dwg FIG 8 Site Extent



Legend

- MW-1 Groundwater Monitoring Well
- Groundwater Monitoring Well (D)
- AS-1 Air Sparging Well (D)
- SVE-1 Soil Vapor Extraction Well (D)
- VMW-1 Vapor Monitoring Well (D)
- P-1 Soil Boring (Pacific Crest, 2014)
- B-1 Soil Boring
- SW-1 Surface Water Sample Location (Pacific Crest, 2014)
- D decommissioned
- Estimated extent of groundwater with CVOC COC concentrations exceeding applicable Site Specific Cleanup Levels
- Estimated extent of unsaturated soil with CVOC COC concentrations exceeding applicable Site Specific Cleanup Levels
- VC Zone A RL = 1.3 µg/L
- VC Zone B RL = 92.3 µg/L
- VC vinyl chloride
- RL remediation level
- Road
- Building
- Property Boundary
- Pre-1965 Operations
- Railroad Tracks
- Cross Section Location and Designation

0 80
 Approximate Scale in Feet



Former Sound Mattress & Felt Company
 1940 East 11th Street
 Tacoma, Washington
 PN: 110-001

Figure 8
 Site Extent